FORUM

FOR APPLIED RESEARCH AND PUBLIC POLICY

Arms and the President

Although the party oracles wailed about divisiveness in the nation, the Bush-Gore race has had much to offer the American people. Families have begun talking together around the kitchen table. Kids have discovered something besides the funnies in the newspapers. Even television is offering honest-to-goodness news analysis, and I haven't seen that—apart from the TV news magazines—since the Gulf War ended.

Cartoonists and late-night comics haven't had so much fun since President Clinton's impeachment. The cartoon I enjoyed the most wasn't even published in a newspaper or magazine—at least, not initially—and it made its creator an instant celebrity. You may have seen it. It's the one of a modified butterfly ballot with an arrow connecting Bush's name on the top left to a voting button on the top right, and arrows from all the other candidates' names running through a rat's nest before connecting presumably with appropriate buttons elsewhere on the ballot. The creator, who is not a cartoonist but just a clever guy, emailed the drawing to a few friends. They forwarded it to other friends. Within days, the drawing appeared on T-shirts from Bakersfield to Bangladesh.

We can be most thankful that while we've been the butt of jokes around the world, there have been no killings, no violence—well, no serious violence, anyway. There has been only rhetoric. Other nations—especially those that have tolerated our oversight of their elections—have laughed at us, but they've grudgingly had to admit that the democratic process does work here.

During the height of the Florida recount, I had breakfast with a friend who had just returned from Palestine. He remarked that his Palestinian friends, who had been watching the recount on television, were impressed with the lack of violence. They were especially surprised not to see guns among the demonstrators who had taken to the streets.

The last time I recall such partisanship in the United States was during the race riots in the South in the 1950s and '60s. And at that time, of course, violence was rife. So were guns. We've been spared the guns this time around, but that doesn't make the attitudes any less frightening.

Politics is not the subject of this issue of FORUM. But guns are. The right to bear arms is almost as partisan an issue as the right to recount in Florida. Folks on both sides of the debate are entrenched in their bunkers; reasonable arguments persuade only the converted. Still, the debate is an important one, and we hope you'll enjoy reading the arguments, regardless of your persuasion.

While you're reading about guns, be sure to read the sections on sustainable business and the elderly, too. These topics aren't quite as partisan as gun control, at least not on a national level. On an individual level, however, they can spark intense heat, and they're every bit as important.

Dennis McCarthy

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The Road Less Traveled

Robert Frost undoubtedly wasn't thinking about business the day he penned these memorable lines. Nonetheless, the lines are an apt description of the position many businesses find themselves in these days. For many businesses, the road less traveled is headed toward sustainability; and for those who have chosen this road, it has made all the difference.

Gary Davis of the University of Tennessee discusses how companies today are making the choice for sustainability. He traces the evolution of the concept from its first appearance in 1987, through its development in the Natural Step, the CERES Principles, Agenda 21, and today's emphasis on the triple bottom line of economic, environmental, and social performance.

Davis notes that to date only a few multinational companies have embraced the principles of sustainability. While there have been notable successes, investors are still wary of any program that might detract from the company bottom line. The main challenge for the decades ahead, Davis says, is for business to demonstrate that sustainability is a worth-while destination, one that can fulfil its promise.

Hunter and Amory Lovins, of the Rocky Mountain Institute, suggest that a new form of capitalism, which they call Natural Capitalism, offers the best route to sustainability. Natural Capitalism, which they see as replacing industrial capitalism, is built on four principles: radically more-efficient use of resources, elimination of the concept of waste, a shift in our economic mindset from owning objects to leasing services, and restoration of natural resources. The authors present a compelling collection of sustainability success stories that show these principles in action.

Ray Anderson is the dynamic force behind one of these success stories. Anderson—the founder and CEO of Interface, a carpeting and flooring manufacturer—tells how he challenged his company to become the world's first fully sustainable enterprise. To achieve this goal, the company is taking a hard look at every aspect of its manufacturing and service processes.

For instance, instead of selling carpet, the company now leases its product and installs it in squares for easy removal. As the lessor, Interface is responsible for maintaining the carpet and replacing squares as they wear out. Interface also recycles worn-out carpeting yarn, converting it into new yarn rather than sending it to a landfill, burning it for energy, or downcycling it into a lower value product.

Much of Interface's success comes from applying the principles of the Natural Step, one of the most widely used models for business sustainabililty. George Basile and Jill Rosenblum of the Natural Step organization discuss in detail its principles, which are based on the proper functioning of ecosystems.

While many companies have successfully used the Natural Step and other models of business sustainability, John Ehrenfeld, a visiting professor at Delft University, the Hague, argues that we need a more comprehensive model before we can transform society. Ehrenfeld offers suggestions for a new definition, which he believes can give sustainability "the fullness of meaning and importance to produce the transformation that is absent from the concept today."

The Editors

Growing Business, Naturally

Businesses pursuing sustainability have made major strides, but the movement needs a much broader base of support, if it is to achieve its promise of transforming the economy.

BY GARY A. DAVIS

Although the term *sustainability* is barely more than a decade old, the concept has a distinguished heritage reaching back at least a couple of centuries to the work of the English economist Thomas Malthus. But during the last decade or so, the concept has taken on deeper, richer meaning, much of it under the banner of business sustainability.

Today, the rhetoric of business sustainability is being translated into concrete practices and measurable indicators. The environmental and social aspects of sustainability are also beginning to come together. The challenge for the decades ahead is to deliver on the promise of business sustainability. Businesses must make the changes necessary to achieve sustainability while maintaining profitability and shareholder value. The movement must also extend far beyond the few major multinational corporations that currently embrace the concept.

Sustainability was first defined in *Our Common Future,* a 1987 report of the World Commission on Environment and Development, commonly referred to as the Brundtland Report. The report defined sustainability as meeting "the needs of the present without compromising the ability of future generations to meet their own needs."

The report focused on what nations and international organizations should do to ensure that economic development could continue to improve the quality of life without destroying the environment upon which all life depends.

The Brundtland Report contained only general statements about what role, if any, individual businesses should have in achieving sustainability. Nonetheless, the groundbreaking report got some business and professional leaders thinking about sustainability and how businesses might help make it happen.

Natural Step

The new ideas about sustainablility captured the attention of Karl-Henrik Robèrt, a Swedish oncologist. Robèrt was concerned that the economic-development and quality-of-life debate was focusing too much on environmental symptoms, without con-

sidering underlying causes. He believed that an understanding of causes could help chart a course for sustainability.

With the help of other Swedish scientists, Robèrt prepared a report describing the basic ways in which humans affect the health of the biosphere. The report also examined possibilities for creating a sustainable society. With the support of the Swedish government, Robèrt sent the report to every household and school in Sweden.

In 1989, Robèrt founded the Natural Step to promote his ideas about sustainability. The Natural Step defined a set of principles, based on laws of thermodynamics and natural cycles, that form a framework for understanding and communicating sustainability:

■ Substances from the Earth's crust must not systematically increase in nature.

■ Substances produced by society must not systematically increase in nature.

■ The physical basis for the productivity and diversity of nature must not systematically be diminished.

■ We must be fair and efficient in meeting basic human needs.

The Natural Step encourages businesses to apply these principles to all their activities and to train employees to truly understand sustainability instead of mindlessly applying corporate policies and procedures. The Natural Step recognizes, moreover, that businesses are the experts on their products, processes, and services. Therefore, instead of telling businesses how to apply these principles, the Natural Step encourages businesses to use the principles for problem solving and for creating business strategies in response to

corporate circumstances.

Major corporations around the world have adopted the framework and are using it to change the way they do business. The Natural Step now has offices in Sweden, the United Kingdom, Canada, Japan, Australia, New Zealand, South Africa, and the United States. (See "Walk This Way" in this issue of FORUM.)

Ben & Jerry's, Seventh Generation, and Aveda, which already had strong green reputations. Today, over 50 companies have endorsed the CERES Principles. Among the endorsers are 12 Fortune 500 firms, including Sunoco, American Airlines, Bethlehem Steel, Ford Motor Company, General Motors, and Polaroid.

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Company, General Motors, and Polaroid.

CERES Principles

Like the Natural Step, the Coalition for Environmentally Responsible Economies was formed in 1989. Several U.S. environmental groups, together with an array of socially responsible investors and public pension funds, formed the coalition to encourage businesses to lead the transition to a more ecologically sound economy. The cornerstone of the coalition's work is the CERES Principles, which encapsulate a company's commitment to environmental awareness, continued improvement, and accountability. (See sidebar: "The CERES Principles.")

Formerly known as the Valdez Principles, the CERES Principles, were initially formulated in response to the Exxon Valdez oil spill in Prince William Sound, Alaska, in 1989.

During the early years—from 1989 to 1992—the CERES Principles were adopted mainly by such companies as the Body Shop,

Agenda 21

In 1992, the United Nations Conference on Environment and Development, in Rio de Janeiro—popularly known as the Earth Summit—stimulated world interest in applying sustainability principles to individual businesses. During the Earth Summit, the Business Council for Sustainable Development released *Changing Course: A Global Business Perspective on Development and the Environment*, the first major report presenting the business argument for sustainable development.

The Earth Summit itself produced Agenda 21, which contained a major chapter on the role of business and industry in sustainable development. In Chapter 30 of the report—"Strengthening the Role of Business and Industry"—the Earth Summit conferees agreed that cleaner production technologies throughout product life cycles, environmental management systems, and market-based economic instruments were the prin-

cipal means by which business could contribute to sustainable development. (See sidebar "Agenda 21 Action Program for Industry.")

While there was no process for implementing Agenda 21, the Earth Summit created interest for sustainability among national governments, international organizations, and business associations.

Eco-efficiency

Following the Earth Summit, the Business Council for Sustainable Development committed itself to help implement Agenda 21 and to define key business strategies and practices that would contribute to sustainability.[1] The council's principal contribution to implementing Agenda 21 has been the development of the concept of eco-efficiency, which the council defines as "the delivery of competitively priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life cycle, to a level at least in line with the Earth's estimated carrying capacity."

To be eco-efficient, according to the council, a company should:
■ Reduce the material intensity of its goods and services.
■ Reduce the energy intensity of its goods and services.
■ Reduce the dispersion of any toxic or hazardous materials.
■ Enhance the recyclability of its materials.
■ Maximize the sustainable use of renewable resources.
■ Extend the durability of its products.
■ Increase the service intensity of its goods and services.

Moreover, eco-efficiency creates business opportunities through:

THE CERES PRINCIPLES

■ **Protection of the Biosphere:** We will reduce and make continual progress toward eliminating the release of any substance that may cause environmental damage to the air, water, or the Earth or its inhabitants. We will safeguard all habitats affected by our operations and will protect open spaces and wilderness, while preserving biodiversity.

■ **Sustainable Use of Natural Resources:** We will make sustainable use of renewable natural resources, such as water, soils and forests. We will conserve nonrenewable natural resources through efficient use and careful planning.

■ **Reduction and Disposal of Wastes:** We will reduce and, where possible, eliminate waste through source reduction and recycling. All waste will be handled and disposed of through safe, responsible methods.

■ **Energy Conservation:** We will conserve energy and improve the energy efficiency of our internal operations and of the goods and services we sell. We will make every effort to use environmentally safe and sustainable energy sources.

■ **Risk Reduction:** We will strive to minimize the environmental, health, and safety risks to our employees and the communities in which we operate, by promoting safe technologies, facilities, and operating procedures and by being prepared for emergencies.

■ **Safe Products and Services:** We will reduce and, where possible, eliminate the use, manufacture, or sale of products and services that cause environmental damage or health or safety hazards. We will inform our customers of the environmental impacts of our products or services and try to correct unsafe use.

■ **Environmental Restoration:** We will promptly and responsibly correct conditions we have caused that endanger health, safety, or the environment. To the extent feasible, we will redress injuries we have caused to persons or damage we have caused to the environment, and we will restore the environment.

■ **Informing the Public:** We will inform in a timely manner everyone who may be affected by conditions caused by our company that might endanger health, safety, or the environment. We will regularly seek advice and counsel through dialogue with persons in communities near our facilities. We will not take any action against employees for reporting dangerous incidents or conditions to management or to appropriate authorities.

■ **Management Commitment:** We will implement these principles and sustain a process that ensures that the board of directors and chief executive officer are fully informed about pertinent environmental issues and are fully responsible for environmental policy. In selecting our board of directors, we will consider demonstrated environmental commitment as a factor.

■ **Audits and Reports:** We will conduct an annual self-evaluation of our progress in implementing these principles. We will support the timely creation of generally accepted environmental audit procedures. We will annually complete the CERES Report, which will be made available to the public.

■ Eco-efficient processes—making resource savings and reducing risk or impact in processes allows companies to diminish the costs of production and site operations.

■ Reusing, recovering, and recycling by-products—cooperating with other companies can offer opportunities to use wastes and by-products as valuable feedstocks.

■ Creating new and better products—following ecological design rules with new and enhanced functionality offers companies new and more profitable business opportunities and increased market shares, as well as cost savings.

■ Eco-efficient markets—allowing more value and profit with less impact for the entire economy, for instance by promoting more efficient use of resources.

Triple bottom line

Today, the field of business sustainability is evolving from general principles and broad norms to specific indicators and consistent formats for reporting. As a result, objective measurements of progress toward sustainability are now being developed that provide customers and investors a basis for evaluating businesses. More difficult to measure, but more important to many stakeholders, are social indicators of business sustainability.

Until recently, businesses considered only the economic and environmental aspects of sustainability. Today, however, corporate sustainability reports are beginning to address social issues as well. For in-stance, the 1998 Shell report *Profits and Principles: Does There Have to Be a Choice?* stands out as a particularly ambitious commitment to management systems, indicators, metrics, and targets across a spectrum of economic, environmental, and social dimensions of business performance.[2] One key feature of the report was the introduction of the concept of the triple bottom line of economic performance, environmental performance, and social performance.

Considerable work is under way on how to capture the social dimension in sustainability reporting. Many of the measures being developed are more qualitative or subjective, and achieving consensus around a set of social measures is likely to be more difficult than

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AGENDA 21 ACTION PROGRAM FOR INDUSTRY

■ Develop economic instruments and laws, legislation, and standards, including voluntary private initiatives, for promoting cleaner production.

■ Implement environmental accounting to internalize environmental costs into the price of goods and services.

■ Conduct annual environmental audits.

■ Adopt and implement codes of conduct promoting best environmental practices.

■ Promote cooperation between businesses to identify, assess, and develop cleaner production alternatives.

■ Adopt cleaner production policies, which also affect supply chains and customers.

■ Cooperate with workers and trade unions to continuously improve knowledge and skills for implementing sustainable development operations.

■ Encourage venture capital funds for sustainable development projects and programs.

■ Establish worldwide corporate policies on sustainable development.

■ Transfer environmentally sound technologies and share expertise with corporate affiliates and governments in developing countries.

■ Promote partnerships of large business and industry with small and medium-sized enterprises to help facilitate the exchange of experience in managerial skills, market development, and technological know-how.

■ Create national councils for sustainable development.

■ Increase research and development of environmentally sound technologies and environmental management systems.

■ Develop and implement responsible and ethical management of products and processes for health, safety, and environmental protection through codes, charters, and initiatives integrated into all elements of business planning and decision making, and foster openness and dialogue with employees and the public.

■ Strengthen consideration of environmental aspects of foreign investment by United Nations organizations and agencies.

■ Support research and development on improving the technological and managerial requirements for sustainable development, in particular for small and medium-sized enterprises in developing countries.

achieving consensus for environmental measures.

Measuring and Reporting

The underlying premise behind indicators of business sustainability is that in business, only what gets measured gets done. Therefore, businesses need consistent, reliable ways to measure their

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measure their financial, environmental, and

social performance.

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financial, environmental, and social performance.

There are at least three major initiatives in the measurement and reporting of sustainability on the firm level: the World Business Council for Sustainable Development's eco-efficiency indicators, the Global Reporting Initiative, and the Global Responsibility Platform to audit and publish sustainability reports.

■ **Eco-efficiency indicators**. The World Business Council for Sustainable Development has developed a set of ratios for measuring eco-efficiency, using the following equation:

$$E = \frac{V}{F}$$

where E = eco-efficiency, V = the value of a product or service, and F = an environmental factor.

This equation is based on the goal of maximizing product or service value while minimizing resource use and adverse environmental impacts.

As an indicator of energy con-sumption, for instance, a company might use the ratio of net sales divided by total energy consumed per year. By comparing the eco-efficiency ratio over a period of years, the company would have a valid indicator of whether its energy consumption was becoming more efficient. Similarly, an eco-efficiency ratio of the annual amount of material produced divided by the amount of greenhouse gas produced would give a valid indicator of greenhouse gas production.

The intention of the World Business Council for Sustainable Development is not to develop one single approach to measuring and reporting eco-efficiency. Rather, the council wants to establish a general, voluntary framework that is flexible enough to be widely used, broadly accepted, and easily interpreted by a broad spectrum of business and industry. The specifics of defining, measuring, and communicating eco-efficiency will necessarily vary from one business to another, and comparisons between different businesses must be approached with great caution.

In 1999, the council launched a pilot program to test the validity of its eco-efficiency indicators concept. The pilot attracted 23 companies worldwide from various industrial sectors, including mining, electronics, consumer goods, chemicals, petroleum, life sciences, and banking. The results of the study showed that the indicators are valid measures of eco-efficiency across a broad range of industries.[3]

■ **Global Reporting Initiative**. In 1997, the Coalition for Environmentally Responsible Economies, in partnership with the United Nations Environment Programme, established the Global Reporting Initiative.

The initiative's mission is to develop globally applicable guidelines for reporting on economic, environmental, and social performance, for corporations, governments, and nongovernmental organizations.

The GRI's goals are to:
■ Elevate sustainability reporting practices worldwide to a level equivalent to financial reporting.
■ Design, disseminate, and promote standardized reporting practices and customized measurements.
■ Ensure a permanent and effective institutional host to support such reporting practices worldwide.

The GRI released its *Sustainability Reporting Guidelines* in June 2000.[4] These guidelines are the first global effort for sustainability reporting based on the triple bottom line.

■ **Global Responsibility**. Now that common indicators of business sustainability are being developed, we may eventually be able to compare companies, as well as their products and services, according to their triple bottom line performance. Companies could benchmark their performance with others in their sector; they may even be able to use superior performance as a competitive advantage.

A consistent format for reporting and an accessible repository for these reports will greatly facilitate stakeholder use of this information.

Businesses could also use sustainability reporting as a means of generating dialogue with customers, investors, and suppliers.

This is the premise behind Global Responsibility, a new company established in Monaco to develop the Global Responsibility Communication Platform. The Platform, which began as a research project at the International Institute for Industrial Environmental Economics at Lund University in Sweden, is an Internet-based service that offers a website for sustainability reporting and stakeholder dialogue.[5] Initial member companies include Volvo Car Corporation, Sony International Europe, ITT Flygt, and Skanska.

Businesses can publish their sustainability reports on the Global Responsibility website, using a reporting format that purportedly satisfies the criteria of the Global Reporting Initiative and other guidelines. Global Responsibility's audit partners, KPMG and Deloitte & Touche, verify the reliability of company information by random auditing.

The Platform also provides stakeholders an Internet forum and chat rooms to communicate with companies. In addition to sustainability reporting, the Platform provides information on environmental labeling and other environmental data about company products.

Sustainable Consumption

Until now, businesses concerned with sustainable development have mainly considered only the supply side of the market. Companies have primarily focused on making environmental improvements through changes in process and product design. Envi-

ronmental metrics have focused on resource inputs and environmental pollution of manufacturing facilities. Social metrics have generally dealt with the impacts of manufacturing facilities in the community. The demand side of the market—consumption—has not undergone the same scrutiny, even though sustainability will not be achieved with-

out significant changes in our patterns of consumption.

In 1999, the United Nations Commission on Sustainable Development issued a report on sustainable consumption that largely focuses on the role of governments in promoting sustainable consumption.[6] The role of businesses is not defined, but the report clearly calls upon governments to change consumption patterns to promote sustainability.

Recognizing that the burden of changes in consumption patterns will ultimately fall on business, the World Business Council for Sustainable Development recently undertook stakeholder dialogues on product innovation to promote sustainable consumption.

This new dimension of business sustainability requires a new level of openness on the part of business. The discussion will ultimately address how products and services are marketed. It will have to address core business strategies of firms in identifying and responding to customer needs and

in selecting technologies and delivery systems to meet those needs.

The Next 10 Years

Although governments are lauding the voluntary efforts of businesses to achieve sustainability, some in the environmental community are greeting these

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efforts with skepticism. Michael McCloskey, chairman of the Sierra Club, for instance, is not convinced that the principle of sustainable development is sound. He fears "that 'sustainability' will prove to be no more than a boon to publicists who will paste new labels on old bottles and claim that every project that makes their clients rich is sustainable."[7]

Even if we accept the sustainability concept and put faith in the efforts of individual businesses to make real improvements in environmental and social performance through voluntary efforts, important questions remain to be answered. Will businesses be able to demonstrate convincingly to their investors—the stakeholders who count the most to management—that improved environmental and social performance results in improved financial performance and competitive advantage over the time horizons that most investors care about? The performance of the stock of some of the companies that are

leaders in sustainability initiatives indicates that the financial community is not yet convinced.

Since only a tiny minority of businesses are now engaged in sustainability efforts, how will these efforts be broadened to involve all sectors of the market and all sizes of businesses in the developing as well as the industrialized world to make a real difference to the environment and society?

Of course, the journey must start somewhere, and the efforts of the leading companies are laudable and may produce measurable results due to the sheer scope of their economic activity. But at the current rate of expansion, how many years will it take business sustainability initiatives, such as indicators and reporting, to penetrate the majority of the world's businesses? These are the immediate challenges for the sustainability movement. It will be at least another decade before we can expect to have any clear answers.■

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NOTES

1. The World Business Council for Sustainable Development was formed in 1995 from a merger of the Business Council for Sustainable Development and the World Industry Council for the Environment.

2. See <http://www.shell.com/library/publication/1,5833,,00.html?article=2871&type=publication&siteid=1532>.

3. See <http://www.wbcsd.ch/publications/measuring.htm>.

4. See <http://www.globalreporting.org/Guidelines/June2000/June2000GuidelinesDownload.htm>.

5. See <http://grcp.cybercom.se/scp/>.

6. See <http://www.un.org/esa/sustdev/cpp14.htm#report>.

7. Michael McCloskey, "The Emperor Has No Clothes: The Conundrum of Sustainable Development," *Duke Environmental Law & Policy Forum* 9 (Spring 1999), p. 153.

Pathway to Sustainability

*Natural Capitalism offers our best hope
for achieving a sustainable future.*

BY L. HUNTER LOVINS AND AMORY B. LOVINS

I t's generally conceded that two great wars were the defining events of the 20th century. When future historians look back on the century, however, they may well decide that a third war—the war against the Earth—was the single most important event of the era.

Industrial capitalism has been waging a war against the Earth for nearly a quarter of a millennium. Today, however, a new form of capitalism, rapidly emerging in a growing number of businesses, is confronting industrial capitalism on a broad front and is offering hope that the war against the Earth can finally come to a close. We call this new economic system Natural Capitalism.

The very term itself emphasizes that industrial capitalism, as it is now practiced, is unnatural and an aberration. Industrial capitalism defies its own logic. It does not value, but rather liquidates, the most important forms of capital, especially natural capital—the biological world whose resources and ecosystem services make possible all life.

According to a pioneering analysis of the world's ecosystems prepared by the United Nations, the World Bank, and the World Resources Institute, "There are considerable signs that the capacity of ecosystems, the biological engines of the planet, to produce many of the goods and services we depend on is rapidly declining."[1] Fortunately for the Earth, however, the emergence of Natural Capitalism could well mean that the end of the decline is in sight.

Ecosystem Services

Ecosystem services are the natural processes vital to the planet's metabolism. They include the natural resources, but also the many values of intact ecosystems. These free and automatic services provide tens of trillions of dollars of worth each year—more than the global economy. Indeed, their value is nearly infinite, since without them there can be no life and therefore no economic activity. But none of their value is reflected on anyone's balance sheets.

Deficient logic of this sort can't be corrected simply by monetizing natural capital. Many key ecosystem services have no known substitutes at any price. The $200-million Biosphere II project, despite a great deal of impressive science, was unable to provide breathable air for eight people. Biosphere I, our planet, performs this task daily at no charge for six billion of us.

The best technologies can't substitute for water and nutrient cycling, atmospheric and ecological stability, pollination and biodiversity, topsoil and biological productivity, and the ability to assimilate and detoxify society's wastes. There is no longer any serious scientific dispute that every major ecosystem service in the world is in decline. With 10,000 new people arriving on Earth every hour, more people are chasing after fewer resources. The limits to economic growth are coming to be set by scarcities of natural capital. These ecosystem services underpin all life and thus all economic activity.

This is not to say that commodities are scarce. Prices for such resources as oil—despite the recent price spike—and copper are low and will trend downwards for some time, in part because companies have gotten better at extracting these materials with very

powerful technologies that look cheap, especially if their environmental costs are not counted. Increasingly, what is limited is the ability of deteriorating living systems to sustain a growing human population.

Sometimes the cost of destroying ecosystem services becomes apparent only when the services start to break down. In China's Yangtze basin in 1998, for example, upstream deforestation triggered flooding that killed 3,700 people, dislocated another 223 million, and inundated 60 million acres (24 million hectares) of cropland. That US$30-billion disaster forced a logging moratorium and a $12-billion crash program of reforestation.

Worldwide, the economic losses due to extreme weather have been rising since the 1950s, and steeply since the 1980s, from less than $50 billion to now $300 billion per year. Such losses reflect gaps in the ideology of the industrial economy, which, for example, harvests wood fiber in a way that prevents forests from properly regulating watersheds to prevent flooding, or provides energy in a way that damages the self-stabilization of the Earth's climate.

The Next Industrial Revolution

Industrial capitalism was born in England in the mid-18th century with the first industrial revolution. Before that time, it was inconceivable that people could work more productively. If you needed two horsepower, you needed two horses; if you wanted more cloth, you had to hire more skilled weavers, if you could find them. So it made sense to enable the relatively scarce people to do more work by substituting machines and abundant nature.

The textile mills introduced in the late 1700s soon enabled one Lancastershire weaver to produce the cloth that had previously required 200 weavers. This was only one of many technologies that increased the productivity of workers as well as prosperity.

As technical and organizational innovations spread through sector after sector of the economy, affordable mass goods, purchasing power, a middle class, and everything we now call the industrial revolution emerged.

Profit-maximizing capitalists economized on their scarcest factor of production: skilled people. They substituted the use of the seemingly abundant resources and ability of the planet to absorb their pollution to enable people to do more work.

The capitalist logic of economizing on scarce resources—because that is what limits human progress—remains true. What has changed—indeed, has reversed—is the pattern of scarcity. Today, we have abundant people and scarce nature, not the other way around. Now, as the economic gurus call for even greater efforts to increase labor productivity, as if people were still scarce and nature still abundant, a completely different approach is needed.

Today's patterns of relative scarcity and abundance dictate using more people and more brains to wring four, 10, or even 100 times as much benefit from each unit of energy, water, materials, or anything else borrowed from the planet. Success at this will be the basis of competitiveness in the decades to come. Increased resource productivity will be the hallmark of what author and businessman Paul Hawken calls the Next Industrial Revolution.

Four Principles

Radically increased resource efficiency is the first principle of Natural Capitalism. It offers not only increased profits, but also the solution to most of the environmental dilemmas facing the world today. It greatly slows depletion of resources at one end of the economic process and the discharge of pollution—resources out of place—at the other end. It creates profits from not having to pay for either. And it also buys time, forestalling the threatened collapse of natural systems.

That time should then be used to implement the remaining three principles of Natural Capitalism:
■ Eliminate the concept of waste by redesigning the economy on biological lines that close the loops of materials flows, making "wastes" either disappear or become feedstocks for new processes and products.
■ Shift the structure of the economy from focusing on the processing of materials and the making of things to the creation of service and flow, so as to reward resource productivity and loop-closing.
■ Reverse the planetary destruction now underway with programs of restoration that invest in natural capital.

Together, the four principles of natural capitalism enable businesses to behave as if ecosystem services were properly valued. Behaving in this way will begin to reverse the loss of such services while increasing profits.

Increasing Productivity

It is relatively easy to profit by using resources more efficiently because they are used incredibly wastefully now.

Globally, the economy mobi-

lizes a resource flow of half a trillion tons per year. But only about 1 percent of that huge flow of materials ever gets embodied in a product and is still there six months after the sale. The other 99 percent is waste. Cutting such waste represents a vast business opportunity.

Energy efficiency. Nowhere are the opportunities for savings easier to see than in energy. The United States has already cut its annual energy bill by $200 billion since the first oil shock in 1973, but the country still wastes $300 billion worth of energy each year. Just the energy thrown away by U.S. power stations as waste heat equals the total energy used by Japan for everything. Moreover, the efficiency of converting fuel at the power station into incandescent light in the room is only 3 percent. Modern cars use only 1 percent of their fuel energy to move the driver.

But many companies have shown how to reduce such waste and increase profits. Southwire Corporation—an energy intensive maker of cable, rod, and wire—halved its energy per pound of product in six years. The savings roughly equaled the company's profits during that period, while many competitors were going bankrupt. The energy efficiency effort probably saved 4,000 jobs at 10 plants in six states. The company then went on to save even more energy, still with two-year paybacks.

Dow Chemical's Louisiana Division implemented more than 900 worker-suggested energy-saving projects from 1981 to 1993, with average annual returns on investment in excess of 200 percent. Returns and savings both tended to rise in the latter years, even after the annual savings had passed

$100 million, because the engineers were learning new ways to save faster than they were using up the old ones.

State-of-the-shelf technologies can make old buildings three- to four-fold more energy efficient, while new buildings can be 10-fold more efficient and cheaper to build. Examples include large and small buildings in climates ranging from well below freezing to sweltering.

In our own house, at 7,100 feet (2,200 meters) in the Rocky Mountains of Colorado, we grow bananas despite a severe outdoor climate that has gone as low as -40°F (-40°C). The house cost less than normal to build because the superwindows, superinsulation, and ventilation heat recovery, which let us eliminate the furnace, cost less than the furnace would have cost to install. We also saved 90 percent of the household electricity—the average usage is only about 110 watts, or the equivalent of one lightbulb—99 percent of the water-heating energy, and half the water, with extra investments that paid for themselves in the first 10 months, using 1983 technologies. Today's technologies are much better.

Other houses we helped to design have achieved normal or better comfort, with no air-conditioning equipment, at outdoor temperatures up to 115°F (46°C), yet they too cost less than normal to build. We showed how to modify a 200,000-square-foot (18,600-square-meter) glass office tower in Chicago to save three-quarters of its energy, while making employees more comfortable, healthier, and more productive, at no more cost than the normal 20-year renovation that would have saved nothing.

Architecture professor Suntoorn

Boonyatikarn built a delightful house in Bangkok that uses only 10 percent of the normal amount of air-conditioning, yet maintains superior comfort and cost nothing extra to build. Similarly, an existing California office building was cost-effectively improved to save more than 90 percent of its air-conditioning energy while improving comfort.

Outside the box. You've seen the mental exercise that calls for finding the solution that connects nine dots with four interconnecting lines, drawn without lifting the pencil. The clichéd solution is to "think outside the box."

A friend of ours who posed this problem for his class was amazed the next day when a student said she could solve it in three lines. Because these are not mathematical dots of zero diameter, if the lines are long and slim enough and the dots fat enough, the lines can skim the edges of the dots in a big "Z". Our friend realized that asking the class to "find the solution with four lines" had artificially limited the students' creativity. Thus liberated, the students then devised a multitude of ways to do it with one line. There is the origami solution, in which you fold the paper; the geographer's solution, in which the line goes around the world; the mechanical engineer's approach that cuts the dots out and impales them on the pencil. Of course, the statisticians tell us that if you crumple the paper and stab it enough times eventually the line will go through all nine. Our favorite came from a 10-year old girl, who said, "I used a fat line; you never said it had to be a skinny line."

Inventor Edwin Land once remarked that "people who seem to have had a new idea have often just

stopped having an old idea." The world's leading interiors company, Interface, recently experienced what Land called "a sudden cessation of stupidity" when redesigning a standard industrial pumping loop for installation in a new Shanghai factory. The original, supposedly optimized, design needed 70.8 kilowatts for pumping. Interface's Dutch engineer, Jan Schilham, made two simple design changes that cut that from 70.8 to only 5.3 kilowatts, a 92 percent reduction. Yet the redesigned system cost less to build and worked better in all respects.

Schilham's solution required no new technology, but only two changes in the design mentality. First, he chose big pipes and small pumps rather than small pipes and big pumps. The friction in a pipe falls as nearly the fifth power of its diameter.[2]

Normal engineering practice balances the higher capital cost of a fatter pipe against the present value of the pumping energy that the pipe's lower friction will save over time.

But this textbook optimization is wrong because it ignores the capital cost of the pumping equipment—the pump, motor, variable-speed electronic control, and electrical supply—that must be big enough to overcome the pipe friction. Ignoring the potential to make that equipment much smaller, and optimizing one component—the pipe—in isolation, fails to fully exploit the system. Optimizing the whole system instead, and counting savings in capital cost as well as in energy cost, makes the whole system cost less but work better.

Schilham's second innovation was to lay out the pipes first, then the equipment. The normal se-quence is the opposite: install the equipment in traditional posi-tions—far apart, at the wrong height, facing the wrong way, with other things in between—then tell the pipefitter to hook it all up. The resulting long, crooked pipes have about 3 to 6 times as much fric-tion as short, straight pipes.

Using short, straight pipes in-stead of long, crooked ones cuts both capital and operating costs. In this case, in addition to other benefits, it also saved 70 kilowatts of heat loss, with a 3-month pay-back, because straight pipes are easier to insulate.

So why does this matter? Pump-ing is the biggest use of electricity worldwide. Electric motors use three-fifths of all electricity. Every unit of friction saved in the pipe saves about 10 units of fuel, cost, pollution, and climate change at the power station. More important, though, the approach of optimiz-ing only the pieces of a design usually suboptimizes the whole system. The process of whole-sys-tems thinking, and of optimizing for multiple benefits, should be applied to every technical system that uses energy and resources. Optimizing a whole pumping sys-tem, a whole building, a whole factory, a whole economy, can typi-cally yield resource savings of three- to 10-fold, yet cost less to build.

Village Homes. Consider another example of design integration, from real-estate development. Typical U.S. tract-home develop-ments drain stormwater away in costly underground pipes. Village Homes, an early solar housing de-velopment near Sacramento, Cali-fornia, instead installed natural water-catchment channels in the landscaping. After a storm, the channels would fill with rainwa-ter. Most of the water would soak into the ground, recharging the groundwater, while the rest would run off about a day faster than mosquito larvae could hatch.

Not needing the big pipes in the ground saved $800 per house and provided more green space. The developer then used the saved money to pay for extensive edible landscaping that provided shade, nutrition, beauty, community fo-cus, and crop revenues to support more amenities. The landscaping, plus people-centered site plan-ning—pedestrian/bike greenways in front of the houses, cars around the back on narrow, tree-shaded streets—saved more land and money. It also cooled off the mi-croclimate, yielding better com-fort with little or no air-condition-ing, and it created safe and child-friendly neighborhoods that cut crime by 90 percent in a neigh-borhood that real-estate agents once described as weird.

Village Homes is now the most desirable place to live in the whole town, with market values averag-ing $11 per square foot ($1 per square meter) above normal, and sales three times faster than aver-age. As usual, the same integrative design that improved environmen-tal, resource, and human perfor-mance also improved market and financial performance.

Hypercars. Combining many new technologies with new design thinking can yield unexpected breakthroughs. For example, Rocky Mountain Institute's Hypercar[SM] design synthesis for automobiles and other road ve-hicles can produce a large sport-utility vehicle that gets 100 miles per gallon-equivalent, powering its electric propulsion motors with an onboard fuel cell using com-pressed gaseous hydrogen. A

smaller version—an ordinary 4-to-5-passenger family car—could achieve roughly 120 miles per gallon.

Made of advanced polymer composites like carbon fiber, the sport-utility vehicle would be ultra-light, weighing only 1,700 pounds (770 kilograms) but could carry the same load up a 30-degree slope.

It could carry six adults and 140 cubic feet (4 cubic meters) of cargo with Mercedes comfort and safety, yet with the performance of a BMW. Its body materials wouldn't dent, rust, or fatigue. It would be ultra-reliable and emit no pollution, producing only hot drinking water. Its hydrogen could be profitably produced without harming the climate. The car could also be plugged back into the electric grid when parked, becoming a mini-power plant on wheels and selling back to the grid enough power to earn its owner up to half the cost of buying the car.

This combination of technologies—to which roughly $10 billion has already been committed by automakers and potential new market entrants—will ultimately save about as much oil as OPEC now sells. Indeed, it probably spells the end of the car, oil, steel, aluminum, nuclear, coal, and electricity industries as we know them, and the beginning of successor industries that are cleaner and more profitable. Ford Motor Company Chairman William Clay Ford Jr. has predicted that hybrid-electric cars and trucks could account for 20 percent of vehicle sales by 2010. President Okuda of Toyota even envisaged that hybrids could account for 33 percent of sales by 2005.

Bill Ford, as well as the chairman of General Motors, also pre-dicts that both engine-driven hybrids and traditional cars will eventually be replaced by fuel-cell vehicles. At least eight major automakers have announced volume production of fuel-cell cars in model years 2004-05, and two—Honda and Toyota—intend to do so in 2003.

With these sorts of advanced characteristics, hypercars should be available within five years and dominant within 10. The traditional car industry will be toast in about 20 years.

Profitable environmental protection. All of these ways of saving energy mean that global climate change can be prevented at a profit because saving fuel costs less than buying fuel. Leading companies are starting to capture this potential. DuPont recently announced that by 2010, it will reduce its carbon dioxide emissions by 65 percent from 1990 levels, raise its revenues 6 percent a year with no increase in energy use, and get a 10th of its energy and a quarter of its raw materials from renewables—all in the name of increasing shareholder value. ST Microelectronics, the world's eighth-largest chipmaker, has set a goal of zero net carbon emissions by 2010 despite a 40-fold increase in production from 1990, again in pursuit of commercial advantage.

This is why the European Union has already adopted Factor Four—at least a fourfold gain in resource productivity—as the new basis for sustainable development policy and practice. Some countries, like Holland and Austria, have declared Factor Four a national goal. The Organization for Economic Co-operation and Development environment ministers, the government of Sweden, and distinguished industrial and aca-demic leaders in Europe, Japan, and elsewhere have gone even further, adopting Factor 10 improvements as their goal. The World Business Council for Sustainable Development and the United Nations Environment Programme have called for Factor 20. There is growing evidence that even such ambitious goals are feasible and achievable in the marketplace. They may, in fact, offer still-greater profits.

Eliminating Waste

While resource efficiency is Natural Capitalism's cornerstone, it is only the beginning. Natural Capitalism doesn't mean merely reducing waste; it means eliminating the entire concept of waste by adopting biological patterns, processes, and often materials. This implies eliminating any industrial output that represents a disposal cost rather than a saleable product. There should be none of what in the 20th century were called "wastes and emissions" but are properly called "unsaleable production." If we can't sell it, we shouldn't produce it; we should design it out.

DesignTex, a subsidiary of Steelcase—the world's largest maker of office furniture—commissioned the architect Bill McDonough to design a "green" textile for upholstering office chairs. The fabric it was to replace used such toxic chemicals to treat and dye the cloth that the Swiss government had declared its edge trimmings to be a hazardous waste. If the trimmings of the chair fabric are toxic wastes, what's in the rest of the cloth that we're sitting on?

McDonough's team screened more than 8,000 chemicals, rejecting any that were persistently

toxic, built up in food chains, or caused cancer, mutations, birth defects, or endocrine disruption. They found only 38 that weren't harmful. From these, however, they could make virtually every color they might need. The cloth would look better, feel better in the hand, and last longer because the natural fibers wouldn't be damaged by harsh chemicals. The new fabric has won design awards. Production also costs less because it requires fewer and cheaper feedstocks and causes no health and safety concerns; there is nothing that could harm the workers or the neighbors.

When the Swiss environmental inspectors tested the manufacturing plant that produced the cloth, they thought their equipment was malfunctioning; the water coming out of the plant was cleaner than the Swiss drinking water going in because the cloth itself was acting as an additional filter. But what had really happened was that the redesign of the process had eliminated any waste and toxicity. As architect McDonough put it, the redesign took "the filters out of the pipes and put them where they belong, in the designers' heads."

Professor Hanns Fischer of the University of Zürich could certainly appreciate McDonough's perspective. He noticed that his university's basic chemistry lab course was turning pure, simple reagents into mainly hazardous wastes, incurring costs at both ends. The students were also learning once-through, linear thinking. So the instructional design was partly reversed; in some of the lessons, the students turned the toxic wastes back into pure, simple reagents. Waste production declined 99 percent, costs fell by about $20,000 a year, and the students

learned the closed-loop thinking that must ultimately save the chemical industry. The only problem was that the students kept volunteering vacation time to repurify the wastes because it was so much fun. Demand for wastes soon outstripped supply.

Closing the loops in the flow of toxic materials can also be a good way to encourage better design that eliminates toxicity altogether. For example, how clean would you design a car to be if the exhaust pipe were plumbed into the passenger compartment instead of being aimed at people on the streets? How clean would you make the discharge from your factory if the waste outfall were upstream of the water intake? The first environmental minister of Australia made many factories do exactly that. How safe would you make your explosives factory if you built your house next to it? That's what Mr. DuPont did; his company has been the world leader in industrial safety ever since.

