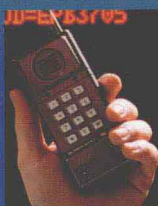
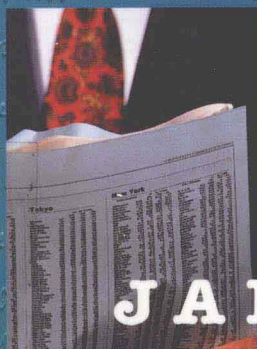


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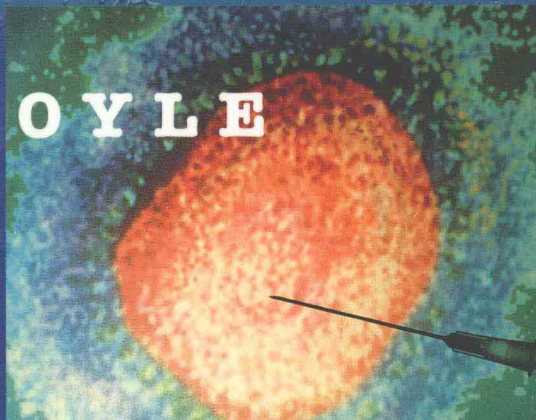


LAW AND THE

**CONSTRUCTION OF
THE INFORMATION
SOCIETY**



JAMES BOYLE



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Shamans, Software, and Spleens

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Harvard University Press
Cambridge, Massachusetts
London, England

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Printed in the United States of America

This book has been digitally reprinted. The content
remains identical to that of previous printings.

First Harvard University Press paperback edition, 1997

Library of Congress Cataloging-in-Publication Data

Boyles, James.

Shamans, software, and spleens : law and the construction
of the information society / James Boyle.

p. cm.

Includes bibliographical references and index.

ISBN 0-674-80522-4 (cloth)

ISBN 0-674-80523-2 (pbk.)

1. Intellectual property. 2. Copyright—Moral rights.
3. Authors—Legal status, laws, etc. 4. Information society.

I. Title.

K1401.B69 1996

302.2—dc20 95-42433

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Preface

For the last twenty years we have been told that we are shifting from the industrial to the information economy. Sometimes the phrase used is “information society,” sometimes the more dynamic “information revolution.” Most people take these vague expressions to refer to an electronic (and nerdy) modernity—something to do with computers, the Internet, and possibly Vice President Gore. Those who read the science pages might also mention the manipulation of genetic information. With or without Vice President Gore or the human genome, the information revolution is understood as primarily a *technical* one. Most journalistic coverage of the subject limits itself to breathless accounts of the newest technological wonder, with occasional brief forays into futurism. The characteristic quality of these techno-futures is that social relationships, wealth distribution, and belief systems all stay pretty much the same. Only the gadgets change. But this is just bad science fiction. Right now, behind the visible information revolution in technology and economy, a significant but unexamined process of rhetorical and *interpretive* construction is going on. This process of construction produces justifications, ideologies, and property regimes rather than mainframes, software, or gene splices. Yet it will shape our world as thoroughly as any technical change. To understand this process, one needs more than a

modem or a multimedia kit; one needs a social theory of the information society. This book tries to provide one.

Consciously and unconsciously, we are already developing the language of entitlement for a world in which information—genetic, electronic, proprietary—is one of the main sources and forms of wealth. We think about issues of entitlement using the vocabularies of classical liberalism, market, family, and property rights. (“Because it’s my right.” “Because it’s efficient.” “Because it protects family values.” “Because it’s *mine*.”) Each of those ways of thinking makes assumptions about the relevance of information—whether to the well-functioning state, the efficient market, or the realm of personal privacy and individual ownership. How might those assumptions influence and in turn be changed by an information economy? If there are no fresh starts in history, if the future is made from fragments of the past, then the discourse of entitlement in an information society will draw on images of information that were produced in a society where information bore a very different relationship to technology, to power, to wealth, a different relationship even to our own bodies. To put it another way, if history is collage, then we need to look at the available pictures, scissors, and paste. That is what I have tried to do here, using law and the surrounding discourses on which legal analysis draws, from aesthetics to economics, as my raw material.

