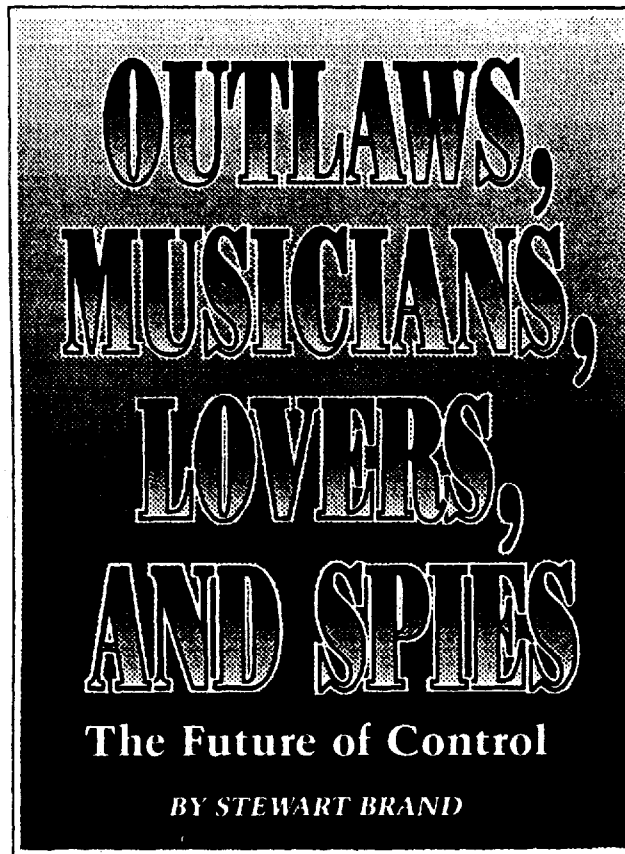


*This is not an article,  
but an artifact. It is a  
book proposal I wrote  
in October 1989, for  
a book which will not  
be written, at least  
by me. Though the  
proposal won a nice  
advance from a New  
York publisher, I  
chickened out of the  
project, for reasons  
given shortly.*

—SB



## THEME

# W

HY DOES NO ONE

worry about our children's love of computers? Parents who usually reject invasive novelty in their kids' education are embracing computers in the schools and at home. Evidently they know that fluency in new forms of communications is a shortcut to power, that communication is control.

Corporations know the same thing. Going into the 1990s they are scrambling to comprehend the structure of the emerging information environment and take early competitive positions in it, knowing that whoever comprehends first and becomes fluent first shapes the environment for everyone else.

But a peculiarity of the new information environment is that it's seldom corporations who become fluent first. The tools of communication innovation are too widespread. Increasingly the real exploration is *precommercial* — by invisible elites such as librarians, disabled people, programmers, black marketers, outlaws, musicians, lovers, spies.

Specialized subcultures like these grab new media and run with them, innovating headlong in the directions of their own desires rather than in the approved directions of commercial development. They're assisted by the continuing turbulence of the information economy. As the whole underlying technology of communications continues to advance and replace itself, infrastructure and markets refuse to settle down, and slow-moving large organizations remain at a disadvantage. The new information environment is a seething texture of constant surprise.

To corporate audiences I've been saying: "Information wants to be free (because of the new ease of copying and reshaping and casual distribution), and information wants to be expensive (it's the prime economic event in an information age) . . . and technology is steadily making the tension worse. If you cling blindly to the expensive part of the paradox, you miss all the action going on in the free part. The pressure of the paradox forces information to explore constantly. Smart inventors and marketers quietly follow."

This book is about how information explores, and how that changes the nature of societal control. The emerging communications process is simultaneously self-subversive and self-organizing, deeply at odds with our cultural and economic habits.

You could see the disparities at a meeting of AT&T strategic planners last winter. Rock musician Peter Gabriel was attending as a member of the Global Business Network, a research and consulting group I work with which had organized the gathering. One of the AT&T executives interested in intellectual property asked Gabriel, "What do you think of piracy?" Gabriel said softly, "I think of piracy as advertising."

