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THE ENVIRONMENT:
WHY SHOULD BUSINESS SCHOOLS CARE?
(AND HOW SHOULD THEY RESPOND IF THEY DO?)

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June 1990

During this summer semester it has been my privilege to teach a lecture course and seminar in environmental policy at the Wirtschaftsuniversität Wien, and to observe some of the rising interest there in the implications of environmental questions for business management, for Austria, and for the university itself.

I take the liberty before departing, therefore, of offering a few observations. In doing so, I certainly do not presume to know many of the important considerations that must shape decisions at this university, nor to preach a single optimal course of action. But perhaps a few observations from an interested visitor will be of some value.

Let me begin with a favorite cartoon which appeared not long ago in an American newspaper. It showed several business administration students whispering together in the back of a classroom in which the professor had just written the word PRODUCTION in large capital letters on the blackboard. The professor is saying, "Today, class, we are going to talk about production, which means the making of real things." In the back of the classroom, however, one of the students is complaining to two others, "I didn't come here to learn how to make real things -- I came here to learn how to make money!" And another responds in agreement, "Let's sue the Business School -- maybe we can make some money that way!"

What is most telling in this story, humorous as it may be, is the attitude that the ways we make real things and the ways we make money are unrelated. This attitude, if true, is a central issue for the role of environmental questions in business. It is consistent with the conventional wisdom that materials and energy have historically represented a declining portion of both costs and profits, and that the real money therefore is to be made in reducing labor costs, in sales and marketing, and in finance. Environmental issues in this case become simply matters of regulatory compliance, of overhead costs for waste treatment technology, and perhaps of image marketing (e.g. "natural" ingredients").

It is possible that this attitude is more typical of American business schools than of the WU. Unlike any American business school that I know of, for instance, the WU does include institutes for regional planning and for technology, which at least provide opportunities -- whether or not many students utilize them -- for cross-fertilization between mainstream business management and other disciplines concerned about "real things." The WU also seems to have at least some students who are very active and involved in environmental questions, not merely in making money: witness the recent environmental conference "QUO VADIS?", jointly sponsored by AIESEC at the WU and by collaborating student organizations at the technical and legal universities.

More generally, however, changes now gathering force in the world of "real things" are rapidly changing many of the basic assumptions and opportunities of business management throughout the world. These changes include in particular the increasing scarcity and instability of some materials and energy supplies; the dramatically increasing cost of waste management, and of rehabilitating environmental conditions degraded by

pollution; and especially in the less developed nations, the explosive growth and urbanization of the world's population.

These environmental issues can no longer be considered merely a passing fad of the affluent middle and upper classes. They represent, rather, a major and enduring change in the real world in which businesses must operate, both worldwide and in Austria. For a business university such as the WU, they present major challenges, but also a tremendously important opportunity and responsibility: to lead in providing the different training that the rising generation of business managers will need.

Let me offer several examples of how these issues affect major fields and institutes of business management.

ENVIRONMENTAL PROTECTION AS WASTE REDUCTION

An important change in perspective on environmental protection has been promoted over the past few years, not by governments or environmentalists but by voices within the business community itself. This idea is that pollution prevention pays: that the ways we use materials and energy to make real things do matter, that wasting materials and energy is expensive, and that innovations to reduce waste and pollution therefore are not only a contribution to society but even to a firm's own profits and competitiveness. In the words of a leading business advocate,

Pollution is a visible sign of inefficiency in industrial operations. It's money that is going up the chimney, down the sewer and out of a plant in waste trucks ("Profit...", 1980).

This insight challenges the attitudes and assumptions of people throughout each business: not just environmental engineers and waste treatment plant operators, but chief executives and vice presidents, cost accountants, plant managers, product designers, shop floor workers, and others. It also should challenge people who manage business organizations outside the manufacturing sector, such as in agriculture, in hospitals, in universities, and in government operations: all organizations that generate waste materials and energy (cf. Prete et al., 1988).

Waste disposal historically was accomplished by two practices. One was dilution of wastes in the environment, trusting to the natural "assimilative capacity" of air and water to reduce chemical concentrations below the thresholds of any harmful effects. As the sanitary engineers would say, with their touching sense of poetry, "the solution to pollution is dilution." The other practice was simply dumping of materials in shallow landfills, trusting that they would not cause unacceptable hazards to human health in such locations.

Since 1970, government regulations have required increasingly costly technological measures for waste "treatment", requiring all major businesses to install costly technologies at the "end of the pipe" to reduce the toxicity of their wastes before discharging them into the environment. More recently, they have imposed increasingly stringent (and therefore costly) technological controls on the design and operation of landfills as well.