Ultimately, companies that need environmental regulation will not be around, because they will not be profitable. They will have wasted money to make things that nobody wants. In such a biological world, the design lessons of nature will improve business as well as health, housing, mobility, community, and national security. In this coming world, companies will take their values from their customers, their designs from nature, and their discipline from the marketplace. Companies that ignore this will do so at their peril.

The Solutions Economy

The third key element of Natural Capitalism is to shift the structure of the economy from focusing not on matter and things, but on ser-

vice and flow—from the episodic acquisition of goods to the continual flow of value and performance.

This change in the business model creates incentives for continuous improvement in the elimination of waste because it structures the relationships so that the provider and customer both make money by finding more-efficient solutions that benefit both.

For example, in Europe and Asia, the Schindler Elevator Company leases vertical transportation services instead of selling elevators, because it believes that its elevators use less energy and maintenance than others. By owning the elevators and paying their running cost, Schindler can provide to customers, at higher profit and lower cost, what they really want, which is not an elevator but the service of being moved up and down.

Similarly, Electrolux/Sweden leases the performance of professional floor-cleaning and commercial food-service equipment, rather than the equipment itself, and is experimenting with leasing household "washing services" charged by the weight of clothes washed—like the way many photocopier services charge by the page. And Dow and Safety-Kleen lease dissolving services rather than sell solvents. Now the whole American chemical industry is exploring this business model. Most French commercial buildings are heated by chauffagistes—"heat contractors" who provide the service of thermal comfort.

In all these cases, both customer and provider profit from minimizing the flow of energy and materials.

Carrier, the world's largest manufacturer of air-conditioners, is experimenting with leases of comfort instead of sales of air-con-

ditioners. Making the equipment more efficient or more durable will give Carrier greater profits and its customers better comfort at lower cost. And since making the building itself more efficient so that less cooling yields the same comfort, Carrier is starting to team up with other firms that can improve lighting, glazings, and other building systems. Providing a more systemic solution, creating a relationship that continually aligns interests, is obviously better for customers, shareholders, and the Earth than selling air-conditioners.

Or consider the Films Division of DuPont. Once nearly defunct, the Films Division now leads its 59-firm market because it is able to make films ever thinner, stronger, and better matched to customers' needs. Because the higher-performance film is more valuable to customers, it fetches a higher price, but it contains fewer molecules and hence costs less to make. Moreover, rather than using virgin raw materials, DuPont recycles nearly a billion dollars of used film per year, recovered from customers using a process called "reverse logistics," a new topic of study in business schools. Jack Krol, past chairman of DuPont, has remarked that he sees no end to DuPont's ability to profit from this loop-closing and "dematerialization," doing ever more and better with less material, until the company ultimately is selling almost nothing but ideas.

Reinvesting in Natural Capital

The fourth principle of Natural Capitalism is to reverse the planetwide destruction of ecosystems by reinvesting some of the profits from eliminating waste, in the most productive way. Typically this means restoring natural capital, to produce more abundantly the biotic resources and ecosystems services that are becoming scarce.

If natural capital is the most important, valuable, and indispensable form of capital, then a wise society will reinvest in restoring it where degraded, sustaining it where healthy, and expanding it wherever possible—the better to create wealth and sustain life. It is easiest to see how this can be done in the industries of forestry, farming, and fishing, whose success depends directly on the health of the natural systems around them. But it is starting to spread to many other industries as the primary inputs to manufacturing come to be grown, not mined, and living nanotechnologies replace vast factories.

Such transitions, however, will place a premium on learning to understand biological models and on using nature as model and mentor rather than as a nuisance to be evaded.

Restoring ecosystem services might sound expensive. But whole-system solutions can be restorative in low-cost and often even profitable ways. They enable life to flourish, creating more life and hence more value. Production is carried out automatically by nature; people need only create hospitable conditions and do no harm. In this exciting sphere of innovation lie virtually unlimited opportunities.

■ Allan Savory, a wildlife biologist from Africa, has redesigned ranching to mimic the migration of large herds of native grazers that co-evolved with grasslands. This can greatly improve the carrying capacity, even of arid and degraded rangelands, which turn out to have been not overgrazed but undergrazed out of ignorance of how

brittle ecosystems evolved.

■ The California Rice Industry Association cooperated with environmental groups to switch from burning rice straw to flooding the ricefields after harvest. They now flood 30 percent of California's rice acreage, harvesting a far more profitable mix of wildfowl. Benefits include free cultivation and fertilization by millions of wild ducks and geese, lucrative hunting license fees, and groundwater recharge, with rice as a byproduct.

■ Biologist John Todd designs "living machines," serving such functions as heating, cooling, cleaning up wastes, and purifying air. Some of his "machines," for example, are sewage treatment plants that look like gardens—because that's what they are. They make sewage into exceptionally clean water, plus valuable flowers, an attractive tourist venue, and other byproducts, with no toxicity, no hazard, no odor, and lower capital costs. The treatment plant can easily be small enough to serve an urban neighborhood or even a single building, avoiding the dis-economies of excessively centralized collection and treatment systems. Living organisms are also being used to remediate toxic pollutants into forms that are harmless or salable or both.

Some of the most exciting developments are modeled on nature's low-temperature, low-pressure assembly techniques, whose products rival anything humans can produce. Janine Benyus's book *Biomimicry* points out that spiders make silk, strong as Kevlar but much tougher, from digested crickets and flies, without needing boiling sulfuric acid and high-pressure extruders.

The abalone makes an inner shell twice as tough as ceramics,

and diatoms make seawater into glass. Neither group needs furnaces. Trees turn sunlight and soil into cellulose, a sugar stiffer and stronger than nylon but much less dense. Then they bind it into wood, a natural composite with a higher bending strength and stiffness than is found in aluminum alloy, concrete, or steel. Yet trees don't need smelters, kilns, or blast furnaces.

We may never be as skillful as spiders, abalones, diatoms, or trees, but such benign natural chemistry may be a better model than industrialism's primitive approach of "heat-beat-and-treat." These nature-mimicking practices adopt the design experience of nearly 4 billion years of evolutionary testing in which products that don't work are recalled by the manufacturer. Though many details of such practices are still evolving, the broad contours of the lessons they teach are already clear.

Putting It All Together

What would a company that used natural capitalism as its strategic paradigm look like? A striking example is emerging at Interface, an Atlanta-based interiors company. Most broadloom carpet is replaced every decade because it develops worn spots. An office is shut down, furniture is removed, and carpet is torn up and sent to landfills where the millions of tons deposited each year will last for up to 20,000 years. New carpet is then laid down, the office is restored, and operations are resumed, with workers possibly being sickened from the carpet-glue fumes.

Interface's visionary chairman, Ray Anderson, committed Interface to becoming the first company of the next industrial revolution. Interface has been system-

atically implementing each of the principles of Natural Capitalism. First, its staff has sought to increase the productivity with which they use energy and materials. They implemented the QUEST program to identify and eliminate waste in Interface's worldwide operations. From 1994 to mid-2000, this added $143 million to the bottom line and now provides 27 percent of the company's operating profit.

Second, Interface has sought to close the loops of materials flows. It is implementing a program to recycle carpet virtually completely. Other companies that claim to recycle carpet actually "downcycle" it, taking used carpet, chopping it up, and reusing it in lower-grade products such as carpet backing. But this wastes the embodied energy in the nylon face of the carpet and uses more oil to make new nylon for the new face. In contrast, Interface's new "Solenium" product, released in 1999, is almost completely remanufacturable into identical carpet. The face is a new type of polyester that can be separated from the backing and remade into new face, while the old backing becomes new backing. This severs the connection to the oil well at the front of the production cycle and to the landfill at the back end.

Solenium also provides better service. The new floor covering is nontoxic, virtually stainproof, easy to clean with water, four times as durable, a third less materials-intensive, climate neutral—the climate impacts of making and shipping it have all been offset—and, in appropriate applications, superior in every respect. It also turns the avoided waste into profit.

Interface implements the third principle of Natural Capitalism by

preferring to sell floor-covering services rather than new carpet. People want to walk on and look at carpet, not necessarily own it. Under Interface's Evergreen Service Contract, the company will install carpet tiles, which Interface will own and remain responsible for keeping clean and fresh. As needed, Interface will replace the 10 to 20 percent of the carpet tiles that show 80 to 90 percent of the wear. This provides better service at lower cost. It also increases net employment, eliminates disruption—worn tiles are seldom under furniture—and turns a capital expenditure into a tax-deductible operating lease.

Solenium's quadrupled durability and one-third lower materials intensity, coupled with the four-fifths lower materials flow from replacing only the worn parts, will cut Interface's net flow of materials and embodied energy by 97 percent even before the remanufacturing of the Solenium begins. When these attributes are combined with the remanufacturing, the continuing use of virgin materials will fall by more than 99.9 percent.

Finally, Interface is initiating a program to grow its feedstocks, mindful that this will require the company to ensure that its suppliers practice sustainable farming, so that they don't just substitute one form of unsustainability for another. This will put Interface in the forefront of making a steady market for organic farmers who restore the land through their practices, and it will ultimately free this once petrochemical-intensive firm entirely from its dependence on oil. Interface will then take nothing from the planet, do no harm, and provide a better service at lower cost and higher profit.

Interface's first four years on this systematic quest returned doubled revenues, tripled operating profits, and nearly doubled employment. Its latest quarter-billion dollars of revenue have been produced with no increase in energy or materials inputs, just from mining internal waste, closing the loops, eliminating toxics, and shifting to a service model. In the fifth year, external circumstances unrelated to Interface's sustainability work hurt the company, but it stayed profitable and is now coming back strongly. (See "The Next Industrial Revolution" in this issue of FORUM.)

Beyond Profits

Implementing the elements of Natural Capitalism tends to create an extraordinary outpouring of energy, initiative, and enthusiasm at all levels of a company. It removes the contradiction between what people do at work and what they want for their families when they go home. This makes Natural-Capitalist firms among the most exciting places in the world to work.

Civilization in the 21st century is imperiled by three problems: the dissolution of civil societies into lawlessness and despair; weakened life-support systems; and the dwindling public purse available to address these problems and reduce human suffering. All three share a common cause: waste. Fortunately, all three have a common solution, equally unacknowledged yet increasingly obvious: the reduction of this waste and the implementation of the principles of Natural Capitalism.

Curitiba. This solution is perhaps best illustrated by the city of Curitiba, Brazil, whose population of 2.5 million has quadrupled in the past 20 years. The city has a per-capita municipal budget roughly 15 times smaller than that of the troubled American city of Detroit, Michigan, even though Detroit is less than half its size. Yet Curitiba, though not free of problems, has solved its problems better than any American city we know. It has achieved remarkable success by substituting brilliantly integrative design for wealth.

In a community-based process run largely by architects and women, the city has treated its formidable economic, social, and ecological needs, not as competing priorities to be traded off, but as interlinked design elements with synergies to be captured. Hydrology was integrated with physiography, nutrient flows with waste flows, transport with land-use, education with health, participation with dignity. In short, Curitiba has built one of the world's great cities, by design.

Most of the biggest tasks in Curitiba's development were carried out by private companies, often in partnership with their communities, and working under simple rules that rewarded the desired results. For example, the city has probably the world's best public transport system, based on a safe, fast, clean, cheap, and radically redesigned bus service. The bus system carries three-fourths of all commuters and serves all neighborhoods fairly because the 10 competing private bus companies are rewarded, not for how many people they carry, but for how many kilometers of route they serve.

Corporate responsibility. Worldwide, the leaders in eliminating waste will be companies. But there remains a vital role for governments and for civil society. It is important to remember the purposes and limitations of markets. Markets make a splendid servant but a bad master and a worse religion. Markets produce value, but only communities and families produce values. A society that substitutes markets for politics, ethics, or faith is dangerously adrift. Commerce must be in the vanguard of creating a durable system of production and consumption by properly applying sound market principles. Yet not all value is monetized; not every priceless thing is priced. Nor is accumulating money the same thing as creating wealth or improving people. Many of the best things in life are not the business of business. And as the Russians and Somalis are finding under the "gangster capitalism" they've been subjected to, unless there are democratic ways to establish and maintain a level playing field, only the most ruthless can conduct business.

One powerful tool that governments use is tax policy. Such taxes as FICA and other penalties on employment that grew out of the first industrial revolution, encourage companies to use more resources and fewer people. Groups like Redefining Progress have shown how gradual and fair tax shifting and desubsidization can provide more of what we want—jobs and income—and less of what we don't want—environmental and social damage. Redefining Progress is an Oakland, California, policy organization, committed to a more-equitable and sustainable world.[3]

But governments, though vitally important, cannot solve all our problems. Today, over half the world's 100 largest economic entities are not countries, but companies. Corporations may well be

the only institutions in the world with the size, skills, resources, agility, organization, and motivation to solve today's toughest problems. Such business leaders as Ray Anderson of Interface, Mark Moody-Stuart of Royal/Dutch Shell, and Pasquale Pistorio of ST Microelectronics are redefining what corporate responsibility means. As we cross the threshold into the next industrial revolution, many technological and institutional changes will beset us. E-commerce alone will revolutionize business. In this turbulent time, companies seeking stability and profit are turning to the ideology of Natural Capitalism.

Companies and countries that conscientiously pursue the four principles of Natural Capitalism—profiting from advanced resource productivity, closing materials loops and eliminating waste, providing their customers with efficient solutions, and reinvesting in natural capital—will gain a commanding competitive advantage.[4]

They'll be behaving as if natural and human capital were properly valued. But they'll also be making a profit today, when these values are set at zero.

As former DuPont Chairman Ed Woollard remarked, companies that take these opportunities seriously will do very well, while those that don't won't be a problem—they simply won't be around.■

L. Hunter Lovins is chief executive officer for strategy and Amory B. Lovins is chief executive officer of research at the Rocky Mountain Institute, Snowmass, Colorado.[5]

NOTES

1. World Resources Institute, United Nations, and the World Bank, *World Resources 2000-2001, People and Ecosystems: The Fraying Web of Life* (Oxford, UK: Elsevier Science, 2000).

2. Thus if the diameter of the pipe were doubled, the friction within the pipe would be only 1/32 as great.

3. See <http://www.rprogress.org/>.

4. Hundreds of such cases are documented in our book, *Natural Capitalism: Creating the Next Industrial Revolution* (Boston, MA: Little, Brown, 1999), coauthored with Paul Hawken, and at the website <http://www.natcap.org>.

5. The authors have retained copyright to this article.

The Next Industrial Revolution

We're all passengers on Spaceship Earth, but a few centuries of destructive manufacturing practices have placed our vehicle at risk.

BY RAY C. ANDERSON

Deep into his novel *Ishmael*, author Daniel Quinn uses a metaphor to describe our civilization as it has arisen out of the first industrial revolution and the agricultural revolution before that. He likens our civilization to one of those early attempts to build an airplane—the one with the flapping wings and the guy pedaling madly to make the wings go. You've seen the image in old film clips. In Quinn's metaphor, the man and the plane go off a very high cliff and the guy is pedaling away and the wings are flapping, the wind is in his face, and the poor fool thinks he's flying. But the fact is, he's in free fall and just doesn't realize it because the ground is so far away. He's not flying because his plane is not built according to the laws of aerodynamics.

Quinn says that our civilization is in free fall, too, for the same reason: it wasn't built according to the "laws of aerodynamics" that allow civilizations to fly. We think we can just pedal harder and everything will be okay; pedal harder still and we can fly to the stars. But we will surely crash unless we redesign our craft—our civilization—according to laws of flight that will permit us to wing into what author Paul Hawken calls the next industrial revolution.

The next industrial revolution? Is that realistic? Clearly, the first one is just not working out very well, as Quinn's metaphor so aptly demonstrates. In fact, according to economist Lester Thurow, we've already passed through the second industrial revolution and are into the third. In his 1999 book *Building Wealth: The New Rules for Individuals, Companies and Nations*, Thurow holds that the first industrial revolution was steam-powered. The second, which was electricity-powered, made possible the third, which is the information revolution, ushering in the information age. Clearly, all three stages have emerged with vastly different characteristics, and all three are revolutionary in scope.

Yet they all share some fundamental characteristics that lump them together with an overarching, common theme; they were and remain an unsustainable phase in civilization's development. For example, someone still has to manufacture your 10-pound laptop computer, that icon of the information age. If you count everything processed and distilled into the manufacture of those 10 pounds, going all the way back to the mines for materials and wellheads for energy, the weight will be as much as 40,000 pounds.

Not much has changed over the years since the beginning of the industrial revolution except the sophistication of the finished product. So I refer to all three of Thurow's stages collectively as the first industrial revolution, and I believe the next truly revolutionary industrial revolution will be predicated on sustainability.

Fossil Fuelishness

I run Interface Inc., a manufacturing company that annually produces and sells over a billion dollars worth of carpets, textiles, chemicals, and architectural floor-

ing for commercial and institutional interiors. Our factories process raw materials into finished, manufactured products. Our raw materials come from suppliers who operate their own factories.

A few years ago, I decided I wanted Interface to become the first fully sustainable industrial enterprise—a company that could fly on its own into the next industrial revolution. In 1995, the year we set our sights on the stars, our sales were slightly more than $800 million. Our first task was to examine Interface's entire supply chain, to find out where the materials came from that produce so great an amount of carpets, textiles, and other items. What we discovered horrified me. We found that to manufacture $800 million worth of products, our factories and suppliers, together, extracted from the Earth and processed more than 1.2 billion pounds of material—that's 1.2 billion pounds of materials from Earth's stored natural capital.

Of the roughly 1.2 billion pounds, about 400 million pounds represented relatively abundant inorganic materials, mostly mined from the Earth's crust. The remaining 800 million pounds was petrobased, coming from oil, coal, or natural gas. What troubled me the most was that roughly two-thirds of that 800 million pounds of irreplaceable, nonrenewable, exhaustible, precious natural resources was burned up to produce the energy to convert the other third—along with the 400 million pounds of inorganic material—into products used in offices, hospitals, schools, airports, and other facilities.

That fossil fuel, with its complex, precious, organic molecular structure, is gone forever—changed into carbon dioxide and other waste products, many of them toxic, that were produced in the burning of the fuel. These substances, of course, were dumped into the atmosphere to accumulate and to contribute to global warming, to melting polar ice caps, and someday, in the not too distant future, to flooding coastal plains, such as much of Florida. In the longer term, the lapping waters may even flood the streets of Boston, New York, New Orleans, and other coastal cities. Meanwhile, we breathe what we burn to make our products and our livings.

This uncontrolled consumption of natural resources cannot go on indefinitely. My company, and essentially every other company I know of, is plundering the Earth.

Mea Culpa

Of course, no one other than me is accusing me of such wasteful practices. In fact, in terms of our civilization's prevailing attitudes, I'm a kind of modern-day hero, a captain of industry who founded a company that provides over 8,500 people with jobs that support some 27,000 family members, all of whom depend on those factories that consumed those materials. Besides, Interface pays fair market prices for every pound of material it buys and processes. Shouldn't that assuage my guilt?

The answer is, only if the market's price covers the full cost, and unfortunately, it doesn't. Who paid for the military power our government sent into the Middle East to protect the oil at its source? You did, through your taxes. Who is paying for the damage done by storms, tornadoes, and hurricanes that result from global warming? You are, through your insurance premiums. Who will pay for the losses of coastal lands in Florida and the cost of the flooded, abandoned streets of Boston, New York, and New Orleans in the distant future? Future generations, your progeny, that's who.

Bill McDonough—professor of architecture at the University of Virginia, business entrepreneur, and a leading proponent of green design—uses the term "intergenerational tyranny" for this taxation without representation levied by us on those yet unborn.

These points illustrate how the revered market system of the first industrial revolution allows companies like mine to shift those costs to others, to externalize those costs, even to future generations. In other words, the market, in its pricing of exchange value without regard to cost or use value, is opportunistic and permissive, if not dishonest. It allows the externalization of any cost that an unwary, uncaring, or gullible public will permit to be externalized.

So am I a thief, too? Yes, in terms of the definition that I believe will come into use during the next industrial revolution. The perverse tax laws, by failing to correct the errant market and force it to internalize those externalities such as the costs of global warming and pollution, are my accomplices in crime. I am part of the endemic process that is going on at a frighteningly accelerating rate worldwide. This process, if it's not stopped, will rob our children and their children, and theirs, and theirs, of their futures.

No industrial company on Earth and—I feel pretty safe in saying—not a company or institution of any size is sustainable, in the sense of meeting its current needs without, to some extent,

depriving future generations of the means of meeting their needs. When the Earth runs out of finite, exhaustible resources and ecosystems collapse, our descendants will be left holding the empty bag.

Kinder, Gentler Technology
If Interface is to become the first industrial company in the world to attain environmental sustainability, we will have to focus on more than just doing no harm; we will have to restore some of what's been lost since the first industrial revolution. To restore means to put back more than we take. The way to become restorative is first to become sustainable ourselves and then to help or influence others to move toward sustainability.

At Interface, we have undertaken a quest, first to become sustainable and then to become restorative. And we know broadly what that means for us. It's a daunting challenge, and it means creating and adopting the technologies of the future—kinder, gentler technologies that emulate nature. That's where I think we will find the model.

Someone recently mused that a computer is mundane, but a tree is a technological marvel. A tree operates on solar energy and lifts water in ways that seem to defy the laws of physics. When we finally understand how a whole forest works and learn to apply its myriad symbiotic relationships analogously to the design of industrial systems, we'll be on the right track. That right track will lead us to technologies that will enable us, for example, to operate our factories on solar energy.

A halfway house for us may be fuel-cell or gas-turbine technologies. But ultimately, I believe we have to learn to operate off cur-

rent income the way a forest does and, for that matter, the way we do in our businesses and households, not off stored natural capital. Solar energy is current energy income, arriving daily at the speed of light, in inexhaustible abundance, from that marvelous fusion reactor just eight minutes away.

Those technologies of the future will enable Interface to feed its factories with recycled raw materials—recycled raw materials that come from harvesting the billions of square yards of carpets and textiles that have already been made. Nylon face pile can be recycled into new nylon yarn to be made into new carpet; backing material can be recycled into new backing material for new carpet; and, in our textile business, polyester fabrics can be recycled into polyester fiber, to be made into new fabrics. These recycling processes represent a closed loop—using those precious organic molecules over and over in cyclical fashion, rather than sending them to landfills, or incinerating them, or downcycling them into lower-value forms by the linear processes of the first industrial revolution. Linear must go; cyclical must replace it. Cyclical is nature's way.

In nature, there is no waste; one organism's waste is another's food. For our industrial process, so dependent on petrochemical raw materials, this means technical "food" is to be reincarnated by recycling it into the product's next life cycle, and the next. Of course, the recycling operations will have to be driven by renewable energy, too. Otherwise, we will consume more fossil fuel for the energy to recycle than we will save in virgin petrochemical raw materials by recycling in the first place. We want a gain, not a net loss.

If we get it right during the next industrial revolution, we will never have to take another drop of oil from the Earth for our products or industrial processes. Those technologies of the future will enable us to send zero waste and scrap to the landfill. We're already well down this track at Interface. We have become disciplined and focused in all Interface's businesses on what is sometimes called the low-hanging fruit, the easier savings to realize. We named this effort QUEST—Quality Utilizing Employees' Suggestions and Teamwork. In the first five years of this effort, we've reduced total waste in our worldwide business by nearly 50 percent, which has saved $133 million, and those savings are paying the bills for all the rest of this revolution in our company. We are on our way to saving $80 million or more *per year* when we reach our goals.

Cradle to Cradle
We're redesigning our products for greater resource efficiency, too. For example, we are producing carpets with lighter face weights—less pile—but better durability. It sounds paradoxical, but it's actually working in a measurable way. We're making carpets with lower pile heights and higher densities, using carpet face constructions that wear better in high traffic but use less materials. This is just one example of the kinds of technologies that will help drive the next industrial revolution.

Those technologies of the future will enable us to operate without emitting anything into the air or water that hurts the ecosystem. We're just beginning to understand how incredibly difficult this will be, because the materials coming into our factories from our sup-

pliers are replete with substances that never should have been taken from the Earth's crust in the first place.

Those technologies must enable us to get our people and products from Point A to Point B in resource-efficient fashion. In our company alone, at any hour of the day, we have more than 1,000 people on the move, while trucks, ships, and sometimes planes deliver our products all over the world.

One potential solution for our transportation needs is the hypercar developed by Rocky Mountain Institute physicist Amory Lovins. When operational, Amory's super-lightweight, super-aerodynamic hypercar will use solar energy for electrolysis of water to extract hydrogen to power its fuel cells. A flywheel or an ultra-capacitor with nothing moving and nothing to wear out will store energy, including the recaptured energy generated in braking the car, with this energy going to power electric motors on each wheel, dispensing with the drive train altogether.

To complement and reinforce these new technologies, we will continue to sensitize and engage all 8,500 of our people in a common purpose, right down to the factory floor and right out there face to face with our customers.

We must also redesign commerce in the next industrial revolution and redesign our role as manufacturers and suppliers of products and services. Already, we are acquiring or forming alliances with the dealers and contractors that install and maintain our products, requiring an investment of some $150 million in the United States alone since 1995. With these moves downstream into dis-

tribution, we are preparing to provide cyclical—what Bill McDonough calls cradle-to-cradle—service to our customers, as the distribution system becomes a collection and return system as well.

In our reinvented commercial system, carpet need not be bought or sold at all. Leasing carpet, rather than selling it, and being responsible for it cradle-to-cradle is the future and the better way. Toward this end, we've created and offered to the market the Evergreen Lease, the first ever perpetual lease for carpet. We sell the services of the carpet—color, design, texture, warmth, acoustics, comfort under foot, cleanliness, and improved indoor air quality—but not the carpet itself. The customer pays by the month for these services.

In this way we make carpet into what Michael Braungart—a chemist and partner of Bill McDonough—terms a product of service, what Paul Hawken describes as licensing in his book *The Ecology of Commerce*, and what the President's Council on Sustainable Development calls extended producer responsibility. Walter Stahel, Swiss engineer and economist, was perhaps the first person to conceptualize such a notion.

Environmental sustainability, redefined for our purpose as taking nothing from the Earth that is not renewable and doing no harm to the biosphere, is a mountain, but we've begun the climb. Teams all through our company in manufacturing locations on four continents are working together on hundreds of projects and technologies that are leading us toward sustainability.

Steps to Success

We've embraced the Natural Step—the frame of reference con-

ceived by Karl-Henrik Robèrt of Sweden to define the system conditions of ecological sustainability—as a compass to guide our efforts. In the thousands and thousands of little things, the Natural Step framework is helping provide what we have termed the sensitivity hook-up, among our people, our communities, our customers, and our suppliers. We want to sensitize all our constituencies to Earth's needs and to what sustainability truly means for all of us.

We started this whole effort at Interface on two fronts. The first was focused on waste reduction. That's the revolution we call QUEST. We define waste as any cost that goes into our product that does not produce value for our customers. Value, of course, embraces product quality, including aesthetics, utility, durability, and resource efficiency. Since any waste is bad, we're measuring progress against a zero-based waste goal. A revolutionary notion itself, our definition of waste includes not just poor quality and scrap—the traditional notions of waste. It also means anything else we don't do right the first time—a misdirected shipment, a mispriced invoice, a bad debt. In QUEST, there's no such thing as "standard" waste or "allowable" less-than-perfect quality.

QUEST is measured in hard dollars and, as I said, we took nearly 50 percent, or $133 million cumulatively, out of our costs in the first five years, on our way to our goal of more than $80 million per year of waste reduction. Scrap to the landfills from our factories is down over 60 percent since the beginning of QUEST in 1995, in some factories, 80 percent.

We've also begun to realize that

conceptually it might be possible to take waste, by its current definition, to a level below zero as measured against our 1994 benchmark. For instance, if we substitute recycled materials for virgin materials, we are eliminating someone else's wastes and thus are creating, in effect, negative waste when measured against the old norms. If successful, we will have replaced the old system, now obsolete, with the new, nonwasteful system.

Among the other initiatives we've launched is EcoSense, which is based on a concept we call EcoMetrics. As an example, consider the following hypothetical tradeoff. One widget consumes 10 pounds of petrochemically derived material, a nonrenewable resource. Another, functionally and aesthetically identical to the first, consumes only six pounds of petrochemically derived material, substituting four pounds of an abundant inorganic material, but also requires a small amount of a chlorinated paraffin. That chlorine could be the precursor of a deadly dioxin. How does one measure the true cost or value of that chlorinated paraffin?

EcoMetrics explores some perplexing tradeoffs and is predicated on a scale that weighs such diverse factors as toxic waste, dioxin potential, aquifer depletion, carbon dioxide emissions, habitat destruction, nonrenewable resource depletion, and embodied energy.

In February 1996, we brought together these two revolutionary efforts—QUEST, the hard-dollar effort, and EcoSense, the environmental effort. We merged the two task forces and formed 18 teams with representatives from our businesses worldwide. Each team had an assigned scope of investigation.

It turned out to be a wonderful marriage, integrating these closely related efforts, positively changing our corporate culture, and finding a whole new world of opportunities and challenges. Today, there are more than 400 projects—from persuading our landlord to install compact fluorescent light bulbs in our corporate headquarters office, to creating sustainable businesses within our company.

Formula for Success

In the 21st Century, as the new industrial revolution gathers speed, I believe the winners will be the resource-efficient. Meanwhile, the argument goes on between technophiles and technophobes, one insisting that technology will save us, the other contending that technology is the enemy. I believe the next industrial revolution will reconcile these opposing points of view, because there is another way to express the differences between the first industrial revolution and the next. The well-known environmental impact equation, popularized by ecologists and authors Paul and Anne Ehrlich, declares that environmental impact is a product of population size, affluence, and technology. This can be expressed mathematically as

$$E = P(A)(T)$$

According to the equation, an increase in population, affluence, or technology results in worse environmental impact. Technology—at least the technology of the first industrial revolution—*is* part of the problem, reinforcing the technophobes' position.

But just what are the characteristics of the technologies of the first industrial revolution? For the most part, they are extractive, linear—

take, make, waste—fossil fuel-driven, focused on increasing labor productivity per worker, abusive, and wasteful. And they are unsustainable.

What if the characteristics of technology were changed? Let's say they were renewable, rather than extractive; cyclical (cradle-to-cradle), rather than linear; solar- or hydrogen-driven, rather than fossil fuel-driven; focused on resource productivity, rather than labor productivity; and benign in their effects on the biosphere, rather than abusive. And what if they emulated nature, where there is no waste?

Might not it then be possible to restate the environmental impact equation as

$$E = \frac{P(A)}{T}$$

By moving technology from the numerator to the denominator, we change the world as we have known it. The technophiles, the technophobes, the industrialists, and the environmentalists could be aligned and allied in their efforts to reinvent industry and civilization. The mathematically minded see it immediately. In the new equation, the more technology the better because there would be less impact. Furthermore, it would begin to put the billion unemployed people of Earth to work, increasing resource productivity, using an abundant resource—labor—to conserve diminishing natural resources. Technology would become the friend of labor, not its enemy. Technology would become part of the solution, not part of the problem.

What will drive technology from the numerator to the denominator? I believe getting the prices right is the biggest part of the answer. That means tax shifts and,

perhaps, new financial instruments, such as tradable emission credits, to make pollution cost the polluter. In any event, it means eliminating the perverse incentives and getting the incentives right for innovation, correcting the market's fundamental dishonesty in externalizing societal costs and, instead, harnessing honest, free-market forces. If we can get the incentives right, entrepreneurs everywhere will be thankful; there will be new fortunes to be made in the next industrial revolution.

But what in turn will drive the creation of tax shifts and other politically derived financial instruments? Those will ultimately be driven by a public with a high sense of ethics, morality, love of the Earth, and a longing for harmony with nature. When the people—through the marketplace—show their appreciation for these qualities and vote with their pocketbooks for the early adopters, the people will be leading; the good guys will win in the marketplace and the polling booth. And the rest of the political and business leaders will have to follow.

As a politician once said, "Show me a parade and I'll gladly march in front of it." So, too, will business and industry respond to the demands of this new marketplace, and Earth will gain a much-needed reprieve.∎

Ray Anderson is chairman and chief executive officer of Interface Inc., Atlanta, Georgia.[1]

NOTE

1. This article is adapted from Ray Anderson's book, *Mid-Course Correction* (Atlanta, GA: Peregrinzilla Press, 1998).

Walk This Way

The Natural Step provides a clear path for achieving sustainability through increased product stewardship, environmental awareness, and respect for people and the planet.

BY GEORGE BASILE AND JILL ROSENBLUM

At its core, sustainability is about meeting human needs—now and into the future. The concept is also all about linkages and connections, complex systems, and multiple perspectives. Meeting human needs in the present and future requires us to recognize the human connections with the planet and with each other. From there, we must embed that recognition in all that we do.

As individuals, we are effective at understanding and acting on our immediate needs—watch out for that car, get that project done, pick up that child, eat that food—but we are not nearly as good at understanding how our individual actions affect the world around us and, in turn, how those impacts affect us as individuals.

Today, people are dominating the planet at unprecedented, and almost unbelievable, levels. We have transformed about half of all the land on the planet. We are exploiting every major ocean fishery. We are even changing the composition of our global atmosphere and our global soils.

There is nothing inherently unnatural about this, but ours appears to be a perilous path. As living, breathing creatures we interact with nature every minute of every day. There are now 6 billion of us living on this small planet and billions more on the way. The result is that our individual actions are adding up to ever-more obvious impacts on the basic services that nature provides us, services that we require to survive. Our greatest impacts have occurred over the last couple of centuries on a planet that measures its lifetime in billions of years.

The disconnect between the economy and the natural world creates a blind spot in the vision of strategic decision makers in business, including consumers and shareholders. Responsibilities such as maintaining forests and protecting the air are not seen as priorities when compared with supply, demand, margins, costs, and profits.

It is not that natural resources are taken into account and then discounted. More generally, they are simply not put into the decision-making equation at all, or they are incorporated in disconnected bits—social here, environmental there, economic somewhere else. Often, they become visible to business decision makers only when advocacy groups, legislative pressures, or a loss of access to a resource points them out.

So, we come full circle. In many cases meeting our immediate human needs and understanding the impacts of those actions on other people and the planet become the very same thing. How do we design with both the present and the future in mind? What are our models? What are our guideposts, our design criteria?

A growing number of companies are recognizing that sustainability must be part of good business decisions. One approach many companies are taking is the Natural Step framework, which is based on science and strategic planning.

Best Foot Forward

Sustainability is a complex topic incorporating social, environmental, and economic parameters.[1] The very complexity of the topic has resulted in inaction and a perception that integrating environmental and social objectives into design parameters or decision-making processes is a practical impossibility with relatively little potential payoff. This flawed perception has been enhanced by a

lack of concise and scientifically valid ways of presenting a clear picture of desired outcomes and operational guidelines.[2]

The Natural Step is a nonprofit educational organization working to build an ecologically and economically sustainable society. Its mission is a straightforward, albeit challenging, one: to accelerate the shift toward sustainability by making the concept simpler to understand and easier to practice.

The Natural Step offers a framework that centers on scientifically based principles for sustainability. The Natural Step framework is nonjudgmental and nonprescriptive and serves as a design guide for businesses, communities, academia, government entities, and individuals working to redesign their activities to become more sustainable.[3]

The Natural Step was founded in Sweden in 1989 by Karl-Henrik Robèrt, a pediatric hematologist. Robèrt witnessed firsthand the connection between human illness and toxins and the determination with which parents of stricken children met this challenge. His concern that so much of the environmental debate was focused on downstream issues—effects, rather than systemic causes of problems—led him to action. He began by asking how the parental drive for the immediate well-being of children could be linked back to the long-term issue of sustainability, and what role science could and should play in forging that link.

With the help of other leading scientists, Robèrt developed a consensus document that focuses on sustainability and, through that lens, generally describes the basic knowledge of nature's functions and how society influences natural systems. It further addresses the notion that, as components of natural systems, humans are threatening themselves by compromising natural resources and functions.

Working extensively with physicist John Holmberg, Robèrt ultimately defined a set of system conditions for sustainability, based on the laws of thermodynamics as well as natural cycles. Together, the concepts behind the consensus document and the system conditions form the kernel of the Natural Step framework.

The Natural Step focuses on solutions and encourages a nonconfrontational approach to problem solving. Nonetheless, when confrontation arises, the Natural Step still has an important contribution to make. Activism often has a major role in forcing businesses to take a seat at the table, setting an agenda for action, and making sure that progress continues. The Natural Step's approach complements the activist's role by providing a path forward for companies embarking on a sustainability initiative, whether by unilateral choice or through market, public, or legislative pressure.

The Natural Step framework encourages consensus-based dialogue as a means of addressing complex environmental and social issues, and it recognizes that what happens in one part of a system affects every other part, often in unexpected ways. The goal of the framework is to provide pragmatic design criteria that can be used to guide social, environmental, and economic actions. It serves as one compass that can direct individuals and organizations toward sustainability.

Systems Science

The Natural Step framework takes a systems perspective of the Earth as a means for understanding how to achieve sustainability—for both the people and the planet. Because sustainability is about meeting human needs while staying within the bounds of the planet and the biosphere, understanding those boundaries and how humans interact with them is a core part of understanding sustainability.

People are good at meeting immediate needs. We are not as good at understanding how our individual actions affect the rest of the world—for instance, how our choice in housing may affect a rainforest in British Columbia. Yet, people are exploiting the planet at unprecedented levels. The knowledge gap between individual actions and impacts to the Earth is the essence of why we need a holistic perspective when pursuing sustainability. Such a perspective makes it possible to generate principles that describe how the system works and that can guide us toward global sustainability.

Consider the Earth as a whole. Matter and energy are neither created nor destroyed. Since the Earth is a closed system for matter, matter is regularly being transformed from one thing to the next. The atoms that made up the dinosaurs are the same ones that make up us. Moreover, matter tends to disperse and become disordered. When you wash your hands, the bar of soap dissolves and runs down the sink, but its matter has not disappeared. It has only been transformed into a less-concentrated, less-ordered mixture of water, soap, and dirt.

What has value to us, therefore, is the order and concentration of matter—in other words, having the right stuff in the right place at the right time. It takes energy to make this happen, and the most

significant external energy source we have is the sun. Green plants are the primary architects that use the sun's energy, through photosynthesis, to transform disordered matter into useful structure.

This brief description does not describe all of the system properties relevant to global sustainability, of course, but it does highlight the concept, and it demonstrates why ecosystems are important for creating order on Earth. Ecosystems provide services such as clean water, clean air, topsoil, biodiversity, protection from harmful solar radiation, and food. Ecosystems are the result of complex interactions that happen within and around the biosphere, creating services that people, and all living things, rely on to survive. They are critical to meeting human needs sustainably, yet are so fundamental to our existence that they are virtually invisible to us as individuals.

It is ecosystem services that we are affecting through our collective individual actions. In a sustainable world, our demand for ecosystem services does not outstrip the supply. Science combined with a systems perspective allows us to see and understand the vital roles these services play in a sustainable world, as well as how we interact with them.[4]

The Natural Step framework relies on this systems-based, scientific understanding of the planet and the biosphere in designing sustainability initiatives. By designing with the planet in mind, we can integrate sustainability into the decisions we make. Sustainability can serve as a way to link our actions, our businesses, and our communities directly into the enormous realm of services the planet and biosphere provide.

First-order Principles

Any system is defined by its first-order principles.[5] The games of soccer or chess, for instance, are defined by the objectives and the rules of the games—the first-order principles—not by various strategies and skills, which come later.

The Natural Step begins with a goal of sustainability, for both people and planet, and combines science and a systems perspective in articulating four first-order principles for sustainability:
■ For society to be sustainable, the environment must not be subjected to increasing concentrations of substances extracted from the Earth. There is a threshold beyond which the environment cannot tolerate the spread of greenhouse gases, surface and groundwater pollutants, toxic metals, and other contaminants. Knowing exactly where this threshold lies is a practical impossibility. This means we should substitute certain minerals that are scarce in nature with others that are more abundant, using all mined materials efficiently, and systematically reducing dependence on fossil fuels.
■ Similarly, the environment must not be subjected to increasing concentrations of substances produced by society. As is the case with natural materials extracted from the Earth, there is a threshold beyond which the environment cannot tolerate the spread of human-made substances. Synthetic compounds such as DDT and PCBs remain in the environment for many years, accumulating in the tissues of organisms, causing profound problems for animals up and down the food chain. Other compounds, such as CFCs (chlorofluorocarbons), can destroy the ozone layer, contributing to cancer. Un-

fortunately, it is often not possible to predict these complex impacts before they happen. We therefore should replace certain persistent and unnatural compounds with ones that are normally abundant or break down more easily in nature, and we should learn to efficiently use all substances synthetically produced by society.
■ Nature's functions should not be systematically impoverished by physical displacement, overharvesting, or other forms of ecosystem manipulation that destroy the ecosystem's ability to renew itself. Escalating habitat destruction and the loss of biodiversity remove the foundation stones of ecosystems and the services they provide. Our health and prosperity depend on the capacity of the environment to renew itself and rebuild wastes into resources. We therefore should use resources only from well-managed ecosystems, systematically pursuing the most productive and efficient use of those resources, and exercising caution in all kinds of modification of nature.
■ To avoid violating the first three principles of sustainability, we should use natural resources fairly, efficiently, and responsibly with a goal of meeting human needs globally. If a billion people lack adequate nutrition while another billion have more than they need, we are violating this principle. When we learn to use our resources fairly, efficiently, and responsibly, the needs of all people and the future needs of people yet unborn stand the best chance of being met.