Gabriel explained that piracy is an inducement for him to tour the world, where there is a huge paying audience for his concerts, thanks to the global black-market cassette traffic in his music. When he tours to places like southern Africa, he encounters local musicians and music which he soon incorporates into his own work. He and other stars like Paul Simon are able to bring a global audience to artists who before had only a regional following. Thus came "World Beat" music, which is binding the hordes of global teenagers into a single overlapping culture oblivious of national governments. The multi-billion-dollar world music business is being reshaped by its customers, in the face of strenuous resistance by the distributors but with the quietly subversive collaboration of the musicians.

Further disparities. At the same meeting I noticed that the AT&T people referred to their customers as "consumers" or "end-users." It seemed an odd way to think about information, so I mentioned that at the WELL, the computer teleconference system which I co-founded, we think of information customers as *producers*. They create nearly all the information on the WELL, and they actively shape the system. The more we let them do that, the more profitable our system becomes. By contrast, treating information customers strictly as consumers is leading the mass-market videotex system called Prodigy toward failure, despite (or because of) the \$700 million sunk into it so far by IBM and Sears.

It's the difference between market research and customer research. In market research you estimate how many modems are in American homes and imagine what people might like to do with them. In customer research you examine what people actually do with rudimentary new media, and then you figure out how to improve the service and charge for it. Watch who grabs and re-directs new devices like cellular phones, backyard satellite dishes, 976 numbers, e-mail, video cassettes, radio scanners, computer games, breath-driven keyboards, cyberspace tools, or the MIDI

interface that makes any computer a sophisticated musical instrument. Watch where fanaticism leads.

What people actually do with new media is fall in love — with the new medium and with fellow enthusiasts. Like musicians they revel in complex new fluencies, delight in composing new works, and become artists, creating beyond themselves. As the rest of the culture lags behind, they find themselves ahead of the laws, limited only by what's possible rather than what's decreed. Like spies, they traffic in secrets, explore the hidden real structure of society, and influence events from behind the scenes. Often their unruly inventions become civilization's tools . . .

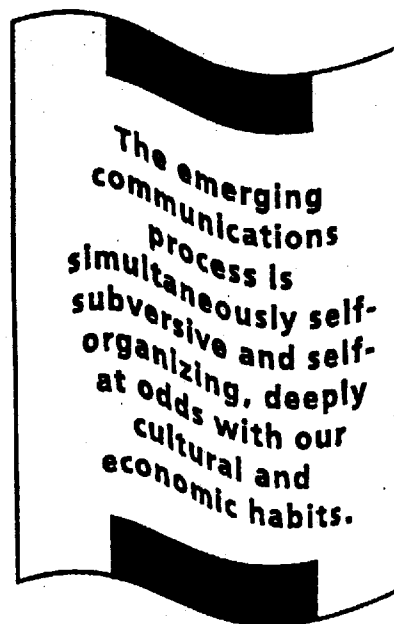
- "Talking Books" for the blind from the Library of Congress led the way to the huge audio book market of today. Some devices that now reach directly into the nervous systems of the disabled will eventually reach into all of us.

- The origin of computers was in espionage — Alan Turing creating a machine to decrypt Nazi military signals — and signals intelligence now is exploring the subtle and vast uses of massive parallel processing to analyze and decrypt the very fabric of global communications.

- Sex unabashed and uncurtailed made France's Minitel system into the world's leading videotex success. Sex likewise is bound to toy with every new form of broadband communications — you can't catch AIDS through a fiberoptic cable. Systems that permit such traffic will grow and adapt faster than ones that don't.

One way to understand the new information environment is to watch for strategies that work in it. In recent years music distributors (*not* musicians) have fought a fierce holding action against the coming of DAT — Digital Audio Tape. They complain that of the annual \$9 billion of recorded music in the US, only \$4 billion is actually sold. The rest is home-copied — "stolen," says the industry — and DAT will make the situation worse, they say.

A gent named Charles Garvin took the trouble to study what home-copiers of music actually do. ►



What they do most of the time is recombine commercial material to suit themselves, fill whole 90-minute cassettes, and improve fidelity. So he founded a distribution company called Personics to improve on what the home-copiers were doing. The service is now rolling out in music stores nationwide. You go up to a "Listening Post," listen in headphones to any of 15,000 recorded cuts, combine them as you like, and pay at the counter. It is a blazing success. Garvin says, "Up to this point the industry's response to home taping has been,

to outlaw, tax, and otherwise legislatively discourage it. These efforts have dismally failed. Personics' approach is, instead, to treat the phenomenon as evidence of massive latent demand; to treat it not as an illegitimate product to be outlawed, but as a service to be provided."

