Part II: Computerized economics as an instrument of brainwashing

by David Goldman, Economics Editor

One of the surviving founders of "systems analysis" economics, retired Yale Professor Tjalling Koopmans, described the transformation of the economics profession in a recent interview as follows:

> The quantitative approach started gaining ground in Europe during the 1930s. We started seeing a lot of activity in new thought in systems analysis. Although we at the time were only a small minority of the economics profession, we drew on the thought of Russell, Wittgenstein, Ernst Mach, and Bortkiewicz, who was a statistician in Germany. In 1931, an econometric society was set up in England, and an econometrics group was established in Oxford. The leaders were Ragnar Frisch, Tindbergen, and someone you could say brought the whole group together. This is Jacob Marschak, who was born in Russia and had studied in Germany during the Hitler years, and who then moved to the United States and established himself at the New School for Social Research. At the same time, Marschak met [Alfred] Cowles, and joined the Cowles Foundation.

As Koopmans described systems analysis, it followed the precise groove dug by John von Neumann in his 1932 paper:

> Linear programming describes the production process as a set of alternative processes, each process defined by ratios of inputs of different capital stocks, to one unit of output. We assume that if we double inputs we will get double outputs. For different assumed outputs, we see whether we can reach a production goal and price goal, assuming constraints on primary inputs.

Two networks in the United States received the gospel according to Russell and Carnap. One was the group around Yale Professor Irving Fisher, now most famous for his predictions that the 1920s stock boom would last forever. Fisher was a failed mathematician whose passion in life was eugenics, the "race science" that became unpopular when the Nazis championed its cause so effectively. He was vice-president for the United States of the Third International Commission on Eugenics under the Theodore Roosevelt administration; Chairman of the Board of Scientific Directors of the Eugenics Record Office as of 1917; Chairman of the Board of the Euthenics Corporation; and a member of the Eugenics Research Association. As a "pioneer" in monetary economics, Fisher was also a father figure to such other committed eugenicists as future Federal Reserve Chairmen Laughlin Currie and William McChesney Martin. Currie, whom J. K. Galbraith praises for stocking the Washington bureaucracy with Harvard Keynesians after World War II, went on to direct postwar World Bank activities in Colombia, and is credited with the first successful program for population-growth suppression in the developing sector.

One of Fisher's Yale University students, Minneapolis newspaper heir Alfred Cowles, provided the first bankroll for the new "systems science" in the United States. The same year that Abraham Flexner recruited John von Neumann to the new Princeton Institute for Advanced Studies, Cowles engaged Irving Fisher to create the Cowles Commission on Economics Research. A year earlier Fisher had founded, at Yale, the Society for Quantitative Economics, along with the Vienna-

trained Norwegian Ragnar Frisch. The Cowles Commission began quietly in Colorado, and then moved to the University of Chicago, where Milton Friedman was beginning his Ph.D. program under Henry Simons. Future Noble Laureate Kenneth Arrow, one of the authors of the *Triple Revolution* statement on behalf of "post-industrial society," began work with the Cowles group while at Chicago, before departing for Stanford. 1975 Noble Prize winner Koopmans moved the Cowles Commission back to Yale, where it began, in 1955. 1981 Nobel Prize winner James Tobin, the reigning American Keynesian, became a subsequent head of the Cowles Foundation.

The road to RAND

The other great track of postwar promotion in the economics profession was the one culminating in the RAND Corporation at Palo Alto, the embodiment of what, during wartime, was to be known as "Operations Research" and later the Strategic Bombing Survey.

The same circles at Princeton, Columbia, and Harvard who imported the Russell-Carnap "systems" theory dominated Anglo-American wartime science policy. As noted in *The Ugly Truth About Milton Friedman,* [by this author and *EIR* founder Lyndon LaRouche] the Unification of the Sciences project was imported wholesale into the United States through the U.S. Emergency Committee in Aid of Displaced Foreign Scholars, controlled by Abraham Flexner, by Chicago transplant to Columbia John Dewey, by Dewey's prize student Wesley Clair Mitchell of the National Bureau of Economic Research, and by Oswald Veblen (Thorstein Veblen's younger brother), late of Army Ordnance and then at Princeton.

Meanwhile, at the Massachusetts Institute of Technology, Vannevar Bush had, by 1932, made operational the first electronic differential analyzer, the ancestor of the computer built during the war for military use at the same school. Norbert Wiener, the inventor of the term "cybernetics," was already at MIT collaborating with Bush, the future wartime science chief. Bush was hired in 1932 by the British government to reproduce his work there. With the collaboration of Cambridge University's Sir John Lennard-Jones and others, Bush helped to establish the Cambridge Mathematical Laboratory, which worked jointly with MIT to produce the first computer. Properly speaking, the computer as we know it was hatched at MIT, with refinements at the Princeton Institute for Advanced Studies in cooperation with RCA, under the principal influence of von Neumann.