Implementation

Applying first-order principles when planning for sustainability has a number of advantages that stem from integrating clearly articulated objectives into the entire

planning process. Volvo, for instance, has redefined itself as a transportation company that takes responsibility for all aspects of its service—from roads to impacts to services. Volvo has begun to design a car with sustainability in mind. Guided by the first principle—do not subject the environment to increasing concentrations of substances extracted from the Earth—Volvo has been conducting research on a variety of engine options, including electric hybrids and fuel cells, rather than simply refining the current combustion engine. And the company is using much less wiring in its electrical systems, which has the twofold effect of reducing the amount of copper needed in building a car while making the systems lighter.[6]

Or consider the case of Electrolux, a leading home-appliance manufacturer, which decided to phase out the use of CFCs in its refrigerators and freezers. Although a new type of CFC on the market did not contribute to ozone depletion and greenhouse effects the way the older CFCs do, Electrolux decided the newer compound was not a long-term solution because it too was persistent in the environment. Guided by the second principle—do not subject the environment to increasing concentrations of persistent compounds—Electrolux opted instead for another design strategy that would eventually remove the compounds altogether.[7]

Because the Natural Step's first-order principles are derived from a systems perspective, they are valid at multiple scales and across differing activities.[8] They thus offer a common framework and language for approaching complex sustainability issues, such as transportation, agriculture, and new technologies, as well as specific issues such as the use of plastics.

Strategic Principles

Implementing a sustainability effort for any organization, enterprise, or community requires the integration of many pieces, from creating an overall vision and strategy to taking actions, assessing actual outcomes, and modifying actions as needed. At a minimum, sustainability is best described in terms of this ongoing process, rather than in terms of any given project.

Given a set of sustainability principles to guide its vision and to describe its overall objectives, a company can then define its strategy. Among the processes the Natural Step uses are the following:

■ **Backcasting**. Backcasting begins with envisioning a successful future outcome.[9] The traditional approach to solving environmental problems is to repair the damage and control downstream effects. Consider, for example, a power plant that releases sulfur dioxide into the air. To remove the sulfur dioxide, which is a major contributor of acid rain, the company installs scrubbers. Through the process of backcasting, however, the company doesn't try to remove the pollutant by tacking on new technology. Instead, the company looks backward at the production process—backcasts, applying the system conditions to define a future successful outcome—to find ways to avoid producing sulfur dioxide in the first place.

Once a company has fixed on a desired outcome, it looks for strategic paths that will guide it to its desired goal, with minimal environmental impact. For instance, Collins Pine—a forest products company based in Portland, Or-

egon—used backcasting to come up with an innovative alternative to disposing of sander dust. Instead of continuing to treat the dust as a waste, the company realized the dust could be used as filler in the production of particle board. What had once been a waste became a valuable raw material.

■ **Flexible platforms**. An inherent challenge facing many sustainability initiatives is finding a way to ensure that the short-term availability of resources will lead toward satisfying long-term need. To do this, investments should focus on technically feasible stepping-stones, or "flexible platforms," that lead from current conditions to desired outcomes. Nike's Apparel Division provides a good example of this approach.

Nike prefers to use organically grown fibers in its products, even though the current supply of organic cotton is limited. The company therefore weaves as much organic cotton into its products as organic farmers can supply at a reasonable cost. Nike's ultimate goal is to manufacture products from materials produced solely by sustainable agriculture practices. The flexible platform approach allows the manufacturer to use as much or as little material as is available at any given time while economically supporting the outcomes it wants.

■ **Good return on investment**. When companies evaluate flexible platforms, they should give priority to those that stand a relatively good chance of yielding a good return on investment. In other words, they should identify processes that are relatively inexpensive, meet a growing market demand, or anticipate coming regulatory changes. In short, sustain-

able processes must also be cost-effective, but they must be cost-effective in terms of sustainability.

Being cost-effective under the old nonsustainable economic model may not be good enough. By treating sander dust as a raw material instead of a waste, for instance, Collins Pine saved more than $500,000 in the cost of replacing a burner and another $525,000 per year in the cost of raw materials

■ **Precautionary principle**. To promote sustainability, many businesses, and even nations, often follow the "precautionary principle." The precautionary principle states that we should avoid making critical environmental mistakes when there is uncertainty regarding the ecological or economic consequences of a specific activity. On a global scale, for instance, 39 industrial nations have signed the Kyoto Protocol, agreeing to reduce their greenhouse-gas emissions even though no one can definitively prove that the buildup of greenhouse gases in the atmosphere is causing global warming. Despite the huge economic cost of greenhouse-gas controls, the nations that signed the protocol followed the precautionary principle because they recognize that the cost of global warming will be orders of magnitude greater if it should come to pass.

The precautionary principle also serves to protect businesses from making unwise investments of time, money, and resources and from trading one problem for another. By combining this approach with a sustainability focus, business can make better decisions.

The 21st-century Corporation

In their studies of companies worldwide that have committed to sustainability, Brian Nattrass and Mary Altomare, co-directors of Strategic Organizational Learning at the U.S. office of the Natural Step, have described a vision for a corporation of the 21st century. Companies that subscribe to this vision apply the Natural Step framework in shaping design criteria and generating stepwise strategies to move ever closer to their goals. Nattrass and Altomare have termed these companies "evolutionary corporations." According to Nattrass and Altomare,

> An evolutionary corporation consciously operat[es] with a growing understanding of the dynamics of the natural systems within which it is embedded and aligns its actions with those systems. It consciously chooses strategies consistent with vital evolutionary choices for all the systems with which it is connected and upon which it depends.[10]

To do this, these companies must recognize the impact that human systems have on a global scale, take responsibility for the increasing role that industry plays, engage in purposeful design and redesign of their products and services, work toward a positive future for all stakeholders, and extend their planning and strategic decisions to include the well-being of future generations and other species.

Nattrass and Altomare offer the following companies as examples of industry leaders that qualify as evolutionary corporations:

■ **Interface Inc**., an Atlanta-based company that manufactures carpets, textiles, and flooring, saved $133 million in the first five years of its zero-waste program, primarily by recycling used carpets and textiles. Under Interface's Evergreen Lease program, carpet is not sold, but rather leased, to customers. When a carpet wears out, Interface reclaims it and replaces it with new carpeting made, in large part, from recycled components of used carpets. (See "The Next Industrial Revolution" in this issue of FORUM.)

■ **Scandic Hotels**, a hotel chain based in Stockholm, introduced its Resource Hunt program to find ways to cut back on energy, water, and waste-handling costs at its 120-plus hotels throughout northern Europe.

During the first two years of the Resource Hunt program, Scandic Hotels reduced average energy consumption at its hotels by 12 percent, reduced water consumption by 12 percent, and reduced waste generation by 28 percent.

■ **IKEA**, a home-furnishings company based in Denmark, has captured important energy savings in its North American operations as a participant in the U.S. Environmental Protection Agency's Green Lights program. The program promotes the use of energy-efficient lighting. After only three years in the program, IKEA saved more than $500,000 annually from lighting and air conditioning reductions.

Companies such as Interface, Scandic Hotels, and IKEA are setting the standard for corporations in the 21st century. They are following the first-order principles that the Natural Step espouses. The success of these companies is proof that science and a systems perspective are important tools to lead us down the road to sustainability.

Nature as Paradigm

Nature exists in a dynamic equilibrium, ever-changing, yet providing a consistency of life-sup-

porting resources and services that humans rely upon. If we ignore this deep integration between people and the planet, we do so at our own peril. There is no reason to ignore the natural world when we make business decisions. Indeed, there are profound and undeniable reasons for embracing nature. The Natural Step provides a compass and a bridge for companies that want to design their businesses with the world in mind.■

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NOTES

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Being and Havingness

Sustainability reaches to the core of human nature. If humans can learn to value being over having, sustainability can follow.

BY JOHN R. EHRENFELD

Ever since the 1700s, when English economist Thomas Malthus predicted the collapse of human economies, social critics have worried that economic demands may outstrip the Earth's capacity to provide for human needs. As of yet, Malthus' dire prediction that agricultural productivity would lag behind the demands from a growing population has not been realized. Periodically, social sentinels make similar predictions about the imminent collapse of society due to resource limitations.

During the past 30 years, anxiety about running out of resources has been complemented by concerns that the wastes produced by our economic excesses are overstressing the capacity of ecosystems. Even more recently, as evidenced by the Earth Summit in Rio in 1992, dialogues that focus on exceeding environmental limits have been augmented by talk of equity, environmental justice, and other social issues. Together, these underlying concerns have become conflated under the rubric of sustainable development.

The Earth Summit and the current concerns about sustainability are manifestations of a consciousness that has been awakened by confronting worldly phenomena that threaten health and welfare and shake our confidence in the infallibility of technological control. The appearance of sustainability on the scene is, in part, a consequence of this skepticism and deeper worry.

Sustainability's Roots

Actually, anxiety about sustainability has historical roots that predate Malthus. In fact, they go back at least as far as the Bible and the earliest writings of human societies. In one of the classics of environmental literature, "On the Historical Roots of Our Ecological Crisis," cultural historian Lynn White argues that the roots of our current crisis lie in ancient Judeo-Christian notions of dominion over the Earth and its riches.[1] The Cartesian/Baconian ideology of the Enlightenment, which still underlies our social paradigm, adds technological domination to the theocratic views of the Old and New Testaments, upping our anxiety ante.

This anxiety also has deep biological and social roots. Biologists and philosophers have noted that living organisms demonstrate instinctual patterns of behavior whose primary purpose is survival. These instincts are wired into our neural circuitry and are with us as we develop into adults. Equipped with the magic of language, our species accumulates and labels experiences as "good" or "bad" according to their survival value.

Over the relatively short evolutionary time of *Homo sapiens*, language ability has permitted the development of social conventions and ethical rules that augment this basic biological sense of survival. These rules add a supra-instinctual repertoire to the hard-wired neuronal circuits that each of us carries around from birth, and they have become the constructs of our most basic social norms, such as fairness, justice, dignity, and so forth. Each of us acquires these rules through education and acculturation.[2]

So where does sustainability show up in this discourse? Sustainability or, better, unsustainability, arises as a social construct of collective fears and anxieties whose roots are the biological patterns of behavior every one of us possesses.

Action at a Distance

Other forces are at work in our society that also contribute to our anxiety about sustainability. Technological advances today allow societies to observe and monitor the world around them and to adjust their cultures in accordance with their reflective observations. Such social reflection was unavailable in earlier periods. For much of the past centuries, ideology, poor communications, and other factors created a kind of cultural inbreeding. Today, information travels at electronic speed around the globe. As a consequence, we shape our responses to threats—both perceived and real—and to changing conditions much more quickly than at any time in the past.

Despite this social reflection, however, societies have great difficulty in engaging in ethically responsible behavior in a world where the consequences of action are far removed in time and space. And today, since so much more of our behavior has consequences that are felt in remote corners of the Earth, our failure to achieve sustainability may well be an unintended, but very large, consequence of modern life.

Sustainable Development

The Earth Summit, which was attended by the largest number of heads of state in history, attests to the commitment of powerful world leaders to the notion of sustainability. The Earth Summit notion of sustainability, however, equates *sustainability* with *sustainable development*, which according to the Brundtland Commission, is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[3] This concept is essentially only a variant of the current economic development paradigm, which is, itself, unsustainable.

For one thing, sustainable development is little more than a metaphor for eco-efficiency, which is defined as more product or service value for the same or less negative environmental influence. The problem is that efficiency improvements are insufficient to counter the absolute impacts created by current economic growth rates. A second shortcoming is that the idea of sustainable development fails to capture the inherently radical nature of sustainability and its ties to its social and biological origins. Thus to be truly sustainable, the concept of sustainability must embrace much more than the concept of sustainable development.

I Own, Therefore I Am

Some 25 years ago, the eminent psychoanalyst Erich Fromm wrote a remarkably prescient book, *To Have or To Be?* in which he maintains that "the first crucial step toward [a healthy economy] is that production shall be directed for the sake of 'sane consumption.'"[4] Fromm comes to this now-central notion of sustainability from a psychological/therapist stance. He notes the possibility of two fundamental modes of human existence: being and having. According to Fromm, the "having" paradigm, which has come to dominate modern industrial cultures, has turned pathological, and only a shift to the radical, alternate "being" mode can save both the human species and the natural world in which we live. Fromm insists that "having and being are two fundamental modes of experience, the respective strengths of which determine the differences between the characters of individuals and the various types of social structures."[5] Having is a familiar mode of living in which identity is completely tied up with possessing. Being is much more diffuse as a concept. It is the experience of acting and leads to a sense of aliveness and connectedness that humans only rarely recognize.

Fromm notes that the beingness of experience has become lost even in the modern linguistic practice of using nouns in place of verbs. One says, for example, "I have an idea" instead of "I think." At the extreme, the relationship of humans to each other and to the surrounding world collapses into a pathological identity: I am equals what I have and consume.

Fromm's concern over this existential consequence of modern ways of living is echoed in other philosophies, ranging from Martin Heidegger's notions of what constitutes a human being,[6] to Abraham Maslow's hierarchy of human needs,[7] or to the more recent works of Nobel economist Amartya Sen and philosopher Martha Nussbaum on needs and capabilities and their relationship to flourishing.[8]

Flourishing is about leading a good life, a notion as old as human history itself. Just as the environment we live in is showing signs of stress—one might say that Mother Nature is not flourishing today—humans are not becoming satisfied in spite of ever-increasing consumptive patterns.

Sustainability Defined

With all this as preface, I define *sustainability* as a possibility that humans and other life forms will flourish on the Earth forever. Flourishing means not only survival, but also the realization of whatever we as humans declare

makes life good and meaningful, including notions like justice, freedom, and dignity. And as a possibility, sustainability is a guide to actions that will or can achieve its central vision of flourishing for time immemorial.

Possibilities are unconstrained by the limits to action created by deterministic rules. Such rules are the product of past experience, and they limit action to incremental change. If societies can escape the bounds of the existing mode of living, then all is, indeed, possible—even that which does not appear available from inside the existing paradigm. Sustainability as possibility is, thus, a profoundly and radically different notion of the world than those that dominate our current way of thinking. It is a future vision from which we can construct our present way of being.

This sense of sustainability is clearly insufficient as a guide, although it can be a very powerful way of thinking about sustainability. It lacks a reference to the actors who must maintain the possibility, and it ignores its importance in a normative hierarchy. Incorporating these additional features in a more practical form, I suggest the following working definition: sustainability is a possible way of living or being in which individuals, firms, governments, and other institutions act responsibly in taking care of the future as if it belonged to them today, in equitably sharing the ecological resources on which the survival of human and other species depends, and in assuring that all who live today and in the future will be able to flourish—that is, satisfy their needs and aspirations.

Having now suggested that present strategies and policies coming from eco-efficiency and sustainable development are insufficient as bases for designing a sustainable world, let me suggest a strategic framework for my definition of sustainability. Let us begin by establishing three, more or less independent, strategic categories—rationalistic, naturalistic, and humanistic—each springing from a different worldview.

Rationalistic Strategies

Rationalistic concepts spring from our historic ways of thinking and reflect dominant basic ideologies such as competitive markets, utilitarianism, and optimism in technology. It is in this category that we find the Brundtland idea of sustainable development and eco-efficiency and other ways of speaking about resource productivity. Even though I suggest a new way of thinking is needed, I do not claim that these concepts are unimportant. All can be markers on the way to sustainability.

Eco-efficiency is unarguably a guide to improved performance in the environmental dimension of sustainability, but it does not directly address human flourishing or ecological limits. To a large extent, the problems we face spring from the limited way we come to know and act in the modern, technological world.

Extended producer responsibility, the precautionary principle, and products-service systems are recent rationalistic strategies. Extended producer responsibility, with strong roots in Europe, is a policy framework aimed at making manufacturers responsible for minimizing undesirable environmental impacts. In its most common setting, extended producer responsibility requires firms to take back the goods they produce at the end of the goods' life and dispose of them in an environmentally sound manner, thus avoiding the unintended problems of unsound throw-away practices.

The precautionary principle, also found more in Europe than in the United States, is a reformulation of the classical ethics principle that one should not act if the action is known to cause harm. When such knowledge is unavailable, this classical form can be restructured into the precautionary form, which maintains that one should not act if the consequences of the action are unknown.

Products-service systems are now complementing the older notion of products as the primary form of manufactured artifacts. The U.S. firm Interface Inc., which produces flooring products, has begun to offer services of industrial carpeting through a lease and take-back strategy rather than through the traditional route of customer purchases. Under this approach, clients rent, rather than purchase, carpeting from Interface. When the carpet needs to be replaced, the company removes the old carpeting, recycles it, and replaces it with new flooring. (See "The Next Industrial Revolution" in this issue of FORUM.) Xerox has a similar strategy in which the company leases products to customers but retains all lifetime maintenance and disposal responsibilities.

Car-sharing—acquiring vehicles for short periods from cooperatives or firms offering this service—is another approach that is growing in Europe. In addition to the obvious efficiencies of higher use per vehicle, the system has resulted in lower automobile use by participating households. Instead of purchasing a car, families rely entirely

on car-sharing for their automobile needs. At the same time, these families shift to other modes—walking, public transport, or bicycles—for part of their total mobility demands.

Naturalistic Strategies

Naturalistic concepts are based on models of natural systems and their limits in supporting human economic activities. Industrial ecology, for instance, has strong roots in the ecology of natural systems. Basic ideas include closing material loops through recycling and reuse, avoidance of destructive activities that upset natural metabolism, and thermodynamically efficient use of energy.

The Natural Step, a program that began in Sweden in 1989 and has since spread to industrial nations around the world, offers a framework to help businesses and governments become more sustainable, based on principles that sustain the natural world. One of its design rules, for instance, is based on the belief that the accumulation of synthetic materials in the biosphere has been pathologically perturbing to evolutionary processes. (See "Walk This Way" in this issue of FORUM.)

The Factor Four concept—which states that we could achieve a four-fold increase in energy efficiency by doubling wealth and halving energy use with existing technology—popularized by Ernst von Weizsäcker and Amory and Hunter Lovins—suggests that reductions in consumptive practices are needed to relieve environmental stresses.[9] American architect Bill McDonough and German chemist Michael Braungart have also developed a set of naturalistic design rules with similar roots in nature.[10] Their first principle,

"waste equals food," builds on the closed-loop structure of ecosystems.

Humanistic Strategies

The humanistic category emphasizes the flourishing aspect of sustainability. The Earth Summit, for instance, embraced the notions of fairness, justice, and equity in sharing the Earth's resources. In the United States, environmental justice is slowly becoming codified through regulations designed to assure that poor and minority communities do not get more than a fair share of environmental risk from industrial activities located in and near their neighborhoods.

Meanwhile, large transnational firms are adopting uniform environmental and health standards worldwide. Companies might even begin to think of changing the shape of compensation profiles if they want to transform, rather than nudge, change towards sustainability. For instance, they might raise the compensation of workers and others relative to senior executives, sending a signal that success depends on the contributions of everyone. This would have immediate positive impacts on income distribution.

Given the inherently political character of these social targets, policies to move toward them have been slow to develop. The world's institutional framework and underlying policy rationality are both obstacles and opportunities for progress. So far, it would seem that more obstacles than possibilities have been found. Government is seen as the primary actor in producing progress in this dimension of sustainability, but businesses can also act on their own.

Another element, perhaps the most intriguing and also the most

problematic, in the humanistic category is the search for authentic satisfaction—that is, recovering our beingness, in the sense used by Fromm and others. The idea of converting products to services, as Interface has done, begins to recognize that humans do not seek material goods as their primary goal. Rather they seek satisfaction of some unfulfilled need or want. And while providing services, in an economic sense, is a mere step towards producing authentic satisfaction in responding to the human existential search for being, it is a step nonetheless.

To go further, one must begin to delve into philosophy as well as economics. Critics of modern life often claim that the pervading presence of technology has hidden ourselves from ourselves and from the world. Indeed, everything out there—including other creatures—has come to be seen as a potential tool for something. The essence of worldly objects and our relations to them is lost in the day-to-day experience of modern living. And that loss is in part a factor in the existential concerns that raise consciousness of unsustainability in the first place.

The Hunt for Hope

Given the tacit assumptions of the current underlying social paradigm—which maintains that technology will solve the problems of, at least, the naturalistic axis of sustainability—we are faced with quite a dilemma. Critics claim that modern life has not only caused the unintended consequences of ecological damage, it has also eroded the very sense of our human beingness. What can possibly be done?

These same critics of modern life tend to be quite pessimistic, yet

they hold out hope that human-kind awareness can be awakened through the creation of experiences that reveal, rather than conceal, the world. Such revelations traditionally have been the province of aesthetics, through art and crafts-manship. The very notion of technology springs from the Greek *techne*, which originally referred to a process of creation in which the object and the artisan or the user were intimately linked beyond mere instrumentality.

This kind of creativity can still be found in the commodified world today, albeit only rarely. In the United States, museums, not malls, are the primary repository of those technological artifacts that have power to evoke something beyond a sense of utility. In Europe, industrial design engineering programs are common in the universities, and beautifully designed products can be found in the shops and even the built environment. New notions for design coming from nature are also emerging today.

In her book *Biomimicry*, Janine Benyus shows us how to put nature back into technological structures.[11] For example, she points to research that shows that natural processes can produce materials with wondrous properties by using chemicals found in nature, without recourse to high pressures and temperatures. The closest material humans have yet invented to match the properties of spider silk is Kevlar, used in bulletproof vests. But Kevlar comes from petroleum derivatives, subjected to high temperatures in a bath of concentrated sulfuric acid, producing hazardous by-products. Spiders, however, can convert flies and crickets to a high-tech material, using a low-tech process, and the by-products are all benign.

This aesthetic aspect of sustainability is by far the most difficult to attain because it requires skills that, if humans ever did possess them on a broad scale, have largely withered away. But that is no excuse for omitting this experiential dimension from the design of sustainable strategies by firms, public bodies, and even individual actors.

Eco-efficiency or any of the rationalistic frameworks, by themselves, lack transformational power. It will take a combination of strategies drawn from the naturalistic and humanistic categories to create a new paradigm of sustainability. The naturalistic components are needed to bring economic activities back into synchrony with natural processes. And it will take the humanistic elements to design the functions of the industrial system that will produce the flourishing needed beyond the mere satisfaction of economic measures of well-being.

Industry, as the most powerful institution in today's world, can do much by itself by adopting strategies based on combinations of these frameworks. Companies, acting the same way they do in making any strategic choice, should select only those strategies that work for them. And, of course, they should act rationally in designing their individual strategies. Appealing to moral imperatives in calling on businesses to lead the change toward sustainability, is important. But for the time being, business will—and should—continue to obey the rules that have become sedimented in the cultural structures of modern industrial societies. To do otherwise is to flirt with disaster.

Rationality is only a reflection of the underlying beliefs and values of an institution. If the humanistic and naturalistic ideas become central to thinking and acting, a new sustainable rationality will slowly emerge. If and when this happens, sustainability might come to possess the fullness of meaning and importance to produce the transformation that is absent from the concept today.■

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Days of Old

The New Century's Great Challenge

Aging Gracefully?

The presidential race of 2000 taught us many things: subliminal advertising works best when it is in fact subliminal, our politicians' grasp of mathematics is a bit fuzzy, and the elderly vote counts—again and again and again in parts of Florida. Indeed, issues related to aging and the aged—Social Security, Medicare, the cost of prescription drugs—are high on everyone's list of concerns. Why? The country and the world are graying, with great consequence for all.

With aging come many facts and even more questions—both on a global and individual level. At the global end of the scale, Peter Peterson, author of *Gray Dawn: How the Coming Age Wave Will Transform America…and the World*, likens the situation to a demographic iceberg looming ahead. "What's visible above the waterline is the unprecedented growth in the ratio of elderly to working-age people," Peterson says. "What lurks beneath the surface are the wrenching fiscal and economic costs that threaten to bankrupt even the greatest of powers." The bulk of the iceberg, according to Peterson, is the unfunded pension and health-care liabilities, which are two to five times larger than the collective GDP of the developed countries.

Steering clear of the iceberg—something policymakers here and abroad have as yet been unwilling to do—will require a new paradigm. Peterson suggests a combination of six strategies: postponing retirement, increasing the size of today's economy, increasing the size of tomorrow's workforce, stressing filial obligation, basing benefits on need, and requiring people to provide for their own future needs.

Health and social services consultant Richard Ladd narrows the focus a bit by looking at the options for getting long-term care and paying for it. What he finds is that the lion's share of public long-term-care dollars—78 percent or $30.2 billion—goes to nursing homes. The question that finding raises is whether some of those dollars might be better spent on alternatives—that is, "whether nursing homes are caring for people who do not require that level of service and could be adequately, if not better, cared for in a community setting." According to Ladd, the answer varies, but in some cases is definitely yes.

Using alternatives, of course, presupposes the availability of alternatives. Unfortunately, such is not always true in rural areas. Indeed, Carolyn Rogers, a demographer at the U.S. Department of Agriculture, points out that "rural areas have fewer health resources and services and a lower ratio of doctors, nurses, pharmacists, and other health care personnel to elderly residents than do urban areas." Rural elders also tend to be poorer than their urban counterparts, further reducing their options and decreasing the likelihood of good health. Just as rural areas vary from urban, however, so too do rural areas vary among themselves. While some rural areas have been aging through the loss of young adults, others have been aging because they attract retirees. In fact, so-called rural retirement counties have grown much more rapidly than other rural counties—21 percent from 1990 to 1998—and accounted for a quarter of all rural population growth during that time.

Not surprisingly then, many rural areas have come to consider attracting retirees as an economic development strategy. Build a golf course, and they will come. Professors William Haas and William Serow, however, say "not so fast." They cite two reasons. First, the peak of the baby boomers will not reach retirement for another decade; second, only about 5 percent of retirees are likely to move upon retirement.

Finally, at the individual end of the scale, philosophy professor John Hardwig examines the profound, and profoundly difficult, responsibilities that come with aging. For as he says, "To be old is to face the end of life." Relating experiences of those close to him, as well as insights gained from conversations with seniors, Hardwig asks a question—which some might consider taboo—that is the opposite of Francis Schaeffer's famous book: "How should we then die?"

The Editors

The New Century's Great Challenge

*Can the world's great powers respond to a silent
and slow-motion crisis? Global aging will be a test.*

BY PETER G. PETERSON

Americans have a right to be pleased with the federal government's improving fiscal condition. Mired in large and growing deficits when the 1990s began, the country, for the first time in a generation, now enjoys a budget surplus. That's the good news. The bad news is that America's leaders, using today's prosperity as an excuse, are backing away from the longer-term deficit challenge that still looms—a cumulative shortfall of $34 trillion in today's dollars over the next 75 years for Social Security and Medicare alone. This challenge, posed by the coming age wave, requires fundamental reform of pension and health-care entitlements to make them sustainable in a much older society.

Unfortunately, the politics of senior benefits makes it hard to propose any reform that doesn't sweeten the deal. In harsh economic times, a common argument in favor of spending more on the elderly is that they are vulnerable and dependent. Today, when the economy is booming, another argument has come to the fore. Since the prospects for young people look so good, why not share the wealth with old folks, too?

To be sure, during the presidential campaign, both candidates spoke openly about the need to fix these old-age programs for future generations. But beneath the rhetoric of reform lies an ongoing tendency to play politics by adding to, rather than subtracting from, the sum total of unfunded retirement promises. Over the past two years—as the surplus projections have grown—the nation's leaders have agreed to repeal the Military Retirement Reform Act of 1986, reinstate the Medicare benefits trimmed by the 1997 budget deal, offer a new long-term care benefit to all federal retirees, and eliminate the Social Security earnings test. They have also seriously debated major senior benefit expansions, including a rollback of Social Security benefit taxation and a prescription drug benefit for Medicare.

Political Paralysis

One might suppose that all this fiscal largesse is made possible by austerity elsewhere in the overall federal budget. To the contrary, leaders have agreed in prin-

ciple to major tax cuts while ramping up spending in a variety of nonentitlement areas, from education to national defense.

Or else, one might think this generosity is made possible by some grand change in America's long-term fiscal outlook. But that's not the case either. In fact, since the mid-1990s, the officially projected cost of Social Security as a share of taxable payroll beyond the year 2030 has actually increased. Nor has the recent prosperity altered the fundamental demographic, social, and technological forces driving up the future cost of health care. In November 1999, a Social Security Advisory Board appointed by President Clinton and Congress warned that current projections may greatly underestimate future longevity and, hence, future entitlement costs.

So there hasn't been any improvement in the long-term outlook. Instead, what's happening in America is that, without a near-term problem to force legislative action, leaders are either unable or unwilling to make the necessary longer-term choices.

America is not the only country facing rapid growth in the public cost of supporting the elderly. Nor is it the only country whose political system seems unable to confront this fiscal challenge. The same urgent need for action and the same paralysis are evident throughout the developed world. Indeed, such nations as Japan, France, Germany, and Italy face aging burdens that are larger—and will arrive sooner—than what the United States faces, and they are not experiencing the same degree of near-term economic prosperity and fiscal plenty. In many of these countries, this is leading to a heated public debate over the fu-

ture of welfare states in general and of old-age entitlements in particular. This debate is often more rancorous than in the United States, though not necessarily more productive of reform.

In Japan, the 2000 debut of a large new government program offering long-term care assistance to the elderly—the so-called "Gold Plan"—has touched off emotional discussion about the reciprocal obligations of younger and older generations. The young welcome some relief from Japan's tradition of unquestioned filial piety. But they wonder about its future cost in a no-growth economy that no longer generates any fiscal dividend—and in a demographically shrinking society that has one of the highest life expectancies and one of the lowest birthrates in the world.

The French Prime Minister Lionel Jospin, having brought his socialist coalition to power by opposing the previous government's draconian and "Anglo-Saxon" pension reforms, now in turn finds himself compelled to confront the growing public cost of retirement. But he has few options. Having told French workers they can cut their hours to 35 per week, the government can't easily come back and tell them they have to retire later. President Jacques Chirac, meanwhile, is suggesting that the opposition parties advocate a funded pension system that helps

workers buy shares in French companies—a stand with some appeal in a society where few households own stock and many complain about the growing influence of foreign stockholders.

Germany, declared European Central Bank chief economist Otmar Issing in 1999, is in danger of becoming "the sick man of Europe" unless it reforms its old-

The present economy is moving slowly but steadily ever more at the expense of future generations.

age benefits. This warning was soon echoed in a report by Germany's Economics Minister Werner Mueller that declared, "The present economy is moving slowly but steadily ever more at the expense of future generations." After provoking a firestorm of controversy, the report ended up narrowing the range of discussible options. Even the modest reforms proposed by Chancellor Gerard Schroeder—such as temporarily indexing pensions to prices rather than wages—are eliciting plenty of criticism, not just from union leaders still bent on *lowering* the retirement age, but even from a conservative opposition that had previously recommended many of the same reforms. One former conservative minister, Nobert Blüm, went so far as to call Schroeder's proposals "pension politics a la Honecker," a reference to the former dictator of East Germany.

Then there's Italy, Europe's pension basket case. Early in 2000, Prime Minister Massimo D'Alema

scrambled to muster political support for a cost-cutting pension-reform act, which, had it passed, would have been the fourth pension reform to be enacted in Italy since 1990. To show their opposition to the reform, Italy's trade unions—dominated by retirees—threatened a general strike. Treasury Minister Giuliano Amato, who has since become prime min-

waterline is the unprecedented growth in the ratio of elderly to working-age people. What lurks beneath the surface are the wrenching fiscal and economic costs that threaten to bankrupt even the greatest of powers. To date, the developed countries have accumulated unfunded liabilities for pension and health-care benefits that are roughly three times

come widespread public denial. People find it hard to believe that a system that worked wonderfully for their parents—who signed up early—won't do nearly as well for their kids, who are signing up late. In Europe, where the welfare state is more expansive, the public regards generous unfunded pensions as the very cornerstone of social democracy. In the United States, the problem is not so much a habit of welfare-state dependence as it is the peculiar American notion that every citizen has personally earned and therefore is entitled to whatever benefits government happens to have promised.

We must adopt an entirely new paradigm of aging

that is affordable and sustainable in a rapidly

graying world.

ister, responded by using pensions as a generational wedge issue to woo younger voters, many of whom are unemployed, live with their parents, and feel that government no longer cares about their future. "Young Italians believe the unions only represent their fathers" and would be happy to abolish them, he declared while proposing to divert some of the planned pension savings to a more broadly based social security system "that benefits sons as well."

The growing fiscal cost of old-age benefits is no longer an issue of interest only to budget and pension experts. It is gradually becoming the focal point of societywide interest and concern. Yet most leaders have barely begun to educate voters about the full magnitude of what is at stake.

Global Aging

A demographic iceberg looms in the future of the largest and most affluent economies of the world: the challenge of global aging. What's visible above the

larger than their collective gross domestic product (GDP). This hidden and unsustainable lien on the future dwarfs the level of official public debt attained by most countries even in times of war.

The central policy issue is not whether the developed countries will change course, but how and when. Will they do so sooner, when they still have time to control their destiny? Or later, in the midst of economic crisis and political upheaval?

Timely reform won't be easy. Indeed, it will not happen at all without just the right combination of legislation, leadership, and public consensus building. Voters have become habituated to pay-as-you-go systems that bank every generation's future retirement on the next generation's resources, rather like a giant Ponzi scheme. The most direct reform approach—simply cutting public retirement benefits—would impose widespread hardship on working-class households that have few alternative means of support. Any reform approach, moreover, must over-

A successful reform approach must therefore go beyond mere fiscal sacrifice and offer a positive vision of a society that cares for its future. It must prepare society to meet the needs of a burgeoning number of elders without overburdening the economy or overtaxing the young. While restraining pay-as-you-go promises, it must encourage—even require—people to prepare alternative means of support. We must, in other words, adopt an entirely new paradigm of aging that is affordable and sustainable in a rapidly graying world.

Collapsed Assumption

During the early post-World War II decades, the developed world greatly expanded public pension and health-care benefits for retirees. At the time, this expansion seemed affordable. The number of retirees was relatively small, the cost of health care was modest, and rapid growth in the workforce, economy, and tax base was expected to continue indefinitely. Since the mid-1970s, however, all of these conditions and assumptions have collapsed.

Consider longevity. When Social Security was founded in 1935, the typical U.S. worker at age 65 could expect to live another 11.9 years. By the year 2040, that worker is projected to live another 19.6 years. If the normal retirement age had been indexed to longevity since 1935, he or she would today have to wait until age 73 to receive full benefits—tomorrow, even longer. In reality, workers throughout the developed world have been retiring earlier, not later, further expanding the number of retired beneficiaries while depleting the number of working taxpayers. In Western Europe, most workers are eligible for full public retirement benefits at age 60. Over the past 25 years, the employed share of men aged 60 to 64 has dropped from 70 to 32 percent in Germany and from 67 to 22 percent in France.

Meanwhile, the fertility rate—the number of lifetime births per woman—of the developed world has entered an unprecedented decline. In the early 1960s, that fertility rate was 2.7. Today, it has fallen to 1.6, far beneath the 2.1 replacement rate needed merely to maintain a fixed population from one generation to the next. So steep is the fertility decline that continental Europe and Japan are on track to lose two-thirds of their current population size before the end of the 21st century. In nearly every developed country, with the possible exception of the United States, the working-age population—aged 15 to 64—will start shrinking no later than the 2020s. Combined with rates of productivity growth that have fallen since the 1950s and 1960s in most countries, this expected workforce shrinkage has radically reduced official projections of real growth

in future worker payroll, which normally constitutes the tax base supporting today's pay-as-you-go retirement systems.

Florida is well known for its vast number of elderly people, aged 65 and over, who make up nearly 19 percent of the population. What is less well known is that today's Florida is a demographic benchmark that every developed nation will soon pass. Italy will pass it as early as 2003, followed by Japan in 2005 and Germany in 2006. France and Britain will pass present-day Florida a decade later, around 2016. The United States and Canada will pass it in 2021 and 2023. The delay is largely due to large postwar baby booms, which are now slowing—but will later accelerate—the aging of their populations.

A standard indicator of the social cost of aging is the ratio of working-age people to elderly people. As recently as 1960, this ratio was 6.8 to one in the developed world. Today, it has fallen to 4.5 to one. By the year 2030, the Organization for Economic Co-operation and Development (OECD) projects it will fall to 2.5 to one. This figure, stunning as it is, may be optimistic, since it assumes fertility rates will rebound from today's low levels and longevity will grow more slowly in the future than it has in the past. In any case, it understates the seriousness of the challenge because it doesn't

reflect the trend toward earlier retirement. The actual ratio of contributing workers to retired pensioners is much lower and has been dropping much faster. It has already dropped to 3.0 in the developed world, and the International Monetary Fund projects it will drop to 1.5 by 2030. In some European countries, it is projected to drop beneath 1.0.

Continental Europe and Japan are on track to lose two-thirds of their current population size before the end of the 21st century.

Unsustainable Projections

Graying means paying. Between 1995 and 2030, according to the OECD, the average bill for public pensions in the developed world will grow by over 4 percent of GDP. In nations that have the most generous pension systems or are aging the most rapidly—for example, Japan and the countries of continental Europe—the extra cost will amount to over 6 percent of GDP, or over 15 percent of worker payroll. In the United States, the extra cost will be less, about 2.5 percent of GDP.

Thanks largely to far-reaching reforms that were enacted during the 1980s by British Prime Minister Margaret Thatcher and Australian Prime Minister Bob Hawke, Britain and Australia face no significant cost growth. Both reforms allow pay-as-you-go benefits to shrink gradually as a share of average wages and, for most workers, replace them with personally owned savings accounts.

Yet pensions aren't the only

public costs that rise as populations age. Public health benefits could turn out to be an even bigger burden. Not only are health costs rising faster than GDP for everyone, but the elderly consume three to five times more health-care services per capita than younger people. Moreover, the more elders age, the more they consume, es-

All told, the cost of public retirement benefits—pensions and health care—is on track to rise by between 9 and 16 percent of GDP in most of the developed countries. This vast increase is three to five times what the United States currently spends on national defense. It also represents an extra 25 to 40 percent taken out of every

Government borrowing to pay for projected pension deficits alone would, by the 2030s, consume all the savings of the developed world.

pecially long-term care. And it is precisely the population of the oldest old that will be growing the fastest—a phenomenon demographers call the "aging of the aged."

Stir these factors together, and the likely cost trend is explosive. If health-care spending per capita grows just 1 percent faster per year than the average wage, public health benefits would rise by 6 percent of the typical developed country's GDP between 1995 and 2030. And this is a conservative assumption. In the United States, where percapita Medicare outlays have historically risen 4 percent faster per year than the average wage, the growth will probably be much greater. America's insatiable appetite for high-tech medicine is thus likely to overwhelm any advantage it derives from the relatively modest cost of its public pensions. None of these calculations, moreover, includes government initiatives—already under consideration in several countries—to cover rising out-of-pocket spending on long-term care for elders.

worker's taxable wages—in countries where total payroll tax rates often exceed 40 percent already.

The massive fiscal challenge of global aging leaves the developed world no easy options. Deficit financing won't work. Government borrowing to pay for projected pension deficits alone would, by the 2030s, consume all the savings of the developed world. Cutting other public spending won't work. So great is the projected growth in retirement benefits that many governments could eliminate all nonbenefit spending—from defense and infrastructure to police and schools—and still run deficits by the 2020s. Raising taxes won't work. Most developed countries are now at or beyond their threshold of efficient taxation—the point at which receipts are maximized in the long term—and many European leaders warn that higher tax rates will slow the economy more than raise new revenue. This is particularly true for payroll taxes in economies where high structural unemployment can be attributed in part to the high cost of labor.

A New Paradigm

Developed countries need to move toward a new paradigm of aging, one that is every bit as revolutionary as the demographic transformation they are entering. The objective of this new paradigm is to make aging both more secure for older generations and less burdensome for younger generations. It can be implemented through policy reforms that can be grouped into six basic strategies, each promising huge fiscal and economic payoffs.

First, reduce elder dependency by encouraging later retirement, longer work lives, and lower barriers to elder employment. Governments everywhere, especially in continental Europe, could generate enormous savings without lowering elder living standards by raising the eligibility age for public pensions.

Second, increase the size of today's economy and tax base by encouraging more work from the nonelderly—either by getting working-age citizens to work more or by increasing the inflow of working-age immigrants. Nations with high labor costs and high unemployment, such as Germany, or with low rates of immigration, such as Japan, would be well advised to consider this American strategy.

Third, increase the size of tomorrow's economy and tax base by raising more-numerous and productive children, so that the cost burden is spread over a larger, more-affluent rising generation. The Scandinavian and French tradition of generous public funding for pro-natal incentives and investment in children is likely to spread to other countries—in part, in response to worries about population decline.

Fourth, reduce the fiscal cost of elder dependency by stressing filial obligation—that is, by increasing the willingness of tomorrow's grown children, however numerous or productive they are, to support their own elder parents through informal and familial channels. Societies in which the extended family is weakest, elder poverty is highest, and long-term care costs are rising the fastest—for example, the United States—have much to learn from Confucian societies such as Japan, where most elders still live with their adult children.

Fifth, reduce the fiscal cost of elder dependency by targeting benefits on the basis of financial need. Though Australia is now the only developed country where all public pension benefits are means tested, many other countries may eventually turn to this floor-of-protection strategy.

Sixth, reduce the fiscal and economic cost of elder dependency by requiring people to provide in advance for their own old-age dependency—by saving and investing more of their income during their work lives. Britain, Australia, Chile, and Singapore are showing the developed world that there are many different ways to move toward "funded" retirement savings—that is, savings that represent the accumulation of real economic assets.