By the 1980s, after over a decade of treatment and landfilling requirements imposed by national governments, all three of these conventional waste disposal practices--dilution, landfilling, and waste treatment--had become both increasingly costly and to some extent discredited. There were at least six reasons for this:

1. Dilution and landfilling were not solving the problem of pollution, as illustrated by rivers catching fire, lakes "dying," oil spills, ground water contamination from leaking landfills, and adverse health effects due to air pollution.
2. Dilution and landfilling simply redistributed the problem. Neither actually reduced the mass of materials discharged into the environment: they simply spread them around differently, so that the materials accumulated elsewhere, such as in distant lakes or forests (acid precipitation), in ground water (leachates from landfills), or in fish (toxic chemicals reconcentrated through food chains).
3. Treatment only changed the form of the materials discharged. It removed wastes from one medium only to discharge them into another: water pollutants became sludges or volatile vapors, solid wastes were burned, air pollutants were scrubbed into ash slurries or sludges, and so forth. They still had to be put somewhere, and the siting of such disposal facilities was becoming increasingly costly and controversial.
4. From a business point of view, as regulations tightened on all three media, waste disposal costs became a far more significant and rising cost of production. These costs included direct capital and operating waste costs for waste management technologies; they also included administrative costs of regulatory compliance, costs of negotiating public approval for new facilities, and open-ended economic liability for cleanup costs of any resulting pollution.
5. These costs, moreover, were simply deadweight losses, not investments from which the company could expect to recoup future profits or savings.
6. Finally, the energy crisis of the 1970s dramatically increased both the costs themselves, and business awareness of the material and energy costs of production.

To quote once again from a business speaker:

Most of our technology was designed at a time when materials and energy were cheap. Quite correctly, it was optimized for that set of circumstances. But there's an immense opportunity to rethink the whole thing now in terms of today's prices... Every manager, whatever his function, has to rethink his job in terms of both what he does inside the company and his actions that affect the outside environment... You can go into any plant and by changing processes reduce waste without adding on any pollution control equipment ("Profit..." 1980).

The time was ripe, therefore, for new ideas that addressed pollution at more fundamental levels of materials and energy, economics, and business decisionmaking. These ideas are now becoming increasingly widespread in the business community, and beginning to be adopted by governments as a new framework for environmental management as well (Schechter, 1987; U.S. EPA, 1986, 1987).

Waste reduction was advocated by researchers at least as early as the late 1960s (Bower and Spofford, 1970; Kneese and Bower, 1979), but was first popularized by two authors within the business community itself, in the mid- to late 1970s. One was the 3M Corporation, which undertook a full-scale commitment to waste reduction and pollution prevention and then publicized the results widely. Within the first six years of this program, 3M operations had implemented 545 projects that saved the company a total of \$97 million; many of these savings continue to lower annual operating costs, and new

opportunities for further cost reduction continue to be identified (Low- or Non-Pollution Technology, n.d.).

The other author was Michael Royston, a British-born chemical and environmental engineer and lecturer at the Center for Industrial Studies in Switzerland, whom I have quoted twice above and whose 1979 book, Pollution Prevention Pays, attracted broad attention to the concept within the business management community as well as from governments (Royston, 1979).

The concept of waste reduction is based upon two general principles:

1. Waste residuals from a production process actually represent losses of valuable materials and energy from the process; and
2. Energy, manpower, materials and capital must be used to manage the process wastes.

By reducing the quantity of materials lost from the production process, or recovering the energy and materials they contain, the values of those materials and energy are themselves saved; and in addition, the costs associated with managing them as wastes can be significantly reduced. In fact, reduction of wastes saves money in far more ways than one might initially suspect. For example:

1. Avoidance of disposal and discharge costs: This is the most obvious benefit, but includes both the operating costs of existing treatment technologies and disposal facilities, the avoidance of expensive investments in new facilities, the rising costs and difficulties of siting new facilities, and the avoidance of future cleanup costs if new knowledge should lead to even tighter regulation in the future.
2. Reduced compliance costs: Waste reduction will significantly reduce the bureaucratic costs of complying with hazardous waste regulations, and may allow many firms to escape these costs altogether.
3. Lower risk and liability costs: Hazardous waste reduction means that firms entrust fewer wastes to transporters and disposal sites that may handle them improperly, and in many cases substitute less hazardous materials within their own operations as well. These changes should lead to reduced liability for cleanup costs, as well as to a safer workplace for their own employees--and for both reasons, to reduced insurance costs.
4. Reduced production/maintenance costs: Materials and energy that are not discharged as wastes represent materials that do not have to be purchased as raw material inputs to production either: the less going out as waste, the more efficiently it is being converted into products on which a profit is made. Dramatic examples of this change have been documented in such businesses as metal plating, in which until recently very expensive as well as toxic materials have commonly been wasted because of a lack of attention to waste reduction opportunities in the design of rinse systems.
5. Income through sale/reuse of wastes: The recovery of materials from waste streams often provides opportunities for recapture of materials that can actually be sold, either directly or through brokers or waste exchanges, for an additional profit.

