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COVER Optical imaging of primate visual cortex based on the intrinsic, activity-dependent signals. An overlaid image of the orientation columns (cortical regions that respond preferentially to visual stimuli containing borders of a particular angle, indicated by a particular color) and the ocular dominance columns (cortical regions preferring left eye stimulation coded by a darkening of color). See page 417. [Field of view: 6 millimeters by 3.5 millimeters. Imaged by Daniel Y. Ts'o, Ron D. Frostig, Edmund E. Lieke, and Amiram Grinvald, The Rockefeller University, and IBM Research Division]

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The Laws of Sociodynamics

Events in Eastern Europe, the Far East, and the United States indicate that there are laws of sociodynamics every bit as fundamental as the laws of thermodynamics. Systems that obey the laws of human nature and economics work; those that defy them fail. The first law of sociodynamics would appear to be, "There is no free lunch." That law holds even if lunch is converted to energy equivalents like breakfast and dinner. The second law is, "Humans are motivated by what has been done for them lately," a harsh rendition of the more publicly stated version, "I am motivated to work for the good of humanity, and it is a fortunate circumstance that what's good for humanity is good for me." The third law, is, "Humans have a basic urge to sweep criticism about themselves under the rug," an urge which is encouraged strongly by bureaucracies and absolutely by dictatorships.

Westerners are currently enjoying some smug satisfaction at the economic disasters revealed in Eastern Europe, but smugness cannot last long under pressures of a global economy. In a free enterprise system the free lunch is usually packaged as "loans" or "taxes on corporations" that won't cost the taxpayer a cent. Subsidies to people who want to buy homes are camouflaged as "savings and loans," foreign assistance is made painless as "foreign loans," and bolstering of industries threatened by foreign competition as "industrial loans." The goals are worthy; the only error is the implication that it will not cost anything. Mandating environmental regulations conjures to innocents the vision of some chairman of the board saying to his chief executive officer, "Joe, old friend, these new regulations are going to cost a bundle, so your billion-dollar salary has to be cut in half because it is unthinkable for me to pass the cost on to the little guy by increasing the price of our product." In the real world, the unthinkable usually happens. New regulations should require an Economic Impact Report in which real costs and who will pay them are exposed before enactment of any legislation. We could, for example, have environmentally perfect cars that have priced themselves out of the international market. Then white-collar workers in Los Angeles will benefit, but blue-collar workers in Detroit will suffer.

The second law of sociodynamics is subtle because many people are truly altruistic and incentives vary. Nevertheless, to expect sustained effort in any area of work, the incentives must be significant and appropriate. "To each according to his needs, for each according to his abilities" is an attractive slogan for artists and scientists, who are paid in large part by fame and psychic income, but it provides little motivation for a farmer or a ditchdigger as Soviet agriculture illustrated. So a well-working system requires pluralism—fame as incentive for some types of jobs, money for others. The difficulties arise when the incentives are forgotten. Scientists, for example, are willing to work for astonishingly little money but the quid pro quo is sufficient research funds to allow them to receive the inner satisfaction of a job well done. If society wishes to pay artists and teachers relatively little, it must at the very least provide the rewards of job satisfaction. Scientists today are asking for more research support, not higher salaries. Businesses are asking for capital gains, not more prizes. Good scientists and good teachers deserve a decent salary, and good businessmen deserve respect, but the incentives for superior performance must be designed differently for each profession in order to maximize productivity.

The third law is particularly important because the complexity of modern society means projects and professions get very big. There is a great urge for bureaucracies to conceal the little human error here and the little mechanical error there because in their enlightened view the unwashed masses might come to the wrong perspective. As a result, little errors become big errors. Even a vigilant press and a democratic society cannot prevent failure of conscience such as a Watergate or a failure of diligence such as the Hubble trouble; but they will prevent failing systems from lasting over generations as they did in the Soviet Union.

The world is entering an era of global competition and global tension that will be far less forgiving of systemic errors than in the past. Facing true costs, providing proper incentives, and being willing to expose error and inefficiency will be required of nations, political programs, and scientific projects. The obvious correlation between the laws of thermodynamics and the laws of sociodynamics is that whenever they are violated, someone will feel the heat.—DANIEL E. KOSHLAND, JR.