Although law is my starting place, I have tried to go beyond the style of legal writing best described as Jetson’s Jurisprudence—a listing of technological marvels in the hope they will make a related set of legal rules alluringly futuristic by association. My main focus is on the way our society conceives of information, and on the paradoxical results that conception may entail. To use the jargon, this is an analysis of the social construction of reality. Unlike many such analyses, however, it has a practical intent. Thus I offer not only analysis and structure, but a conclusion—one much qualified in the pages that follow, but a conclusion nonetheless.

The conclusion is that—for a set of complicated reasons traced out in the pages that follow—we are driven to confer property rights in information on those who come closest to the image of the romantic author, those whose contributions to information production are most easily seen as original and transformative. I argue that this is a bad thing for reasons of both efficiency and justice; it leads us to have *too many* intellectual property rights, to confer them on the *wrong*

people, and dramatically to undervalue the interests of both the *sources of* and the *audiences for* the information we commodify. If I am right, this unconscious use of the author paradigm has wide-ranging negative effects, with costs in areas ranging from biodiversity and the production of new drugs to the shape of the international economy and the structure of the computer industry. As one Orwellian case study here reveals, it may even threaten our control over the genetic information in our own bodies.

Why should we believe that the idea of authorship would assume more importance in an information economy, let alone that it might produce the negative consequences I describe here? The argument is a complicated one with a simple conclusion. In law and ideology as in other more prosaic realms, things that seem to “work” tend to be used. Information presents special problems; the idea of authorship seems (wrongly) to solve or at least defer those problems.¹

But what does it mean to say that information presents special problems? I do not mean that the regulation, ownership, and control of information presents special *technical* or *functional* difficulties, though that is sometimes true. The “problems” I refer to are problems in the realm of ideas, paradoxes, or tensions in our assumptions, brought to the surface when the subject is information. To put it more specifically, as a form of wealth, a focus of production, and a conception of value, information is a problematic category within our most basic ways of thinking about markets, property, politics, and self-definition.

In market terms, information has significant “public good” qualities; it is often expensive to create or generate but cheap to copy. Economic theory tells us that “public goods” will be underproduced because there will be too little incentive to create them. Suppose I spend two years and fifty thousand dollars creating a software program that can be copied for the price of a diskette. Alternatively, to use a nonelectronic example, suppose I spend the same time and money testing a thousand substances to find out which are valuable drugs—drugs that someone else can produce for pennies once the information about their properties is known. I sell one copy of my program, one dose of my drug, and then find the market has disappeared. Who would spend the time to write the program or test the drug in the first place? The obvious answer to these problems is the creation of “intellectual” property rights. Give inventors, scientists,

programmers, and genetic engineers some kind of legal monopoly—a protection against copying. But information also has significant “efficiency” qualities; the more costly and restricted the access to information, the more inefficient the market, scientific research community, computer industry, or what have you. Is there a balance between incentive and efficiency? If so, how do we know where to strike it?

Information is problematic in other ways. Liberal political theory sees free access to and transmission of information as the lifeblood of the public sphere. The First Amendment is only the most famous of the many incarnations of this ideal. It is already hard—if not impossible—for us to square this tradition with two others: our strong idea of intellectual property rights on the one hand, and our vision of individual privacy on the other. In a world where “information” was the dominant form of wealth, the problem could only be magnified. I could go on but the basic point is simple. Information presents special problems and the discourse of authorship *seems* to solve those problems. (Actually, it merely assumes them away in a particularly unfortunate manner.) The discourse of authorship premises a grant of a limited monopoly (most familiarly, an intellectual property right) on a transformative originality more often assumed than proved. The author stands between the public and private realms, giving new ideas to the society at large and being granted in return a limited right of private property in the artifact he or she has created—or at least assembled from the parts provided by our common store of ideas, language, and genre. Precisely because of the way it couples romantic appeal and *apparent* efficacy, I would argue that this way of thinking—with its corresponding suppression of the claims of “sources” and “audience”—will be the default mode for dealing with issues of ownership and control of information.