Piracy as market research; customers as album producers. Garvin watched where the music was exploring and quietly followed.

A similar strategy is evident in the coming of cyberspace — head-mounted display units giving the user active immersion in computerized "virtual reality." For years the military has been ex-

perimenting with multi-million-dollar helmet displays for fighter pilots. Mike McGreevy at NASA didn't have that kind of budget, so he looked for a low road, making a cyberspace rig out of off-the-shelf components, including some from Radio Shack. He widely publicized the work, published the details of his procedures, and waited for consumer electronics firms to crowd his door, which they did. As a result, the first commercial cyberspace toolkits and games will be available to the general public by next year, instead of 10 or 20 years later, coming from makers as diverse as Nintendo/Mattel and Autodesk. Amateurs will craft new worlds which will demand ever more capable cyberspace tools. We are entering a decade of designer realities.

In the electronic information economy, hierarchies are at a disadvantage that has nothing to do with politics. "Electronic Markets and Electronic Hierarchies" is the title of a landmark 1987 paper

by Thomas Malone and colleagues which says, in summary, "By reducing the costs of coordination, information technology will lead to an overall shift toward proportionately more use of markets — rather than hierarchies — to coordinate economic activity." Computer-enhanced communication makes the economy both more locally lateral and more global, both to the detriment of hierarchies such as traditional businesses and nations. Inventive guerillas flourish in such times.

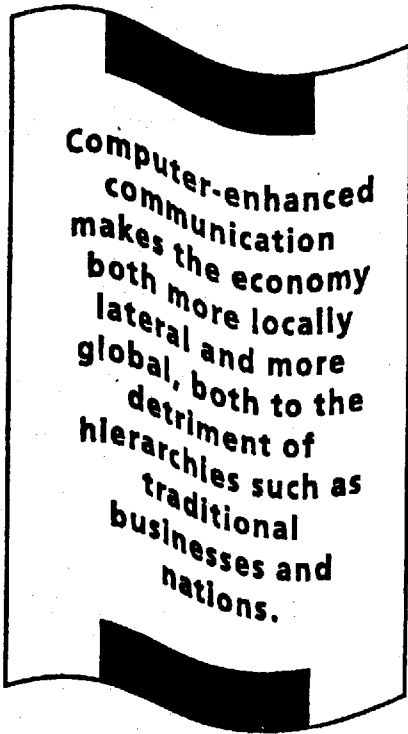
This is more than a different way to see the customer and the market. It's a different way to see the world and the very idea of control. Even the former "consumers" of national purpose in rigid hierarchies like China and the Soviet Union have begun to turn creative, in part because of a long history of failure, in part because of the new communications environment. At the same time, the loosening of national boundaries by information flow permits new large-scale groupings such as "Europe 1992."

The unraveling of the command economies signals a deep shift in how control works in the emerging communications structure. It's a shift from the dominance of hard, accountable control from above to soft, unaccountable control from below. "Control" is increasingly seen in the feedback sense — the innumerable tiny local adjustments that keep a market economy or an ecosystem resilient and adaptive. No one's in charge, but the system flourishes.

This kind of understanding has had a major boost from recent computer-simulation capabilities which gave rise to the study of chaos and "the sciences of complexity." At the Santa Fe Institute, for instance, a Citibank-funded study of "The Global Economy as a Complex Adaptive System" has taken off. A complete revision of economics is in process, resulting from the collaboration of economists, biologists, physicists, and computer scientists, some of them Nobel laureates. They've thrown out such basics as rational players, unlimited knowledge, and blind self-interest, and they're coming up with economic models that work for a change.

In the world of computer science, a revolution is under way as a dozen different subfields converge on what's called "emergent computation" — highly complex, highly parallel simulations that have "emergent" properties resembling life. No one's in charge, but the system flourishes. It flourishes on detailed local innovation, just as civilization now does.

From the very instruments of the communication and control revolution are coming the beginnings of a theory of it.



# BOOK

**S**IZE: 80-90,000

words, plus footnotes and index.

FORM: Journalistic essay.

SCHEDULE: Research, 1990; writing, 1991. Delivery of finished manuscript, end of December 1991.

AUDIENCE: Primarily general public; plus general business, communications and computer business, and communications and computer academics.