All of these strategies will stir up controversy, and no one yet knows which will be widely implemented—or where. Some, like pro-natal policies and stepped-up immigration, will trigger cultural and social controversy—for example, over their impact on women's rights and workers' wages. Others, like investing more

in children, may require more patience and wisdom than most governments now possess.

Obviously, some reforms are better suited to some countries than to others. In continental Europe, reform will need to pay special attention to income equity and class solidarity. In the English-speaking countries, on the other hand, personal autonomy, asset

ownership, and high-octane returns will have more appeal. French voters will never split up their state pension system into 30 million 401(k) plans, while Americans will never switch to a universal flat pension—or consent to having a health minister tell them when they can see a doctor.

Or consider differences in attitudes toward family. Scandinavian elders have a long tradition of living apart from their families—a tradition that remains strong even in Minnesota, which has the most nursing-home residents per capita of any state in the union. They will never be as amenable to living with their grown children as are Japanese elders—or even Italian elders. On the other hand, crowded Japan will never push pro-natal policies to the extent Scandinavia already has.

For the United States, I have long advocated gradually raising the Social Security retirement age to 70, indexing it to longevity thereafter, and subjecting all fed-

eral benefits to an affluence test for households above the median income.

I am also attracted to reforms that require individuals to provide for their own retirement through some form of mandatory and self-funded savings program. This strategy does most to overcome one of the biggest economic challenges of an aging society, which is how

Britain, Australia, Chile, and Singapore are showing

the developed world that there are many different

ways to move toward funded retirement savings.

to sustain adequate rates of national savings and investment. It offers individuals the most retirement and income flexibility in a future in which, quite frankly, no one knows how long people may live or how high health expenses may rise. It guarantees the most security and the highest return to contributing workers, while freeing up government resources for a more generous floor of protection. Above all, it is the only strategy that does not impose direct (tax) or indirect (economic and familial) burdens on future generations.

Rising above Ideology

I believe global aging will become the transcendent political and economic issue of the 21st century. By 2030, some developed countries may exceed a median age of 55, which is 20 years older than the oldest median age of any country on Earth as recently as 1970. Nearly half of the adult population of today's developed countries and perhaps two-

thirds of the voters will be at or beyond today's eligibility age for publicly financed retirement.

So we have to ask, when that time comes, who will be doing the work, paying the taxes, saving for the future, and raising the next generation?

Indeed, the coming demographic transformation raises fundamental questions about the future of the developed world. How will this transformation restructure the economy as many nations with shrinking workforces experience a long-term stagnation, or even decline, in their real GDP? How will it affect global financial markets and regional economic unions like Europe's Economic and Monetary Union as different nations respond to the aging challenge with widely diverging benefit reforms and fiscal policies? How will it reshuffle the ethics of life and death as medical progress acknowledges limited resources? How will it transform attitudes toward progress and posterity as youth becomes less influential? How will it affect the geopolitics of the next century, and particularly the capacity of the great powers to maintain their security com-

mitments as today's global divide between rich and poor nations is redefined as a divide between old and young nations?

At issue is whether the world's great powers can respond to a silent and slow-motion crisis. Global aging will be a test. Some say that democracies can focus only on this year's emergency—a problem known in American circles as the Pearl Harbor syndrome. Others say that political gridlock on global aging is due to declining confidence in government. Voters know something has to be done but don't trust politicians to act in the voters' long-term interests or to distribute the short-term sacrifices fairly. Without that trust, voters cling to the retirement status quo, however unsustainable.

One thing is certain: before taking effective action, leaders must rise above ideology and engage the practical realities. The left will have to stop defending the expansion of retirement benefits as the cornerstone of progressive government, and realize that they are fast pushing all future-oriented spending—from education to research and development—out of public budgets. The right will have to move beyond a program of mere

fiscal restraint, and offer a coherent blueprint for how society intends to care for tomorrow's vast number of elder dependents. Both sides will have to resist the power of the organized elderly, who favor the status quo over what most elders personally care about—their grandchildren's futures. Otherwise, the developed world may eventually witness a socially destructive war between the generations over the use of public resources.

Amid the partisan crossfire, citizens can easily forget that they share a common destiny. To make timely reform possible, every special interest must join a new coalition on behalf of our common destiny. Unless we embrace a new paradigm of aging, many of our highest hopes for the future will be sacrificed.■

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Population in Need

Nursing homes get the lion's share of public long-term care funds, but those monies might be better invested elsewhere.

BY RICHARD C. LADD

While the need for long-term health care can occur at any age, the elderly, especially those over 85, are the predominate users. In fact, nearly one in five persons between ages 75 and 79, and nearly half of those over 85, will need long-term care.

Unfortunately, the need for long-term care comes to everyone who lives long enough to suffer limitations in his or her ability to perform, without help, the daily activities of living.

Most people who reach that stage will have family or friends to assist them. Some will be able to afford to pay for long-term care by themselves or with the help of insurance. Still others, however, will need public assistance to receive the physical and medical help they need.

Increasing Numbers

In the United States today, an estimated 35.3 million Americans are above 65 years of age, and 4.3 million Americans are above 85. In 1900, 3 million were age 65 and over, and only 122,000 were over the age of 85. By 2050, projections show that more than 80 million people over the age of 65 will be living in the United States, and almost 19 million will be age 85 and over. Why? Americans are living longer and enjoying better health today than ever before. In 1900, only 80 percent of children survived to age 10, while today nearly 99 percent do. This survival rate is compounded by the percent of the population living to age 65 and age 85, mostly as a result of advances in medicine and better health care.

In the early years of the 20th century, long-term care was not a major problem, primarily because few lived long enough to need it. For most of those who did, family and friends provided the needed assistance. Those without family or friends or the income to pay for care were housed in "old-folks' homes" or nursing homes, paid for with public funds or provided by charitable organizations.

By mid-century, as life expectancy increased and more elderly began reaching old age, long-term care became more of a problem for individuals and for the government. As the number of aged individuals increases, the problem will only grow worse. If solutions are not found soon, baby boomers may find long-term care hard to obtain.

Footing the Bill

As age increases, so does need. Unfortunately, however, income and consequently the ability to pay for assistance decreases. For example, people at age 65 typically have more income than they do at age 75. And people at age 75 typically are more likely to need long-term care.

Race also figures into the equation. While most elderly are white—at age 65, 85 percent are white, and at age 85, 88 percent are white—blacks who reach old age typically have more impairments, and less money to pay for long-term care. Most Hispanic persons needing long-term care are cared for by family—this being much more of a cultural tradition.

As with most goods and services, the cost of long-term care is higher today than in the past. Nevertheless, the percentage of people able to pay for their own long-term care has remained roughly the same for the past five years, even though the cost of long-term care has been increas-

ing faster than the income of the elderly.

Examining specific income levels gives an idea of who needs help in paying for care and who does not. While the elderly with incomes above $25,000 are able to finance their own long-term care, those with incomes between $15,000 and $25,000 would likely need some public assistance. The elderly with incomes under $15,000 would need a significant amount of public assistance. Whether family and friends are available to provide care is obviously an important factor, as is the type of care needed. Living in a nursing home costs between $35,000 and $55,000 a year. Living in an assisted-living facility costs between $20,000 and $35,000 per year. The cost of home care is between $5,000 and $20,000. At these prices, less than 20 percent of the elderly are able to pay for care outside their homes without drawing down assets. If they live long enough, even these higher-income elderly may eventually need help in paying for care. **Insurance**. Insurance, of course, plays an important role. Yet, only about 6 percent of the elderly have coverage for long-term care. As that figure shows, long-term-care insurance isn't for everyone. The cost is high, since most purchasers are over 65. And if persons have high income and large assets, they can afford to forego insurance, buying their own long-term care when, and if, it is needed. On the other end of the spectrum, people with low income and modest assets may be wise to let public programs pay for their long-term care and not spend what little income they have on insurance.

Long-term-care insurance is best for those people with large assets and low income, because the insurance protects those assets. Of course, the insurance premium must fit a person's budget and should not be purchased if it means foregoing food or medication. Unfortunately, many elderly find themselves in this category. These people have low or moderate income but own their own homes and have money in the bank or in stocks and bonds. For these people, long-term-care insurance may be a good buy.

Medicaid. Publicly funded long-term-care programs are another alternative. Programs funded by local and state governments, as well as those funded by the federal government, have been growing at an increasing rate and will continue to do so.

Medicaid is the single largest source of government funds to nursing homes, accounting for nearly all such funds. A joint federal-state-funded program, Medicaid is designed to assist people with low incomes and limited assets.

Medicaid also funds long-term-care programs outside of nursing homes. Eligibility requirements for these programs are much stricter. In most states current maximum annual income for Medicaid eligibility outside of a nursing home is $6,144 compared with a maximum annual income of $18,432 for persons staying in a nursing home.

The one exception is the Medicaid Home and Community-Based Waiver Program, which is used by all states and has been in existence since 1981. At the option of the state, this program can use the same eligibility requirement as those used for nursing homes. The federal government does not limit the type of long-term-care service provided under this program. Consequently, some states have been innovative with it. For instance, Washington, Oregon, Texas, New Jersey, and Arkansas have financed a great deal of their long-term-care programs with funds from the waiver program, including home care, adult foster homes and assisted-living facilities, home-delivered meals, minor home improvements for handicap accessibility, and adult day care. Wisconsin has a very innovative home-care program, much of it funded through the waiver program, that funds just about anything it takes to keep people in their own homes.

Whether a person is in a nursing home or receiving care in a community setting, Medicaid requires a copayment. The amount of the copayment varies from state to state, but in a nursing home it is generally all of a person's income except a small amount—$75 or so per month—needed for personal incidentals. For married couples, the spouse still living at home can retain more income. The copayment for those receiving care in the community is all income above $512 per month, which is kept for housing and food. For people who do not have an income of at least $512 per month, the federal government will make up the difference out of the Supplemental Security Income program. Many states will also add a supplement to this amount.

Medicare. Medicare accounts for a small percentage of the total and is a purely federal program, with states having little or no input or management. Medicare, however, provides assistance only after a person has spent at least three days in a hospital. In addition, Medicare pays the full cost of care in a nursing home for only 20 days and

requires a $97-per-day copayment for the next 80 days. Consequently, after the 20th day it is essentially ended in most states. After the 100th day, Medicare assistance stops altogether.

OOA/SSBG. Two other long-term-care programs—the Older American Act Program and the Social Service Block Grant Program—are funded entirely by the federal government. Both have limited funding, and the funds can be used to purchase other services besides long-term care.

There is no required federal means test for either of these programs, and the OAA requires only that a person be age 60 or over. Both programs were intended to target those most in need, but they often fall short. An in-kind state match is required for the OAA but not for the SSBG.

The Lion's Share

By far the largest share of public long-term-care dollars—78 percent or $30.2 billion—goes to nursing homes. The numbers vary from state to state, with the lowest percentage in Oregon at 54 percent and the highest in Tennessee at 98 percent. The largest share of cases—that is, clients served—belongs not to nursing homes, but to community-care services. The Health Care Financing Administration, the federal agency charged with administering Medicaid, reports that nursing homes accounted for 24 percent of all Medicaid spending in 1996, but only 4 percent of all Medicaid clients. Obviously then, nursing homes are much more expensive than community-based long-term-care programs.

Since nursing homes are designed to care for the most impaired individuals—something

that they generally do well—the expense of operating such homes is not surprising. The question is whether nursing homes are caring for people who do not require that level of service and could be adequately, if not better, cared for in a community setting. The answer varies but in some cases is definitely yes.

A study by the University of California at San Francisco found that in 1995, nursing homes in Hawaii, New York, Virginia, North Carolina, and South Carolina served highly impaired populations. Nursing homes in Iowa, Nebraska, Wyoming, North Dakota, and Utah, however, served populations that were not that impaired. The causes for this include tradition and the power of the nursing home lobby and its success at preventing alternative services. States having patients with low-impairment levels in nursing homes need to expand their community programs and, where appropriate, transfer residents to these programs

Redistribution Needed

If government is to help care for the growing numbers of elderly in this country, it will have to achieve a better distribution of funds between nursing homes and community-based programs. Nursing homes will have to be limited to caring for the most impaired individuals, and community programs will have to do a better job of targeting services to those most in need. This is best achieved through a variety of community-based programs like home care, adult foster homes, assisted-living facilities, and other programs such as home-delivered meals and adult day care.

The elderly should have a choice when selecting their long-term-care service. Unfortunately, no state has fully achieved this goal. The closest to it are Oregon and Washington, with Texas, Arkansas, California, Idaho, Kentucky, and Illinois not far behind. In these states, especially Oregon and Washington, private and public clients have a real choice of long-term services, from nursing homes to a wide variety of community programs.

Some states, like Wisconsin and Indiana, are implementing changes that will result in much-better-balanced long-term-care programs. Wisconsin has implemented a new program in five counties, with plans to expand the program statewide in the next few years, that allows counties to provide whatever services are needed, including nursing homes, within a cap set by the state. As a result, many more community services are expected. Indiana is working hard on getting legislation to allow funding for many more congregate-care facilities and home care.

While most states are working to expand community programs, many are frustrated by the powerful nursing-home lobby. The United States Supreme Court's Olmstead decision—which says that under the Americans with Disabilities Act, disabled persons should be allowed services outside an institution—may help pave the way for a better balance and enable states to care for the growing numbers of elderly who will look to them for help.■

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The Graying of Rural America

*The aging of the population poses special,
and varied, challenges for rural areas.*

BY CAROLYN C. ROGERS

In 1998, 44.6 million Americans were elderly—that is, aged 60 and older. In general, rural areas throughout the nation have a higher proportion of the elderly than do urban areas—the elderly constitute 15 percent of the rural population and 12 percent of the urban. And rural populations are aging rapidly as a result of aging-in-place, out-migration of the young, and in-migration of the elderly.[1]

While many of the issues of aging are the same in urban and rural areas, there are important differences. Previous research suggests several key themes. First, the rural elderly are diverse, both in terms of socioeconomic characteristics and geographic concentration.[2] Second, the rural elderly are more likely than their urban counterparts to be poor.[3] Third, rural elders face significant disparities in health-care services when compared with urban elders—the range of health-care services is narrower, fewer alternatives are available, services are less accessible, services cost more to deliver, and fewer health-care providers exist in rural areas to offer specialized services.[4]

Diversity

The older population comprises a diverse group, with wide variations in demographic and socioeconomic characteristics and residence. Significant differences are found in marital status, health, education, and economic standing between the younger elderly (under 85 years old) and the older elderly (aged 85 and older). For instance, women outnumber men at older ages, even more so at the most advanced ages; health declines and poverty increases with age; and older individuals are more likely to be single.

Just as important as differences in demographic and socioeconomic characteristics of the elderly are residential and regional differences. While the number of rural elderly varies from region to region—reflecting in part the distributional differences in the total population—older persons have become increasingly concentrated geographically. Significant numbers of the rural elderly now live in the South and to a lesser extent the Midwest.

Particularly attractive to the elderly are so-called retirement areas, including northern Michigan, northwestern Arizona, the Ozarks in Arkansas, central Texas, western North Carolina, and eastern West Virginia.[5] Indeed, during the past 20 years, rural retirement counties—counties whose elderly population grew at least 15 percent during the 1980s as a result of in-migration—have grown much more rapidly than other rural counties. From 1990 to 1998, the population of retirement counties increased by 20.7 percent, predominantly as a result of in-migration. Although retirement counties constitute only 9 percent of all rural counties, they accounted for 25 percent of rural population growth during 1990 to 1998.

Other rural areas have been aging through the loss of young adults, especially regions dependent on farming and mining, such as the Corn Belt, Great Plains, and Southern Appalachian coal fields.[6] While the young have left for urban jobs, older persons have remained in these areas and become an ever-increasing proportion of the total population.

Not surprisingly, concentrations of the elderly have significant impacts on the communities in which they reside—impacts that vary widely. Rural retirement areas seem to benefit the most, as in-migrating retirees boost the tax base, help sustain local businesses, and contribute to churches, charities, volunteerism, and other civic activities.[7]

In rural areas that suffer from out-migration of the young and aging-in-place but do not experience a significant influx of retirees, many communities find it difficult to meet the increased demand for medical and social services and long-term care—especially given the erosion of the tax base. Remote and isolated areas face additional difficulties. The elderly in remote rural and farm-dependent communities tend to be older and poorer than the elderly in retirement communities. Furthermore, comprehensive, state-of-the-art medical care and facilities tend to be available only in large urban centers. Traveling long distances to these centers may be required and is often possible only for the younger or more affluent segment of the elderly rural population. Consequently, declining health, reduced income, and widowhood at advanced ages often lead to return migration to urban centers where the necessary health and social services are located or where children of the migrants live.[8]

Poverty

Rural elders are more likely than urban elders to be poor. And within rural areas, elder poverty rates are highest in the most rural areas. Among rural counties, the poverty rate for older persons ranged from 12.8 percent for coun-

ties of 20,000 population adjacent to a metro area, to 20.6 percent for nonadjacent, completely rural counties.[9] Unfortunately, the most remote rural areas—with the highest poverty rates—also have slower growth in population and tax bases and consequently lack the resources to provide needed services to the elderly.

Women constitute 71 percent of the elderly poor—older women are more likely to be poor than are older men, and women outnumber men at older ages.[10] Women also make up most of the older elderly, age 85 and older. With advancing age, economic well-being tends to decline. Therefore, a larger share of the older elderly are poor or near-poor, having an income less than 150 percent of the poverty level, which was $7,818 for a single individual over 65 years of age or $9,862 for an elderly family of two in 1998.

In 1998, over half of the older elderly in rural areas were poor or near-poor, compared with only a quarter of those 60 to 64 years old. Because rural populations have a higher proportion of older elderly than do urban populations, this issue is much more urgent in rural areas. The older elderly are the most economically vulnerable of the older population and also the most in need of health, medical, and other services in rural areas hard-pressed to provide such services.

Economic status in later life is a cumulative product of a lifetime of earnings, savings, and spending, as well as participation in pension, health insurance, and public assistance plans. On average, rural people are less educated than their urban counterparts and therefore have suffered a financial disadvantage throughout their working ca-

reers, resulting in higher current poverty rates and lower retirement income. Rural elders also depend somewhat more on Social Security income than do urban elders, who are more likely to have other sources of retirement income. Unfortunately, monthly Social Security benefits are less in rural areas than in urban areas.[11] Lower average wages in rural areas also mean that working adults have less income and fewer financial resources to support older family members.

Rural-urban differences in poverty rates for the elderly may also be due in part to differences in the composition of the elderly population in rural and urban areas. Older age, minority status, and widowhood are associated with a higher likelihood of being poor. Hence, the older age structure among the rural elderly would tend to raise their poverty rates. On the other hand, a higher proportion of whites and a higher proportion of married persons within the rural population would serve to lower poverty rates.

Finally, there is the matter of assets—accumulated during the working years—which supplement earnings and other income in retirement. Sixty-three percent of the elderly receive income from assets. While home ownership leaves many older persons asset-rich but income-poor, home equity is by far the single most valuable type of asset held by the elderly. Most older persons own their own homes. In 1998, 83 percent of the elderly owned their homes, as did 71 percent of the older elderly. Rural elders were more likely to own their homes (87 percent) than were urban elders (81 percent). In addition, rural elderly homeowners tend to have small or no mortgages and thus lower

housing costs. Eighty-six percent of rural elderly homeowners in 1995 owned their homes free and clear, compared with 78 percent of the urban elderly. However, their homes tend to be lower in value and in somewhat poorer physical condition.

Health Care

Most younger elders (under 85) assessed their health as good to excellent in 1998, with urban elders reporting somewhat better health than rural elders across all age groups. With advancing age, self-assessments of health as well as physical functioning consistently decline. At age 60 to 64 years, 35 percent of rural elders reported excellent or very good health, but by age 85 and older, only 20 percent did so.[12]

Residential location affects health status indirectly. Rural elders are more likely to have characteristics associated with poorer health because they are more likely to be less educated and financially worse off than the urban elderly, and lower socioeconomic status is strongly associated with poor health. Rural elders are also more likely to have certain chronic conditions—for example, arthritis and hypertension—which have a strong effect on health status and the ability to perform various activities of daily living.[13] Hence, the rural elderly may have a greater need for health care services than their urban counterparts.

Older persons who move to retirement areas tend to be better educated than the average older person, and they are more aware of programs and services available to them. They also tend to be in better health and bring higher than average income to the retirement area. The retirement community benefits from an increased population and tax base and, hence, is in a better position to provide needed services.

In other nonretirement rural areas, the number and types of facilities and services available are often inadequate.[14] Rural areas have fewer health resources and services and a lower ratio of doctors, nurses, pharmacists, and other health care personnel to elderly residents than do urban areas.[15] Indeed, the per capita supply of primary care physicians in rural areas is considerably lower than in urban areas.[16] Within rural counties, physician-to-population ratios are related to county population size, with the smallest rural counties having only a quarter as many physicians per capita as the largest counties. A lower physician-to-population ratio in rural areas suggests that rural elders may visit doctors less frequently because physicians are less accessible. In addition, the resources and scope of services in small rural hospitals are often limited.[17] Older persons, as well as the nonelderly, also require emergency medical services, such as ambulances, which are not universally available in rural areas. Rural elders are more likely than urban elders to have to travel farther and longer to reach their usual sources of care. As a result, rural elders may have greater unmet health care needs.

The Rural Difference

The aging population has major policy and program implications. Some, but not all, are the same in both urban and rural areas. The graying of rural America takes on a different shade because of the diversity of conditions, the disproportionate share of poverty, and the limited availability of health care services and facilities. For example, rural elders in general depend more on Social Security, Supplemental Security Income (SSI), and Medicare than do urban elders. In addition, rural elders receive lower payments from Social Security and SSI than their urban counterparts. Why? In the case of Social Security, payments are based on lifetime earnings, which tend to be lower for rural retirees. SSI payments, however, are lower because low-income rural elders are concentrated in highly rural southern states, and these states provide a lower supplement to the federal SSI contributions than other states.[18] Thus, one step in the right direction for rural elders would be to mandate uniform payment levels for SSI.

On another front, rural health care delivery underwent significant changes in the 1990s—some as a result of changes in the private sector, others at the hands of government. Some of the most important changes in rural health policy were efforts to mitigate historic discrepancies between rural and urban providers, such as that found in Medicare reimbursement schedules, and improve the availability of services in rural areas. Despite these changes, resources for rural health care systems remain relatively insufficient. Many rural communities continue to experience shortages of physicians, and more rural hospitals than urban are under financial stress. More will need to be done. Public policies are needed that help rural providers participate in new systems of care and maintain their livelihood under new systems of finance.

The graying of America poses a

major challenge to governmental programs. And a great part of that challenge will be to treat fairly all older Americans, including those who reside in the countryside. To do that, policies and programs aimed at the elderly must take into account the rural difference.∎

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19. Views expressed are those of the author and not necessarily those of the U.S. Department of Agriculture.

The Retirement Rush

Communities seeking to attract migrant retirees may not reap an economic windfall from the baby-boom generation.

BY WILLIAM H. HAAS III AND WILLIAM J. SEROW

People who can afford to move upon retirement, purchase a new home, and settle into a new community are for the most part comparatively affluent. They have money to spend taking in the local sights, eating out, furnishing their homes, and landscaping their yards. Yet they typically require relatively little in the way of local publicly provided services such as schools.

Recognizing this potential source of income, in recent years, many state, county, and municipal governments have been increasingly interested in the role that retirees can play in the economic development of their communities. In some instances, retirees moving into an area can provide an infusion of external funds into a locality's existing economic base and stimulate growth in employ-

ment and income. It is hardly surprising, then, that many localities have embarked on attracting retirees as a nonpolluting source of sustained economic growth.

While much has been written on the causes and effects of elderly migration, there has been surprisingly little attention paid to longer-term issues associated with the phenomenon. Most theoretical and empirical work implicitly assumes that communities can use this strategy with little fear of failure; all they need to do is have, or be willing to provide, the amenities—mountain, lake, or ocean views; golf courses; yacht clubs; and cultural attractions—thought to be essential to a retirement Mecca.

Yet this strategy requires the host locality to make a long-term commitment to constantly rejuvenate the retiree population. Otherwise, the young, healthy, afflu-

ent retirees of today might evolve into older, sicker, poorer retirees of tomorrow. To avoid aggregate aging by the population of retirees, a new stream of migrants is needed. It would therefore be wise to urge caution on the part of communities blindly embarking on a course of mining gray gold.

Post-war Surge

We initially became aware of the changing nature of retirement destinations in the early 1990s.[1] These changes occurred as awareness of the business potential of retirement migration spread. As the World War II generation—which was enjoying unprecedented wealth—began to retire, its members were naturally lured by sunnier climates. Historic retirement communities in Florida, Arizona, and California grew up because of their advantages such as climate, social and recreational amenities, and low tax rates and cost of living. More recently, some emerging retirement communities in Sunbelt and coastal states have opted to take a more aggressive course and have essentially marketed themselves to retirees. Ten states, including North Carolina, Georgia, and Virginia, have emerged as the principal states of destination for retirees.[2] Since the early 1980s, economists and gerontologists have analyzed the virtues of, and outlined strategies for, recruiting retirement migrants.[3] North and South Carolina have produced magazines aimed at people of retirement age, extolling the virtues of retirement in the state. Alabama set up a program called Alabama Advantage for Retirees, within the Alabama Department of Economic and Community Affairs, to promote the development of retirement communities and to recruit retirees.

Those who would vie to lure retirees, however, should keep in mind two factors that may affect the economic viability of historic and emerging retirement communities. First, the baby boom was preceded by two and a half decades of low fertility and limited immigration. Therefore, the number of workers approaching the traditional retirement age of 62 to 65—the average age, since the early 1980s, at which Social Security retirement benefits have kicked in—will continue to ebb for the next decade or so. Those born in 1946, who constitute the leading edge of the baby boom, will likely work for another 10 to 15 years. The peak of the baby boom did not come until 11 years later, in 1957, and those workers will likely not retire until 2020 or later.

Second, during the past three decades, there has not been a significant upward trend in the percent of individuals who change their residence at retirement age; the proportion of persons of retirement age who are likely to change residence, therefore, is fairly small, less than 5 percent.

Is there any reason to anticipate changes, either increases or decreases, in the propensity of young retirees to embark on a long-distance move at or immediately after the time of retirement? Will the concept of retirement as we know it now continue to hold for the next generation of retirees? Will couples totally withdraw from the labor force, thereby making relocation in retirement feasible? Or will one or both continue to work full- or part-time?

Another consideration is the changing nature of work. Flex-time and telecommuting may affect the attachment of the labor force to a particular location. While these trends may increase participation of the elderly in the labor force, they could also serve to facilitate relocation. These trends have not yet been analyzed with precision, but an analysis of data from the 2000 census will help determine whether older workers are still commuting or instead working from home more than in the past.

In addition, the timing of retirement is changing, and people are increasingly returning to the labor force after retirement. While those who follow the traditional career path—working for 20 or 30 years at a regular job with retirement benefits—may retire early, others may start their career later or follow a more intermittent career path and retire later. This has traditionally been the pattern for women, an increasingly career-oriented segment of the labor force. Women with higher educational attainment are most likely to re-enter the labor force after raising a family. It is from this segment of the elderly that traditional retirement migrants are most likely to be recruited.[4]

Another unknown is whether there will be an increase in the age of eligibility for full Social Security retirement benefits and for increases in the amount of the monthly benefit for those who delay receiving benefits beyond normal retirement age. Although people who can afford to choose their retirement location typically do not rely primarily upon Social Security, these benefits are still a significant source of income for all but the most wealthy in later life. Even the top fifth of older households derive 20 percent of their income from Social Security.[5] Therefore, if Congress ups the age limit for Social Security eligibility, people will delay retirement and, accordingly, migration. Because of the rising risks of disability, illness, or even death, any increase in the age at which people retire is likely to reduce, albeit slightly, any given age group's likelihood of migration.

Pension Plans

Since most people who relocate in retirement are relatively affluent, pension income may be a more-important determining factor than Social Security, and changes in the structure of pensions may influence the behavior of future generations of retirees. Pension coverage may change along with changes in the workplace. Indeed, people may hold more than one job over the course of their working life, and become entitled to more than one pension. For example, a military officer could easily retire at 40 or 45 and begin another 20-year career that also offers retirement benefits. On the other hand, the shift from manufacturing to service industries as the primary source of employment for more people may mean losses in benefits. Moreover, the declining role of organized labor may also lead to a decline in the number of jobs that offer pension plans.

During the last 20 years, there has been a shift from pension plans that guarantee a certain income to retirees—called defined benefit plans—to plans that are less certain and depend upon the contribution of the employer and the worker. The value of these defined contribution plans depends on the return on investment. The former provide the employee with a measure of certainty and little risk in retirement income, while the latter can provide the long-term growth associated with equity markets. Yet such growth for retirement income is based on the

quality of the investment strategy. In addition, short-term volatility and downturns in equity investments may create havoc in timing of retirement; people may be reluctant to retire if there is a temporary downturn in the stock market. This uncertainty may alter the financial decisions people make upon retirement—for example, whether to relocate—since their income and wealth may fluctuate considerably. As yet, there are no data from recent short-lived downturns in the financial market to support this contention. The true test of this hypothesis awaits the emergence of a sustained bear market.

In addition, we do not know to what degree the performance of the equity markets is based on the capital influx of baby boomers now entering their prime retirement savings years. The 1998 Consumer Expenditure Survey shows that the share of pretax income expended on pensions and Social Security is at a maximum between ages 35 and 54, though the figure is only about 8 percent.[6] How will market performance be influenced as the age structure of our society shifts? There has been speculation that as baby boomers reach retirement age, they might withdraw funds from equity markets and live off their investments. Others note that the period of retirement will last several decades, and there is no reason to expect any individual to convert all his or her savings from equities to fixed income at a single time.

The smaller generation of the baby bust is unlikely to match in volume the baby boomers' investment portfolio. Will this set of variables slow the growth of the equity markets and hence influence retirement incomes? A potentially disturbing trend is that earnings of younger males ages 18 to 34 are now much lower relative to earnings of males in their 40s and 50s than was true a generation ago. If this snapshot translates into a pattern of lower lifetime earnings, the future health of equity markets and hence of the stability of retirement incomes could be in jeopardy.

During the past several years, annuity-like vehicles such as IRAs and 401k/403b plans have become more prevalent for building primary and supplementary retirement income. These vehicles have two potential drawbacks as engines for producing retirement income. First, such income is based upon the behavior of equity markets. Second, these mechanisms may allow for early withdrawal of principal. In addition, the Employee Benefit Research Institute found 52 percent of the plans had loan provisions that allow contributors to borrow against the principal of these investments.[7] Only 18 percent of contributors had outstanding loans, however, and those averaged only 16 percent of the account balance. Loans and the loan ratio peaked among 40-year-olds and steadily declined with age. Present trends, therefore, do not appear very ominous. Yet individuals may turn to these retirement accounts to serve as bridge income in times of job transition. Recent tendencies in the labor market, whereby individuals now expect to hold many jobs and work for many employers over the course of their working lives, may aggravate this trend. Any pre-retirement withdrawals that are not replaced have the effect of lowering pension wealth and income.

Housing Market

The age structure of the population will also influence the housing market when the baby boomers approach retirement age. As they reached adulthood, set up independent households, and started to raise families, baby boomers competed among themselves for limited housing. This demand spurred a growth in building and raised the cost of housing. Yet the smaller group that followed the baby boomers will ultimately lower the growth rate of demand for housing.

Hence, when baby boomers retire, they may find the real estate market rather flat. Even though only a small fraction will consider moving to a retirement location, those who do may have trouble selling their homes, or their homes may not have appreciated in value as much as those of their parents and older siblings, who used that capital appreciation to finance their own retirement moves. There is little doubt that the substantial increase in housing prices experienced in the 1970s and 1980s has not been replicated in the 1990s and seems unlikely to do so in the foreseeable future.

Golden Age

The parents of the baby boom were the benefactors of the post-World War II economic miracle. Their economic experiences in retirement have been called the golden age of retirement by some.[8] Many parents of baby boomers retired when the Dow Jones Industrial Average was measured in three, not five, digits. While the magnitude of this potential intergenerational transfer of wealth may be difficult to calculate, consider that in 1993 the median net worth of households whose head was aged 65 to 74 years exceeded $90,000, in 1993 dollars. By way of comparison, median net worth for their

children, aged 35 to 44 in 1993, was less than $30,000. Much of this wealth is, of course, held in the form of home equity, and therefore subject to liquidity and stability problems. Nonetheless, the assets of just these 11.6 million households would have amounted to more than $1 trillion.[9]

Academics and policy researchers during the last decade and a half have generally been quite upbeat about the economic impact of retirement migrants on the host community. Based on the positive forecast of retirement migration, many states and local communities have embarked on ambitious campaigns to recruit retirees. Yet a number of interrelated factors will influence the future trend of retirement migration. The return on the time and money invested may not materialize for communities. Demographic and economic trends suggest at the least a cautious outlook.

Typically, people who are going to relocate by choice will do so about the time of retirement, which for most couples will occur when the husband is within a few years of age 65 and the wife about three years younger. This population is not likely to increase very much, certainly not in historical perspective, until after the year 2010, when the baby-boom generation begins to reach conventional retirement age. In the meantime, therefore, the annual number of new retirees seeking the amenities of a retirement community will be comparatively small.

Baby boomers are still 10 or more years away from the typical retirement age. When they retire, the small percent of them who are able to relocate and choose to do so will have wider choices than their parents did. Historic retire-

ment communities are still attracting retirees, yet newly emerging communities provide competition and may reduce the overall influx to established retirement communities. Thus, any individual community, regardless of its amenities or climate, is in a position to compete for these retirees.

A number of questions arise about the economic position of baby boomers as they approach retirement age. How will their spending and savings habits affect the economy? Will they continue to work at other jobs? Will changes in the economic and institutional climate add even more uncertainty to the level and stability of pension incomes? Will retirement income also be tied to the economic fortunes of the generations preceding and following baby boomers into retirement?

While baby boomers will likely benefit from unprecedented bequests, the behavior of housing and equity markets of the future may portend serious problems for the financial well-being of the generation, due largely to the smaller size of the following generation.

We should recall the recent observation of the American Association of Retired Persons: "The idea of the Baby Boomers as a homogeneous group is more myth than reality. With its members spanning nearly 20 years of life, Baby Boomers are represented by a wide range of life stages, life experiences and life values….One of the key characteristics of the Baby Boom cohort is its diversity."[10] This diversity alone makes forecasting the behavior of the group all the more challenging.∎

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NOTES

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The End Game

The end of life places profound responsibilities on the elderly.

BY JOHN R. HARDWIG

To be old is to face the end of life. This is not to say that young people never die. Nor that the old have nothing else to do, no valuable contribution still to make. But after old age comes death. That's simply a biological fact. It will remain a fact regardless of the medical technologies we develop, social programs we institute, and changes we make in our attitudes about aging and the aged.

There is a strong taboo in our culture against talking about the end of life, perhaps especially with the elderly. There is even a taboo against talking with a dying person about this central feature of her experience, even when it's obvious to everyone that she is dying.

But the elderly know. For some, the body fails before the mind. They feel the approach of death in their joints, their ears and eyes, their lungs, their bowels. Each year, the body performs more poorly than it did the year before. When the body starts to fail, we live with the specter of becoming frail, immobile, eventually debilitated and unable to care for ourselves. For others, the mind fails before the body. When the mind starts to fail, we have more senior moments, and the grace we try to muster on those occasions does not hide the premonition they contain. We become more forgetful, increasingly confused, and more disoriented. Then, too, we live with the specter of dementia, of being unable to care for ourselves, and of death.

Even the elderly who are in excellent mental and physical health live in the face of death. For they know life will not last. It cannot last. Probably it will not last much longer. We ought not to pretend otherwise. To face the end of life is not, then, the same as actively dying. It is not even necessarily to carry a terminal diagnosis. Even when there is no terminal illness in sight, one is lurking around the corner. Thus was it ever; thus shall it ever be. So, when we talk about the responsibilities of the elderly, we are talking about the responsibilities of those facing the end of life.

Our New Way to Die

And yet, our medical technology is changing old age and death. The end of life used to come both earlier and much more quickly. When people commonly died of infections, the span between the onset of a terminal illness and death was often a matter of days, a few weeks at most. Moreover, anyone who became bed-ridden for any length of time would often develop pneumonia, and since pneumonia could not be effectively treated, the bed-ridden died. Under such conditions, few lived to be as old as many now do. People aged, became old much earlier, then usually died fairly quickly. This was accepted; not much could be done.

The progress of medicine changed all that. In large part, the change has come since World War II, with the development of effective antibiotics and the respirator. Today, we die of chronic illnesses rather than infections. As a result, the noted geriatrician Joanne Lynn reports that the average American now knows three years in advance what she will die of. Since much is known about most terminal illnesses, a lot is also known about what those three years will be like. Moreover, Lynn reports, the average American male is debilitated for five years before he dies, the average female for eight years before she dies. Today, the elderly live a long time in the face of death.

Those of us who are not yet old will quite likely live even longer facing our demise. There is no reason to believe that medical progress will now halt in its tracks. We can expect to have even better treatments for a wide range of

killer diseases. Those diseases that we cannot defeat, we will be better able to treat and, thus, to slow. These better treatments for terminal conditions will mean that most of us will live even longer facing death. Most of us will live longer than is common today, decline more slowly, and face even longer periods of disability and debility; and our dying will be much more prolonged than it was for previous generations.

If such a long dying seems grim, remember that it's medical progress that brings this new death. It is precisely because our medicine is so successful in treating so many diseases that we live so long and die so slowly. We are all happy to have this medicine available. I know I am. It brings us longer, healthier lives. But there is a dark side to this medical progress; it also saddles us with years of chronic illness and debility and a long, slow dying process. We shall have to learn—both as a society and individually—how to deal with a long, slow demise.

Society's Burden

This new kind of death brings very different problems from those of a quick death. For all of recorded history, the predominant fear has been that death might catch us unawares, carrying us off so quickly that we would not have time to make preparations. The Anglican *Book of Common Prayer* used to include the plea, "and from a sudden death deliver us, O Lord." Now, many Americans believe that dying quickly is the way to go— "she never knew what hit her." But our problem will most often be how to live in the face of death for years and years. My own mother, 90 years old and wheelchair-bound in a nursing home, said to

me over and over, "I'm ready to die. I've been ready for years. Why does this have to take so long?" For her, and for an increasing number of Americans, the problem is no longer that death comes too soon and too quickly. Too often, death comes too late and too slowly.

The slow decline toward death brings serious burdens to the elderly and dying, as my mother's anguished cry attests. But this new extended old age and prolonged dying also brings burdens to families, friends, and society at large.

One of the first problems is how to pay for the care that the elderly and dying will need. A nursing home in the San Francisco Bay Area now costs $5,000 to $7,000 a month. Any medical care and medications that might be needed are on top of that. Over six or eight or 10 years, those monthly payments add up. Many of the elderly do not have the $500,000 to $1 million saved for end-of-life care. Many could not have saved that much. And things look even worse for the future. In all likelihood, we will one day require even more care than the elderly now do. When individuals or families can't cover the cost, society will have to, for we cannot just let old people die in their apartments. And yet the amount of money society has set aside to cover such expenses is steadily declining.

Perhaps even more important than the financial question of how to deal with protracted death, however, is the moral one. For regardless of how undesirable a sudden and premature death might be, it is morally much simpler to handle than a slow dying. Faced with the threat of an unexpected and early death, we do what we can to extend life. We do so almost automatically and without soul-

searching. And when we fail, however grieved we may be over the death itself, there is moral solace in knowing we did what we could. When the overwhelming majority of deaths were premature and nothing much could be done to prolong the life of the dying, we could adopt a very simple moral maxim—save lives! Whenever possible, prolong life! As long as possible! That was simple, clear, easy to follow, and ethically compelling.

Now, we face the excruciating moral issue of when to stop trying to save a life. We could prolong the life of this person if we choose, and we must decide how far to go with the effort. We must also ask, whose interests will shape the decision to stop the effort? The moral burden of this choice is weighty, often excruciating, and it falls on someone—the patient, the family, or a professional caregiver. Our society and most of us individually will have to come to terms with a whole series of profound moral dilemmas raised by deaths that are too slow and too late.

Now, the elderly undoubtedly have responsibilities resulting from an all-out attempt to prolong their lives. For example, the elderly may well have a responsibility not to use their political power to secure a disproportionate share of social resources for themselves, at the expense of the young. But for any individual old person, the responsibility to look after the interests of society is relatively unimportant; we can normally presume that society is able to take care of itself.

Familial Burdens

The families and loved ones of the elderly are less able to look out for themselves. We must, then, also consider the burdens to family and

loved ones brought on by our new way of dying. Perhaps most important are the human burdens of actually providing hands-on care for a seriously ill or debilitated family member. Many families are struggling with the problems of trying to provide round-the-clock care for an elderly relative. Often, such care leaves the caregiver exhausted, with no friends, no life of her own. This caregiving can go on for decades. The burdens of such care often undermine even the health of the caregiver.

We must also recognize the familial financial burdens of old age, debilitation, and a slow dying. Many families struggle with the problem of how to pay for the medical and nursing care that a prolonged end of life presents to families. Thousands and thousands of families are bankrupted every year by medical costs and these are most often associated with the end of life.[1] Is it worth that cost to postpone a death in the family? Is that always the right thing to do?