The importance of the structure of thought I outline here goes beyond the negative effects of any particular rule or set of rules. The notion of the author does for information, for the knowledge-value revolution, what the Divine Right of Kings did for the monarchy, what classical economists’ notion of the justice of “natural” unregulated markets did for the economic relations of the industrial revolution. This then is the story of the *imperial author* and the role that *the ideology of authorship* might play in an information society.

The author-vision conjures up a new political economy of wealth supported, and reflexively constituted, by a particular ideology of

entitlement. At the bottom of the pyramid would be those whose lives, bodies, and natural environments provide the raw materials, or those who themselves are the ultimate “audience,” for the products of an information economy. At the top of the pyramid of entitlement claims—at least in theory—would be those who gather and shape information and information products. More important, perhaps, is the fact that the bureaucratic and corporate actors who *employ* the manipulators of information can justify their own, derivative intellectual property rights through the rhetoric of individualism and original genius. In fact, a striking feature of the language of romantic authorship is the way it is used to support sweeping intellectual property rights for large corporate entities. Sony, Pfizer, and Microsoft tend to lack the appeal of Byron and Alexander Fleming.

Actual “authors”—writers, inventors, genetic and software engineers—often lose out under the kind of regime I describe here. It is not merely that they find their work belongs to their employers. There are justifications for such a result, albeit ones that are currently invoked too widely. The true irony comes when we find that large companies can use the idea of the independent entrepreneurial creator to justify intellectual property rights *so* expansive that they make it much harder for future independent creators actually to create. The expansion of intellectual property inhibits the very process on which the expansionists premise their arguments. This irony has not gone entirely unnoticed. For example, recent years have seen the development of a fascinating set of protests in the software industry. People who owe their fame, and in some cases their fortunes, to their status as innovators—Mitch Kapor, creator of Lotus 1-2-3, Richard Stallman, the creator of GNU Emacs—have begun to argue that contemporary intellectual property rights are so broad as to *slow* the rate of innovation.²

The structure of thought I describe here does not make an equivalent social pyramid inevitable, anything but. Nor does it mean that struggling authors, inventors, and computer programmers are going to reap the rewards of the information society. How should we understand it then?

I am not imagining a conspiracy of the software designers or the genetic engineers; a real-life revenge of the nerds. Quite the contrary. My claim is that—for a number of reasons—the author vision exercises a strange fascination over our conceptions of the commodi-

fication of information, so that it is hard *even to imagine an alternative system*. There is nothing inevitable in all of this, however. No World Spirit stands ready to chide us if we stray from the path I sketch here. No executive committee of the ruling class or unbreakable consortium of multinationals dictates such a result. For one thing, the author paradigm—when played out in the way I describe here—produces effects that are not only unjust, but unprofitable in the long term. As the Bellagio Declaration points out, “At present, drugs drawn from the rain forest or from indigenous pharmacopeias do not economically support the protection of either. Traditional patterns and dances can be taken without permission or recompense, perhaps diminishing the chance that the culture that originated them will survive.”³ Even a conventional economic analysis supports the idea that it is in the interest of those who are exploiting a “commons” to make sure that the commons continues to exist. The author vision blinds us to the importance of the commons—to the importance of the raw material from which information products are constructed. But precisely because of that blindness, there is some space for intervention by scholars, citizens, and activists of various stripes—before the information society’s assumptions about entitlement rigidify in an inegalitarian and ultimately self-defeating pattern.