The journalism is what should sell *Outlaws, Musicians, Lovers, and Spies* to the general reader — the sheer bizarreness, glee, and originality of the subcultures as they dodge authority to explore electronic sex, group virtual reality, global music, free data, penetration of all secrets, and full life without a working body or complete mind. The book is aimed at everyone curious about how culture evolves these days. The point is: *anyone* can play.

## Rough Outline:

### Preface

### Chapter 1: World Beat

The world is a club that never closes for the current generation of musicians. Born instrumentalists, they are the first to seize, exploit, and reinvent new devices for performance and distribution.

Interviews for this chapter include Peter Gabriel, Brian Eno, Paul Simon, Todd Rundgren, Jerry Garcia, Bernie Krause, Charles Garvin, and whomever they lead to. A good cover photo might be the view from the control panel of Peter Gabriel's astounding studio with a British brook running transparently under it.

### 2: Singing the Body Electric

Caught between social pressures and the individual's drive, sex always explores. The story of sex in the success of French Minitel is often alluded to; now it is told in detail. Likewise the 976 saga in the US — the view from the other end of those \$2/minute calls that repositioned the phone companies as an entertainment medium. Life and love on the Date-a-Base bulletin boards. And cyberspace hackers speculate on their sensuous frontiers.

Initial interviews: Albert Bressand (leading French information economist), Jaron Lanier (prime visionary and inventor of cyberspace tools); the Mitchell Brothers (cheery San Francisco porn producers and distributors).

### 3: Independent Living

Crip power: intense motivation from the disabled, generous ingenuity from the engineers/inventors, and design problems at the heart of the human mind/body add up to routine breakthroughs that eventually enable us all. Mute Stephen Hawking transformed into a riveting public lecturer via his personal computer is a mild, visible example of what's coming.

Initial interviews: Center for Independent Living in Berkeley; Mark O'Brien, author of "How I Became a Human Being"; Chuck House (Hewlett-Packard VP who is investigating what makes the "functionally illiterate" function so well).

### 4: All Librarians Are Radicals

The only communicators taking *full* advantage of the electronic convergence of all media are the librarians, who owe allegiance to no single industry. In America librarians are officially sanctioned outlaws. They truly believe information ought to be free and follow wherever it explores. They now call themselves "information scientists," and they are.

Initial interviews: James Billington, present Librarian of Congress, who recently wrote to me; Daniel Boorstin, previous Librarian of Congress and author of *The Discoverers*; Eric Drexler, expert proponent of "hyper-media."

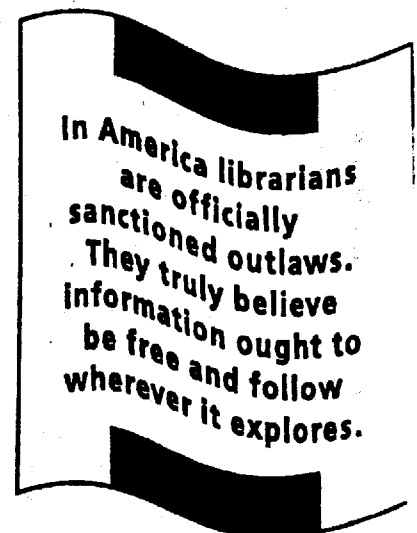
### 5: Reprogramming Civilization

If Steve Jobs and Wozniak had been thrown in jail in 1972 for selling "blue boxes" (which gave free access to the world's phone system), the competitive advantage given the US by the personal computer revolution would have been set back ten years. Now that all communications forms are computerized, programmers are designing the world's information infrastructure, and they know it. Salient fact: most programmers are libertarians.

Initial interviews: Jobs and Wozniak; Captain Crunch; Russell Brand (no relation, author of *Attack of the Tiger Teams*); Marc Porat; and others whose names are unfamiliar or will be protected.