It may sound callous and vulgar to mention money in the context of providing care for an elderly family member, especially when life itself is on the line. But on the personal and familial level, the human costs of having to pay for health care can be enormous. For the vast majority, there is more than just money at stake.

Consider the case of Ann, a single, 55-year-old career professional who cared for her 87-year old mother during the mother's three-year struggle with terminal congestive heart failure. Besides three years of complete exhaustion, the care of her mother cost Ann her job, her career, her home, and all of her savings.

A career change at age 55 is difficult at best. Ann is unlikely to find another job nearly as remunerative or interesting. Even if she manages to start a new career, she no longer has enough working years left to recoup her savings. The end of her mother's life will profoundly alter the rest of her own life. Even her health care may well be affected, since affordable health insurance these days often comes only with a good job. It was not, of course, a question of saving her mother's life, except very temporarily. Her friends and family knew that her mother's congestive heart failure was terminal and that it was only a matter of time. And so it was.

Whose Burden?

Our society could—for a while longer at least—lift the weight of this responsibility from families like Ann's. We could develop a comprehensive plan to care for those who cannot take care of themselves, including the aged, the chronically ill, and the dying. We could, but it looks like we won't. In fact, we are moving in precisely the opposite direction.

In the United States, the burdens that families and loved ones bear when there is chronic illness, debility, or protracted death are steadily being increased by the cost-containment measures designed by insurers—mainly employers and the government. Health-care costs in this country continue to grow much faster than our economy, giving rise to a very real need on the part of employers and government organizations to try to contain escalating health care costs.

One common strategy in the campaign to control these costs is to force families to provide more of the daily caregiving and to require patients and their families to pay more of the costs of health care. Thus, health insurance covers less of the cost of chronic illness. Patients are also discharged from health-care facilities "quicker and sicker," as the saying goes. They then go home—still unable to care for themselves—where they have to be cared for, almost always by the women in the family.

Now, any society must decide whether to bear the burdens of the unfortunate collectively or individually. Health insurance, social security and retirement funds, and welfare plans are all devices that allow us to bear responsibility collectively. Under a system of collective responsibility, those who are fortunate enough not to have family members who become seriously ill or who cannot care for themselves subsidize those who are not so lucky, and we all insure ourselves against having huge burdens fall upon us or our loved ones.

Accordingly, we could decide to tax ourselves to provide collectively for the needs—not just the medical care—of people who can't care for themselves. That's what Canada is trying to do, and apparently no one there is impoverished by an illness in the family. Contrast the United States, where tens of thousands of families are impoverished every year by the cost of medical treatment.

The emphasis in the United States today is on individual responsibility. The popular idea in our country is that each person should be responsible for himself, and families should take care of their own without looking for much help from the rest of us. This approach may well reduce our taxes. But that is not the end of the matter. A social decision not to bear responsibility collectively

does not mean that responsibilities simply evaporate. Rather, it increases our individual responsibilities, sometimes dramatically. If we choose not to provide collectively for those in need, we must protect and provide for our loved ones individually, at a time when we ourselves may also be in need.

As we reshape our social context, we also redefine our personal responsibilities. A renewed emphasis on individual responsibility means that many more of us will have to make very difficult individual choices at the end of our lives, if we are to protect our families and loved ones. Each of us must live and die in the social context we create together. Either we will bear responsibilities for our elderly collectively or we will have to face these responsibilities individually—often through personal caregiving, which can mean the loss of all assets, the sacrifice of careers, and, sometimes, the sacrifice of health. If we do not provide collectively, many of us will also face excruciating individual moral decisions when we become old. We may regrettably find ourselves in situations in which there is simply no responsible way to continue living, as all options impose too great a burden on our loved ones.[2]

Responsible Aging and Dying

All developments and choices that will dramatically affect the lives of others, especially family and loved ones, raise serious moral questions. So our new way of dying, combined with our penchant for individual responsibility, requires troubling ethical choices: How much can I ask my family and loved ones to do to support me during the final years of my life? How many years can I ask them

to sacrifice because I would like to avoid institutional care or to live a little longer? Can I seriously compromise their futures and even their children's futures just because I want to live a little while longer or in the style I enjoy? What will be my responsibilities to my loved ones as I near the end of my life?

These are deeply disturbing questions—questions we all would rather avoid. So far, we have largely avoided such questions by just shutting them out of our minds and our family conversations. But this ostrich posture stands a fair chance of making matters much worse for those who have to take care of us and support us at the end of our lives. There is no easy moral solution, no comfortable and safe moral ground.

Now, I do not deny that the families and friends of those facing the end of life have responsibilities, too. They have a responsibility to help us in this time of need. Perhaps they even owe us for help we gave them earlier in life. But there must be limits to their responsibilities, if the other members of our families are to be given an equal chance to live their own lives, achieve their own goals, and satisfy their desires. There must also be limits if families are to do what's best for all members of the family, not just what's best for the members who happen to be elderly. There must be limits if family members have other responsibilities, to partners or children or careers. The caring capacity of families must not be exceeded or completely swallowed up in the care of a family member who is facing the end of life. Longer life or the opportunity to live at home must not become an altar on which all other goals and values of the family are

sacrificed. So, though families and loved ones also have responsibilities to the elderly, this does not eliminate the need to think about the responsibilities of those who are facing the end of life.

Many old people do think about the burdens on family that their old age and debility may bring. It is a common refrain among old people that they hope not to live so long that they become a burden to their loved ones. But fewer have considered what steps this hope might require of them. Most of us will not be able to avoid such questions—for we do not die alone. Our deaths are not simply our own, affecting no one but ourselves.

Professional ethicists may be appalled at the very suggestion that people have responsibilities at the end of life. Bioethicists, for example, focus almost exclusively on the kind of death the patient wants for herself. That, in fact, is their concept of a good death. But life is not about just doing what you want; often it's not even primarily about what you want. Neither is death.

One can live responsibly or irresponsibly. Accordingly, one can age responsibly or irresponsibly. One can respond to illness, disability, debility, or harbingers of dementia responsibly or irresponsibly. And one can die responsibly or irresponsibly. Most of us will face choices at the end of life, and our choices may be either responsible or irresponsible. In aging and dying, as in the rest of life, a self-centered life is wrong. It is irresponsible and wrong to make our choices thinking only about what we want for ourselves, without duly weighing the ramifications of our choices on the lives of others—especially on the lives of those who are close to us, for we have a spe-

cial obligation to try to protect them.

As we age and then begin dying, we will have to figure out how we can protect the lives of our loved ones from the tragedies that our old age and death could bring upon them. If we are to keep the endings of our own lives from seriously compromising the lives of our partners and children, it will be up to us to make very difficult choices. Most of us will have to decide for ourselves how we will structure the ends of our lives, trying to balance what we want for ourselves with our responsibilities to use our choices to protect the well-being of our loved ones.

Gauging Your Responsibilities

Having said all this, we come to the really serious question: how can I determine the extent of my responsibilities to family and friends? Exactly what are my responsibilities to my loved ones as I age, approach debility or dementia, and then die? How can I protect their lives from being seriously damaged by my old age and death?

To my mind, these are the right questions we will all need to ask. But I will not even attempt to provide answers here. To begin with, the questions are too new. We have not devoted enough careful thought to them. The very idea of a responsible death is really quite foreign to us. Besides, I have no moral authority to define for others what their responsibilities are at the end of life. I also believe answers to these questions will be very contextual, shaped by many nuances of particular families. The responsibilities of an old person to her family will be shaped by their dreams, hopes, fears, and aspirations; by the history of the family, including who has made sacrifices

for whom; and by the patterns of interaction that have characterized the common life of this family. I don't know nearly enough about any family except my own to be able to define the responsibilities of the elderly to the rest of the family.

The List

Having only questions to raise, not answers to offer, I leave you with a thoughtful, impressive list of responsibilities of those facing the end of life. It was drawn up by members of a seniors' organization that I was invited to address a couple of years ago.[3]

As I was preparing my talk for the organization, I decided I would break the taboo against talking with seniors about the end of life. Instead, I told the group that there are important responsibilities of others—particularly family members—to the aged, the infirm, the ill, and the dying, but that I wanted them to tell me what they thought were the responsibilities of those facing the end of life.

The group came up with a remarkable list. We had only 45 minutes for our discussion, so we could not spend much time talking about each proposed responsibility. But all items on the list were at least briefly discussed. Not everyone present agreed with every item, but there was considerable consensus about many items. And there were regular comments like, "I'd better start doing that."

At the end of our brief discussion, one women came up to me and said, "My husband passed away three weeks ago. I just want you to know how comforting and helpful this discussion has been to me."

Some items among the responsibilities these seniors formulated are controversial. Still, each item represents the deeply held convic-

tion of someone who is thoughtfully facing the end of life. Each is worthy of serious consideration. This list of responsibilities strikes me as an excellent starting point for moral discussion of our responsibilities at the end of life. I offer it as such:

■ Talk with your family about death.

■ Discuss death and dying while you are well. Renew this discussion periodically.

■ Review the life you have shared, set things right, and ask for forgiveness from your loved ones.

■ Talk with your loved ones about what they will do after you're dead and about how their lives will be without you. This will give them permission to go on to full lives after you're dead.

■ Help your spouse achieve enough independence and enough of a life of his or her own to live happily without you.

■ Teach your spouse and inform your children about your finances.

■ Teach household responsibilities to ensure that your spouse has competencies he or she will need when you are dead.[4]

■ Don't insist on personal care. Don't ever say, "Never put me in a nursing home." If you've already said it, retract it and apologize.

■ Don't live so long that your loved ones will wish you were dead.[5]

■ Die in a way that will leave your family in the best position.[6]

■ Make both a will and living will.

■ Assign a power of attorney to a trusted family member or friend who is likely to be of sound mind when you no longer are.

■ Put all assets in both spouses' names, or else clearly separate them. Review this item periodically.

■ Do things to minimize disagreements and conflicts among your survivors.

■ Write an obituary and make funeral and burial plans. Address the issue of donation of your body.

■ Don't leave to others decisions that will cause guilt.

■ If you decide on suicide, be considerate of those who will find your body.

■ Tell your story. It will help you accomplish the other items on the list.■

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NOTES

1. See Kenneth E. Covinski et al., "The Impact of Serious Illness on Patients' Families," *Journal of the American Medical Association* 272 (1994), pp. 1839-44.

2. See John Hardwig et al., *Is There a Duty to Die?: And Other Essays in Bioethics* (New York, NY: Routledge, 2000).

3. This list was formulated by the Institute for Continued Learning, in Johnson City, TN, on November 5, 1998. The Institute for Continued Learning is a group of seniors who meet regularly to participate in educational events and programs. All are retired. The youngest member of the group is 55 years old. Most are in their 70s.

4. In discussion, many felt the husband should cook, clean, and do the wash for a couple of months while the wife pays the bills, gets the car serviced, and takes care of the house and yard.

5. A discussion followed about a comment one member had heard from a friend: "I wish my mother had died while I still loved her."

6. A discussion followed about whether there is a responsibility to commit suicide. Some Institute members think there is.

7. Material in this paper has been drawn from Hardwig et al., *Is There A Duty to Die?: And Other Essays in Bioethics.*

The Right to Bear Arms

Dueling Statistics

Guns *R* Us

Pro- and anti-gun-control forces tend to use the same caliber of ammunition in their arguments: statistics or—depending on your point of view—lies, damn lies, and statistics. Nearly half of all households in the United States have guns. There is nearly one gun for every man, woman, and child in the country. The homicide rate in the United States is eight times higher than in comparable countries.

Gregg Lee Carter reviews the statistical arguments used in the debate over gun control, but finds no clear answers in the numbers. Even in countries like the United States, where gun ownership and gun violence rates are both high, correlation does not imply causation, Carter maintains. In Switzerland, for example, virtually every adult male is a gun owner, yet that country has a low overall murder rate. In fact, social homogeneity may be more predictive than gun ownership of low rates of violence. Instead of trying to prove causality, Carter says that gun-control advocates are now underscoring the social and medical costs of gun violence as a rationale for instituting stricter gun controls.

The Founding Fathers—who hunted game, fought for freedom, and relied on their guns for self defense—may be rolling over in their graves at this precautionary approach. In fact, much of the discussion hinges on divining the intention of the authors of the Second Amendment to the Constitution. George Rice says the gun-control issue is just that, an issue of who controls the guns. The earliest gun laws were, in part, intended to keep guns out of the hands of African Americans. Likewise, laws were used to disarm Native Americans and send them to reservations. Legal, or illegal, possession of guns has been a norm in our national history. Rice says our gun nostalgia should be replaced with a collective consensus to uphold the right of society to be free of gun violence.

Yet the unarmed are easy prey for criminals. Paxton Quigley, a personal protection expert, decided to learn to use a handgun after a close friend was raped. Quigley cites evidence that guns are an effective deterrence to criminals. Moreover, in her years teaching thousands of women to shoot a handgun, she finds that those who conquer their fear of guns gain more control in other areas of their lives.

Japan has a long history of weapons control. Increasingly, other countries are striving to rein in the possession of firearms. The United Kingdom, Canada, and Australia are moving toward zero-tolerance policies that leave law-abiding citizens with no means of self-defense, say Linda Gorman and David Kopel. This greatly simplifies the business as usual of most criminals. Banning guns, in fact, does little to reduce the overall rate of violent crime, and governments sometimes go to absurd lengths to ensure the public safety. In New South Wales, for example, a law banning the sale of knives to anyone under 16 effectively means government now controls many children's hobbies such as fishing. In addition, Gorman and Kopel find that countries bent on making the possession of firearms illegal vastly expand their powers of search and seizure.

Even the staunchest gun-control opponents agree with one statistic: in the United States, the brunt of gun violence falls on poor, inner-city, primarily African-American youths. Timothy Brezina and James Wright say it's impossible to keep out of the hands of children some of the approximately 200 million guns in circulation, even with stricter laws. Knee-jerk lawmaking in the aftermath of extreme and statistically rare cases—such as the Littleton, Colorado, massacre—deflects attention from the underlying cause of youth violence: an impoverished social environment.

Indeed, creating a safe and healthy environment for all is a worthy goal. Before we rush to lay down our arms and disarm everyone else, however, we might want to heed the words of Benjamin Franklin: "Those who beat their swords into plowshares usually end up plowing for those who didn't."

The Editors

Dueling Statistics

The debate over gun control is often a war of statistics. Even more puzzling is that both sides in the debate often invoke the same statistics.[1]

BY GREGG LEE CARTER

Research and public debate on gun control are quagmires into which the average academic, public policymaker, and citizen should be wary of diving. Indeed, every single entry point into the issue represents a morass so difficult to navigate that making an informed decision whether to support or oppose control of firearms could be a full-time job.

The central issue is whether there is a causal link between the prevalence of gun ownership and the level of gun violence. There is already a significant amount of data familiar to researchers, policymakers, and writers in the field.[2] But few policymakers and concerned citizens have in-depth knowledge about it, and both sides in the debate are adept at using statistics to their advantage. Even to the initiated, the data point to no clear and easy answers.

A Bloody Nation

Two facts cannot be denied, even though different analysts draw different conclusions about their significance. First, national gun laws in the United States are weak compared with those of almost all other economically developed democratic nations. And second, the level of gun violence in the United States is also high.

In 1998, health researchers Etienne Krug and colleagues compared firearm-related deaths in the United States and 25 other high-income countries. They found that the rate of firearm deaths from homicide, suicide, and accidents in the United States—14.24 per 100,000—is eight times higher than in economically comparable countries. Moreover, the overall homicide rate in the United States is six times higher than that of a typical economically developed country.[3]

To gun-control advocates, these two sets of facts are causally related, and the end result is evil; large numbers of firearms afloat in society produce large numbers of violent crimes, suicides, and accidental deaths. Guns are not just another weapon. Assault, accidents, and attempted suicide with a gun are many times more likely to result in death or serious injury than actions taken with any other weapon.[4]

Gun-control opponents, on the

other hand, argue that the United States would be a violent and bloody society with or without the omnipresence of firearms, including handguns and assault rifles. Logic and data also support this argument. Even if we remove all of the firearm homicides for the United States, the murder rate is still 1.75 times greater than the entire homicide rate of the typical high-income country.[5] In short, the data do not fit nicely either the pro- or anti-control arguments. Moreover, even when complex multivariate statistical techniques are used, the answers become no clearer.

These varying assessments lie at the very core of the controversy over gun control. That is, those working for enactment of strong national gun laws are motivated, at heart, by the belief that such laws will reduce violence and save lives.

The largest and most important organization promoting federal policy to reduce gun violence, Handgun Control Inc. (HCI), contends that gun control works. In the fall of 2000, for example, HCI sent a letter to its membership contending that the 1993 Brady Handgun Violence Prevention Act resulted in a drop in gun deaths from 37,776 in 1992 to 32,436 in 1997, the latest statistic available.[6]

Those who oppose the agenda of HCI, on the other hand, dispute the very premise that a comprehensive federal gun-control policy will reduce gun violence. In the words of the National Rifle Association, "Guns don't kill, people do." In its flyers, the NRA repeatedly stresses that strict national gun laws, especially registration and licensing, would have no effect on criminal violence, "as criminals, by definition, do not obey laws."[7]

International Comparisons

While the overall murder rate in the United States is six times higher than the average of economically developed nations, an even more dramatic comparison is the rate of murder by guns, which is 7.07 per 100,000. That's more than 12 times higher than that of its peer nations, which averages just 0.58.[8]

Paralleling these dramatic differences in murder rates are differences in gun prevalence. A study published in 1993 by Swiss criminologist Martin Killias showed that in the United States, 48 percent of households have some type of gun. That's three times greater than for the typical European country—16.2 percent—and twice as high as the rate of Australia and Canada—24.3 percent.[9]

Further statistical analysis of those data reveals strong correlations between gun prevalence and murder rates. For example, in countries with a high level of ownership of guns of any type, the murder rate is significantly higher than in countries with low levels of ownership. In countries that have high numbers of households with handguns, the murder rate is even higher.[10]

On the other hand, Florida State University criminologist Gary Kleck analyzed the Krug data and found a much more modest correlation between gun ownership

and total homicide rate.[11] Kleck contends that because the sample size is larger in the Krug study of 36 nations than in the Killias study of 13 nations, his correlation analysis presents a more accurate description of the relationship between gun ownership and homicide rates. Kleck also examined 18 studies on the correlation between gun prevalence and violent crime in U.S. cities and counties. His analysis shows no consistent relationship.[12]

Unlike the United States, most western European countries and other economically developed nations have strict national gun laws. These countries require that guns be registered, that gun owners be licensed, and that guns be stored and transported with utmost security. To get a license, a potential gun owner must typically pass an exam on gun safety. Also required are comprehensive background checks of individuals seeking to purchase guns, including any history of criminality or mental incapacity.

Only recently, since 1994, has the United States enacted similar legislation requiring anyone seeking to purchase a handgun from a licensed dealer, manufacturer, or importer to submit to a background check. Of special interest to gun-control advocates, handguns are either outlawed or restricted so severely that ownership is extremely rare in most European

Unlike the United States, most western European countries and other economically developed nations have strict national gun laws.

countries and Canada. No such prohibition exists on the national level in the United States, where a comparatively high percentage of households—29 percent—own a handgun. Compare that number with the minuscule percentages elsewhere: 0.1 percent in the United Kingdom, 0.2 percent in the Netherlands, 2 percent in Australia, 2.5 percent in Spain, and 7

Killias, which compared economically developed western democracies, is arguably preferable to the more recent Krug study, which included statistics from developing countries in Asia and the Middle East as well as high-income European countries. Further, we should avoid simplistic comparisons of pairs of countries since such comparisons can be tailored

1990s, the rate of homicide due to firearms for black males in their early twenties was more than eight times higher than the rate for all individuals in the same age group: 140.7 per 100,000 for black males as opposed to 17.1 for all males.

The escalating prevalence and use of guns in

underclass neighborhoods have turned these

areas into killing fields.

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percent or less in Belgium, Canada, Finland, France, Norway, and Spain.

The striking exception in Europe is Switzerland, which has few restrictions on gun ownership. Because of its low murder rates, both overall and by guns, Switzerland is the NRA's favorite example of the maxim "guns don't kill, people do." However, gun-control advocates are swift to note that Switzerland's population is highly trained in firearm safety and usage since most adult men are members of the national militia.

Yet we must not oversimplify when making cross-national comparisons. Many factors other than gun prevalence may affect the level of violence in any particular country. There are social and cultural differences among the nations that could account for violence or the lack thereof, especially degrees of social heterogeneity and solidarity, as well as levels of economic development. A fair comparison should include countries similar in their economies, politics, and cultures. Indeed, the 1993 study by

to support either side of the gun-control debate.

To wit, gun-control opponents like to compare Switzerland and Mexico. Since all able-bodied males belong to the Swiss home guard and must possess a firearm, gun prevalence is high in Switzerland, yet gun violence is quite low. Conversely, Mexico has a low level of household gun ownership but a relatively high rate of gun violence. Gun-control supporters favor pairing the United States, which has high rates of gun-related violence and high levels of gun ownership, and Japan, where few people own guns and acts of violence are less common.[13]

Faces of Death

It is important to note that the high rates of gun violence in the United States do not affect all Americans equally. Reports published over the years by the Bureau of Justice Statistics reveal that black males in their teens and early twenties are the most likely to suffer such violence.[14] For example, in the early

Similarly, the rate of homicide due to firearms for black teenagers was 105.3, but 14.0 for teenagers as a whole. While the absolute numbers of victims involved has fallen since 1994, the racial slants in the data have not. All parties involved in the analysis of gun violence—scholars as well as opponents and advocates of gun control—view these figures as an enormous calamity in the African-American community.

For example, sociologists James D. Wright, Joseph F. Sheley, and M. Dwayne Smith assert that the escalating prevalence and use of guns in underclass neighborhoods have turned these areas into "killing fields."[15] Law professors Robert J. Cottrol and Raymond T. Diamond, both of whom the NRA holds in high esteem, declare that the "black-on-black violence that plagues the mean streets of our inner cities" is tragic.[16] Josh Sugarman, head of the Violence Policy Center, an organization dedicated to strict gun control, laments that in many inner-city black communities "youth funerals are so commonplace that the dilemma is not facing the question of death, but what to wear."[17]

The stark statistics regarding young minority males and gun violence provide an interesting contrast to the high-profile gun tragedies involving young people in the past five years. All but one of these high-profile incidents have involved white male teens from small towns and suburbia: Springfield, Oregon; Pearl, Mississippi; Paducah, Kentucky; Jonesboro,

Arkansas; Edinboro, Pennsylvania; Raleigh, Virginia; and most tragically, Littleton, Colorado. Yet in inner-city America, the shooting and wounding of youths in poor black neighborhoods surrounding schools is commonplace, though little publicized except in local newspaper or local radio and television news broadcasts. In short, white and minority gun violence receive different treatment in the national media.

Cause and Effect

The question at the very crux of the controversy between advocates and opponents of gun control is whether there is a causal relationship between guns and violence. From the mid-1980s through the early 1990s, guns diffused throughout the inner cities and many suburban communities of the United States. At the same time, these areas witnessed rising rates of violence. Between 1984 and 1992, according to the FBI Uniform Crime Reports, property crime was leveling off; on the other hand, violent crime kept increasing—steeply so between 1987 and 1993.

Most significantly, handgun violence catapulted from 589,000 murders, rapes, robberies, and assaults committed with handguns in 1988 to 1.1 million in 1993.[18] The fact that crime rates—property, violent, and gun-related—have fallen in the past eight years to roughly those levels of the early 1980s does not negate the hypothesis that the influx of guns was connected to the steep rise in violence in the late 1980s and early 1990s. The black riots of the 1960s were self-limiting because one can only burn down a neighborhood so many times. Much of the inner-city youth violence of a dozen years ago was also self-limiting since the most violent were the first to be cut down. Those succeeding them were more mindful of the destructiveness of guns, especially of semiautomatic pistols. The survivors also realized the benefits of a stabilized drug market.

Criminologist Alfred Blumstein contends that, beginning in 1985, drug dealers recruited younger sellers, who are less aware of the risks of the trade and less likely to receive long jail terms if caught. Like their older counterparts, the younger sellers carried arms for self-protection, and these guns found their way to other youths through neighborhood networks. Teenagers are also more reckless, so fights that once would result in a bloody nose have escalated into gun fights that leave people dead. An impoverished social environment alone cannot explain the spike in violence that occurred in the 1980s, since economic despair and poor educational achievement are nothing new to ghetto neighborhoods.[19]

Blumstein also contends that white juvenile homicide rates increased during the same era because gun possession crossed over into suburbia, as guns begat guns in close-knit teenage circles. The Bureau of Justice Statistics data lend support to this interpretation. However, national survey data reveal no increase in the percentages of individuals, including blacks and urban-dwellers, or households possessing a gun. Some analysts therefore reject the notion that guns spread throughout the inner-city and parts of suburbia during this period and accept the simpler interpretation that there was a rise in gang activity—and gang members use guns.[20]

But national survey data have

An impoverished social environment alone cannot explain the spike in violence that occurred in the 1980s.

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some limitations. Respondents are noninstitutionalized adults willing to take the surveys, which are based on personal interviews. This almost certainly skews the results, since respondents are unlikely to admit the possession of guns if their possession is illegal. For those living in New York, Boston, Miami, Chicago, Los Angeles and other urban areas during the 1980s, who saw and heard gunfire in the streets, the survey data can't seem to detect the diffusion of guns they witnessed firsthand.

Even if we accept the argument that gun prevalence and violence rose hand-in-hand in the 1980s and 1990s, correlation itself does not of course prove causality. Several prominent students of gun control argue that the causal arrow might very well run the other way: that is, that rising rates of violence prompt citizens to arm themselves. Moreover, simple correlations do not take into consideration other variables that might affect the primary variables, implying that the correlation between

guns and violence is spurious. Perhaps rising immigration rates and subsequent rises in violence based on cultural conflict account for the rise in gun violence in the 1980s. Or the surge in violent crime may have been the result of the growing presence of violent youth gangs—which sprang from low to high levels with the introduction of crack cocaine in many urban areas.

A culture in which the citizens are very similar is more likely to have laws that represent the wishes and desires of a large majority of its people.

In short, the data do not fit neatly either the pro- or anti-gun-control side of the debate. However, it is not unreasonable to hypothesize that the easy availability of guns, both legally and illegally, and their diffusion in urban areas during the 1980s greatly magnified the problems of violence associated with culture conflict and street gangs, even though some would argue that these forces would produce the same levels of violence even if guns were not on the scene.

Baby Bust

During the late 1980s and early 1990s, property crime—larceny, burglary, and auto theft—rates were flattening out in the United States. This trend seems to support the hypothesis that demographic trends influence the rate of crime, since this flattening out was predicted long ago by demographers and criminologists who realized that much of the rising crime rate in the 1960s and 1970s was due to a large population of young people, who tend to take more risks, including participating in crime. As the post-World War II baby-boom generation aged, it was predicted, crime rates would fall, since more than half of all street crime is committed by individuals under 25, with arrests peaking at age 18. Yet, if property crime was flattening out between 1984 and 1994, the demographic hypothesis doesn't explain why violent crime—robbery, murder, aggravated assault—was not. The diffusion of guns into urban areas could account for the divergent trends in property crime and violent crime.

At the international level, the correlation between gun prevalence and violence might result from other factors, throwing suspicion on the causal link. The two most important factors are social homogeneity and economic inequality. Were the United States more socially and economically homogeneous, would its much greater prevalence of guns really matter that much?

A culture in which the citizens are very similar—sharing similar ethnicity, religious beliefs, income levels, and values, such as Denmark—is more likely to have laws that represent the wishes and desires of a large majority of its people than is a culture where citizens come from diverse backgrounds and have widely disparate income levels and lifestyles, as in the United States.[21]

For this reason, countries with a good deal of homogeneity normally have lower levels of law violation and violence than their heterogeneous counterparts. Kleck presents data in support of the notion that culture, not gun availability, is what best distinguishes the United States from other developed countries with much lower rates of violent crime. For example, in both Great Britain and Canada—two countries with low gun availability and low homicide rates that are often contrasted with the United States—guns were not restricted in the early part of the 20th century, yet homicide rates were still extremely low, 12 to 14 times lower than in the United States.[22]

It is difficult to rule out these alternative explanations for much greater levels of violence in the United States compared with other economically developed countries. In fact, there is ample evidence that heterogeneity can play a huge role in sparking violence and crime: witness the former Yugoslavia. However, it is again not unreasonable to hypothesize that the easy availability of guns greatly magnifies the problems of crime and violence in the United States, with its high levels of social and cultural heterogeneity and economic inequality.

In addition, guns are much more lethal than other weapons. Gunshot wounds are much more likely to result in death than wounds inflicted by knives, the weapon generally assumed to be the next most lethal.[23] In comparing rates of violence in the United States with those of peer nations, gun-control advocates observe that assaults in the United States are more likely to involve guns, and guns kill. There is support for this position. A 1988 international crime survey revealed that the

overall U.S. assault rate was 5.4 percent, not quite twice the rate in other developed countries, which average 2.9 percent, but the U.S. homicide rate is six times greater. Moreover, several nations have rates of assault with weapons on par with those of the United States. For example, in the Netherlands and France, the rate of assault with all weapons was 15 percent in the Netherlands and France, 14 percent in Northern Ireland and the United States, and 12 percent in Canada. Yet the homicide rates of those same nations, where the weapon is much less often a gun, are many magnitudes smaller than in the United States.[24] Such data support the argument that guns transform violent situations into lethal events. As epidemiologist David Hemenway phrases it, "the presence of a firearm allows a petty argument to end tragically."[25]

Holes in the Data

Law professor John R. Lott disputes this conclusion, as well as most others concerning gun prevalence and violence. Indeed, the research of Lott and his colleague David Mustard has fueled one of the greatest debates on the issue of gun control. Their work also reinforces the controversial research of Kleck and others who tout the advantage of gun possession in defending against criminal attack. Lott observes that murderers are rarely law-abiding citizens. "In the largest seventy-five counties in the United States in 1988, over 89 percent of adult murderers had criminal records as adults." Indeed, what qualifies as an acquaintance murder is much less often a friend killing a friend, or a

man killing his wife or girlfriend, than a gang member killing the member of another gang or one criminal killing another.[26]

Even more important, Kleck and Lott's analyses of individual city, county, and state data reveal no consistent relationship between gun prevalence or ownership and violent crime. Moreover, when individuals are freely allowed to carry concealed weapons, rates of violent crime drop. Their interpretation is straightforward and has intuitive appeal:

> Criminals are rational, and they are less likely to rape, rob, or assault when they are fearful that a potential victim may be armed. In Canada and Britain, for example, with tough gun-control laws, almost half of all burglaries are "hot burglaries" [where a resident is at home when a criminal strikes]. In contrast, the United States, with fewer restrictions, has a "hot burglary" rate of only 13 percent. Criminals are "not just behaving differently by accident…. The fear of potentially armed victims causes American burglars to spend more time than their foreign counterparts "casing" a house to ensure that nobody is home.[27]

An appealing justification in support of Lott's argument is that, in states that allow ordinary citizens to carry concealed handguns, the violent crime rate is signifi-

cantly lower than in states where this is not the case.

However appealing, the research in support of the deterrent effect of bearing arms has been assailed on a number of fronts, mainly methodological. For example, Kleck's data, a probability survey based on a national telephone survey, led him to estimate some 2,500,000 defensive uses of guns

In states that allow ordinary citizens to carry concealed handguns, the violent crime rate is significantly lower than in states where this is not the case.

per year. However, economists Philip J. Cook and Jens Ludwig question Kleck's data. They do so because his estimate is so far out of line—by a factor of 25—with the estimate of 100,000 incidents of defensive gun use by the *National Crime Victimization Survey* (NCVS), the "most reliable source of information on predatory crime because it has been in the field continuously since 1973 and incorporates the best thinking of survey methodologists."[28]

Further confusing the picture, the 1994 National Institute of Justice survey on the private ownership of arms revealed a very high estimate for defensive gun use: 1.5 million uses. That's a million less than Kleck's data reveal, but 15 times the NCVS data. Cook and Ludwig still contend the NCVS data are much more accurate. For example, if the National Institute of Justice survey estimates are correct, during a 12-month period in 1994, more crimes were foiled by armed citizens than the number

of violent crimes committed, according to the NCVS, and the "number of rapes in which a woman defended herself with a gun was more than the total number of rapes estimated from NCVS. For other crimes...the results are almost as absurd."[23]

The Lott and Mustard study showing that carrying concealed weapons can significantly deter violent crime is also problematic. They use complex statistical analyses of data on more than 3,000 U.S. counties over an 18-year time span. But several recent studies have poked holes in their findings.[30] And, as economist William Shughart observes, Lott and Mustard have "triggered a healthy econometric argument that is far from settled."[31]

In short, the relevant data don't fit neatly on either side, and it will probably be a long time before the question is convincingly answered. In the meantime, complex arguments regarding the relationship between gun prevalence and violence have prompted some on the pro-control side to adopt a new view. Gun-control advocates know that, in certain cases, eliminating guns can and does reduce violence: put metal detectors in airports, and hijackings disappear; put metal detectors in high schools, and shootings on school grounds disappear. However, with some 200 to 250 million guns currently in circulation in the United States,[32] we are not going to eliminate our guns—not soon, not ever. Neither, given our great levels of heterogeneity and inequality, are we going to eliminate crime. But by keeping guns out of our streets as much as possible—that is, by strictly controlling them—we can reduce the harm they cause.

This view is becoming increasingly popular with those examining the medical and other costs of gun violence. It is best expressed in Cook and Ludwig's conclusion that "guns don't kill people, but they make it real easy." Controlling guns may not reduce violent crime, but it may reduce the harm done in such crime. Cook and Ludwig estimate that gun violence—including medical costs, lowered job productivity, the cost of the criminal justice system, the expense of maintaining security in schools, and others—costs the U.S. public "on the order of $100 billion per year, and affect[s] all of our lives in countless ways."[33] Rest assured, though, that this estimate, and the analyses underlying it, will spawn critical reaction from those who are opposed to gun control.∎

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NOTES

1. James Lindgren and Franklin E. Zimring, "Regulation of Guns," in Sanford H. Kadish, ed., *Encyclopedia of Crime and Justice* (New York, NY: The Free Press, 1983), pp. 836–841.

2. Short biographies and summaries of the writings of many of the participants in the debate can be found in Marjolijn Bijlefeld, *People for and against Gun Control: A Biographical Reference* (Westport, CT: Greenwood Press, 1999).

3. E.G., Krug, K.E. Powell, and L.L. Dahlberg, "Firearm-Related Deaths in the United States and 35 Other High- and Upper-Middle-Income Countries," *International Journal of Epidemiology* 27(2) (April 1998), pp. 214-221. The data were from the early and mid-1990s.

4. Lindgren and Zimring, "Regulation of Guns," p. 837.

5. Krug, Powell, and Dahlber, "Firearm-Related Deaths in the United States."

6. Sarah Brady, *Letter to the HCI Membership* (Washington, DC: Handgun Control, November 7, 2000).

7. *Ten Myths about Gun Control* (Fairfax, VA: NRA Institute for Legislative Action, 1994), p. 9.

8. See Table 1 in Krug, Powell, and Dahlber, "Firearm-Related Deaths in the United States," p. 216.

9. Martin Killias, "International Correlations between Gun Ownership and Rates of Homicide and Suicide," *Canadian Medical Association Journal* 148(10) (May, 1993), pp. 1721-25. Since Killias's study, the U.S. percentage has fallen; see note 30 below.

10. Gregg Lee Carter, *The Gun Control Movement* (New York, NY: Twayne Publishers, 1997), p. 11.

11. Gary Kleck, *Targeting Guns: Firearms and Their Control* (New York, NY: Aldine de Gruyter, 1997), p. 254.

12. Gary Kleck, *Point Blank: Guns and Violence in America* (New York, NY: Aldine de Gruyter, 1991), pp. 185-215.

13. Ibid., pp. 188-189.

14. See, for example, Lisa D. Bastian and Bruce M. Taylor, "Young Black Male Victims," *Bureau of Justice Statistics Crime Data Brief, National Crime Victimization Survey, NCJ-147004* (Washington, DC: Bureau of Justice Statistics, U.S. Department of Justice, December 1994); and Landis F. Mackellar and Machikio Yanagishita, *Homicide in the United States: Who's At Risk?* (Washington, DC: Population Reference Bureau, 1995).

15. James D. Wright, Joseph F. Sheley, and M. Dwayne Smith, "Kids, Guns, and Killing Fields," *Society* 30(1) (November 1992).

16. Robert J. Cottrol and Raymond T. Diamond, "The Second Amendment: Toward an Afro-Americanist Reconsideration," *Georgetown Law Journal* 80 (December 1991), p. 359.

17. Josh Sugarman, *National Rifle Association: Money, Firepower and Fear* (Washington, DC: National Press Books, 1992), p. 21.

18. *Handgun Violence* (Washington, DC: Bureau of Justice Statistics, May 15, 1994).

19. Alfred Blumstein, "Youth, Violence, Guns, and the Illicit-Drug Industry," *Journal of Criminal Law and Criminology* 86(1) (Fall 1995), pp. 10–36.

20. For example, see Kleck, *Targeting Guns*, pp. 72-74 and 256-258.

21. Gene Stephens, "The Global Crime Wave," the *Futurist* 28(4) (July/August 1994), p. 23.

22. Kleck, *Point Blank*, pp. 393-394.

23. See Philip J. Cook and Jens Ludwig, *Gun Violence: The Real Cost* (New York, NY: Oxford University Press, 2000), pp. 34–36.

24. See Carter, *The Gun Control Movement,* table 1.2, p. 19. Victimization data are from Jan J. van Kijk, Pat Mayhew, and Martin Killias, *Experiences of Crime across the World: Key Findings from the 1980 International Crime Survey,* 2nd ed. (Boston, MA: Kluwer Law and Taxation Publishers, 1990), pp. 36–37. The survey asked the same questions in each country to obviate the problem of varying official national definitions of "assault."

25. "Guns, Public Health, and Public Safety," in Dennis A. Henigan, E. Bruce Nicholson, and David Hemenway, *Guns and the Constitution: The Myth of Second Amendment Protection for Firearms in America* (Northampton, MA: Aletheia Press, 1995), p. 57.

26. John R. Lott, Jr., *More Guns, Less Crime: Understanding Crime and Gun-Control Laws* (Chicago, IL: University of Chicago Press, 1998); John R. Lott, Jr. and David B. Mustard, "Crime, Deterrence, and Right-to-Carry Concealed Handguns" *Journal of Legal Studies* 26(1) (January 1997), pp. 1-68; Gary Kleck and Marc Gertz, "Armed Resistance to Crime: The Prevalence and Nature of Self-Defense with a Gun," *Journal of Criminal Law and Criminology* 86(1) (Fall 1995), pp. 150–187.

27. Lott, *More Guns, Less Crime*, p. 5.

28. Philip J. Cook and Jens Ludwig, *Guns in America: National Survey on Private Ownership and Use of Firearms*. Research in Brief Report No. NCJ165476 (Washington, DC: National Institute of Justice, Office of Justice Programs, U.S. Department of Justice, May, 1979), p. 9.

29. Ibid.

30. See, for example, William Alan Bartley and Mark A. Cohen, "The Effect of Concealed Weapons Laws: An Extreme Bound Analysis," *Economic Inquiry* 36(2) (1998), pp. 258-265; Dan A. Black and Daniel S. Nagin,. "Do Right-to-Carry Laws Deter Violent Crime?" *Journal of Legal Studies* 27(1) (January 1998), pp. 209-219; and Hashem Dezhbakhas and Paul H. Rubin, "Lives Saved or Lives Lost? The Effects of Concealed-Handgun Laws on Crime," *American Economic Review Papers and Proceedings* 88(2)(1998), pp. 468-474.

31. "Review of More Guns, Less Crime," *Southern Economic Journal* 65(3) (January 1999), p. 659.

32. National probability surveys of the U.S. population produce varying estimates on the total number of guns and the percentage of households with at least one gun. Over the past three decades, the General Social Survey estimate has been dropping—from an all-time high of 54 percent in 1977 to the current (1998) low of 35 percent. Trend results on this and other GSS variables are available from <http://www.icpsr.umich.edu/GSS99/index.html>.

33. Cook and Ludwig, *Gun Violence*, p. 117.

Victims of Violence

*Gun-control policy has rendered the entire society,
but especially poor minorities, victims of gun violence.*

BY GEORGE RICE

For more than two centuries, lawmakers in the United States have attempted to formulate meaningful policies that protect individual rights while fostering safe environments. Meanwhile, entire segments of our nation's population have become victims of violent acts committed with guns. When a victim of gun violence is injured or dies, many questions arise. Who can legally own a gun? How many can one individual own? Who should not own a gun? What types of guns should be legal for civilians? Should gun owners be licensed and guns registered? These questions all boil down to one central issue: what is the cause of gun violence?

Since the founding of this na- tion, guns have been used as a tool both to create and deny liberty. The United States was, in fact, born out of an armed rebellion with liberty as its primary goal. But who was liberated? And who then became the victims?

The American Revolution was largely an economically driven conflict. The original 13 colonies had a vested interest in creating an independent state free of Brit- ish control. But wealthy planta- tion owners who controlled the local economy could then impose their will on those who were not property owners. Owning guns and influencing gun policy were two ways the Founding Fathers were able to impose their will. The long-term legacy of guns as a tool of policy is seen today in our low-income, urban environments, where gun violence is all too often a part of everyday life.

Since the birth of America, vic- tims of gun violence have taken both center stage and a back seat in the arena of gun policy debate, but the use of guns as a means to control people has often been very deliberate. Whether through de- liberate policy, or as a result of di- rect violence, gun-control policy has made our African-American communities the biggest victim of gun violence.