When I began this project, I found I was working largely without maps. There have been few attempts to produce a critical social theory of the information society. Most newspaper coverage has concentrated on a few narrow issues, generally defined by the technology to which they relate—the information superhighway, computer privacy, the Clipper chip. This is useful, but it doesn’t get us far. An analogy might help to illustrate the point. Imagine a group of feudal serfs gathered around a newly invented power loom, wondering whether the lord of the manor will now increase the tithes. With the easy arrogance of hindsight, we find the picture ridiculous. How silly it would be to assume that all social arrangements, all hierarchies, all ideologies of entitlement, will remain exactly as they are and only the technology of production will change! Yet this is exactly the assumption made by most discussions of the *information society*.

There are exceptions, of course. Books have proclaimed the dangers of “futureshock” or—more interestingly—have speculated about the “knowledge-value revolution”—the tendency for an increasing proportion of a product’s value to be made up of its information content.⁴

Anne Wells Branscomb's book *Who Owns Information?* published in 1994, provides excellent case studies that illustrate the conflicting goals of information policy, and the absence of any holistic perspective.⁵ Naysayers have argued persuasively that the fetishization of the computer may drive us to social arrangements, educational theories, and workplace experiences that are neither humane nor desirable, neither efficient nor equitable. At least one excellent book has been written about electronic civil liberties and the demonization of the hacker.⁶ These insights are valuable, but much of the literature alternates between a meliorist historicism and a dark but crude economic determinism in which "the big companies" always get the results they want. One is left wanting more—more explanations of exactly whose ox is gored and how the goring is justified, more discussion of the complex reciprocal relationship between our current ideas of politics, justice, efficiency, and entitlement and the variegated set of economic and technological changes that are collectively referred to as the information society.

In my own field—law—there is surprisingly little writing on the impact of "the information society," and most of what there is manages to be both vague and optimistic.⁷ More information is, by definition, good. What threats could an information society hold? Occasional articles discuss the relevance of the Fourth Amendment to electronic mail, the remedies for the unauthorized use of someone's genetic information, the trade effects produced by the intellectual property provisions of the GATT (General Agreement on Tariffs and Trade). But the key to these articles is that information issues are considered in isolation, each ingeniously stretched or trimmed to fit the Procrustean bed of the nearest legal category. One looks in vain for a general discussion of how the information economy will affect law, and of how the assumptions embedded in law will affect the information economy.

By and large, the self-consciously academic literature of postmodern theory and cultural studies offers even less than the popular or legal literature.⁸ It is hard to understand why, given the philosophical climate of postmodernity. If postmodernism has a material base—a social reality on which it reflects, a set of shared experiences that makes it seem apt and convincing—then that reality is the world of electronic media. Postmodern theories are full of references to computers, hypertext, channel surfing, and the processed image. (And

Madonna, of course.) Postmodernists are also fond of references to the knowledge/power nexus, and it is hard to think of a more promising starting place for the analysis of an information age. Thus, for reasons of both content and form, one would expect postmodern philosophy to have sophisticated and interesting things to say about the ways in which a new political economy of information power is constructed, conceived, and defended.

Sadly, what one finds instead are rather uninformed sweeping statements about American popular culture made by (French) academics whose main source of information seems to be each other's books; there is also an occasional snippet from the Pay TV in the airport hotel or the 1950 B movies that are badly dubbed back home on TeleFrance 1.

In any event, such was my perception of the available work on the subject. If this book strikes some as altogether too analytic and programmatic for the postmodern age it is because the paucity of the critical literature denied me the luxury of constant irony, a tone that flourishes only in conditions of overabundance—theoretical as well as material. I would also add in my own defense that the following pages are entirely free from references to Madonna. Surely this ought to be worth something.

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The Information Society

The idea that we are moving toward an “information age” or an “information society” has now passed from iconoclasm through orthodoxy to cliché. Yet the idea is a vague one, even for a cliché, capable of conjuring up radically dissimilar images in different minds. For some, the information age simply means a shift in emphasis in the global economy, a shift from tangible to intangible goods, from things to ideas, from tractors to software. Others imagine that the information age will be the age of direct democracy, as technology gives a global citizenry both the knowledge and the means of control necessary to decide the daily issues of the polity. Ross Perot’s promise of the electronic town meeting is only the most recent of such modern-government reveries. For still others, the information age conjures up a science fiction, “cyberpunk,” dystopia—a world dominated by large corporations trading equally in genetic and electronic information, a culture in which genetic engineering will become a matter of fashion rather than science, where instead of fake Rolexes or Vuitton bags, the underworld will offer cheap copies of the latest computer program or the trendiest gene-splice technique.