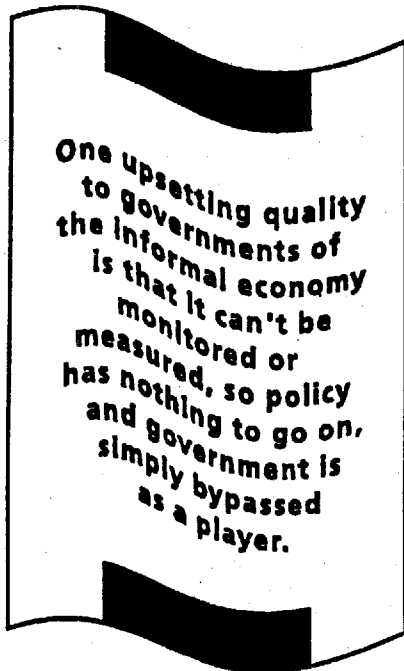
### 6: SigInt

Until recently the National Security Agency succeeded in limiting the effectiveness of encryption devices available for



private use. That's now breaking down. Meanwhile amateur industries are emerging around such things as using "scanners" to eavesdrop on cellular phone calls. And there's the "chippers" — right-wing hackers (!) who reverse-engineer and privately peddle microchips that defeat satellite TV signal scrambling. When the world is mostly communications, and no communications are secure, what is that world like?

Initial interviews: the deviser of "public key" encryption systems, now at MIT; the chap at Xerox PARC who released an NSA-disapproved encryption scheme into the public nets; Donn Parker, the computer security expert at SRI International; some retired spies.



### 7: Grey Markets

From Peru and South African townships to Italy and the Soviet Union, grey markets are the salvation of tottering economies. In robust economies like the US the information market is permanently part grey, and it's the most innovative part. Even scientists have their "grey literature" (papers passed around informal networks before publication). One upsetting quality to governments of the informal economy is that it can't be monitored or measured, so policy has nothing to go on, and government

is simply bypassed as a player (that's the whole idea). With constantly new information technology, the future is: ever greyer markets.

Initial interviews: Peter Schwartz; Albert Bressand; Hernando de Soto, author of *The Other Path*; Esther Dyson; Tom Malone.

### 8: The Costs of Getting It Wrong Big

"Quick is beautiful," says Freeman Dyson. Most megaprojects are doomed in the turbulent information environment. The series of videotex debacles, soon to culminate with Prodigy I expect, is testimony to expensive corporate habits of top-down marketing in a bottom-up world. A giant like IBM, which made a last brilliant surge with the adroitly imitative PC, can only watch in horror as upstart companies like Thinking Machines, Tandem, Apple, and Korean clone-makers crowd it out of the market. While media mergers like Time and Warner are exploring new levels of disec-

omies of scale, job-shops like Colossal (film and video) devolve profitably into an array of tiny scattered production units.

Initial interviews: Ted Papes, CEO of Prodigy; Alex Singer, Hollywood director; Mike McGreevy, NASA; Lawrence Wilkinson, head of Colossal.

### 9: Auguries of Emergence

The diverse pioneers of computer science are converging on "connectionist" breakthroughs which will provide the body of theory and practice of communication and control in the '90s. "Emergent computation" is as rich as reality and as full of surprises. It is already transforming economic theory, which is coming to resemble ecology. In the next decades such computation will merge with every level of human activity from the individual to the global.

Initial interviews: Danny Hillis, inventor of The Connection Machine; Doayne Farmer, deviser of the "rosetta stone" of connectionist disciplines; Kenneth Arrow, Nobel economist; George Cowan, head of Santa Fe Institute.

### 10: The Future of Control

... is unknowable, but some trends are evident. Specific questions can be framed now, specific signals watched for, specific scenarios explored. The concept of control is dividing into top-down and bottom-up, with grass-rooted, fine-grained, ecological-style, bottom-up control in the ascendance. Markets are replacing hierarchies — not entirely, but enough to change everything. In such a working environment anyone can invent in the mode of outlaws, musicians, lovers, and spies.

Initial interviews: Catherine Bateson, lifelong student of the two forms of control; James Beniger, author of *The Control Revolution*; Mary Douglas, author of *How Institutions Think*.

### Footnotes

Extensive, almost a parallel text, with detailed access to useful sources.

### Index

## EPITAPH

February 1990

**I** WANTED THIS BOOK to exist — still do. I would love to have written it. But as the prospect of actually researching the thing approached, I became pinched with dread. My reasons for not doing the work may be someone else's reasons for taking it on.

For me it all just seemed too broad, too laborious, too slippery and fleeting, too crowded, too sequential, and not necessarily useful.

Broad and laborious. I was looking at having to become familiar with the core and the cutting edges of fields as diverse as world music, espionage practices and prospects, library science and fantasies, the universe of the disabled, the covert and overt explorings of sexual pioneers, and whatever the next generation of hackers and computer scientists is up to, meanwhile keeping up with the exploding domains of communication technology. Such toil needs the stamina and single-mindedness of an author younger than I.