6. Finally, waste reduction provides major benefits not only to waste generators but to the community, in the form of a healthier environment, with less risk of air pollution, ground water contamination, fires or explosions; safer highways, since reduced generation means less hazardous materials cargoes are transported; and less taxpayer costs for new treatment and disposal facilities, which often must be provided or at least permitted by government (and of course most businesses are also taxpayers themselves).

There are by now many examples of successful waste reduction innovations, all of which have been proven profitable and usually with surprisingly short payback periods. These innovations have been documented in a lengthening list of publications and compendia (e.g. Royston, 1979, 1980; Huisingh *et al.*, 1985, 1986; Sarokin *et al.*, 1985; Gardner and Huisingh, 1987; Schecter, 1987; U.S. Congress, OTA, 1986, 1987; U.S. EPA, 1987). But they are not yet close to universally utilized, nor are the procedures for identifying such opportunities -- often called "environmental auditing" -- yet taught in standard business school curricula. Significant opportunities exist in this area for both teaching and research (National Research Council, 1990).

ACCOUNTING FOR THE ENVIRONMENT

Under traditional accounting practices, some costs of waste management often are not incorporated explicitly into the formal accounting/control framework. Some costs of waste disposal, such as sewer charges, are normally included in utility costs, while others may be treated as administrative costs or general overhead ("period costs"). In either case, however, many firms do not identify them in sufficient detail to charge them directly to individual products or processes, often because despite their potential importance to environmental protection, they represent only a small fraction of total production costs. The result is that cost and risk assessment are separated from control and business mix decisions, and managers are given no incentive to reduce waste disposal costs unless total margins (over all production lines) are threatened.

Second, even if a firm wishes to identify waste disposal costs in detail, there are widely varying practices and no clear accounting standards concerning how to do so. One such problem, for instance, concerns how to allocate joint costs of waste disposal in multi-product plants. Another is how to value materials and energy that are recovered, such as waste sawdust that is recovered from a sawmill and reused as an input to pulp manufacturing. Significant differences may result in the apparent benefits of waste reduction, as well as in actual tax and cost considerations. Similar issues also arise in evaluating plant modernization or replacement decisions that serve in part to reduce waste discharges (in order to comply with water and air pollution standards, for instance), but also increase productivity and cut costs overall.

Finally, traditional financial disclosure practices fail to recognize potential contingency costs of leaks, spills, unsafe waste disposal sites, and other environmental impairment liabilities until a lawsuit or regulatory action is initiated. As a result, managers fail to see the true financial risks of unsafe waste management (and conversely, the potential benefits of waste reduction); and capital markets may not distinguish appropriately between well-managed and risky firms (Todd, 1989; Naj, 1988).

There are both important opportunities and urgent needs for collaboration, therefore, between experts in accounting and experts in scientific and technological fields to identify refinements in accounting practices that would incorporate environmental cost and risk considerations more effectively into business decisions, both by executives and managers and by capital markets.

NATURAL AND ORGANIZATIONAL ENVIRONMENTS

Even when pollution prevention apparently pays in direct economic terms, many businesses have proven unexpectedly slow in adopting new technologies or practices. The organizational behavior literature suggests that corporations have more than one goal, and that their behavior in practice reflects political compromises among the multiple goals of their constituencies: owners, senior managers, employees, suppliers, distributors, customers, competitors, regulatory agencies, neighbors, the financial community, and society in general (cf. Scott, 1987; Cameron, 1980; Cohen, 1984).

Any attempt to intervene to achieve a particular outcome, therefore, such as waste reduction or environmentally preferable products, requires explicit consideration of how it advances or retards other corporate goals, what tradeoffs it requires among them, and how its pros and cons are perceived by these various affected constituencies. To my knowledge, however, few scholars of organizational behavior have yet attempted to explore the many potential applications of their knowledge to the problems of businesses and the natural environment.