Whatever the information age will ultimately look like, some parts of it are already with us. It is not simply that the market for computers and software is a huge one or that the manipulation of genetic information is a fast-growing area of the economy. It is not even the shift

of so many skilled workers into jobs that collect, refine, manipulate, package, and deploy *data*, rather than more tangible things. The *idea* of information has colonized new areas of human activity. Aerodynamics, weather prediction, and traffic patterns have been reconceptualized as problems for information technology, but also as problems to be thought about through the metaphors offered by computer models. Popular magazines write beautifully illustrated articles about the delights of chaos theory, full of mystifying anecdotes about dripping taps and butterfly effects. The scientists interviewed show uncharacteristic enthusiasm for their discoveries. They talk of “patterned randomness” and “familiar haphazard arrangements.” Behind the oxymorons, one can sense the missionary zeal of a new paradigm, the excitement of reimagining everything from the performance of the stock market to the behavior of gas-turbine blades as a series of data-packets, clustered in some elegant fractal geometry.

Academics are very fond of talking about the collapse of disciplinary boundaries, a process they seem to imagine as principally involving the creation of a whole new group of readers for *their* work. In information theory right now, one can watch the disciplinary boundaries evaporate in real time. One of my favorite Internet discussion groups—the Biological Information Theory and Chowder Society—spends much of its time discussing Maxwell’s demon (which used to be thought of as a thermodynamics thought experiment), the possibility of reversible computing (which used only to concern those who fantasized about nanotechnology), and Shannon’s mathematical models of information transmission (originally set out in the context of radio communication). Yet most of the participants are not mathematicians, electronic engineers, physicists, or radio buffs. They are biologists attempting to understand genetic information—combining other disciplines for useful ways of thinking about information transmission, compression, and entropy—and creating a new discipline called bio-informatics in the process.

Information is not merely an organizing concept for the technologies and disciplines of the twenty-first century. It is a central feature of the international economy. Indeed, the protection of information “value-added” in products is one of the key elements in the foreign policy of the developed world. Intellectual property—which stretches beyond “information” conventionally defined—has become a major area of international concern. This is particularly, and

ironically, true for the United States, which used to be the biggest pirate of them all.¹ It has been claimed that over one-quarter of the United States' total exports rely on intellectual property rights. The International Trade Commission claims that foreign piracy of U.S. intellectual property costs \$40 to \$60 *billion* per year. The music industry claims to lose \$2.45 billion worldwide. The software industry claims that it lost \$15.2 billion in 1994.²

The interesting thing about this supposed wave of piracy is not that these huge numbers are absolutely accurate. Indeed, the assumptions on which they are based turn out to be extremely problematic. The interesting thing is the transformation of social and technological conditions that would cause a wave of piracy to exist at all. Why is the software industry losing billions of dollars? Because both the facilities for copying and the market for using information technology have increased in quantum leaps over the last ten years. As the marginal cost of both hardware and copying drops, the "information content" assumes a greater proportion of the product's value. This is as true of the \$100 million invested in developing computer architecture or source codes that can be copied for pennies as it is of the \$100 million spent in genetically engineering a strain of wheat that grows its own "copies." Unacknowledged by most students of international relations, the "sanctity of intellectual property" has come to play an iconic role in the foreign policy of the developed world similar to the role played by "freedom of the seas," or "prompt, adequate, and effective compensation for expropriation," in an earlier age.