The computer's initial uses centered on ballistics calculations, bomb site calculations, and strategic bombing battle plans (the Air Force "Project Scoop"). Electronic calculation was only one facet of the project directed on the American side by Vannevar Bush and by James Conant of Harvard and by Churchill's science adviser Sir Henry Tizard for the British: as Carol Cleary has shown in unpublished manuscripts, the modern system of control of technology through arbitrary classification procedures emerged from this wartime crew. But the dream of "artificial intelligence" was born with the first operational computers; the first response of its makers was to attempt to keep the technology secret, and construct one giant computer capable of containing all the data in the world so that an elite possessed of such superior knowledge might rule the world! However, the limited uses of von Neumann's systems approach, bogged down in the algebraicist prejudices built into the initial logic hardware, qualified the computer more as an instrument for deluding the credulous than for policy planning as such.

Cambridge University's Nicholas Kaldor supervised the construction of the first computer-based econometric model for the Strategic Bombing Survey in 1946, with Wassily Leontief as chief statistician. It brought together the work of 1941-45 in development of computer-based models conducted jointly by Vannevar Bush's National Research Defense Council and P. M. S. Blackett's "Blackett's Circus," the outgrowth of the Cambridge Mathematical Laboratories. Bush's group, headquartered at the Carnegie Endowment in Washington and funded by John D. Rockefeller II when government money ran short, included James Conant of Harvard, sent to London to work with Blackett; MIT President Karl Compton; and Bell Laboratories President Frank B. Jewett.

Integrated into the same effort that developed the first working numerical-computational models were the British psychological warfare command, H. V. Dicks and John Rawlings Rees of the Tavistock Institute, the experts on the impact of strategic bombing on enemy morale and, subsequently, the inventors of the program to sell computers as a means of brainwashing corporations and government.

This is the group that came together under the direction of Prudential Life Insurance Company Chairman Frank d'Olier—the major funder of the Princeton Institute—for the Strategic Bombing Survey (SBS). Its participants, including J. K. Galbraith and George Ball, are a *Who's Who* of the post-war establishment. Air Force Intelligence, which assembled the U.S. SBS team, regrouped the top staffers from the Cambridge-directed survey and from Bush's group in Washington into a semi-official Air Force think tank, the RAND Corporation. RAND was the recipient also of the SBS computer model, the first working econometric model of the postwar period. According to Futures Group officer Wayne Boucher, "It was an entirely East Coast defense establishment operation. None of the people in Santa

Monica knew RAND was there—and the RAND people didn't know Santa Monica was there."

RAND was the hothouse for every "name" economist in the postwar United States. The present chairman of the Cowles Foundation, Herbert Scarf, reminisced in a recent interview:

> It was the Air Force that set it up. In the 1950s, RAND was a great place to be. It was like Cowles. Do you know who was in the Economics Department at RAND in the 1950s? All the people who became [Kennedy and Johnson Administration Defense Secretary] Robert McNamara's whiz kids. But these were people who were in the economics group at RAND and include Albert Wohlstetter and [future Hudson Institute founder] Herman Kahn, who were working on analytical formulation; Alain Enthoven, who was a top person at the Defense Department, Daniel Ellsberg, William Gorham, who is the current head of the Urban Institute, and Henry Rowen, the famous defense analyst. At the same time, Paul Samuelson, another Nobel Prize winner [1970] was at RAND at the late 1940s and early 1950s as a consultant.

So were Tavistock's H.V. Dicks and Brigadier Frank Kitson, inventor of the British "low intensity operations" approach used so horribly in Malaysia, Crete, Kenya, and Northern Ireland; both lectured at RAND in 1950, while Dicks spent six months there working on the Russian psychological profile. The new Delphi had been transplanted successfully from Vienna, to Cambridge, to the major East Coast universities, and thence to Santa Monica, where its tendrils overran the American defense establishment of the 1960s.

Economics as brainwashing

The "information theorists" who set out to turn corporate and governmental management into bureaucratic slush built on a tradition that goes back to the turn-of-the-century founding of the Chicago and Columbia Social Work Schools. John Dewey's "social psychology," i.e. the assertion that the human mind can contain no more than heredity and social institutions dump into it, was the core of Chicago monetarism, according to Dewey's student Wesley Clair Mitchell, the man who invented Milton Friedman:

> To find the basis of rationality, then, we must not look inside the individual at his capacity to abstract from the totality of his experience the feeling elements, and to compare their magnitudes [as Jeremy Bentham and the other utilitarians had argued]. Rather we must look outside the individual to the habits of behavior slowly evolved by society and painfully learned by himself. Of course, the use of money is one of these great rationalizing habits. It gives society the technical machinery of exchange. . . . It is the foundation of that complex system of prices to which the individual must adjust his behavior in getting a living . . . since it molds his objecive behavior, it becomes part of his subjective life. . . . Because it thus rationalizes economic life itself, the use of money lays the foundation for a rational theory of that life. Money may not be the root of all evil, but it is the root of economic science.

In other words, monetarism is not an instrument for *analyzing* the behavior of firms but rather a method for *controlling* it. That, as LaRouche and I showed in *The Ugly Truth About Milton Friedman,* is precisely what Mitchell's National Bureau of Economic Research, the unofficial thinktank for the Federal Reserve System, set out to do. Its "business cycle theory" insisted that excess investment led to excess capacity and recession, in a way not basically different from the Cambridge view, and therefore recommended tight money policy at any time the economy began to expand—thereby creating a self-fulfilling prophecy of "yin-yang" economic behavior.