The term *victim* may refer to a person who has experienced gun violence as an intended target of a gun-wielding assailant, someone threatened by the brandishing of a gun, or someone wounded or killed by a gun. However, a broader definition of *victim* in- cludes society as a whole, which lives with the threat of violence on a daily basis. In fact, the many Af- rican Americans who have been di- rectly victimized are in a sense dual victims. They carry the pain of their individual experiences along with their collective victim- ization. Whether or not gun laws should be more or less restrictive, we still need to explore inconsis- tencies in American policies and analyze how those inconsistencies cultivate social controls via gun policy.

Tradition of Violence

In 2000, as we sit on a perch of prosperity, the historical struggles in which guns played a crucial part in day-to-day existence are merely a memory. Maybe this is why we have a nostalgic connection to guns. They're seen as symbols of freedom and, often falsely, as sources of courage. The phrases *rugged individualism* and *manifest destiny* conjure up images of gun- toting Americans triumphantly

surviving dire situations, whether hunting for much-needed food or defending their homes, while blazing trails across the continent.

A less romantic look at the colonization of America, however, reveals gun-related atrocities such as gunfights in towns, battles over ranches, and even lawfully sanctioned duels. Eventually, the social and economic landscapes changed, along with the nature of gun violence. Duels were outlawed, ranch borders were settled, and even Dodge City became quiet.

Flash forward to present-day America. Our great metropolitan centers are monuments to the efforts of every ethnic group that crossed the seas to populate this nation, whether willingly or by force. Many of our cities are still battlefields. In poor, urban neighborhoods, violence is a part of everyday life. But gun violence, like the spread of illegal drugs into affluent suburbs and office environments, has spilled over into mainstream America, as the recent surge of schoolyard and workplace shootings shows.

But guns are not the sole issue. Guns have always been present in our communities. The issue is who feels threatened by them and who controls them.

Consider, again, the American Revolution. Common Americans toting their own guns filled the ranks of the colonial militias, representing and defending their colony. This was also the case in the Continental army to a lesser extent, which represented and defended all the colonies as a whole. The colonial army provided soldiers with additional guns to fight the British. These soldiers joined together during the American Revolution, stood up to the mighty British army, and subsequently helped found what is now the most powerful nation on Earth. So it stands to reason that, when shaping gun policy for the fledgling nation, the authors of the Constitution wrote in the Second Amendment, "A well regulated Militia, being necessary to the security of a free State, the right of the people to keep and bear Arms, shall not be infringed."[1]

The Power of Policy

Today, we debate whether the Second Amendment pertains only to maintaining the current National Guard, or if the term *the people* was truly intended to mean that anyone without a felony record has the right to own and carry a gun. Historically, however, these revolutionaries were addressing a pressing concern. They wanted guns to protect their interests, so they formulated policy to ensure that guns would be available.

The debate over gun control also tries to determine who, in the minds of the framers of the amendment, was to be protected by these guns and who was to be controlled. Pulitzer Prize winning historian Garry Wills maintains that when James Madison wrote the Second Amendment, he was placating southern slave owners who felt that they would have no way to police the vast population of enslaved Africans throughout the South if the availability of guns to the ruling white class was not guaranteed in writing.[2]

As the effort to free America from British rule raged on in late 1776, it became increasingly problematic to maintain a sufficient number of troops in the Continental army. Winter approached, and for many soldiers and militiamen, the sense of patriotism that drove them to join the effort began to chill with the weather. Earlier that spring, George Washington had inherited an army with many African-American freemen in the ranks. Upon taking command, Washington promptly instructed his recruiting officers to cease enlisting blacks.

Giving military training and guns to African Americans made slave-holding Southerners uncomfortable. It gave rise to one of their worst fears, widespread slave insurrection. To soothe the fears of his constituency, South Carolina Congressman Edward Rutledge moved to discharge all blacks in the Continental army.[3]

A compromise was later reached by which blacks who had previously served in the army were permitted to reenlist, but no additional African-American patriots were allowed to join the fight.[4] Those in control of policy, however, chose to reduce the numbers of enlisted men and weaken their defenses rather than relinquish a small portion of control over a segment of the population. They did so at great personal risk, knowing that failure to defeat the British would likely result in their execution for treason.

Needless to say, the revolution was successful. A new nation was born, and those in control celebrated their freedom. However, the tide of freedom did not raise African Americans in the South out of bondage. In fact, control of African Americans persisted through a gun policy that prohibited free blacks and enslaved Africans, who were not considered citizens of the new republic, from owning or bearing arms.

Consider, for example, Maryland's first gun-control law, passed prior to the Revolution. It provided

that no Negro or other slave within this province shall be permitted to carry any gun, or any other offensive weapon, from off their master's land, without license from their said master; and if any Negro or other slave shall presume so to do, he shall be liable to be carried before a justice of the peace, and be whipped, and his gun or other offensive weapon shall be forfeited to him that shall seize the same and carry such Negro so offending before a justice of the peace.[5]

Leaping forward a hundred years or so, we find similar policies instituted when Native Americans were forced, at gunpoint, to report to reservations. They surrendered with their armies, and indeed their entire nation, when confronted with the overwhelming force of the U.S. Army. Many were required to relinquish their guns. Unable to hunt, the newly sedentary reservation population quickly became dependent on the often-corrupt Bureau of Indian Affairs. Hunger, illness, and death followed as policies to control guns and people collided with the lack of basic necessities.

One could argue that disarming a defeated nation after a war is not only common, but also prudent. Moreover, the vanquished Native Americans were allowed at times to maintain a cache of rifles for hunting. But the intent of the policy was clear. One of the main reasons for the Indian wars was white colonialists' desire for land held by Native Americans. When their lands were stolen, Native Americans' desire to preserve their way of life led to armed conflict. Native Americans were forced to give up their way of life by laws created without their knowledge

or approval and enforced at gunpoint. In a letter written to the Secretary of State in 1821, Governor Andrew Jackson wrote:

I have been long impressed with the absurdity of entering into treaties with the Indian tribes residing within our territorial limits, subject to our jurisdiction and to such laws as Congress may pass for their security, happiness and safety.[6]

History does not reveal many policies formulated to secure the happiness and safety of these subjugated people.

The Power of Gun

The American South had a long history of segregation of the races, both by tradition and by law. When African Americans tried to improve their lives by moving into better housing, which happened to be in white neighborhoods, they crossed the color line and were often greeted with violence, intimidation, and guns. Their homes were burned, firebombed, and riddled with bullets as whites resisting integration made their very public statements about power and control.

Consider the case of African-American physician Ossian Sweet. On September 8, 1925, in Detroit, Michigan, Sweet and his family moved into their new home in an all-white neighborhood. The Sweets had purchased the middle-class home several months prior to the September moving date. In other Detroit neighborhoods, whites had instigated beatings and firebombings to drive out new black residents. The Sweets, therefore, waited until these attacks subsided to move into their new house.

The first day went relatively well. At first, local residents and a few protesters from other neigh-

borhoods offered only verbal intimidation as the Sweets moved a few of their belongings into their new home. Among those belongings were guns and ammunition brought along in anticipation of violence. They didn't have to wait long. The next night a mob estimated at 2,000 gathered outside their home with the intent of terrorizing the Sweets and forcing them to move out of the neighborhood. Stones crashed through the windows of the Sweet home; guns were fired into the air. As the energy of the mob swelled, Dr. Sweet and some relatives there to help protect the family fired into the angry crowd, causing one death and one injury. Police officers present at the scene, who apparently had little inclination to stop the mob from assaulting the Sweet's home, then stormed the house and arrested Dr. Sweet and others on charges of first degree murder.[7]

After many months and two trials, the Sweets were acquitted. But this was a hard-fought and high-profile court battle. Clarence Darrow, arguably one of the most prominent attorneys in the country at the time, joined the Sweet's defense team and offered a moving closing argument that helped ensure acquittal of the defendants.

[Those guns] were taken there to protect the home, the family, the persons, and they were there two days before they were ever used, and they were only used when the house was assaulted, when the stones were raining down on the roof, and the windows were broken, and these black men, with a black man's life behind them, waited as long as these poor people did, who were penned up like rats in a hole, they waited before they shot.[8]

But what does this story tell us about guns and power? The white residents wanted to control the racial makeup of the neighborhood unlawfully. Confident in their numbers and armed with guns, they made the first move. The Sweets, prepared for violence, upped the ante by firing their guns into the encroaching mob, exercising a lawful right to self-defense and exercising control over the space they had legally and rightfully purchased. Then, also under the banner of law, the police eventually diffused the situation by force.

Had the mob not used guns to attempt to intimidate the Sweets, would the family have fired shots from the house? Or if the Sweets had not brought guns into their home for self-defense, would the mob's intimidating gunplay, unmet by a violent response, have resulted in a comparatively peaceful resolution, or would the Sweets instead have been victims of gun violence? Obviously, guns and escalation of gun violence were used on both sides to gain control of the situation.

It is hard to determine who are the real victims of these tragic events. The two individuals struck by the bullets from the Sweets' guns suffered injury and death. But society is also a victim here. The subsequent national coverage and frequent citing of the case turned an incident, in which a family protected property and life, into a national affirmation of the use of violence to affect public policy. This affirmation, already embodied in the law, was upheld in *United States v. Gomez*. This case asserts,

> The Second Amendment embodies the right to defend oneself and one's home against physical attack—particularly if a citizen shows specifically that organs of government charged with providing protection are unable or unwilling to do so.[9]

Although this decision was handed down over 70 years later, it shows how the law may be used to justify potential escalation of violence. Would whites, bent on denying blacks the privilege of living in all-white neighborhoods, and knowing homeowners may indeed protect themselves legally with guns, resort to gun violence earlier and preempt black self-defense? Or would more blacks buy guns and try to emulate the Sweets' actions? The Sweets' story is just one in the long, hard-fought battle against housing discrimination. Many more would follow.

Armed and Determined

As the civil rights movement progressed throughout the country, it was met with resistance from many fronts. Individuals in communities as well as high-ranking officials in government used guns to control outcomes. The case could be made that the federal government used a bigger gun than Governor George Wallace did by federalizing the Alabama National Guard to enforce desegregation.

In the turmoil that ensued in the 1960s, one group stands out as a symbol of armed black self-determination. The Black Panther Party for Self-Defense, founded in October 1966, in Oakland, California, by Huey P. Newton and Bobby Seale, asserted that "any black freedom organization which ignores self-defense does so at its own risk."[10]

Images of Black Panther Party members clad in black leather and armed with shotguns flooded the print and television media. The Black Panther Party, in reaction to discrimination and police brutality, researched California law and determined that they could legally arm themselves. They openly carried guns on the street, at media events, and during protest activities in a display of black power and self-determination. In effect, they were using guns legally to affect public policy

Taking direct action to a higher level, members of the Black Panther Party, armed with shotguns and rifles, attended a state legislative session in Sacramento, California, where they demanded revisions in state law to ensure equality. Many people in California were disturbed by this image, including then-Governor Ronald Reagan. California promptly passed gun-control measures that criminalized such armed displays of self-determination. The law prohibited openly carrying loaded firearms; a permit to carry would be needed.

How do events like this affect the debate over gun control? And where do advocates of gun control and advocates of less-restrictive gun laws fit into the equation? Conservatives tend to back a policy of less-restrictive gun laws, while liberals tend to argue for more-restrictive gun-control measures. The more-liberal political factions often introduce legislation designed to limit gun sales to one per person per month, to register guns and license gun owners, to require safety locks with the sale of a gun, and to require background checks for gun transactions conducted by private citizens at gun shows. These bills often provoke opposition from conservatives, who counter with proposals

to increase penalties for individuals who use guns to commit crimes. Different groups with different political agendas clash, while the seemingly endless dispute over who has the best approach for addressing gun violence drags on. What is certain is that only one segment of society profits from the perpetuation of gun violence—the gun manufacturers.

Some conservatives argue that the gun-control movement has the intent of disarming low-income people, mainly minorities, by proposing laws that would make the manufacture of many kinds of cheap handguns illegal. The guns that this type of legislation targets are very small, cheaply made handguns often used in crimes. Importing similar guns of foreign makes is already illegal in the United States, which resulted in the onset of a domestic cottage industry where these types of guns are now manufactured legally.

Some would like to hold gun manufacturers accountable for crimes committed by people using cheap guns with no safety features. Others criticize this approach, dubbed "no guns for the poor,"[11] saying that if laws to create safety standards for guns are enacted, only the more expensive guns would be available, thus pricing poor minorities out of the gun market. What types of guns are the poor supposed to buy? This question presupposes a need. Do low-income minorities need guns in their community? While it may be difficult to judge another person's need to feel secure, when the political right uses the plight of a minority group to make a point, there is cause for suspicion.

An incident that occurred in Houston in June 2000 at the Texas State Republican convention reveals just how inconsistent those who would determine gun policy can be. On day two of the convention, 12 members of the New Black Panther Party, the National Black United Front, and the New Black Muslim Movement arrived to show their opposition to the scheduled execution of Gary Graham. A convicted murderer, Graham had exhausted the appeal process in Texas. The demonstrators brandished shotguns, AK-47s, and a variety of other rifles as they arrived at the convention, all completely legal under Texas law.[12] Graham was later put to death after events at the convention had become just a memory.

After the convention ended, enraged conventioneers wrote a letter to the chief of police demanding to know why no action was taken and why no background checks were conducted on the demonstrators. Yet the majority of legislators who attended the convention at that time were calling on federal and state governments to reject the establishment of any process to license, record, register, or monitor the ownership of firearms. Indeed, the question put to the police chief had already been answered on the convention floor. The demonstrators were doing nothing illegal according to Texas law.

Life, Liberty

As a society, where do we go from here? What caused our ambiguous combination of gun reverence and gun violence? Economic factors have certainly contributed to this situation, but so have social factors such as a perceived right to bear arms. We have seen the recent rise of school-related gun violence, where children experiencing emotional isolation have lashed out at their classmates from behind the barrel of a gun. We have seen urban youth take to arms to experience a feeling of power over others that they may not otherwise attain. The common factor is that the use of guns has been viewed as an acceptable means to influence and control others.

I have seen the face of gun violence in two very distinct and direct ways. One day, during my 10 years as a federal agent, I found myself looking down the barrel of a shotgun during an undercover cocaine deal. The drug dealer did not pull the trigger. I survived the ordeal, physically unscathed. He's now in prison, serving over 20 years. The other experience, an often-unmentioned face of gun violence, occurred as I held my dying wife in my arms just after she turned her gun on herself as her way of leaving this world on her own terms. These scars don't heal. You just live with them.

What's the lesson then? A drug dealer chooses to use a gun to control his or her drug trade because it is the norm of the "profession." A person chooses to take his or her life with a gun because it has been proven to be an efficient way to commit suicide. These decisions are not made in a vacuum though. They are not solely individual choices. They are based on societal norms and a national history in which we have been socialized to accept guns as part of our everyday world. In both these cases, the individual victims have suffered the consequences of death, jail, and in my case, the loss of a loved one. But collective victimization of society continues unabated.

The right of an individual to possess a gun has been touted in many ways over the past 200 years in the United States, resulting in

death and injury on the scale of war, over 10,000 per year since 1995. Maybe it's time for a collective approach, where we tout the right of society to be free of gun violence. Life, liberty, and the pursuit of happiness do not need to be affirmed by a gun, nor should they be snuffed out by a bullet.∎

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NOTES

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Going Armed in the School Zone

An unfounded faith in the power of laws to change criminal behavior disguises the root causes of juvenile violence.

BY TIMOTHY BREZINA AND JAMES D. WRIGHT

On the morning of April 20, 1999, two students drove onto the Columbine High School campus in Littleton, Colorado, equipped with explosive devices, knives and guns, including two sawed-off shotguns, a rifle, and a semiautomatic handgun. In just 16 minutes, the gunmen fired more than 100 rounds, killing 13 and wounding 21 more before shooting themselves. The Littleton tragedy, the deadliest incident of school violence in U.S. history, aroused panic in the hearts of parents across the United States, and placed new pressure on legislators to pass stricter gun-control laws.

A noteworthy reaction by lawmakers was that of California Assemblyman Dick Floyd, a Democrat who had until then remained silent on the issue of gun legislation. Prior to a vote placing new restrictions on handgun sales, he stated, "I am no longer going to be a nonparticipant. I am willing not only to vote for everything, I'll co-author every gun bill that comes along."[1]

The issue, moreover, cut across party lines. In Colorado, Congressman Tom Tancredo, a Republican with libertarian leanings—recently elected with the aid of a sizable donation from the National Rifle Association—felt the pressure from his constituents. A resident of Littleton who lived just six blocks from Columbine High School, Tancredo told reporters that he could not simply go home and tell neighbors and friends that he had failed to act on the gun issue.[2]

In fact, Tancredo was the only one of the six representatives from Colorado to vote for the House gun-control bill. Had the bill passed, it would have placed additional restrictions on semiautomatic rifles and high-capacity ammunition clips. Back in his home state, the congressman explained that the Columbine incident was a seminal event demanding unconventional action. "It will always be in our hearts as something that changed our lives," he said. "It made us do things we would not have done before."[3]

Yet in a subsequent interview with reporters, Tancredo suggested that the steps Columbine made him take were not necessarily inspired by wisdom or forethought. Instead, he referred to gun control as a superficial response to deeply rooted social problems and admitted that the legislation he voted for in the House would have done nothing to stop the Columbine killings.[4]

The heart of much recent debate over gun control is whether stricter laws would substantially alleviate the problem of school and youth violence. To answer that question, we must understand the ways that violent youths obtain access to guns, the scope of existing gun-control laws, and the likely impact of additional gun-control measures on the problem before us.

Perspective on Violence

Heightened media attention, especially to homicides with multiple victims, has led the public to believe that school violence is a growing problem. In fact, the total number of school-related violent incidents, including suicides

and homicides, has steadily declined since the 1992-1993 school year, as have overall incidents of youth violence. The chance of dying a violent death at school is still less than one in a million.[5]

Although the levels of serious school violence—including homicide, robbery, rape, sexual assault, and aggravated assault—remain unacceptably high, most serious violence occurs outside schools, on neighborhood streets or in the home.[6] Students are three times more likely to be victims of a violent crime away from school than on school property, at a school-sponsored event, or on the way to or from school.[7]

To be sure, the number of multiple-victim homicides has increased in recent years, but fortunately the incidence of such acts remains extremely rare. Since August 1995, an average of just five such acts has occurred each year.[8] Considering the number of children that attend school in the United States—50 million or more—and the number of hours they spend in school each year, multiple-victim homicides at school are "the statistical equivalent of a needle in a haystack."[9]

Because school-related violent deaths are rare and isolated, we must be very cautious about drawing conclusions or generalizations from them. Nevertheless, recent incidents raise many questions about kids and guns, specifically about the likely impact of popular gun-control proposals. The first question is how violent youths gain access to firearms.

Easy Access

How do kids get their hands on guns? This question is often posed as if there were some mystery about it. In fact, guns are easy to obtain. An estimated 200 million firearms are currently in circulation in the United States, and some 40 percent of all households own at least one gun.

In 1991, criminologists Joseph Sheley and James Wright interviewed more than 800 incarcerated juvenile offenders to gauge how hard it would be for them to get a gun when they were released from jail. Even though these juveniles couldn't legally purchase a gun because of their age and criminal record, 70 percent said they would have "no trouble at all" obtaining one. For inner-city high school students answering a similar question, 41 percent believed they could get a gun with no trouble at all; an additional 24 percent said getting a gun would be "only a little trouble."[10] Adolescents in the general population, when asked about the availability of guns, provide somewhat smaller estimates, but the data confirm rather than challenge the fact that guns are not difficult for youths to obtain.[11]

In the same study, juvenile inmates and high school students were asked how they would obtain guns. These respondents reported that family, friends, and street sources are the main sources of guns for juveniles.[12] Evidently, perpetrators of school gun violence obtain guns in the same manner. In the school shooting sprees of the past decade, most of the perpetrators obtained guns from their own households or from the usual sources—parents and grandparents, occasionally from friends, and sometimes from street sources or theft. The shooters in Littleton obtained all of their guns illegally through straw purchases—that is, using older friends and acquaintances to buy the guns for them.

The Scope of the Law

For many people, it is shocking that guns are so easily accessible to youths. This state of affairs, however, is not the result of a large gap in the law. Moreover, the passage of additional legal restrictions will do little to rectify the situation, since most of the avenues through which youths obtain guns are already against the law.

Federal law already prohibits juveniles from purchasing guns through normal retail outlets. The legal age for purchasing firearms at such outlets is 18 for rifles and shotguns and 21 for handguns. Federal and state laws also prohibit persons of any age from carrying guns without a permit and bringing a gun onto school property. And most municipalities have local ordinances that ban the discharge of a firearm within city limits.

Although age restrictions are readily circumvented through the use of intermediaries and straw purchases, this too is illegal. Friends, acquaintances, and drug dealers who provide juveniles with firearms are at the least contributing to the delinquency of a minor and probably violating a dozen other laws as well. For example, Mark E. Manes—the 22 year-old man who provided the Columbine killers with a semiautomatic handgun—was charged with several felony counts: one for supplying a handgun to a minor and one for possession of a sawed-off shotgun. He was sentenced to six years in prison.

Nevertheless, the 1991 survey found that 32 percent of juvenile inmates and 18 percent of inner-city high school students had asked someone else to purchase a gun for them in a gun shop, pawnshop, or other retail outlet.[13] And,

as the Columbine shooters explained in a home-video tape, had it not been for Mark E. Manes they "would have found someone else."[14]

So long as guns are available to anyone, they will also be available to any juvenile with the means and motive to exploit his network of family, friends, and acquaintances for the purpose of obtaining a firearm. However much we wish it to be otherwise, there is no plausible way to limit juvenile access to guns except to limit general access to guns, just as there is no plausible way to approach the problem of child poverty except by addressing the poverty of parents. There is, in turn, no practical way to limit general access to guns without doing something about the 200 million firearms already in circulation. It is by no means obvious how that could or should be accomplished. We are forced to ask, then, whether more or different laws will provide a solution.

Popular Proposals

After the Columbine incident, state and federal lawmakers proposed a variety of gun-control measures. Much of the attention focused on bills that would place further restrictions at the point of sale—measures such as extending background checks to all buyers at gun shows and extending the waiting period for background checks. Other bills would ban the manufacture or importation of certain additional types of firearms and high-capacity ammunition clips, require trigger locks or other safety devices on all guns sold, and create liability for gun owners who do not store their firearms in a safe and secure manner.

Given the ease of acquiring guns through intermediaries and straw purchases, the potential impact of further point-of-sale restrictions is not at all clear. Additional bans on specific types of guns and ammunition, moreover, would do nothing to curb access to guns already in circulation. For example, the manufacture of the combat-style TEC-9 semiautomatic handgun—one of the weapons used by the Columbine shooters—was outlawed in 1994, but that gun remains widely available.[15]

Laws that encourage the safe and secure storage of firearms appear promising at first glance. Many gun owners keep and store firearms in irresponsible ways, a point that gun enthusiasts acknowledge and lament.

But safe-gun technologies—trigger locks and smart guns—are no panacea. The principal aim of safe-gun technologies is to reduce the incidence of accidental discharge of firearms. Yet most of the gun violence that befalls young people is intentional, not accidental. Fatal gun accidents have always been the least important component in the annual death toll. Thus, even if successful, safe-gun technologies will have little effect on the death toll from firearms.

There is a second and more fundamental reason safe-gun technologies are unlikely to have a substantial impact: "safe gun" is an oxymoron. The entire point of a firearm is that it be able to inflict grave harm and to do so reliably, efficiently, and decisively. The only real gun safety consists of well-trained, responsible users.

Ultimately, by passing more laws, and failing to understand the limits of the law, we may fool ourselves into believing that something important has been done about the problems of violence and youth. For example, legislators who promoted similar restrictions in the past, and who saw them become federal law under the Gun Control Act of 1968, believed they would "substantially alleviate" the problem of gun use by juvenile delinquents.[16]

The Limits of the Law

Since existing gun laws already have considerable scope, we must ask whether greater enforcement of existing laws would bring us closer to solving the problem of youth violence.

There is some evidence that aggressive law enforcement can reduce gun-related crime, at least in certain areas and for certain periods of time. Beginning in July 1992, Kansas City led a 29-week experimental crackdown on gun violence. Police intensively patrolled high-crime areas and seized illegally carried guns through plain-view sightings, frisks, and traffic stops. An evaluation of the crackdown indicated a drop in gun crime within the target area, while such crimes did not decrease in a similar non-target area.[17] A replication of the experiment in Indianapolis, however, produced only mixed results.[18]

Although the potential of such efforts is not yet clear, it would be surprising if they did not produce some positive effects.[19] Aggressive law enforcement will surely be a component of successful gun-violence reduction efforts, and when integrated into a comprehensive violence-prevention strategy, positive results may be especially likely.[20] It remains to be seen, however, whether innovative crackdowns can avoid the decay effect—a gradual reduction in effectiveness over time due to adaptive criminal behavior—that so often plagues law enforcement efforts.

Cops-and-Courts Fallacy

Gun-control opponents and advocates alike share great faith that the criminal justice system can prevent and deter crime through legal restrictions or crackdowns and punishment. The criminal justice system has an obvious and critical role to play. But as criminologist Marcus Felson warns, "It is easy to exaggerate the importance of the police, courts, and prisons as key actors in crime production or prevention."[21]

First, most crimes do not come to the attention of officials, in part because victims fail to report them. Even when victims report a crime to the police, the prospect of apprehending a suspect is not very good. For example, less than half of all reported violent crimes end with an arrest, and the figure is much lower for property crimes. As the criminal justice funnel narrows, fewer cases are deemed suitable for prosecution, and fewer still lead to conviction and punishment. Thus official punishment, while it can be extreme, tends to be rare and uncertain. This, of course, is not the fault of criminal justice personnel. They are merely subject to the practical limits of law and law enforcement "in society as we know it."[22]

Moreover, most research indicates that legal sanctions are not particularly effective or meaningful deterrents, most likely because punishment is uncertain at best, and when it does happen, it is delayed. People are deterred from criminal involvement mainly because of informal and nonlegal sanctions such as the anticipation of a negative reaction from significant others, the expectation of guilt or shame for violating personal moral standards, and other stakes in conformity.[23]

It is, therefore, not surprising that gun-control laws typically have little or no effect on rates of violent crime. At best, the effects are modest and short-term.[24] According to the results of a recent evaluation published in the *Journal of the American Medical Association*, the 1994 Brady Law—which requires a background check and waiting period for the purchase of handguns from licensed dealers—is no exception.[25]

In short, uncritical faith in the criminal justice system is part of the problem. The cops-and-courts fallacy leads us to place unrealistic demands on the criminal justice system in hopes that some fine-tuning of the system here or there will produce dramatic effects on behavior. The cops-and-courts fallacy also contributes to severe dependence on the law and discourages the consideration of nonlegal and possibly more-effective responses to crime.[26]

Dangerous Environment

No one engaged in the gun-control debate disputes the fact that youth violence is a serious national problem or that guns contribute to the annual death toll. These facts alone, however, do not support the conclusion that guns are a root cause of the violence.

The language of "risk" promoted by the public health movement encourages us to see guns as being inherently destructive, putting gun owners at risk of destroying themselves or others regardless of their intentions or disposition to violence. This view of the problem, however, relies on a logical sleight of hand that strips violent acts of human agency and intentionality. Gun violence, unlike physical illness or disease, is a willful act.

From the concrete view of risk offered by public health officials, it is surprising that more youths do not engage in gun violence and that the problem is not more demographically widespread. It bears repeating that some 40 percent of all households have at least one firearm. Moreover, a national survey reveals that just under 30 percent of adolescents claimed personal ownership of a gun, and 39 percent reported using firearms for recreational purposes such as hunting and target shooting.[27] Yet few of these adolescents had engaged in acts of violent crime.

In fact, no relationship was observed between recreational firearm use and criminal involvement. If we acknowledge that most crimes involving guns are committed intentionally by a handful of violent individuals, the problem becomes not so much getting guns out of the hands of juveniles, but reducing the motivations for juveniles to arm themselves and use guns against each other in the first place.

When asked to explain why they carry guns for reasons other than recreation, youths overwhelmingly reply they do so for protection and self-preservation.[28] In other words, there is a direct relationship between gun carrying and perceived environmental dangers such as fear of neighborhood violence, past threats of violence, and known victimization of friends and family members.[29]

In the inner city, where the rates of gun carrying by juveniles are particularly high, the attraction to guns is not difficult to understand. Just under half of the inner-city students in the 1991 study knew someone at whom shots had been fired, many had been the targets of gunshots themselves, and just under 15 percent described them-

selves as scared in school most of the time.[30]

In this environment, gun carrying is readily interpreted as a response to the daily threat of victimization and intimidation. This threat not only presents itself at school, but pervades social life and serves as a constant reminder of the powerlessness of inner-city residents. Wracked by poverty and severe social disorganization, these communities provide relatively few incentives for long-term investment in the future, nor do they offer the certainty of the police protection that people in more affluent neighborhoods expect. From afar, the attraction to guns may seem pathological, since the proliferation of firearms only serves to increase the threat of violence within such communities. But from the standpoint of individuals caught in the middle, a gun must seem a bargain at nearly any price, transforming otherwise powerless people into forces to be reckoned with.

Instead of focusing on neighborhoods that statistically are the most dangerous—the inner-city killing fields where violence and despair are rampant—media coverage has focused on multiple-victim homicides occurring in unsuspecting communities, involving white, suburban, or rural school children from apparently good homes. This type of coverage has contributed to the impression that youth violence of today is not only increasing, but that it is more or less random in nature and divorced from the immediate conditions of life. This is a seriously distorted view of the problem, since definite patterns exist. For example, while suburban schools are obviously not immune from violence, rates of serious violence are as much as 15 times higher in some poor, urban schools.[31]

In the highly publicized suburban school incidents of recent years, bullying, harassment, rejection, and long-standing grievances among classmates have been commonplace. While these problems were present in the details of the Columbine incident, this particular shooting spree was atypical in almost all other respects. While school violence is an extensive problem, only a tiny fraction involves guns, and this is especially true of schools in suburban communities.

A Better Response

The gun-control response to school violence illustrates some of the problems that arise when social policy is driven by extreme and unusual cases. Additional gun-control laws will not necessarily prevent determined youths from obtaining firearms. More important, such laws will do nothing to address violence that is not gun-related. Yet this type of violence—the bullying, harassment, fist fights, and knife wielding that can occur at any school—is much more typical and undoubtedly contributes to much of the gun-related violence that does occur.[32]

A better response to school and youth violence is to address the problems that confront youths in their immediate environment, including obstacles to conventional success and the social strains and personal antagonisms that can provoke or escalate aggression. A number of prevention and early-intervention programs have demonstrated positive long-term effects on behavior in rigorous evaluations and might serve as models for other communities.[33] Such programs include "antibullying" campaigns, the implementation of anger-management, impulse-control, and problem-solving curricula at schools, and the provision of early-childhood education and family support services for urban, low-income families.

It remains to be seen whether such programs can be replicated successfully on a wide scale, especially since many people believe that the problems of crime and violence can be solved by creating new laws and applying tougher penalties. When asked to identify the main source of blame for the crime problem, the majority of respondents in a 1994 national survey blamed the criminal justice system and, presumably, its lenient treatment of offenders.[34] This exaggerated dependence on the law helps explain why, to date, so little effort has been spent getting to the root of the problem.[35]

It also remains to be seen whether prevention and early intervention programs will receive adequate funding in the future. The number of dollars currently allocated to prison construction and get-tough measures far exceeds the number allocated to the type of programs described above. Regardless, it is difficult to see how more gun-control laws will alleviate the problem of youth violence, because such laws fail to address the immediate conditions of life that lead youths to carry guns and to break the law in the first place.■

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Of Arms and the Woman

One woman is teaching others to shoot straight, take control, and defend themselves from violent crimes.

BY PAXTON QUIGLEY

I used to be antigun. I feared guns, I never touched guns, and I come from an antigun family. As a matter of fact, my mother used to give money to a national antigun organization. But 12 years ago, something happened that made me reevaluate my attitude. Early one morning—it was about 2 a.m.—I received a call from a friend who lived nearby.

"Paxton," she said, in a strained voice that I'll never forget, "a guy broke into my house. The police are here now. I need to talk to you. Would you mind coming over now?"

When I got there, it was clear that more than a break-in had occurred. My friend's cheek was cut and badly bruised, and one eye was practically swollen shut. Her blouse was also torn. "Did he rape her?" I quietly asked one of the po-lice officers. "Yes," the officer said.

Only later, when we were in the hospital emergency room waiting for a doctor to examine my friend, did she tell me the full story. The attacker had broken in through the bathroom window on the second floor. She awoke to the sound of glass shattering, and after a moment's hesitation decided to run downstairs to escape through the front door. But the man was quick. He grabbed her at the top of the stairs and hit her in the face, knocking her to the floor. He kept hitting her and then forced himself on top of her.

Like me, her self-protection strategy had always been to avoid trouble by being prudent. For much of my adult life, I made little effort to learn how to protect myself against a possible criminal attack. I took Kenpo Karate classes, but mainly for sport, listened to a couple of lectures on self defense, and heeded the advice my parents had given me as a child: don't talk to strangers and don't go certain places alone, especially after dark. It was a simple philosophy and seemingly an effective one, because I'd never been the victim of a serious crime.

Though my friend had fears of being raped, she never really believed she could become a victim. "Part of me always thought that if I didn't have violent thoughts or hurt anybody physically or emotionally, no one would hurt me," she explained to me a few days after the attack. "I just thought that my good karma would protect me."

Until that day I also rationalized that my good karma would keep me from becoming a victim. But after my friend was raped, I realized that was ridiculous and vowed to take action. Over the next couple of weeks, I installed better door locks in my home, a house alarm system, and an exterior motion detector lighting system. I also worked up my courage to take a private handgun lesson at the Beverly Hills Gun Club in Los Angeles.

None of my friends owned guns, and when I told them I was thinking of buying one, they were shocked. "Don't you think you're going a little overboard?" one friend asked. No, I didn't. "Today's criminal," I said, "has no respect for human life. It used to be that criminals just took your money, then left. But now they'll shoot or stab you for no reason at all. They're cowards."

Fear of Firing

Spurred by my change of attitude, I began to research the subject of women and guns and found that

there were more than 12 million American women who owned guns—by now, there are more than 15 million—but virtually nothing had been written on the subject. So I decided to do the writing myself. Eighteen months later, *Armed & Female*[1] was published. Not long after, Ted Stermer, the president of the Orange County Shooting and Training Center—an outdoor shooting range in Santa Ana, California—asked me if I would instruct women in personal protection and the use of handguns. I accepted his offer, seeing it as a natural extension of my book, and began to teach a seven-hour seminar on "Self-Empowerment for Women."

Since then, I have taught thousands of women, and some men, personal protection strategies and how to shoot a handgun. Approximately 80 percent of the students who take my seminar have never touched a gun. They attend because they are concerned about crime and their personal safety and want to know how to take care of themselves and their families. But nearly all of them are scared to learn how to shoot a handgun, and some are nervous about owning a handgun.

Take Janet, for example, a spirited, hardworking family practitioner who was quite candid about guns. "I don't like guns. I'm frightened of guns, and I've seen a lot of gunshot wounds. But after going through the Los Angeles riots and seeing that the police can't protect us, I've decided to learn how to shoot a gun just to see if I'm comfortable with it. But, basically, I have to say that I'm antigun," said Janet.

Although Janet is a tall woman with big hands who could easily hold a Smith & Wesson .357 Magnum revolver, she insisted that she learn on a small gun. She was so uneasy that just the thought of handling a large framed gun was too scary for her. Even holding an unloaded, snubbed-nosed .38 special in the classroom made her anxious. She jokingly said that she was sure she couldn't shoot the side of a barn.

Janet was also concerned about the gun's recoil. She called it *the kick* and was told by friends that she could be knocked off her feet by the kick. Naturally, I always want to make a student feel as comfortable as possible, so I assured her that she could handle it. I explained that I had put on special rubber grips that absorb much of the gun's recoil. She seemed dubious, but I told her that if she tried the same gun without the grips, she'd certainly feel the difference.

Janet, like many of my students, was a real challenge. Frankly, I was concerned that she wouldn't be able to do live-fire shooting on the range. She seemed confused and had a hard time remembering how to unload the gun. To help her, my assistant took her aside and worked with her for about 15 minutes until she was finally at ease with the mechanics of holding a gun.

Janet's dread of guns in general and her specific apprehension that she couldn't control a handgun is typical of many first-time shooters. Control is a major issue for many women who believe they won't be able to safely handle a weapon. As a gun instructor, I have to reassure the students that they are all capable of handling and shooting a gun.

In Charge

Learning to shoot a gun also has an interesting side effect. After students take my seminar, some of them experience amazing changes in their lives. It seems that once a woman loses the overriding fear of a gun and knows she can control it, she begins to have more command over other areas of her life. A number of women have told me that the experience of learning how to shoot and losing their fear was an empowering experience.

One of my students, a young mother of three children, explained to me, "Before I took the seminar, I used to be afraid when I was out with my kids. I felt that if something happened, I wouldn't know how to handle the situation. Since taking the seminar, I now know what I would do, especially with my kids. I felt a slow change come over me. I started feeling more self-assured. I carried myself differently, even the way I walked changed."

A student from Bloomfield Hills, Michigan, who is in her 50s, wrote that "learning how to protect myself with a handgun changed me in the sense that I have a quiet powerful feeling that I can take care of myself, especially in my home. That's a feeling of empowerment. My husband is especially happy that he doesn't have to worry about me if he isn't home. He even tells his friends that I'm empowered."

Another student, a marketing specialist from Phoenix, Arizona, explained that she now has a set of guidelines and rules to govern herself. "Before the class, my life wasn't my own. People were always telling me what to do and what not to do. Now I know what I want and what's right for me, and I don't necessarily take their advice. For me, that's been a great step in my life. I feel in control and that means empowerment to me."

Other women are worried about having a gun in the house if they have children or grandchildren around. Of course, any sane, serious person should be very concerned.

There are many trigger locks on the market. The old standby still used by many law enforcement officials is the trigger padlock. Just place it in the trigger guard behind the trigger and your gun is secure from most children. It will of course require a key before you can use it.

Many people like to store their handguns in a portable safe, which they may keep under their bed for easy access.

Unfortunately, some women believe that owning a weapon will draw violence to them. I've often heard women say, "violence begets violence." Many of these women forget that a gun can be their greatest protector, as well as a deterrent against a criminal.

A former student's experience provides an excellent example of a gun's great deterrent effect. Nancy was napping on her living room sofa one hot July afternoon when she was awakened by a man yelling obscenities and pounding on her front door, threatening to break it down. She didn't move or say anything, praying that the man would go away. But he didn't leave. "He banged so fiercely that I thought the door was going to cave in, and then suddenly he stopped," Nancy recalled, still unnerved by the confrontation. Nancy went to her dresser drawer, where she kept her .38 special, and quickly loaded it. When she heard a noise at her bedroom window and realized that the man was pulling off the screen, she knew what to do. She carried her gun in the ready position—the way she had learned in my class. She walked to the window and pulled back the drape just as the man started to crawl through. He looked at her in a drunken stupor. "Is it loaded,?" he asked. "Just try me," she answered. He slowly backed away as she kept the gun pointed at him, then he turned and fled down the pathway. Nancy watched him disappear and quickly closed and locked the window. Still holding her gun, she telephoned the police. Within minutes, two police officers arrived.

The Best Defense

Because many cases of self defense go unreported, it is hard to know exactly how often guns are used to discourage criminals. In 1993, Gary Kleck, a professor of criminology at Florida State University, conducted a national telephone survey and estimated that between 800,000 and 2.45 million times a year guns are used in self defense. Rarely is anyone shot in these incidents. In fact, Kleck reports that the gun owner fires in fewer than one in four confrontations. In most instances, the mere display of a gun is sufficient to scare off the criminal. Kleck also says that one in six survey respondents who had used a gun defensively was almost certain a life would have been lost without it—suggesting that in some 400,000 cases, guns saved lives.

In his book, *Point Blank: Guns and Violence in America*,[2] Kleck states that people who defend themselves with a gun are more likely to successfully resist criminals and less likely to be hurt. As proof, Kleck cites the National Crime Survey, 1979-1987, which shows that criminals are successful in only 14 percent of home burglary attempts in which people defend their property and lives with guns, while criminals are successful in 33 percent of all attempts. Kleck also theorizes that merely owning a gun has some deterrent effect. The National Crime Survey reported that criminals actually admit they were deterred from committing a crime because they thought the intended victim was armed.

A recent study done by John Lott, a senior research scholar at Yale University, found that letting people carry concealed guns appears to sharply reduce murders, rapes, and other violent crimes.[3] The nationwide study found that violent crime decreased after states made it legal to carry concealed handguns: murder was down 8.5 percent; rape down 5 percent, and aggravated assault down 7 percent. Lott says criminals seem to alter their behavior to avoid the possibility of coming into contact with a victim with a gun.

Sharpshooter

Over the last seven years, I have taught classes in rural, suburban, and urban areas throughout the United States, and I continually hear stories about why women fear guns. In many cases, their fear borders on phobia. But the women who take my seminar at least have made some commitment and are open to conquering their fears.

If you have wondered how my student, Janet, the doctor who was against guns, fared in shooting that day. Well, she quickly moved up to a Smith & Wesson .357 Magnum. And she was the best shooter in the class. At the end of the day when we returned to the classroom for graduation, Janet announced to everyone that she had lost her fear of guns.