The transformation of information technology has implications in areas closer to home than intellectual property protection and international trade. Another side of the transformation can even be seen in the most mundane domestic situations. Why do supermarkets offer their preferred customers discounts just for running an electronic card through a scanner on their way past the checkout? Because technology now permits the store to keep a precise record of those customers' purchases and to correlate it with demographic information about them. Advertisers will soon know everything from our individual brand-name preferences for toilet paper to the odds that a middle-class family on a particular street will buy Fig Newtons on a Wednesday. If you are what you eat, then manufacturers will soon have the information technology to know exactly what you are. This

commercially driven intrusion has not reached Orwellian proportions—at least, not yet. Nevertheless, information technology has the capacity, if not to *end* privacy, then to redefine what we mean by the term. There has been a quantum leap in the ability of both the state and the market to gather, process, and retrieve information about individuals. The best way to understand the change might be to see it as a shift from administration by *actuarial statistics* to administration by *personal biography*. As you apply for your mortgage or file your income taxes, it is not reassuring to imagine the relevant decision makers noting the fact that your consumption of wine is up this year, that you bought two books on depression, or that the videos you rented were violent and escapist. Is freedom inversely related to the efficiency of the available means of surveillance? If so, we have much to fear.³

Finally, we should beware of the tendency to equate information with computers, software, and electronics. Information does not need to be stored in ones and zeroes, and those who collect and manipulate information are not confined to the world of computers (though they often use computers to do their work). The most obvious example is the biotech industry. Why are the drug and chemical companies pushing so hard for intellectual property protection for genetic material, or living organisms? Because they are on, or over, the brink of mass-market production based on the manipulation of genetic information.

We have already reached the point where genetic information is thought of primarily *as* information. We look at the informational message—the sequence of As, Gs, Cs, and Ts—not the biological medium.⁴ The human genome project is simply a large-scale exercise in cryptography. Like archaeologists with the Rosetta Stone, we have broken the cipher, and can now deal with DNA as a *language to be spoken*, not an *object to be contemplated*. We have not yet been forced to think about the implications of this transformation; only science fiction writers or professional moralists worry about equal rights for clones or ponder the morality of the use by computer companies of biological “wetware” based on human brain tissue. Admittedly, Harvard has patented a mouse with some human genes for use in cancer research. You may be surprised to learn that we already have intellectual property-holding “authors” of living animals, even animals that have had human genetic information spliced into their basic ge-

netic code. Still, the most wrenching dilemmas of transgenic animal species—part human, part chimp for example—are some years down the road. As yet, no genetically engineered lumpenproletariat uses the language of the Thirteenth Amendment to plead for citizenship, but in the judgment of many, that is only a matter of time. It is the ultimate mark of the information society that we will soon have “authors” of living, sapient beings, authors who will presumably assert that they are not slavemasters but creators, and entitled to intellectual property rights as such.

For some, these ideas are too futuristic to be taken seriously. In a truly remarkable example of deliberate self-improvement, contemporary intellectuals have convinced themselves that futurism is adolescent (and anyway uncool). Whether or not such bioethical dilemmas will arise, there is something so *strange* in the idea of genetic engineering that it is more comfortable to consign it to the realm of fiction, to worry about the problem only when it is actually presented so squarely as to be undeniable. To be fair, this may not be quite as silly a strategy as it seems. Predictions of technological progress often miss the key twist that transforms the problem. My point is that, even without these futuristic trappings, enough of the information society is *already* with us for it to be irresponsible not to think about it as a whole.

Information Humbug?

There are two powerful objections to this brief account of the information age. The first is that of historical redundancy. Haven't we always lived in an information society? The argument goes something like this: Rome conquered most of the world not because of its legions and its onagers, but because of its superior information technology (the techniques of writing), information class (the scribes of the bureaucracy), information storage (libraries), and information-retrieval mechanisms. In their time, papyrus, the quill pen, double-entry bookkeeping, and the printing press were all revolutions in “information technology.” Thus, says the skeptic, either there is no such thing as an information society or we have always had one. The innovators of yesteryear deserve their place in today's pantheon of the pioneers of the information society. Gutenberg equals Turing. Caxton equals Crick and Watson. The examples could be multiplied,