GREEN MARKETING

Yet another important subject is so-called "green marketing:" that is, the marketing of products that are, on balance, less damaging to environmental processes than their alternatives. Some such products are of course quite traditional and well established already, whether or not marketed as such; others are proposed as new substitutes for more damaging products. "Environmentally friendly" products include in principle, for instance:

- . products that contain less toxic constituents than their competitors;
- . products that require less materials and energy for their manufacture;
- . products that are recyclable;
- . products that are made from recycled materials, thus expanding the markets for substitution of such materials for new raw materials;
- . products that are more durable, thus requiring less frequent replacement; and
- . products which can be decomposed readily by natural processes when discarded.

Many firms are now marketing products as "environmentally friendly." However, there are many ambiguities in some of these claims, and some may ultimately be discredited. All products have some environmental impacts, and many advertising claims being made in this area today are based on quite superficial and selective evidence, or even purely on "image" considerations. Recently in Vienna, for instance, there were advertisements in the streetcars for fresh Jaffa oranges, "the fresh fruit out of the peel, because we already have too much packing material" -- ignoring the fact that both the weight and volume of orange rinds is far more than the paper container for an equivalent amount of orange juice, and that even in Vienna orange rinds are in most areas not yet conveniently recycleable.

Similar issues arise with claims for "biodegradable plastics," which have a starch added to make them crumble after prolonged exposure to sunlight. This characteristic may marginally reduce the hazard of wildlife strangling on sixpack-holders, but it leaves just as much plastic in the environment in smaller fragments. Nor does it eliminate hazards associated with plastic combustion in incinerators; and in landfills the plastic has no sunlight and therefore does not break down anyway (nor do even more "organic" alternatives such as paper, for that matter -- core samples of old landfills, even those built on wetlands that would presumably be ideal for decomposition, have unearthed legible

newspapers from the early 1950s, along with half-eaten but clearly intact corncobs). In short, this apparently attractive alternative does not appear to have, under most circumstances, the environmental benefits sometimes claimed for it.

But there are two important truths underlying the attempt to make such claims. One is that some products are in fact less harmful to the environment, as well as less costly to manage, than their alternatives. The other is that consumers increasingly are demanding such information and acting on it. Buying phosphate-free detergents does reduce water pollution; using pump sprays, rather than FCKW propellants, does help protect the ozone layer; using products made from recycled materials does reduce the need to extract more from the land, as well as supporting the effectiveness of municipal recycling programs; and so on.

Clearly the demand for documentation and standardization of such claims will grow, and with them significant shifts in markets for many types of products. Various countries now have standardized labelling programs, ranging from specific informational labelling (such as toxic or recycled content, or types of plastic for recycling purposes) to more general claims of environmental benefit; a study of such practices was recently completed at the University of Lund on environmental labelling practices in the EFTA countries (TEM Foundation, 1989).

Moreover, if municipal governments are to reduce the enormous and growing costs of waste management, it is essential that strong new markets be developed for recycled materials, and that consumers of all sorts become increasingly responsive to the environmental consequences of their choices. This means not merely households, but especially the major intermediate and institutional markets -- wholesale and retail businesses, state enterprises and government agencies and hospitals and universities, and others -- for large-volume materials such as paper goods and packing materials.

With these trends, therefore, have come new and important challenges for business managers throughout the manufacturing and commercial sectors, and for product design and marketing specialists as well: to reassess their own input factors and procurement opportunities, to create new markets for products containing recycled materials, to expand existing markets through increasing consumers' awareness of their products' environmental benefits, and to reformulate existing products to make them more environmentally beneficial. In particular, they will need to collaborate more closely with environmental scientists and engineers in accurately assessing what the environmental consequences of each line of products is, in comparison with its competitors, throughout its life cycle.

ENVIRONMENTAL CONSIDERATIONS IN STRATEGIC PLANNING

Beyond the implications of operating costs and marketing important to mid-level managers, environmental considerations are potentially important in corporate **strategic** decision processes (see e.g. Miller, 1987; Porter, 1986). It may well prove that very different (and probably more long-term) environmental concerns and opportunities are important at the level of corporate strategic planning than those that are most frequently considered at the level of particular existing products and processes.

These considerations include such questions as where to locate new production facilities, how diverse a business mix the organization aspires to run (for instance, whether or not to integrate new waste-to-byproduct production into the business), and whether and how to coordinate operations with other firms (for instance, co-location of complementary operations for cogeneration of energy, to shorten production sequences and reduce packaging, or to exploit other waste reduction opportunities). For some firms, the

enhanced reputation resulting from a recognized and effective waste reduction program may be the central driving force. For others, especially some small firms, technical and economic risk may overwhelm all other considerations, and demonstration of these factors in practice may be the most persuasive argument.