Slippery and fleeting. My book about the Media Laboratory at MIT is still timely, four years after I researched there, thanks to the slow, deep pace of academic endeavor. But the scintillating grass-roots activity that *Outlaws, Musicians* wants to report on is bound to be out of date by the time the book hits the street — much as *Whole Earth* discovered years ago with its *Whole Earth Software Catalog*. The thesis of the book might continue to be germane, but the news the thesis was built on would yellow rapidly.

Crowded. Many of the writers I am most interested in and friendly with are deep into book projects that impinge closely. Howard Rheingold is doing a book on Virtual Reality, and so is Jaron Lanier. Stephen Levy is doing a book on Artificial Life. John Markoff from the *New York Times* is doing a book on Computer Crackers. My Global Business Network colleague Peter Schwartz is doing a book on global strategy, *Thinking Ahead*. It would be enjoyable to read and cite their works-in-progress, but the fact is I would be confronted with daunting competition and the prospect that my book could wind up with only niche significance. If so many others are covering pieces of this field, it's probably covered.

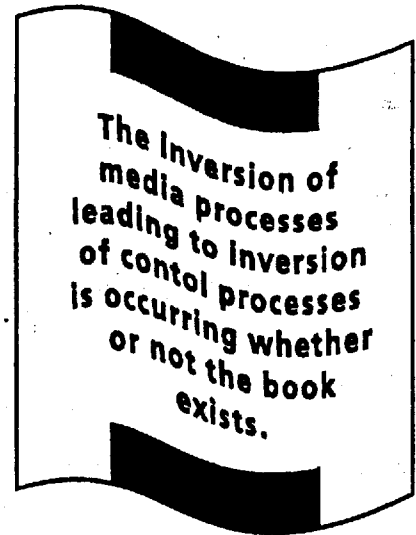
Sequential. Author writes a book. Author is invited to travel about and give talks based on the book. In the process, author learns quite a bit more about the subject, which is reflected in the talks. Eventually that material crystallizes into a new book proposal, which attracts money the way sequels do, and two years later here comes author bobbing by on the same old merry-go-round, slightly different-color horse. A few rounds of that and author starts to look like an image self-copied toward artifacted caricature. I've written two books about information artisans — *II Cybernetic Frontiers* and *The Media Lab*. That's enough.

Useless. Suppose *Outlaws, Musicians* were a success. It wouldn't make much of a difference in the world. The inversion of media processes leading to inversion of control processes is occurring whether

or not the book exists. My drawing attention to innovation by lovers, spies, etc. would, if anything, hamper their activity and subversive effectiveness. The book is observational and interpretive; it has nothing to recommend. No program. (Except maybe this: libraries are major crafters of the emerging information infrastructure — infostructure. Throw respect and money their way and you'll never be sorry.)

All these reasons may be specious. I detail them mainly because it's rare to hear explanations of why something *isn't* done. The motivational fact of the matter is that I was looking through this book project toward one I really wanted to do. Printing this book proposal is part of a lazy shortcut. If I publish the proposal, I can act as if the book is done and move on. (I wrote another proposal, of sorts, got an advance, and am proceeding happily with *How Buildings Learn: And Fail to Learn*, due from Viking in a couple years.)

The several years of notes and references I accumulated for *Outlaws, Musicians* I am turning over with vast relief to Kevin Kelly, who has been gestating a book on information longer than I. He has the eagerness for the task and an originality of viewpoint that I now lack. Frequently he'll report some insight or gossip from the info biz that I thought I already knew about until his perspective changed the item into deeper news. Between his book and mine, I'd rather read his, and can't wait.



## ADDENDUM

*The elfin godfather smiles warmly, unshackles the dazzling gift from his swollen ankle, wipes his brow and says "Whew, that was close. You mean you've never tried one of these? You can see into the future with it. Here —" then dances off in glee. Looking to the future is easy, but explaining the future induces dread in anyone rational or responsible. It definitely calls for youth. I'm actually kinda old myself (38). I'm headed toward taking a sabbatical next fall, and if I'm feeling cocky, I'll try something crazy along these lines. This book proposal is being published in this magazine because it is a project up for grabs.*

—Kevin Kelly

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