The following morning, I received this message from her on my answering machine:

"Thanks for yesterday. I had a great time. I'm a little bit amazed and a little bit proud of myself. And a little bit hooked on shooting. Thanks a million. It was a great experience. I'm buying a gun and I can't wait to go target shooting." ∎

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NOTES

1. Paxton Quigley, *Armed & Female* (New York, NY: E.P. Dutton, 1989), reissued by St. Martin's Press, New York, 1994.

2. Gary Kleck, *Point Blank: Guns and Violence in America* (Hawthorne, NY: Aldine de Gruyter, 1991).

3. John Lott, *More Guns, Less Crime: Understanding Crime and Gun Control Laws*, University of Chicago Studies in Law and Economics (Chicago, IL: University of Chicago Press, 2000).

Self-Defense: The Equalizer

Experiments in tightening gun-control laws have eroded the right of self defense and failed to stop serious crime.

BY LINDA GORMAN AND DAVID B. KOPEL

Reliable, durable, and easy to operate, modern firearms are the most effective means of self-defense ever devised. They require minimal maintenance and, unlike knives and other weapons, do not depend on an individual's physical strength for their effectiveness. Only a gun can allow a 110-pound woman to defend herself easily against a 200-pound man. Yet despite the superiority of firearms as a means of self defense, citizens in different countries, indeed in the 50 states of the United States, face a wide variety of obstacles—from restrictive licensing to outright bans—to buying, owning, or using guns.

Two competing philosophies govern the private ownership of firearms. In nations where government has historically derived its powers from the consent of the governed, as in the United States and Switzerland, guns have been relatively lightly regulated and are owned by sizeable segments of the population. In nations where a central authority grants privileges to people, by history or custom, private firearms are subject to strict control or banned entirely.

Because it is impossible to abolish crime, governments that make guns illegal force law-abiding citizens to chose between protecting themselves and their loved ones or obeying the law. Jeffrey R. Snyder, author of "Fighting Back: Crime, Self-Defense, and the Right to Carry a Handgun,"[1] argues that

> a state that deprives its law-abiding citizens of the means to effectively defend themselves is not civilized but barbarous, becoming an accomplice of murderers, rapists, and thugs and revealing its totalitarian nature by its tacit admission that the disorganized, random havoc created by criminals is far less a threat than are men and women who believe themselves free and independent, and act accordingly.[2]

In countries with strict bans on firearms, when people choose to disregard the law and carry guns for self-defense, governments trying to enforce the law tend to turn political disagreements into theater by characterizing this violation of the law as a moral failing. This threatens individual liberty. As the authors of *The Black Book of Communism* document, Communist states invariably degenerated into blood-soaked terror because those who ran them had the power to exclude those who did not agree with them. Anyone who did not agree with the reigning ideology was

> first labeled an enemy, and then declared a criminal, which leads to his exclusion from society. Exclusion very quickly turns into extermination....After a relatively short period, society passes from the logic of political struggle to the process of exclusion, then to the ideology of elimination, and finally to the extermination of impure elements. At the end of the line, there are crimes against humanity.[3]

When it's illegal to possess the means to protect one's family, the needs of individuals are subordinated to the political wishes of the government.

Fudging Facts

Many governments are currently experimenting with stricter controls over the purchase, possession, and use of firearms. While these countries have little in common politically or economically with Communist states, they share a

tendency of Communist countries to demonize one segment of society: gun owners. Their gun-control programs portray gun owners as the enemy, criminalize their behavior, and paint those who would defend themselves as beyond the moral pale. Moreover, these governments energetically suppress facts showing that gun possession does reduce crime and that gun control fails to do so. In the late 1990s, the Canadian Department of Justice, for example, squelched an independent report it had commissioned on the efficacy of Canadian gun law because the data from its own report proved that Canadian gun laws had not reduced crime. And in 1996, after a gunman armed with a semiautomatic handgun shot and killed 16 children in a schoolyard in Dunblane, Scotland, the British Home Office misled the Dunblane Enquiry commission with false claims about comparative rates of international gun violence.

Gun-control advocates invariably promise that their measures will reduce crime rates and reduce the incidence of suicides. In the United Kingdom, Japan, Canada, and Australia, which either have or are introducing strict gun bans, the promised benefits have failed to materialize and, in fact, crime has increased. Frustrated governments have reacted by expanding the firearms ban to other weapons, including pocket knives. They have also authorized major expansions in the search and seizure powers of the police. These so-called reasonable gun-control measures progressively erode the traditional limits on police powers.

Such compromises can ultimately corrupt the government itself. Just how far democratic governments will progress down the slippery slope of eliminating basic civil rights in their quixotic quest to control gun ownership is anybody's guess, but there are few grounds for optimism. In the words of the late Nobel Laureate George Stigler, "government never knows when to quit."

The Shogun State

Gun-control advocates frequently cite low Japanese crime and homicide rates as proof that gun control can work. In fact, they have things exactly backwards. Japanese society is the result of centuries of emphasis on subordinating individual interests to those of society, and an intricate web of social controls has been developed to ensure cooperative behavior.

Those same social controls may also contribute to Japan's extraordinarily high suicide rates—twice the U.S. level.[4] There are indeed tradeoffs implicit in utopian gun-control proposals. And in spite of strict gun-control laws, murder rates in Japan are as high or higher than in Switzerland, where adult males are required by law to keep arms and ammunition for purposes of national defense.[5]

Though American proponents of gun control believe that eliminating one method of suicide will reduce the total number of suicides, the high suicide rate in Japan does not support this claim. In fact, Japan and Switzerland have such high suicide rates that deaths in those countries from violent crime and suicide combined are higher than those of Australia, England and Wales, Canada, and the United States.[6]

Guns were imported into Japan by Portuguese trading ships in 1542 or 1543. By 1575, the dictator Nobunaga had used a peasant army armed with matchlock guns—the first gun to use a mechanical device to light the gunpowder—to conquer most of Japan. Hidéyoshi, who took control of the army after Nobunaga's death and set about reunifying Japan's feudal states under a strong central government, issued a decree in 1588 banning the private possession of "any swords, short swords, bows, spears, firearms, or other arms." Hidéyoshi apparently understood, like the American Founders, that an armed citizenry would serve as a check on overreaching government. According to Hidéyoshi, "the possession of unnecessary implements makes difficult the collection of taxes and tends to foment uprisings."[7]

By 1650, Japan's *bakuhan* system had developed to give the shogun complete control. Villages were required to form five-household groups, essentially neighborhood associations to "foster joint responsibility for tax payment, to prevent offenses against the laws of their overlords, to provide one another with mutual assistance, and to keep a general watch on one another."[8] Families demanded absolute obedience to the household head. Japan's first constitution, completed in 1889, reflects the general reverence for the centralized state. It took the form of a gracious grant by the emperor, and could only be amended by imperial initiative. Rights and liberties were allowed "except as regulated by law."[9] The rewriting of imperial education policy in 1890—making respect for the government part of the curriculum—was designed to guarantee that future generations would never question imperial authority.

With a history like this, it comes as no surprise that Japanese citizens see nothing wrong with laws

that impose onerous licensing requirements on would-be owners of shotguns or air guns and entirely forbid the private ownership of handguns and swords. Rifles have been prohibited since 1971, and existing rifles must be turned in when the owner dies. Obtaining a shotgun or air gun license requires classes and a written test, shooting-range classes and a shooting test, a safety exam, a mental test at a local hospital, and a medical certificate certifying that the applicant is mentally healthy and not addicted to drugs. The classes are offered only during working hours so people must take time off to attend. Police investigate the families and background of license applicants and have unlimited discretion to deny a license for any reason. Membership in certain political or activist groups is deemed an instant disqualifier.[10]

Gun owners who successfully complete the licensing obstacle course must maintain a locker for the gun and a separate safe for ammunition. They must provide police with a map of their apartment giving the location of their gun safe and submit to annual home inspections at the whim of the police. Licenses must be renewed every three years, and renewal requires the owner to spend another day at police headquarters.

Widely respected and blessed with unparalleled cooperation from the citizenry, the Japanese police have few checks on their power. Neighborhood police visit the home of each gun owner twice a year, recording, among other things, how the occupants are related to one another, where they work, how late they stay out, what their finances are, and what kind of car they drive. The police keep lists of girls believed to have en-gaged in sexual misconduct. Police may search the belongings of suspicious characters at will, illegally seized contraband may be used as evidence, suspects may be detained for 28 days before seeing a judge, and according to the Tokyo Bar Association, the judiciary is uninterested in the fact that police routinely use torture or other illegal means to obtain confessions.

Japan's demographic homogeneity and extensive network of social controls may account for a low rate of reported violent crime, although that rate has risen notably in recent years. Yet criminals still have guns, and that concerns the Japanese police. According to the Firearms Division of the National Police Agency, police seize more than 1,000 illegal handguns every year, at least some of which are smuggled in. During the first half of 2000, there were reportedly 87 serious crimes involving guns—a 26 percent increase over the same period in 1999.[11]

Japan's low violent crime rate may also be due to its ability to institutionalize crime. Some observers argue that political corruption in Japan is rampant and that organized crime has close links with legitimate enterprises. Like any other business, organized crime recognizes that random disorder on the streets is bad for profits. In a country where members of criminal organizations carry business cards, crime syndicates may contribute more to the low crime rate than gun control.[12]

Crime in the Kingdom

Unlike the Japanese, the British government has a long history of trusting common citizens to bear arms for their own defense and the defense of the nation. It also has a long history of taking those arms away from common citizens whenever the government felt threatened. In 1285, in response to rising crime throughout his kingdom, King Edward I enacted the Statute of Winchester requiring all males to own weapons.[13] In 1539, King Henry VIII found that his fear of France outweighed his fear of crime and reversed his earlier command prohibiting anyone but the wealthy from owning a handgun or crossbow, the weapons favored by criminals.

In 1642, a militia loyal to Parliament had prevailed over the King's forces in Brentford. After the Restoration, the monarchy and a compliant Parliament attempted to disarm 95 percent of the population—ostensibly to prohibit hunting by commoners—with the Game Act of 1671. The law authorized daytime searches of any home suspected of containing an illegal gun; nevertheless, people chose to break the law. In 1685, the Catholic king, James II, commanded "a strict search to be made for such [illegal] muskets or guns and to seize and safely keep them till further order."[14]

After James II was driven from the country in the Glorious Revolution of 1688-1689, the 1689 Bill of Rights reaffirmed that "the subjects which are Protestants may have arms for their defense suitable to their conditions as and allowed by law."[15] This established a custom that was followed for the next two centuries. The only exception—a response to the tumultuous civil disorder that followed the Napoleonic War—was the Seizure of Arms Act of 1820, which expired in 1822 and applied to only a few counties. British subjects were armed in Britain while the British government, even when

the first police force was established in 1829, was not.

Reversal of Fortune

At the beginning of the 20th century, Great Britain was much like the United States in the 1950s. There were almost no gun laws and almost no gun crime. While the annual homicide rate was much lower than today—between 1.0 and 1.8 per 100,000 people—Parliament developed an interest in gun control because of rising unrest in the working classes and uninformed press hysteria over technological innovations in firearms, such as new revolvers that were "more dangerous than the bomb."[16] With the Pistols Act of 1903, Parliament once again asserted its authority to control private firearms ownership. The act required buyers to pay a fee to obtain a license at the post office and forbade the sale of pistols to minors and felons.

In the aftermath of World War I and the Bolshevik Revolution, governments around the world took strong steps to secure themselves against revolution. In the United Kingdom, the Firearms Act of 1920 banned CS spray canisters marketed as tear gas for self-defense and allowed British citizens to possess pistols and rifles only if they could show a "good reason" for obtaining a permit. Publicly, the bill was presented as a measure to prevent the criminal misuse of guns. This was the first of many lies to make gun control palatable. In fact, the government was anxious to regulate its subjects because it did not trust them. At a Cabinet meeting on January 17, 1919, the chief of the Imperial General Staff raised the threat of "Red Revolution and blood and war at home and abroad" and sug-

gested that the government make sure the military and police were adequately armed to resist an uprising. The next month, the prime minister wondered if some elements of the army would remain loyal. The Cabinet discussed arming university men, stockbrokers, and trusted clerks—a presumed economic and intellectual aristocracy—to fight any revolution.[17]

Having established the principle that the state was free to regulate firearms and other weapons, the British government proceeded to provide a textbook demonstration of the proposition that government never knows when to quit. In 1936, it outlawed short-barreled shotguns and fully automatic firearms even though no one could cite a single instance of a machine gun being misused in the United Kingdom.

The police, who control the permit process, began adding storage requirements, although Parliament had never enacted such a requirement. Today, if a British citizen wants to obtain or renew a gun license, two police officers will visit his home to scrutinize the gun-security system. Although the law, even today, does not order guns to be locked in a safe, the police routinely compel gun owners to purchase safes—sometimes two safes, the second one for separate storage of ammunition. A man buying a low-powered, inexpensive rimfire rifle—commonly used for target shooting or small game—may have to spend 20 times the gun's value on a safe. A person with five guns may be ordered to add an electronic security system costing thousands. One effect of the heavy security costs is to make it hard for middle-income or poor people to legally own guns—an objective similar to Henry VIII's

crossbow and handgun ban.

Following the fall of Dunkirk, the British government was so short of firearms it imported thousands from the United States and distributed them to its home defense forces. A fearful government collected and destroyed these weapons after the war, along with any gun brought in by returning servicemen. People caught bringing guns home were punished. In 1946, the home secretary announced that self-defense would no longer be considered a good reason for being granted a firearms certificate.

When three policemen were murdered with illegal handguns in 1966, Home Secretary Roy Jenkins, an ardent opponent of capital punishment, diverted public enthusiasm for the death penalty by initiating legislation to "do something about crime." The "something" was a licensing system for shotgun owners. Only six weeks earlier, Jenkins had told Parliament that shotgun controls were not worth the trouble.

Besides imposing the licensing system, the 1967 Criminal Justice Act eroded civil liberties by abolishing the requirement of unanimous jury verdicts in criminal trials, eliminating the requirement for a full hearing of evidence at committal hearings and restricting press coverage of those hearings.

The act further constrained legal self-defense by making it illegal to use a firearm against a violent home intruder. In one recent notorious case, in the summer of 2000, an elderly man, who had been repeatedly burglarized and had received no real help from the police, shot a pair of career burglars—killing one—who had broken into the man's home. The man was sentenced to life in prison.

In 1973, the Heath government proposed even more stringent controls. These far-reaching proposals, which mobilized protests from British shooting associations, were temporarily shelved. Since then, successive administrations have adopted the tactic of advancing most of the 1973 repressive proposals by disguising them as "doing something" during the hysterical reaction that typically follows a particularly sensational crime. In 1988, for example, Michael Ryan shot 16 people to death and killed himself in Hungerford, a small, quiet town in southern England. Ryan, who had permits for a wide variety of firearms, used a Beretta pistol as well as rifles in the killings.

Parliament quickly moved to restrict all types of firearms by passing the 1988 Firearms Act, which made shotgun licenses much more difficult to obtain. Self-loading centerfire rifles were easily confiscated thanks to previous legislation calling for registration and in-house inspection of all rifles and handguns. Home Secretary Douglas Hurd later admitted that the government had prepared the provisions of the 1988 Firearms Act long before Hungerford occurred and was waiting for the right moment of public hysteria to introduce them.

In 1996, this cycle of action and repression was repeated when Thomas Hamilton used handguns to murder 17 people at a kindergarten in Dunblane, Scotland. Hamilton was a licensed handgun owner who retained his license even though the police had investigated him seven times as a pederast and knew him to be mentally unstable. Pandering to a population unaccustomed to using firearms and uneducated about the different types and uses of guns,

the Home Office and the newspapers used bogus statistical arguments to pound away at the theme that, since guns were unnecessary, anyone who owned one was mentally aberrant and presumably dangerous. Opponents of a handgun ban were denounced as accomplices in the murder of school children. All legally owned handguns were confiscated.

Rise in Crime

Unfortunately, the British government's single-minded devotion to eliminating defensive arms has made life more dangerous for British citizens. In the United States, felons are more afraid of running into an armed homeowner than the police. As a result, the hot burglary rate—the rate of crimes that occur when the householder is home—is 13 percent in the United States and about 50 percent in England and Wales.

While imposing ever-stricter gun-control laws that disarm law-abiding citizens, the British government has done little to punish criminals. From 1981 to 1995, the rate of convictions rose in the United States while falling in England—for example, in the United States, conviction rates per 1,000 allegations for murders rose 43 percent, while in England, conviction rates for murders fell 12 percent.

Additionally, police in England and Wales were far less likely than U.S. police to even record crimes that were brought to their attention. In the United States, police record all of the assaults and an estimated 78 percent of the robberies reported to them. In England, police record just 53 percent of the known assaults and 35 percent of the known robberies.[18]

Although the gun-control cru-

sade has reduced the number of legal firearms in the United Kingdom, criminals can arm themselves from an illegal stockpile estimated to include 3 million weapons. Criminals know that guns in general, and rapid-fire weapons in particular, reduce their risk of failure by giving them better control over unarmed victims than do knives or blunt instruments. One of the more brazen incidents took place on August 3, 2000. Court officials dove for cover as a gang of armed men walked into a magistrate court in Slough, a small town just outside of London, fired at the ceiling, and walked out with the three men who had been in the dock facing charges of burglary.[19]

In some areas like Manchester, called "Gunchester" by the police, criminals aged 15 to 25 years old have easy access to everything from Beretta sub-machine guns to Luger pistols. Detective Superintendent Keith Hudson of the national crime squad believes that increasingly criminals are choosing automatic weapons rather than pistols, since the police "are recovering weapons that are relatively new—and sometimes still in their boxes—from eastern European countries."[20]

In fact, violent crime has risen steeply as British gun-control law has expanded. In 1981, England and Wales had lower rates of robbery and burglary than the United States. Assault and motor vehicle theft rates were only slightly higher. By 1995, a U.S. Department of Justice study concluded that rates of assault, burglary, robbery, and motor vehicle theft were roughly twice as high in the United Kingdom as in the United States.[21] Homicide rates remained higher in the United States, as they were even before either country

had any form of gun control, but the gap was beginning to close. While U.S. homicide rates are likely overstated by 10 percent—because U.S. homicide data record homicide arrests rather than homicide convictions—rates have declined in recent years as British rates have risen.[22]

The British government has refused to face the fact that crime has become worse as gun control has expanded; instead, it has concentrated on extending the firearms laws to include control of other weapons, even including pen-knives. Law-abiding citizens who violate even the most obscure portion of the increasingly complex firearms law, even when they are defending themselves, are charged and jailed. The criminals go free. One elderly lady, for example, tried to frighten off a gang of thugs by firing a blank from her imitation firearm. She was arrested and charged with "putting someone in fear with an imitation firearm."[23] Her attackers went free.

In 1996, knife carrying was made presumptively illegal. The government arrested and jailed Dean Payne, a man who worked in a newspaper distribution plant and carried a knife to cut the straps used to hold newspaper bundles, for carrying an "offensive weapon." In the words of the magistrate, "I have to view your conduct in light of the great public fear of people going around with knives.…I consider the only proper punishment is one depriving you of your liberty."[24]

With hindsight it is easy to see how the United Kingdom's approach to gun control brought it to the point where an individual newspaper cutter can be jailed for adding to public fear. Successive government officials began with the false proposition that certain "reasonable regulations" controlling guns in the hands of the law abiding would reduce the criminal use of guns. When the expected results failed to materialize, the governments used the standard argument to defend any failing program—to see results, we need stiffer regulations and more resources. When the public resisted increased regulation, gun-control advocates ignored research that undermined their position, used horrific anecdotes to stoke public fears, and manipulated the resulting public hysteria. Gun ownership for self-defense is prohibited, handguns confiscated, and rifles and shotguns severely restricted; yet there is no reduction of crime in sight, and innocent people are now imprisoned as a frustrated bureaucracy continues to extend its reach.

Canadian Confiscation

Although firearms regulations in Canada and Australia have historically been moderate, both nations in recent years have aggressively implemented the British model, with similar results. In 1920, in the midst of public hysteria over a Winnipeg general strike in which one marcher was killed and 30 were injured, the Canadian Parliament passed a bill mandating that residents obtain a permit to purchase any kind of gun. In 1921, when things had calmed down, the law was modified. Permits were required only to carry or purchase handguns. Handgun registration was imposed in 1934.

Long guns—rifles and shotguns—in Canada were subject to hardly any control at all.[25] In 1940, a government effort to register long guns, under the pretext of World War II, failed. No more than one-third of gun owners cooperated and registered their guns. The effort was abandoned in 1945.

The first modern round of regulation occurred in response to two incidents in 1976 in which boys with rifles ran amok in public schools. A 1977 law required that gun purchasers get a Firearms Acquisition Certificate from the police. Changes in the law in 1995 gave the police the discretion to reject any applicant. Various types of arms were prohibited entirely, and the prime minister, acting through the governor in council, was given the power unilaterally to ban any firearm or other weapon he wishes.

As in the United Kingdom, Canadian legal authorities reject the idea of armed self-defense in any form and have used the gun laws to classify even small canisters of Mace, intended for self-defense, as prohibited weapons.

As a result of two new laws in the 1990s—one pushed by the Progressive Conservative government, the other by the succeeding Liberal government—approximately half of all registered handguns are to be confiscated without compensation upon the owner's death. A large number of shotguns and self-loading rifles have been banned or subjected to highly restrictive regulation. And all firearms must be registered with the police. The latter requirement is causing massive civil disobedience. The unpopular registration law has spurred the provincial governments of Alberta, Saskatchewan, and Manitoba to stop the administration and enforcement of all federal gun-control laws. Official estimates placed the cost of the new registration system at CA$85 (US$56) million.[26] Independent estimates con-

servatively estimate the cost at CA$500 (US$330) million.

In addition, the Criminal Code prohibits "careless" storage of a firearm, and gives the government the authority to create storage regulations. Some incidents from 1996 and 1997 illustrate the practical effect of the law.

Hearing suspicious sounds, perhaps from a burglar, a husband took his unloaded rifle with him one night as he looked around his house. A few days later, the wife told a friend about the incident. Aghast, the friend called the police. The police arrived at the couple's home and bullied their way in. Searching the home, they found the unloaded rifle under a mattress in the bedroom. No children lived in the home. The couple was charged with careless storage of a firearm.

Another incident, involving a single woman who ran a small boarding house in Ontario, demonstrates the difficulty under restrictive regulations for a citizen to protect herself. A male downstairs tenant began harassing and stalking her. Worried that the woman might pose a threat to the tenant, the police searched her apartment and found several unloaded guns in her closets. She was convicted of storing a firearm in violation of regulations. She had been attending school and studying to become a paralegal, but her conviction bars her from a job in the legal field.

As David Tomlinson, President of Canada's National Firearms Association points out, safe storage laws are unenforceable without random police searches of the home. The new Liberal Party gun law, which was enacted in 1995, gives the police the authority to inspect private homes, without a warrant, to ensure that storage laws are being complied with.

Researchers differ about the efficacy of Canadian gun control. Some find that controls have led to increased crime against an ill-defended population. Notably, the Canadian Justice Department worked diligently with only partial success to suppress an independent research report, which had been commissioned by the Justice Department. The report showed the 1977 gun-owner licensing law had been a failure.

Problems Down Under

In contrast to Japan, the United Kingdom, and Canada, Australian gun laws are made at the state, not the national, level. In the 1920s and 30s, the eight Australian states enacted pistol and revolver registration. Long guns, including shotguns and rifles, remained lightly regulated, although controls began increasing in the 1980s.

Police licensing discretion is not always exercised reasonably. Politically connected individuals have been known to get handgun licenses without meeting the standard criteria, while in one major city the senior police officer unilaterally decided that no one except the police should have a firearm. And in New South Wales the police decided that only an approved steel safe bolted to the structure of the house constituted reasonable safe storage.[27]

In April 1996, Australia's gun-control policy changed radically 12 days after a deranged gunman murdered 35 people in Port Arthur, Tasmania.[28] At a May 10 meeting, the police ministers from the Australian states announced that all Australian governments had agreed to a 10-point plan for firearms regulation. All firearms were to be registered, and the sale, resale, transfer, ownership, possession, manufacture, and use of a variety of commonly owned firearms were banned. A buyback plan to compensate the owners of confiscated arms was announced at an estimated cost of AU$500 (US$275) million. Recreational shooters and hunters were required to get a series of licenses and permits. The only reasons for owning firearms were narrowed to permitted hunting, officially authorized vermin control, and participation in shooting sports such as those recognized by the International Olympic Committee. South Australia and Victoria still allow the arms used in paintball games, though South Australia requires their owners to obtain a license.

Though paintball—a game in which contestants shoot each other with harmless capsules of paint—is allowed, self-defense is not. Personal protection is not considered a justifiable reason to have a firearm in any jurisdiction.[29] As far as the Australian governments were concerned, the actions of the murderer in Port Arthur had rendered Australians unfit to defend themselves against criminals. As in the United Kingdom, homeowners who use guns against violent home invaders are often charged with attempted murder.

In many ways, Australia's experiment with gun control is a solution in search of a problem. Even though an estimated one in five Australian households contained a gun before the 1996 legislation, Australia has always had relatively few problems with firearms. According to a 1995 report done for the Canadian Department of Justice, Australian homicide rates were very low by worldwide standards, and only 18 Australians died in accidents with firearms in 1993.[30]

Evidence that surfaced after the legislative push indicated that Australian firearms control legislation had been ready for some time. Gun-control advocates, knowing that their utopian solution would be difficult to pass when people were unemotional about the subject, had been waiting until some horrific event created the requisite public hysteria.

In March 1997, Daryl Smeaton, the director of the Office of Law Enforcement Coordination, Commonwealth Attorney-General's Department, said that firearms control had been a regular item on the Australasian Police Ministers' Council agenda since 1981. In November 1995, the council resolved to release a working paper "as the basis for consultation with firearms interest groups."[31] Promising the usual reductions in crime, suicide, and homicide, the substance of this working paper became law on May 10, 1996, a timetable that left no time for any substantial discussion.

By 1999, Inspector John McCoomb, the head of the Weapons Licensing Branch in Queensland, considered Australia's gun legislation a failure, saying that the gun ban had sent the weapons trade underground.[32] Gangs and organized crime syndicates now run trade in firearms, and only a small fraction of the weapons in the country were turned in during the buyback.

Since restrictions deemed reasonable by the government have failed to eradicate crime, Australian authorities have resorted to the familiar pattern of extending government control to anything that could possibly be used as a weapon. As of May 1, 1998, New South Wales banned the sale of knives to anyone under 16. Possession is also illegal, a move that

theoretically extends government control to children's hobbies since the ban included fishing knives, electric knives, and hobby knives.[33] Victoria officials also planned to ban sales of knives to teenagers in early 2000. As part of the legislation, police would be armed with hand-held metal detectors while on patrol and would be given expanded powers to search for and confiscate knives.[34]

The Cost of Gun Control

Modern British, Canadian, Australian, and Japanese governments have now spent uncounted billions and many decades attempting to ban and restrict firearms. It has been a century of failure. Though banning firearms may reduce suicides and homicides committed with firearms, there is little evidence that a ban on firearms lowers the overall suicide or homicide rate. As defensive guns have been banned, overall violent crime rates have risen. People who want to kill themselves use another method, and criminals who want the control that firearms create readily circumvent firearms bans.

Moreover, prohibition has created a lucrative new criminal market in illegal weapons. Criminals by definition do not obey the law. Without firearms, most law-abiding citizens are no match even for unarmed criminals skilled in street fighting. Banning firearms reduces the risk and thus the cost to the perpetrator of crime. As basic economics would predict, when the cost falls, the supply rises.

As crime rises and illegal arms flood the country, governments react by making the possession of any weapon illegal, vastly expanding their powers of search and seizure and instituting zero-tolerance policies that make many ordinary

activities illegal—such as carrying a knife to cut newspaper bundles or gut fish. Governments demonize anyone who argues that such policies go too far and often distort the meaning of official statistics in an effort to save face.

In short, gun control has corrupted the modern governments that have tried to institute it. Because gun control applies only to the law-abiding, governments who institute it deprive their productive citizens of the means to defend themselves effectively. Governments indirectly become the accomplice of murderers, rapists, and thugs.∎

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NOTES

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22. There is evidence that a substantial fraction of U.S. "murders" are justifiable homicides or excusable homicides. American homicide statistics are based on arrests, not convictions. A killing, in which a householder who shoots a burglar and is arrested on suspicion of murder but is later found to have acted in self-defense, is counted in crime statistics as a murder. Criminologist Gary Kleck suggests that 1,400 to 3,200 American "murders" each year are really justifiable homicide. See Gary Kleck, *Targeting Guns: Firearms and Their Control* (New York, NY: Aldine de Gruyter, 1997).

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▦ INSIGHTS

Southern Exposure

New economic strategies are helping Latin America become a player in the global economy.

BY PAULO PAIVA AND RICARDO GAZEL

After decades of relative isolation and a minor role in the world economy, Latin America has become an active player in the international marketplace. As a player in the global economy at the dawn of the new millennium, Latin America faces numerous challenges and opportunities, from sustaining and improving democratic rules, to increasing economic growth and achieving higher levels of economic and social equity.

Import Substitution

During the 20th century, Latin America's economy experienced two radical changes: the first in the 1930s, and the second in the 1980s and 1990s. In the 1930s, Latin America responded to the world economic crisis by creating strong, entrepreneurial states and adopting a development strategy predicated on a closed economy. The main characteristic of this development model is known as industrialization via import substitution.[1]

In that scenario, the state played a pivotal role as the main investor in the economy through state enterprises such as steel mills; state-owned companies to explore, refine, and distribute oil products; and infrastructure projects such as highways, ports, railroads, and airports. Meanwhile, as a regulator, the state built an institutional framework compatible with that type of growth strategy, including comprehensive labor legislation that precluded collective bargaining.

Moreover, sectors and products thought to be strategically important for the country's economic development enjoyed generous subsidies and strong protection against foreign competition. This growth strategy resulted in inefficient and noncompetitive economies that were insulated from world markets. Prices for protected sectors and products reflected neither international market prices nor changes in domestic demand. The general population bore the costs of production inefficiencies as firms exercised their market power or as inflation climbed. The population also bore the costs of subsidies through government spending, although, due to a lack of transparency, the costs were not explicitly shown in fiscal budgets.

Despite all these problems, the import substitution strategy yielded economic growth rates in Latin America between 1950 and 1980 that were above international averages. Unfortunately, this strategy also resulted in greater income inequality and increased poverty.

The import substitution model was unsustainable and resulted in a general economic crisis in the 1980s, marked by growing budget and trade deficits, accelerating rates of inflation, and recession. Many Latin American countries experienced the worst of two worlds: economic recession and high inflation. At the same time, the world economy was moving toward deeper levels of economic integration, a process that has become known as globalization.

Washington Consensus

The second radical economic change of the 20th century, which beset Latin America in the

1980s and 1990s, began in response to globalization as well as to the crisis triggered by the end of the import substitution strategy. Similar to the changes of the 1930s, the recent transformations included a major shift in the state's role in the economy.

This time, however, reform of the state was aimed at achieving fiscal equilibrium and increasing efficiency in the public sector. A major component of state reform was a comprehensive privatization program of state-owned enterprises accumulated over the previous decades. Privatization was designed to enhance the overall efficiency of the economy, with the state remaining as the primary supplier of public goods while exercising a smaller role in production activities.

In 1990, the Institute for International Economics sponsored a conference in Washington, DC, to evaluate these and other policy reforms Latin America was undertaking to work its way out of the economic crisis. The participants—including Latin American policymakers and representatives from academia, international agencies, and think tanks—reached a consensus on 10 policy issues for Latin America, including such items as fiscal reform, liberalization of trade, deregulation of markets, and privatization. This consensus became known at the Washington Consensus.

Subsequently, economic policy in Latin America embraced the main ideas of the Washington Consensus, including a market-oriented economy with less state intervention, fiscal austerity, and realistic monetary and exchange-rate policies. These characteristics are consistent with a more competitive economy. In this new policy regime, the selected priorities of fiscal equilibrium and monetary stability associated with privatization increased the role played by the private sector as a major agent for capturing private savings and investing them in the productive sector.

Another element of the Washington Consensus adopted by Latin America was the liberalization of trade and capital accounts. As a result, the region today is seeking to open new markets for its products but, at the same time, is also experiencing more competition from foreign producers in local markets.

Together, these elements have produced a new economy, one that is more efficient and more competitive.

Measured Success

There is no doubt that Latin America has advanced dramatically in the last century, especially during the three decades following the end of World War II. Unfortunately, the rapid economic growth achieved in the 1950s, 1960s, and 1970s decreased substantially in the 1980s and 1990s. The annual average growth rate of real gross domestic product declined from above 5 percent in the 1970s to a meager 1.1 percent in the 1980s, and it remained below 3 percent in the 1990s.

The evolution of gross domestic product per capita gives an even clearer idea of the strong negative impact of the past 20 years, but especially the 1980s, on Latin America. From 1960 to 1980, gross domestic product per capita grew by over 80 percent, with the region outper-

forming even the developed countries of the Organization for Economic Cooperation and Development in the 1970s. The 1980s represented a lost decade for the region's economy, however. As population grew faster than gross domestic product, the latter declined by almost 9 percent per capita in real terms.

By 1990, gross domestic product per capita in Latin America represented less than 15 percent of average gross domestic product per capita in the OECD countries. Despite the gains registered in recent years, gross domestic product per capita in 1998 was only 5 percent higher than it was in 1980. In other words, gross domestic product per capita jumped over 80 percent from 1960 to 1980, compared with only 5 percent from 1980 to 1998.

Following the disastrous decade of the 80s, the region experienced economic gains in the 1990s, but growth remained volatile and increasingly vulnerable to crises in international financial markets. Growth volatility had a negative impact on economic and social equity, offsetting some of the region's gains obtained through monetary stability.

Despite these important gains, there is much yet to be accomplished in the region. At the beginning of the 21st century, Latin America is still grappling with serious economic and social problems. For example, the sharp increase in unemployment rates observed in the 1990s—a trend that was less prominent in the past—remains a critical issue. As a result, the region's most urgent issue remains economic growth.

Given the size of the popula-

tion and current income levels, Latin America needs to grow at least twice as fast as the rates observed in the recent past if it is to pare back the region's high levels of unemployment and underemployment. Furthermore, income distribution in Latin America remains the most unequal in the world, with an estimated 200 million people, out of a population of 500 million, living in poverty at the end of the 1990s. As a consequence, Latin America faces two major challenges: it needs to accelerate economic growth as well as promote and improve access to economic opportunities for a large share of the population living in poverty.

Future Challenges

Latin America faces a reality that presents both challenges and opportunities as the region's economy becomes a more active part of the global economy. On the one hand, Latin American producers face more competition from foreign firms in domestic markets. On the other hand, as producers increase their levels of efficiency, they become more competitive in international markets. The net result of these challenges and opportunities will depend on how effectively the region responds to the constantly changing world economy.

In particular, the region must continue to strengthen market-oriented reforms while recognizing the limitations of markets. For example, developing effective regulations and clear rules is likely to increase competition in the marketplace for existing businesses as well as newly privatized enterprises.[2] Higher levels of competition should

result in increased production and lower prices, improving standards of living in the region and increasing public support for the reforms.[3] The fast recovery the Brazilian economy experienced after the financial crisis of January 1999, for instance, was largely due to sound, fiscally austere monetary policy combined with persistence in pursuing institutional market-oriented reforms.

To double recent growth rates, Latin America will need to increase the region's investment levels across all sectors. Transparent regulations and effective supervision aimed at strengthening the financial sector are important requirements since a strong and sound financial sector is a *sine qua non* to achieving higher investment goals.[4]

To facilitate a large increase in investment spending, three key conditions must be met. First, Latin American governments must continue to pursue fiscal responsibility to achieve balanced budgets and to stabilize the public debt as a percentage of gross domestic product. Fiscal austerity will result in less competition from the government for private savings to finance budget deficits. This will trigger a decline in domestic interest rates toward international levels, which, in turn, will foster private investment. Additionally, once budget surpluses are produced, the public sector will have to focus on reducing current spending and increasing investment spending, especially in infrastructure areas where the private sector is not likely to play an important role.

That is the case, for instance, of investment projects character-

ized by social returns above private returns, such as irrigation, energy, and transportation in small rural areas. Similar projects have been launched in education and large-scale health immunization. These important investment projects will face less competition for financing within the public budgets since many previously public enterprises are now operated by the private sector as a result of the recent privatization process.

Second, higher investment requires higher savings, whether domestic or foreign. To increase the domestic savings rate, governments should improve saving mechanisms by offering incentives such as low tax rates on gains from savings in general and tax credit for small, low-income savers. Changes in the retirement systems in many countries in Latin America are likely to result in higher levels of savings as workers become more active in planning and managing their retirement accounts.

Pension funds, mostly managed by the public sector, have had a role in financing investment projects in the past as the funds hold bonds used to finance government investment in infrastructure. Pension funds also hold equities in companies partially owned by the government. Recent and future reforms in retirement systems, with greater management by the private sector, can increase the rates of domestic savings in Latin America. For these privately managed systems to work, pension fund managers must find investment opportunities with attractive rates of return to motivate their members to continue to save.

Third, the recent Asian financial crisis, which spread around the globe, raised some questions as to whether developing countries should continue to open their markets to foreign private capital. Clearly, benefits accrue from reducing the economic instability that results from the contagious effects of financial crisis. It is also clear, however, that in the absence of sufficient domestic savings to finance the needed investment levels to sustain high economic growth rates, foreign private capital remains an important and necessary source of investment financing. Institutional stability, sound fiscal and monetary policies, and a strong financial sector are necessary to strengthen domestic and regional capital markets, attract foreign investors, and reduce the risks associated with global capital markets.

Increasing Competitiveness

To increase Latin America's competitiveness within domestic and international markets, leaders must reduce the current technological gap the region faces vis-à-vis the most advanced economies and other developing countries in Asia.

Additionally, the region continues to experience high transaction costs, especially in the areas of transportation, communication, and finance.[5] For example, ports in many Latin American countries are more efficient in importing than exporting goods, which makes exporting more difficult and costly.[6] Moreover, producers face high transportation costs within the country as they move raw materials and final goods through a relatively old and poorly maintained highway system.

To become more competitive domestically and internationally, Latin American economies must increase their levels of efficiency, but the region should simultaneously aim at a more equitable distribution of the gains of economic growth. To accomplish this, the region needs to invest in education and training, and all social sectors can and should be involved in this task. Partnerships between the public and private sectors, including unions and nongovernmental organizations, designed to foster education and training for all labor segments will be more successful than governments acting in isolation.

Education is perhaps the most important condition for achieving higher levels of economic development with a more equitable distribution of income. Many studies in the labor-economics literature show that formal education and professional training increase both the probability of finding a job and the probability of earning higher wages.

Unfortunately, Latin America has been failing on the education front. Although the illiteracy rate among those 15 years of age or older in the region declined from 28 percent in 1960 to 13 percent in 1990, these gains were below those registered in all other developing regions in the world and were well below the gains observed in the developed countries.

In developed countries, the illiteracy rate declined from around 20 percent in 1960 to 7 percent in 1990. Meanwhile, as the average number of years of education among those over 25 years of age and older in Latin America increased from 3.2 years in 1960 to around 5 years in 1990, many other regions in the world have shown much better results. In Southeast Asia, for instance, the average went from 4.3 years in 1960 to 7.2 years in 1990, and in Eastern European countries, the number jumped from 6 to 8.7 years during the same period. The average level of schooling in Latin America remains below world standards and represents a major challenge that demands immediate attention.

In a highly integrated world economy, production processes have also become internationally integrated. In such a world, countries with large stocks of human capital enjoy a comparative advantage in attracting investments, especially in value-added sectors such as technology-intensive services, in which the use of skilled labor adds to the value of a product. Moreover, given the fast pace of technological change occurring in the world today, education and training are essential if a country hopes to remain competitive in the global economy and to differentiate itself, and its products, from the rest of the world.

At the same time, employment remains the best tool for updating and developing skills to keep current with the constant changes in technologies in a global economy. Unemployed workers can fall behind unless they can acquire the newest set of skills demanded in the labor market. In other words, continuous training of the labor force is a seminal condition at a time

when skills rapidly become obsolete.

Improved Market Access

During the period when Latin America experienced faster economic growth rates than much of the world, inequality among the haves and the have-nots increased, with high levels of income concentration and increased poverty. In the last two decades, economic growth has slowed to levels insufficient to reduce levels of poverty. Thus, to improve the poor's standard of living, a necessary but not sufficient condition involves increasing the economic growth rate in the region. But unless there is a sustained and deliberate effort to increase access of the poor to market opportunities—for instance by giving small firms and very small businesses access to credit, making information on job openings accessible, promoting education and skill enhancing programs—the current high levels of poverty will not decline in Latin America.

Although transfer programs—which provide services such as subsidized housing, food aid, and medical aid to low-income groups—can temporarily alleviate the perverse effects of poverty, the long-term solutions must focus on several goals. Latin American governments should incorporate the poor into the formal economy by increasing their access to market opportunities, including employment and investment opportunities. To that end, these governments must provide the poor with the tools they need to take advantage of these opportunities. Education, including work-related training programs and access to

information on credit and job opportunities, is one of the most important tools the poor can acquire to help them enter the formal economy. A democratic society where the poor are more-active participants in the political process is a crucial step toward more-equitable economic growth.