FINANCING SUSTAINABLE DEVELOPMENT

Finally, the fields of both economic development planning and finance are now facing questions that have overwhelming environmental as well as economic implications. In Eastern Europe today environmental degradation on a vast scale is linked primarily to economic stagnation, in Africa to population, in Latin America to financial debt; but in all, a common fundamental question is how to restructure economic arrangements to meet human needs and aspirations without further destroying the environmental conditions on which the continuation of any human civilization depends.

The 1987 report of the UN World Commission on Environment and Development, Our Common Future, gave to this necessary combination of goals the label "sustainable development" (World Commission on Environment and Development, 1987); and a central task for applied research is to give operational meaning and effective implementation to this concept. This task will require new and intensive collaboration among scholars of economic development planning, international finance, and their colleagues in the environmental and social sciences.

Some voices now call for rapid industrial development in these countries to expand jobs and markets, leaving environmental considerations for later once material standards of living have been improved -- assuming, apparently, that environmental protection remains a luxury consideration for more affluent populations. In reality, however, both the capital that is to be invested and the environmental resources affected are increasingly scarce and important assets, even more so in poor countries than in more affluent nations. It is crucially important therefore that they be allocated carefully, taking into account the full social costs and long-term values involved in each choice.

In some cases, one may hope that careful analysis may well reveal new patterns of economic development that would be both economically and environmentally preferable. In Eastern Europe today, for example, vast amounts of air pollution result from the use of brown coal to heat poorly insulated buildings; far greater benefits both to those nations and to neighboring countries might result from investments in energy conservation measures, and in the economic infrastructure to provide such measures, than in large new smokestack industries. In both Africa and Latin America, there is a growing consensus that both traditional economic development strategies and current patterns of international trade have had devastating effects on both environmental and socioeconomic conditions; not only for these countries' well-being, but for the future of international business itself, serious reassessment and corrective strategies are essential.

THE CHALLENGE TO UNIVERSITIES

A growing number of business firms have now taken the lead in advocating waste reduction, green marketing, and even more fundamental strategies for incorporating environmental considerations into their decisions. A lengthening list of examples gives empirical justification for these trends. Larger initiatives are also underway through international institutions, such as the environmental restructuring within the World Bank, international negotiations affecting businesses such as the Montreal Protocol on FCKW Reduction, and recent proposals by some national leaders to dramatically reduce carbon

dioxide emissions (and by implication, to fundamentally redirect the energy sector and thus innumerable business decisions).

A major gap still, however, is the relatively slow penetration of these ideas into university curricula and research -- not to mention their own operations, although I commend the WU on its own recycling program for used paper. Let me close these remarks, therefore, by highlighting some of the major challenges and opportunities that I believe environmental issues present to a business university.

The most important challenges for business schools in responding to these needs are probably the initial unfamiliarity of the subject matter, rooted as it is in the specifics of particular materials and environmental conditions rather than in the generic principles of finance and accounting, and the intrinsic necessity of interdisciplinary collaboration in addressing such questions.

Waste reduction, for example, requires collaboration between business managers and accountants and engineers, not simply management of people and numbers. Ecological marketing requires collaboration with scientists about what claims are justified, not simply catering to people's desire to think they are buying environmentally friendly products. Environmentally sustainable economic development strategies require creative collaboration between economic development and finance scholars, environmental economists, and a diverse range of environmental and social scientists.

What is needed in a university such as the WU, therefore, is probably two institutional innovations, not one. One is an organizational unit, such as an institute, that has a clear primary focus on these questions, so that they do not merely become submerged in the dominant teaching and research directions of other existing units.

The other and equally essential need is for serious steps to encourage interdisciplinary and inter-institute cooperation in research and teaching, so that the faculty of such an institute includes strong representation of, and links to, diverse fields that are all essential to its intellectual mission: economics and management, economic development planning and international business, law, accounting and finance, marketing and organizational behavior, environmental science and technology, and so forth. No one faculty member or discipline can address these issues satisfactorily alone; real collaboration will be essential.

One device to promote such collaboration might be some arrangement for joint appointments or shared responsibility for such a program, involving faculty from multiple disciplines and with ties to the other relevant institutes of the university as well. The basic point, however, is that a strong environmental program cannot be instituted by one discipline or institute in isolation: it needs a point of institutional leadership, but also real collaboration among interested faculty linked to all relevant aspects of business and to other related disciplines as well.

I hope that these suggestions may help to stimulate your own ideas. Thank you once again for the privilege of joining you.

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