Changes in old labor laws are likewise fundamental to making labor markets more flexible and dynamic. It is important to remember that much of the current labor legislation was designed to avoid collective bargaining by an old interventionist state. New legislation to support a more dynamic and competitive economy aimed at job creation is necessary to increase job opportunities in the region. Similarly, changes in social practices are needed to tackle race, gender, and age discrimination.

Much still needs to be done to improve the lives of the poor in Latin America. Clearly, transfer programs alone are not the solution. The emphasis should fall on creating greater economic opportunities for the poor.

Regional Integration

The challenges presented by the global economy have spotlighted the importance of regional economic integration. For example, access to larger markets within Mercosur—the Southern Common Market created by Argentina, Brazil, Paraguay, and Uruguay in 1991—has allowed member nations to exploit economies of scale. This has resulted in lower average production costs and higher levels of competition in the region.[7] Additionally, joint ventures

among investors of different member countries have resulted in increased leverage in domestic and international financial markets and creation of new business opportunities. Regional integration has also increased Latin America's bargaining power in negotiating trade agreements with other trade areas. Continued economic integration in Latin America is essential for the region's future economic development.

South Meets North

The world has changed dramatically in the last century and is likely to keep changing at an even faster rate in this new century. During the past decade, comprehensive privatization programs, fiscal austerity, and realistic monetary and exchange rates policies under more democratic governments have changed the face of Latin America.

Latin America faces both enormous challenges and unique opportunities in this new century. To succeed in the rapidly changing global economy, the region needs to increase economic efficiency and become more productive and competitive. To do so, it must continue on the path of reform and increase investment levels to close the region's gaps in technological and human capital. To mitigate accumulated social debt, the region needs to double its current levels of economic growth and expand the access of the poor to market opportunities.

There is no doubt that regional economic integration is a core condition for future development in Latin America. Much remains to be done, but a unified and strong Latin America

will experience sustainable and equitable economic development. ∎

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NOTES

1. Import substitution is an economic development strategy—using such tools as quotas, tariffs, and government subsidies—that a country employs to promote domestic industry at the expense of foreign imports.

2. With the privatization of many state enterprises especially in the 1990s, the government role changed from a producer in sectors such as public utilities—telephone and energy, among others—to a regulator of these new privatized enterprises. However, there has been criticism that, in many cases, the government has only transferred its own monopolies to the private sector. Regulations that can curtail abuse of market power by monopolies and oligopolies and actions that can increase competition in these sectors—for example, more than one company for each telephone market—could result in lower prices paid by consumers for these services now provided by the private sector.

3. See "Brazilian Economy Back from the Brink," *Washington Post* (April 1, 2000).

4. One important example of such regulations is the adoption of minimum capital adequacy requirements reflecting the risk exposure of banks. On the supervision side, supervisors should be able to monitor, for example, loan portfolio concentrations, connecting lending, and market risks taken by banks.

5. Transaction costs are the costs—in terms of time, money, and inconvenience—of buying and selling, in addition to the purchase price. For instance, the investment in finding suppliers or buyers is a transaction cost.

6. The technical design of many ports in Latin America, especially in Brazil, is more appropriate to import manufactured goods than export grains, for example.

7. Given larger markets due to economic integration, for example, many firms were able to increase the use of their production capacity, plants, and machinery; lower their average costs, producing more with the same or small changes in fixed costs; and thus increase their levels of competitiveness.

8. The views expressed in this paper are solely those of the authors and do not necessarily reflect the views of the Inter-American Development Bank.

DIALOGUE

Creating Media Savvy

Susan M. Fitzpatrick's article "Sensational News" (FORUM, Fall 2000) is a thoughtful and thought-provoking analysis of the issue of science reporting in the popular press. While she advocates communication between scientists and the public, Fitzpatrick argues that the journalistic tradition, which presents a steady stream of breakthroughs, does not accurately reflect the process of gradual growth and consensus that establishes scientific knowledge. Instead, editorial decisions concerning which stories to cover appear to be based on whether findings can be packaged in a spectacular or controversial way. In the end, this system may create public enthusiasm for science, but forcing scientific findings to fit journalistic conventions will not help the public understand science.

The mass media are the main communication channel between scientists and the general public. Since the general public depends on the media for its information, how can we close the gap between reporting science as news and reporting science for understanding?

As science educators, we have examined the behavior of the universities, funding agencies, and lobby groups that supply media tip sheets and press releases to the media. We have also studied the nature of the transmission, whether it honors journalistic conventions or editorial decisions. In the end, we found that, rather than trying to change the media's message, a more reasonable way to advance the public's understanding of science may instead lie in changing the behavior or knowledge of the receiver of the message.

That is, we must consider what it means to be scientifically literate in the Information Age—an age in which there is an ever-increasing volume and pace of new and changing information. We need to train students to become citizens who can handle information from a variety of sources, including science presented via journalistic conventions. We suggest four ways to foster students' ability to become critical consumers of research presented in the media.

First, students need to understand that science is a complex human activity, not a collection of facts, theories, and methods. Scientific knowledge is built in an incremental manner and is subject to peer review that allows a gradual building of consensus. The public needs to know the difference between textbook science and newspaper science. Formal science education often presents reliable findings and established theories. Newspaper science, in contrast, is tentative, preliminary, incomplete, and presented in an attention-catching style.

Second, students and citizens need to understand some of the key differences between how research is conducted in the human sciences—for example, medical and social sciences—and the natural sciences that comprise much of formal science education. The human sciences are more probabilistic, and there is a greater need to consider the boundary conditions and constraints on interpretation that limit the extent to which a finding can be generalized. The disciplinary knowledge students acquire about the earth, physical, and life sciences may not help them evaluate health and medical research.

Third, students need to learn how to deal with changing information. For example, a recent report indicates that a low-fat, high-fiber diet does not lower the risk of colon cancer. A scientifically literate public needs to understand how to evaluate and reconcile the apparent contradiction with previous knowledge and how to accommodate updated information without becoming mistrustful or cynical. In this example, it could be the case that initial studies on the preventative effects of a high-fiber diet were done with laboratory animals, but a large-scale epidemiological study with humans resulted in different conclusions.

This example leads to our fourth suggestion: we must teach the interested public how to follow up on a news report when the findings presented are personally relevant or important. Rather than relying less on the media, as Fitzpatrick suggests, we need to educate scientifically literate citizens to become more savvy about how to live with the media.

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Sound Evidence, Good Decisions

Researchers have known for some time that the naturally occurring organism *Bacillus thuringiensis* (Bt) is toxic to certain insects, and it has been used for decades as a bacterial insecticide. Recently, transgenic plant technology has allowed researchers to produce crops containing genes that express proteins from the Bt organism, which are toxic to caterpillars and some beetle larvae. Media response to this development has been intense because the topic evokes emotion in the public and provokes determined stances from opponents and proponents of the new technology.

But Anthony Shelton and Richard Roush have thrown a note of caution into the media frenzy in their article "Pest Control, Rumor Control" (FORUM, Fall 2000). These scientists call for a balanced approach in assessing information on these so-called Bt crops, especially the impact Bt crops might have on nontarget organisms that may be sensitive to the same protein that acts as a pest-control chemical. Their specific concern is the response by the media to a few papers that examined the effect of pollen from several corn hybrids on monarch and black swallowtail butterflies.

The first paper, from Cornell University, immediately captured the attention of environmentalists and media in Europe and then in North America. As Shelton and Roush point out,

the alarmist message this paper sent was based on an improperly performed experiment. In that paper, the researchers did not divulge the amount of pollen that larvae of monarch butterflies were exposed to nor the likelihood that larvae in the wild would ever encounter such an undefined dose.

In comparison, a second paper, published in the *Proceedings of the National Academy of Sciences*, provided a properly designed series of experiments whose results indicated that dosages normally encountered by larvae of black swallowtail butterflies would not result in harm. Not surprisingly, environmentalists and the media paid little attention to this study.

A third study on butterflies and Bt corn pollen was published soon after the authors submitted their commentary to FORUM. This paper was electronically published in *Oecologia* by researchers at Iowa State University, Laura Hansen and John Obrycki, and was widely described as a field trial that supported the claims of the Cornell experiment. This study suffered from three flaws. It was essentially a series of laboratory bioassays that were not replicated, it used such small numbers of larvae in each test as to render the results meaningless, and it again failed to demonstrate the probable exposure of larvae in the field.

The major concerns expressed by Shelton and Roush are well taken. The science of transgenic technology is highly complex, and issues relating to environmental impact—such as the distribution and effect of pollen

shed from these plants—are not simple. They involve an understanding of the ecology of the corn crop, its weed competitors, and the biology of these highly visible butterflies. Shelton and Roush are also concerned about the desire of scientists to publish their findings despite shortcomings in their approach and the tendency to extrapolate their data beyond its measured limits. Both of these issues feed a third concern—a misunderstanding of the detailed nature of the experimentation, which results in misleading conclusions by the media, public interest groups, and scientists themselves.

Creation of transgenic organisms is a highly emotional issue for some people; for others, it is further proof that our lives are increasingly regulated by technology and economic forces outside of our control. The authors contend that decision making and progress in technology is better served by deliberate and thoughtful investigation by cooperating scientists than by reliance on whimsical rumors. That is good advice. Fortunately, such technology is highly regulated in the United States and Canada by government agencies whose entire mandate is to assess the risk versus the benefit of these novel pest-management technologies.

Up to this point, these agencies have collected pertinent data, made public disclosures of their decision-making process, brought in experts to advise them on their decisions, and drawn conclusions on the suitability of each individual product for commercial use. I have a great deal of confidence in this regulatory process that ulti-

mately draws on information from well-considered data rather than serendipitous rumor.

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Future Perfect?

Laura Purdy makes a convincing case that a woman determined not to give birth to a child with a serious genetic disease is better off using prenatal testing, followed, if necessary, by abortion, than to use preimplantation genetic diagnosis ("Empowerment or Danger," FORUM, Spring 2000). With prenatal testing, safety and accuracy are higher, and the pregnancy more likely to be completed. Laboratory technologies used after amniocentesis and chorionic villus sampling have few false positives and false negatives, and the risk of induced miscarriage is under 2 percent.

With preimplantation diagnosis, as Purdy notes, the patient must undergo a regime of painful hormone injections to induce multiple-egg production. After eggs are extracted and fertilized, a cell must be removed from any early embryos for genetic testing. For the few diseases in which preimplantation diagnosis has been used, these tests are reasonably accurate. Problems include side effects from the treatment and the low probability of completing a pregnancy successfully. True success rates are unknown.

What are the broader implications of preimplantation diagnosis? One consideration is suffering. Physicians, the general public, and potential mothers often say they advocate testing to prevent a child's suffering, say, from Tay-Sachs disease or cystic fibrosis. How do we know whether another person suffers, especially a child with no other experience in life? Adult handicapped persons commonly claim they do not suffer physically, but from social attitudes and environmental inconveniences. At present, preimplantation diagnosis is generally used for conditions in which young children die slowly and miserably in apparent constant pain.

But let us look at some feminist issues. First, most journal articles on this topic speak of a "couple" getting preimplantation diagnosis. Purdy is an exception. She makes it clear that the woman is the primary player. Yet a woman may "choose" to comply with her partner's wishes. Second, although there may be doubt about a child's experience of suffering, there is no doubt that a caretaker suffers. Yet, because women have been socialized to endure hardship and sacrifice for their children, women may deny that their own suffering should be avoided or alleviated. Third, a candidate for this procedure often knows more about the fine points of a disease than some physicians who are international experts, simply because she has cared for a child dying slowly. Fourth, whatever a woman decides, she is likely to be blamed, because our society blames mothers. Some will say she is a bad mother if she doesn't

welcome a handicapped child; others will call her bad if she fails to request a genetic assessment of her fetus. The point is, any consideration of the merits or ethics of preimplantation diagnosis needs to take into account the implications for women.

Also consider one fact that determines a woman's opportunity to choose this procedure: the gap between rich and poor. Currently, preimplantation diagnosis is available only to women of the wealthy upper 2 percent on Earth. Some analysts therefore speculate that handicapped and chronically ill children will be born only to the poor, who have few resources to care for them, thus further increasing the gap between rich and poor. In my view this is unlikely. Not only do the rich, like the poor, carry through with unplanned pregnancies, but the technique is far from perfect and not widely available nor generally known. Moreover, a low-tech, less expensive prenatal test—the triple-marker blood test—is used with essentially all pregnant women in California. This program and an analogous one in the United Kingdom have resulted in almost no births of children with the common disabilities, Down Syndrome and spina bifida. Nevertheless, attempts to expand and improve costly preimplantation diagnosis are steps against equity and social justice.

Currently, preimplantation genetic diagnosis is used only with known carriers of "serious" genetic diseases in order to find and discard embryos at risk. But this is just the first step on a technical slippery slope. Tech-

niques may be developed some day for much more. Visionaries maintain that, once science progresses, "bad" genes will be corrected through gene therapy.

Visionaries also propose that, in addition to correcting "bad" genes, we might introduce "good" genes that enhance a child's qualities, such as intelligence, musical ability, or athletic prowess. The lure of gene therapy and enhancement may have even fueled the preimplantation enterprise. The journey from technical advances in diagnostic procedures to developmental modification of human embryos will be arduous. Experience with laboratory and farm animals shows that miscalculations in *where* genes are incorporated into chromosomes can disrupt other genes, perturb development, and even cause tumors. And those experiments use single genes with well-defined effects. But to genetically engineer qualities means that multiple genes must be inserted correctly and this greatly increases the margin of error.

Yet Lee Silver, the author of *Remaking Eden* (New York, NY: Avon Books, 1997) is optimistic. He believes that the strong desire of parents to design their children will fuel market pressure that will inspire scientists to overcome the considerable technical obstacles. He proposes that the creation and introduction of artificial chromosomes with genes for many enhancement traits will not disrupt existing chromosomes. Silver predicts that, some 300 years from now, after the rich have steadily incorporated desirable traits into their children, humans will comprise two species

that cannot interbreed: the GenRich and the Naturals.

I see another slippery slope if attempts succeed in making preimplantation genetic diagnosis and prenatal testing cheaper and more easily available. Conceiving an embryo at home and then flushing it out of the womb is one such method. After diagnosis, only a disease-free embryo would be reintroduced into the womb. A second method is to test a pregnant woman's blood or urine at home using a kit to assess genes in the few fetal cells that cross the placenta. To date, both methods are fraught with technical difficulties; yet who knows what the financial incentives from the popularity of do-it-yourself kits might inspire.

But there is also a moral slippery slope. Choosing to give birth to a child with no horrible genetic disease seems commendable. After all, our society lets rich parents provide their children with music and skating lessons. Why not genetically engineer a child with specific talent genes? But where is the line between enhancing a child's opportunities and controlling that child's destiny? Suppose after either genetic or environmental modification, a child refuses figure-skating lessons, preferring to paint with watercolors or join the debating team? Will parents be verbally or physically abusive if they have invested money in that child? And all designs go out the window if she becomes a drug addict or an alcoholic. People who bring a child into the world cannot guard against all vicissitudes of life itself or the unengineered traits of that child.

Why are we put on Earth? Many religions have some variant of the command to go forth and multiply; but in interpreting that exhortation, religions may differ. In our duty to reproduce, is it also our duty to take what comes and use strength from God to handle any difficulties in raising such children? On the other hand, in the view of some faiths, God put us on Earth with brains so that we could be co-creators: it is our duty to correct the mistakes in God's imperfect creation. It is not merely that we are allowed to correct genetic flaws, it is our duty to do so. In one view, we must not play God; in the other, we must.

Let's turn back to Purdy's central question: Are these technologies empowerment or danger? A socially empowered rich woman may choose to gamble and submit her body to high-tech medicine to avoid caring for a disabled child. But Western society, not an individual, is in danger: we are not empowered by being subjected to entrepreneurs who increase the gap between rich and poor and devise more techniques for eliminating diversity among us.

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Local Power

No other region of the country has the mix of investor-owned and consumer-owned or municipally owned utilities that we see in the four Northwest states. And no other region of the country is as blessed—and challenged—by the benefits and costs of its hydroelectric resources. C. Clark Leone has done a thorough job describing the history of electricity service in the Pacific Northwest and the formidable challenges and pressures facing our system today ("Quo Vadis?" FORUM, Summer 2000). The question now is whether and how the natural and structural strengths of the Northwest can be adapted to a changing national environment.

Many of the pressures now affecting electricity policy in the Northwest are not of the region's making. Federal policies that foster competitive wholesale power markets, that separate transmission from generation interests, and that encourage retail competition may benefit other regions of the country, but these policies are proving awkward to apply in the Pacific Northwest.

The federal government owns more than two-thirds of the high-voltage transmission systems, and it markets more than half the Northwest's power generation. Thermal generation and transmission in our region have been built by public and private interests to operate in a cooperative way and to optimize the benefits of the Columbia River power system. This system was not built with competition in mind. But it delivers average

power costs that are among the lowest in the nation.

Recent supply problems and dramatically higher prices in the competitive wholesale power market suggest that competition in this market is far from mature, dependable, and stable. Exposing all customers to the kind of price volatility experienced here recently by some industrial customers, who chose market-pricing over cost-based rates, would impose on smaller customers risks that are hard to justify in light of the benefits of the existing system.

The challenge for the Pacific Northwest—utilities and state regulators alike—will be to encourage a federal policy that is flexible enough to permit the citizens of the Northwest to continue to realize the benefits and shoulder the costs of our region's unique electric service industry. Utilities, state utility regulators, and state policy-makers all face the task of protecting the interests of the public as the electric industry changes. We will not be able to do so if federal policy preempts local control and regional and state solutions.

Electricity is a fundamental part of the infrastructure that fuels our economy and ensures our quality of life. Uncertainty about its availability, and instability in its price, will have inevitable consequences for the economy and consumers, whether electricity is supplied by public or private utilities, and whether electricity is sold competitively or not. Electricity will always be subject to some form of government regulatory oversight. As the industry becomes more dominated by

national and even global dynamics, is there a role for local and state regulation?

I share Leone's view that oversight close to the consumers and industries whose interests are at stake has served us well in the past and should not be lost in the future.

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Rural Challenge

For years, rural schools have been accused of failing to raise the academic performance of students to levels achieved in urban and suburban counterparts. It is refreshing to find an upbeat assessment of the benefits that accrue to students attending rural schools in our nation. Robert Gibbs, in "The Challenge Ahead for Rural Schools" (FORUM, Spring 2000), presents a balanced perspective of the positive and not so positive features of our country's rural education system.

Certainly, the gains have been remarkable in many rural schools over the past two decades. As Gibbs notes, rural schools have caught up with urban schools on math, reading, and standardized test scores in science. Furthermore, rural schools have one advantage that most urban schools do not—smaller enrollment. In these smaller settings, social bonds between students

and teachers, administrators, parents, and community groups are often stronger than in urban schools. These nurturing relationships can be critical in advancing the academic progress and aspirations of rural students.

At the same time, as Gibbs points out, rural schools have their drawbacks, in particular in terms of teacher pay, quality of teachers, and school curricula. Urban teachers are more likely to have graduate degrees and therefore command higher salaries than rural teachers. Furthermore, because they have more resources, urban schools can offer a broader variety of courses, giving urban students a leg up when entering college.

I agree with Gibbs that schools play an important role in improving the lot of rural youth. An issue that Gibbs addresses less forcefully, but which is vital to the long-term academic success of students, is the role that parents and communities can play in promoting the educational progress of rural youth. Indeed, Gibbs acknowledges that the socioeconomic status of parents, as well as the type of jobs available in local communities, can influence the type of investments students are likely to make in their human capital. But Gibbs offers little detail on how to shore up the capacity of parents and communities to make a difference in the lives of children.

Yet the value that parents place on education, coupled with their aspirations for their children's long-term educational plans, has important bearing on educational progress. In rural families, parental aspirations for their children fall short of the

expectations shown by parents of urban and suburban students. Why then are we not devoting more resources to strengthening the ability of rural parents to create strong home environments where high educational aspirations are valued? I am convinced that expanded investments in the home will lead to a higher level of school performance.

At the same time, communities have a strong impact on the educational potential of local children. A community's investment should not be limited to funding local schools. It must include efforts on the part of the whole community to provide students with programs, organizations, and activities that foster social relationships—between students and peers as well as students and adults. Positive social interactions can instill in students the confidence they need to realize their educational potential.

Without question, rural schools have come a long way over the past two decades, and expanded investments in these educational institutions must remain a high priority. It is the active engagement of parents and communities, however, that will undergird the educational progress made by students. Strategies to further improve rural education must recognize the important tripartite relationship among schools, the home, and the community.

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■ BOOKS

Power Surge

BY DAVID FRESHWATER

Richard Hirsh has taken on a heroic task in trying to explain the origins of electricity deregulation in the United States. *Power Loss: The Origins of Deregulation and Restructuring in the American Electric Utility System* provides an exhaustive review of the events that led to deregulation.
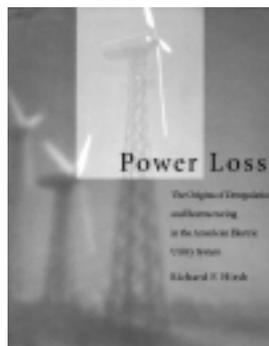
Electricity deregulation has been in the public eye for less than a decade but, as Hirsh points out, the process began in the 1970s, with the slowing of technological progress for large generation plants, the first energy crisis, and the beginnings of the environmental challenge to reduce consumption of power. These events sowed the first seeds of discontent with a regulatory system that was established at the beginning of the last century.

In the last few years, the power industry has led efforts to end regulation. Early in the 20th century, however, the industry saw regulation as a way to ensure stable profits, block competition from municipal power systems, and prevent regulation by local government.

Hirsh first describes the evolution of a consensus that favored public regulation by investor-owned power companies, which were profiting from falling unit costs and rising per capita consumption of electricity. Subsequently, expansion of demand and cheap electricity masked the fact that integrated power companies, which owned the power plants as well as the distribution system, were gaining control of the regulators. In this period, power companies lauded regulation as the source of steadily declining power costs.

The Public Utility Regulatory Policies Act of 1978 (PURPA) unleashed forces that would change that scenario. From Hirsh's perspective, this response to the energy problems of the 1970s marked the beginning of the forces that led to deregulation. A series of decisions, taken in isolation, led steadily to structural change in the industry and a fragmentation of interests. Amazingly, the environment we now find ourselves in was not the result of a clear strategy to change the nature of the industry, but rather a series of incremental changes that cumulatively destabilized an industrial structure. PURPA introduced competition in generation, but it also introduced a new federal regulatory role that intruded upon state regulation. In addition, the decision to require independent power producers to be paid a high price for their power stimulated far more production than had been anticipated and triggered the beginnings of the large producers' opposition to regulation.

Conservation efforts also evolved during the 1980s. At first, programs designed to slow the construction of new generation facilities through greater energy efficiency and conservation began to evolve. Initially, high interest rates made the construction of new facilities uneconomical, and power companies showed some enthusiasm for the concept. But the long-term profitability of the industry, which depended on ever-increasing power sales, suffered. This led to another dilemma; if managing demand for power was a worthy social goal, then the regulatory system had to be modified to eliminate

the incentive for adding generation capacity and increasing demand.

In the mid-1990s, new technologies—specifically combined-cycle gas turbines—allowed low-cost power to be generated in small increments by small, independent power producers. These changes radically altered the underlying technology of an industry that had traditionally relied upon building ever-larger plants to reduce generation costs. In addition, regulators began trying to fund comprehensive energy-efficiency programs by selectively increasing the rates paid by large industrial customers. The increased competition and extra regulatory costs fragmented the supply and demand elements of the industry. Traditional power producers faced higher costs than many of the new independent power producers. Moreover, large industrial customers with significant internal incentives to control costs saw no reason to subsidize conservation incentives for small-volume customers. In 1992, the introduction of wholesale wheeling allowed low-cost producers to link up with large-volume customers. Thus, the consensus that had been in place for almost 100 years ended.

Hirsh's story ends as deregulation goes into effect in the late 1990s. Given the piecemeal evolution of deregulation, we shouldn't be surprised by recent price spikes, supply shortages, and waves of mergers and takeovers. Perhaps the most important lesson of *Power Loss* is that as long as the industry considered it to be the most beneficial type of market structure, the old

regulatory structure prevailed with few challenges. Opinion in the industry changed in part because of technological change, and in part because of external events such as the energy crisis. But change also occurred to a great extent because public policy altered the regulatory environment in important ways.

Power Loss, despite its breadth and depth, is an easy book to read. Hirsh manages to balance facts with interesting vignettes about the key players in the evolution of the industry. His thesis—that there was a breakdown of the industry consensus that favored regulation—provides an intriguing explanation of the electricity industry. Executives of the investor-owned utilities, who had supported regulation, switched their opinion when regulation became a burden to their firms. Only then did they argue for freer markets.

Hirsh's argument fits neatly into the standard model of regulatory capture: the special interests of the regulated industry overwhelm the public interest. If Hirsh's analysis is correct, deregulation may ultimately be better for consumers than the old model, because the industry will have a harder time manipulating markets than manipulating regulators.

Hirsh's analysis, however, has a few missing pieces. In particular, he pays little attention to the role of federal power, municipal electric systems, and rural electric cooperatives. These each play a significant part in the industry. In addition, Hirsh acknowledges that some states may have provided more-effective supervision of the industry than

others. This makes his warning of the dangers of regulatory capture less compelling. Hirsh also does not examine the effect of a growing role for federal regulation as closely as he might. Today, a general trend is to reduce the scope of federal regulatory action, either by deregulation or by having regulation take place at the state level. Instead, the federal role in the electric power industry is increasing. This may have contributed to the wave of mergers within the industry as firms recognize they now face a single regulator.

While regulatory change was supposed to increase competition and lower the cost of electricity, the rapid consolidation of the industry suggests that monopoly power may be growing. Recent shortfalls in supply certainly seem to contradict widespread promises of cheap power. Although these changes are not what the advocates of reducing state-based regulation promised, they are consistent with Hirsh's belief that the electric industry always acts to protect its own interest. Assessing the magnitude of the actual benefits to society from deregulation and restructuring in the American electric utility system will require another book.■

Richard F. Hirsh, *Power Loss: The Origins of Deregulation and Restructuring in the American Electric Utility System* (Boston, MA: MIT Press, 2000); 406 pp.; cloth, $50.00.

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Hard Rock Blues

BY BRUCE FARLING

If there is a poster child for mining gone bad in the West, it's Montana's Mike Horse Mine, the focus of David Stiller's new book, *Wounding the West: Montana, Mining, and the Environment*.

Stiller painstakingly reconstructs the beginnings, heyday, fall, and polluted aftermath of operations at the Mike Horse Mine near Lincoln and the surrounding Heddleston Mining District. His historical review of one mine illustrates how hard-rock mining established a larger foothold in the West. He also relates how this industry's footprint has left daunting problems such as acid mine drainage, huge quantities of metals-laden wastes, and polluted streams.

Aside from cataloguing mining arcana and exposing the warts of an industry, Stiller also explores the cleanup strategy being used at this abandoned mine. He suggests that the approach might be deployed elsewhere to more effectively correct the problems associated with the 557,000 abandoned mines that have been left unreclaimed in 32 states, mainly in the West.

Stiller recounts how the companies now liable for eliminating the pollution from the Mike Horse—New York-based Asarco, absorbed since the book

was written by a Mexican conglomerate, and the Atlantic Richfield Company, recently merged with Amoco and then absorbed by British Petroleum—supposedly cooperated with the state of Montana on what they call a voluntary cleanup plan. This plan, negotiated at the state level, helped these companies avoid a more rigorous regulatory approach that would have been required had the project been listed as a federal Superfund site.

I was once directly involved in influencing cleanup of the Mike Horse Mine. Just how voluntary the effort has been is a matter of dispute. Also in dispute is how effective ongoing attempts at reclamation and pollution cleanup will eventually be. Asarco recently convinced the state of Montana to relax water-quality standards in nearby streams to accommodate the shortcomings of the experimental water-treatment system the company is using for its abandoned mines in the Heddleston District.

Located in the headwaters of the fabled Big Blackfoot River, the Mike Horse and its abandoned underground workings, waste piles, and polluted discharges are not unusual in scale compared to similar unreclaimed mines around the West. But the

Mike Horse has become an icon of environmental degradation in Montana. Photographs of its main portal and the burnt-orange, metals-rich brew it discharged have appeared on numerous front page stories and in televised news reports about the state's mining legacy. The Mike Horse is so notorious its mug shot could be on the wall at the post office.

This notoriety helped make the Mike Horse a cleanup priority in Montana, which Stiller says has an estimated 20,000 to 26,000 abandoned hard-rock mines covering 234 square miles and polluting 1,300 miles of streams.

Stiller explains how hard-rock mines have been developed and how one corporate giant, the Anaconda Mining Company, used its extensive mineral wealth to control a state. The book also recounts how mining contaminated the water and killed trout in one of Montana's most beloved rivers, the Big Blackfoot, which served as the backdrop for Norman Maclean's popular novella, *A River Runs Through It*, later adapted for the screen by Robert Redford.

However, Stiller, a hydrologist and environmental consultant, dwells too long on the technical nuances of hard-rock mining and

on the geochemistry associated with the extraction of metals from the Heddleston District. This amount of detail could lose lay readers. In addition, he devotes an inordinate amount of space telling the story of the Kornec brothers, two elderly, old-school miners who have lived much of their lives in the Heddleston Mining District. Though the Kornecs' tales are interesting, and by many accounts they are gentlemanly sorts, their prominent role in the book reinforces the myth of the crusty prospector, the wise-cracking Walter Brennan loner with mule and shovel. It is uncertain whether such characters ever were, or still are, a part of western American culture. In fact, the role of the lone prospector hiding out in the woods living on a shoestring and making important mineral finds has been unimportant since the days of, say, the Spanish-American War.

Curiously, Stiller never really explores in detail whether the General Mining Law of 1872, the antediluvian statute that says mineral development trumps other values of public lands in the West, should be chucked or refined. The mining lobby has successfully defended this law from much tweaking, and the statute was exploited to its fullest in developing the Mike Horse Mine. The law gives away public minerals for free and is devoid of reclamation requirements. Its patenting provisions turn public land into private holdings, and it is the reason some of the West's backwoods miners—few of whom make much of a living on mining—now live on tracts surrounded by federal land. In fact, Stiller never says how the Kornec family came to live in a chunk of country surrounded by national forest. It is probable the Kornecs live on land once owned by Uncle Sam, since the 1872 Mining Law allowed miners to buy the tract they worked on for no more than $5 an acre.

Wounding the West is an interesting read for anyone seeking to learn the basics of how metals mines have been developed in the West. It also offers important lessons on western mine pollution and the culture of the mining industry. However, determining what audience Stiller aims to reach is difficult. It is at once a technical read, a historical treatment, a folksy tale, and a policy tract. The book is a bit long on technical explanations and mining history, and it is a little too easy on the mining culture. Though it's an interesting read for a Montanan, the author missed an opportunity to use his exploration of the past to tell us how mining should occur in the future.■

David Stiller, *Wounding the West: Montana, Mining and the Environment* (Lincoln, NB, and London, UK: University of Nebraska Press, 2000); 212 pp.; cloth, $25.00

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Spaced Out

BY ROBIN M. ELLERTHORPE

For Lars Lerup, the original concept of the metropolis— which the ancient Greeks defined as a mixture of public and private space where the citizen is encouraged to participate in democratic activity—is obsolete.

In *After the City*, Lerup, dean of the Rice School of Architecture, begins the reader's journey with a series of photographs and essays that juxtapose the elements—natural and fabricated, intended and unintended—that make up today's urban and suburban environments. One photograph, for instance, shows a foreground oil derrick against a background skyscraper.

Because so much has changed in the translation of our urban environments, Lerup invents a vocabulary to capture the ideas and ideals of urban design as intention and mishap, perhaps to describe the alienation most of us sense without understanding or being able to articulate. To further substantiate his thought, he reflects on historic precedents. He then considers the use of space in residential design, based on his research on livable spaces. Finally, he discusses what should be done with the leftover spaces—those areas in between planned developments, what he refers to as *doublespace*—in order to make it understandable or urbane.

Lerup's focus on architectural history helps him to frame his view of the America we live in. The Pantheon in Rome, for instance, is an historic example of doublespace, a concept he creates to help us visualize the areas that urban edges define along with the spaces that are in-between as we go from home-space to work-space to entertainment-space. In defining doublespace, Lerup refers to the Pantheon as a corpse with empty space between the outer stone skin of the building and adjacent walls that represent the structure and the inner core of the building. His reference is pointed— the space between metropolitan developments is also empty, unused, and disconnected from the environments that have purpose.

Jefferson's design for the University of Virginia, an example of an architect's intent usurped by later architects' misguided design, is emblematic of what happens in our urban and suburban environments. Jefferson's original design left one end of a green lawn open "to the frontier" while framing three sides with promenades and a rotunda. The 19th-century architectural firm of McKim, Meade, and White later closed the U. Lerup interprets this as "an attempt to close and dam all

apertures in the open city." In a more modern context, he describes the architecture of distance, where the panoramic view afforded by the open U leads to a perception of middle distance, or the area in-between, ending with the foreground— "the scale of the user."

Lerup makes extensive use of metaphor. For example, Houston—especially as seen from his office on the 28th floor of a building overlooking a canopy of trees at odds with the commercial and residential structures intersecting it—is the ghost of unregulated sprawl, a result of market-driven development. A Chevrolet Suburban is symbolic of the sheltering of suburban inhabitants as they commute to work. For Lerup, the sports utility vehicle embodies the big footprint we choose to inflict on our environment. That bigness is replicated in the sprawl of cities and suburbs and the extravagant size of commercial and residential buildings.

After the City is rich with references to architectural history and historians of architecture, including the 20th-century Italian architectural theorist Manfredo Tafuri, who railed against "the merciless commercialization of the urban environment." Lerup uses this as a jumping-off point in focusing on

America and the suburban metropolis.

For the lay reader, Lerup's language may seem highly academic. Ironically, Lerup laments the lack of access the lay person has to particular professions such as architecture, yet the words he invents and the metaphors he creates may not sufficiently describe concepts critical to understanding *After the City*. Nonetheless, the book will appeal to those at ease with 20th century architectural concepts.

Lerup's images are idiosyncratic, yet haunting. *After the City* gives a valuable new framework for understanding our emerging metropolis environment.■

Lars Lerup, *After the City* (Cambridge, MA: MIT Press, 2000); 228 pp.; cloth, $24.99.

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After the Flood

BY CHRIS HANNIBAL-PACI

It should come as no surprise that North American identities are enmeshed with Aboriginal cultures, despite the representation of Aboriginal cultures in mainstream society as marginal. Since colonial times, indigenous images have been appropriated by national and historical sites, advertising, and school curricula. Many North Americans are well aware their roots are intertwined with multiple cultures, yet these sites and cultures are dissociated from a spiritual connection to the land.

Social and Environmental Impacts of the James Bay Hydro-electric Project is an interdisciplinary collection by distinguished Canadian and American authors on the controversy surrounding hydroelectric development of Cree and Inuit ancestral lands of northern Quebec. The collection provides a narrow wedge of detached expert analysis on the topic. However, if we read it with a critical eye to the cultural materialism of North American identities, we find the historical roots linking development and the displacement of indigenous cultures.

Harold Innis, in his seminal works on the frontier economics of North America—*The Cod Fisheries: An International Economy* (1954), and *The Fur Trade in Canada* (1962)— saw the historic development of the lands and resources of Canada shift from furs and fish to agriculture and industrial development. Yet Innis had relatively little to say about Aboriginal lifeways, economies, title to the land, and rights to live off its bounty.

Those who followed Colum-

bus ashore had no clear vision—material or spiritual—for the future. Ever since, Amerindians and newcomers have been locked in a trajectory of development and change, and it has become painfully clear 500 years later that the meetings of many cultures have produce mixed results. Indigenous people have seen their cultures attacked, and they have survived with varying degrees of success. Settlers and their descendants have emulated, romanticized, acculturated, and destroyed many aboriginal cultures. The growth of two nations, Canada and America, in fact, succeeded through a complex set of negotiations, denial, and acceptance of aboriginal cultures. Contact in 1492, however, was just the beginning. *Impacts of the James*
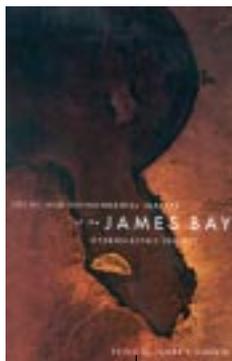
Bay reminds us that the spiritual, physical, and intellectual colonization of indigenous peoples continues to the present.

The James Bay project was made public in 1971 as the largest hydroelectric project in North America. Phase One, La Grande Complexe, completed in 1981, is an engineering marvel made possible by a political accommodation of Cree and Inuit in 1975. Through the collective and individual efforts of James Bay aboriginal communities, environmentalists, academics, lawyers, and politicians, however, the construction of Phase Two, the Great Whale, or Grande Baleine, hydroelectric project has been successfully suspended.

Phase One of the James Bay project was not the first megascale power project in the sub-Arctic, but it is the largest. Stanley Warner and Raymond Coppinger, in their chapter on "Hydroelectric Power Development at James Bay: Establishing a Frame of Reference," estimate the project generates 15,613 megawatts per year and has a reservoir surface area of 15,613 square kilometers. The James Bay project followed closely upon the completion of the generating stations of Kelsey in 1960 and Kettle Rapids in 1966 on the Nelson River in Cree ancestral lands of northern Manitoba.

The Manitoba template of hydro-development established the economic engine of that province without due care for environmental and social impacts and with total disregard for Cree and Métis lifeways. The Nelson River project did not require political accommodation with the aboriginal population until well after its completion, because there was no precedent for including these communities in the process. A significant change resulting from the James Bay project was the requirement to consult Cree and Inuit and gain their consent to complete the project. Aboriginal consent, however, did not lend metaphysical legitimacy to what was conceived of as a purely physical alteration of the environment. Nevertheless, Phase One would not have survived the pioneering environmental and legal challenges without that consent. Since those heady days of the 1970s, we have a better understanding of changes that sprang from the project.

In their chapter "James Bay: Environmental Considerations for Building Large Hydroelectric Dams and Reservoirs in Quebec," Coppinger and Will Ryan provide a scientific perspective on hydroelectric development. Including Cree and Inuit traditional knowledge, especially in considering cumulative impacts, could have made their case much stronger. The James Bay project was heralded by Quebecois as securing their economic sovereignty, but it was equally demonized by Cree, Inuit, and environmentalists as leading to the devastation of immense tracts of lands and waters supporting traditional aboriginal lifeways. Post-impact analysis should mirror such diverse opinion. Coppinger and Ryan ultimately fail to voice aboriginal views and to balance advocacy with what could otherwise have been an excellent overview of hydroelectric development.

While the essays suggest a diversity of views, voices from the bay are noticeably absent from this distant look at James Bay. Adrian Tanner's essay, "Culture, Social Change, and Cree Opposition to the James Bay Hydroelectric Development" is one exception. The collection would have been stronger had it included as well the voices of a highly politicized and knowledgeable group of Cree and Inuit spokespersons educated in mass media communications, on the topic of hydroelectric impacts.

Oran Young, in "Introduction to the Issues," contributes a somewhat myopic, if not outright mythical, overview of the origins of hydroelectric development in North America. He describes the Canadian experience, indeed hydroelectricity policy in the rest of the world, as a product of the American New Deal and experience of the Great Depression. In fact, the roots of hydroelectric development in Canada can be traced to 1916, when Leo Denis, hydroelectric engineer to the Commission of Conservation, and J. B. Challies, superintendent of the Water-Power Branch of the Department of Interior, collected and presented data on the hydrology of all major and minor rivers in the greater part of western Canada. Their field studies began in 1894 and were first reported in 1911 to the Commission of Conservation, chaired by Sir Clifford Sifton and established through the Conservation Act of Edward VII (1909). In 1916, Denis and Challies published a study of the hydrology of the major rivers and streams and their hydroelectric potential, *Water-Powers of Manitoba, Saskatchewan and Alberta.*

Commission of Conservation Canada, Committee on Waters and Water-Powers. Their work drew attention to the developmental potential rather than the environmental or cultural consequences of large hydroelectric projects.

Indeed, environmental histories of development projects, specifically for hydroelectric development, are rare. A recent example is *Cross-Currents*, a historiography of hydroelectric systems in Northern Ontario by Jean Manore. Manore identifies several stages of development since 1880 and charts hydro development as a process of establishing public and voter support, suppressing aboriginal rights, implementing technological innovation, and creating industrial demand. These features were catalysts for a movement of independent

exploration and exploitation of rivers for hydro dams to serve primarily private industrial interests. There was nothing new in the 1970s, when private interests were consolidated into public support for development by submerging aboriginal rights and environmental issues. This changed significantly after 1982, when legal assertions of aboriginal rights and title emerged, and the public, increasingly aware of the destructive impacts of hydro as a green technology, withdrew its support for megaprojects. Canadian courts, and possibly also the public, have begun to affirm aboriginal title and rights. In addition, universities have encouraged interdisciplinary research groups, studies, conferences, and books, to investigate complex problems, in particular those of the aboriginal populations.

Those without any knowledge of the James Bay project will find this collection a concise and informative window to James Bay and hydroelectric development in general. However, it offers no solution to the cultural and environmental problems of hydroelectric development. But perhaps its greatest failure is that it offers no integration of western scientific knowledge with traditional Cree and Inuit knowledge.■

James F. Horning ed., *Social and Environmental Impacts of the James Bay Hydroelectric Project* (Montreal, PQ: McGill-Queen's University Press, 1999), 169 pp.; cloth, $60; paper, $24.95.

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