To put the matter in perspective, there is no objective need for period recessions: *business cycle theory* creates recessions. If that is true, then what is responsible for postwar inflation? As will be demonstrated shortly, *price theory* creates inflation.

To persuade American businessmen to operate within Cambridge's fixed universe, it was first necessary to make the universe appear as fixed as possible. This task the Federal Reserve, dominated by Irving Fisher and Wesley Mitchell's protégés, carried out unpleasantly well, as documented in the cited work. Both domestic and foreign monetary policy—with the 1944 formation of the International Monetary Fund and World Bank—conspired to place limits on the rate of expansion of the American economy, which could not invest for massively expanding markets without running up against such externally imposed limitations of "effective demand." Only to the extent that the military or the space program have provided a direct or indirect market for capital equipment has American industry invested at anything close to the rate of which it is capable since the Second World War. Before the Great Depression, industrialists like Henry Ford and Samuel Insull had invested with the confidence that the improvements in the auto and electrical generating technology they embarked on would qualitatively change the market and cause sufficient expansion to absorb whatever product they might choose to sell. Now, for the first time in American economic history, the "market" became a fixed and

abstract—if not hostile—entity outside the capacity of individual firms to influence, except as they chose to squeeze better shares out of it.

In business schools as well as economic departments, revealed religion became the "neo-Keynesian synthesis," the integration of the Cambridge viewpoint with the "theory of the firm" associated with Chicago's Frank Knight and his "uncertainty principle." Paul Samuelson, late of RAND, and Robert Solow at MIT, among many others, created a new belief-structure of corporate management that treated all industrial activity according to the principles of ground rent.

Rent of land, in the original Malthus-Ricardo doctrine, was the focus of economic theory. It stated that the price of grain (and therefore of labor, and hence the rate of profit in industry) rose as land was gradually settled and new supplies of land were exhausted. As worse land came into cultivation and more labor was required to yield the same output of grain, the price of grain rose at the "margin," i.e. was determined by the production cost of the land most recently put into cultivation. Landlords working better land with a lower cost of production therefore drew a premium, being able to sell their grain as well at the higher, marginal cost, yielding a rent. Of course, the theory was nonsense, as the American economist Henry Carey demonstrated: as newly settled areas absorbed sufficient population to drain marshland and other previously uncultivable land, the best land was brought into cultivation well after such an area was settled. Malthus, as noted earlier, freely admitted that drainage, canals, and roads reversed his earlier conclusions.

Keynesian curves

However, by extension, the "neo-Keynesians" transformed economics into a collection of marginal price curves. There is the supply-demand curve, which shows that more supply will come to market as prices increase; there is the utility curve for each consumer item, which shows that consumers will substitute one item for another in their shopping basket as relative prices change; there is a marginal-cost curve, which shows the individual firm's production costs falling as he produces to scale and then rising as he attempts to increase production by drawing on scarce resources; and there is a point of intersection of all these curves, or "welfare equilibrium." As Paul Samuelson summarizes the case,

> The ideal competitive market is a device for synthesizing (a) the willingness of people to pay for goods with (b) the actual (minimized) marginal costs of all those goods. Without conscious planning, the competitive market does achieve the Robinson Crusoe or the Planning Board most-efficient allocation of resources.

The supply curve for an industry is merely the addition of all the supply curves for individual firms, the supply curve for all consumers is merely the addition of the supply curves for each consumer, the marginal cost curve for all production processes is merely an addition of the marginal cost curves for each production process.

Linear programming, as applied to individual corporations' activities, merely attempts to show corporate management what will happen if its place on these various curve changes. A producer of refrigerators will have to calculate the combined effects of a movement up the marginal cost curve, e.g., through an increase in the price of its raw materials; the effect on its sales if the firm must increase its price in response (i.e. the "price elasticity" of refrigerators); and the propensity of consumers to buy other goods than refrigerators should the price of refrigerators rise relative to all household commodities. All such analyses, which take the movement of the total economy as a given, most often turn out to be nonsense, since they ignore what sort of general economic shift is associated with such things as a rise in the raw-material costs of a particular firm. The proper place of linear programming is reduced, as LaRouche has shown, to production scheduling, inventory control, and so forth. The premise that the economy works as a simple aggregation of the behavior of individual firms invariably gets management into trouble.

But because, in this equilibrium fantasy-world, no net profits exist, and the profits of individual firms depend on the accidental or other allocation of returns to firms through the workings of the "Knight uncertainty principle," then it would follow that a firm that reduces its "uncertainty" stands to gain additional profits. That is where the computer became an instrument of seduction and the means of persuading American managers to adopt practices that would have been cause for lynching a generation earlier.

Ensconced at the New School for Social Research—founded earlier by John Dewey and Thorstein Veblen—"the man who put it all together," Jacob Marschak, propounded a highly specific solution to the Cambridge problem of stopping over-accumulation. "Information theory," of which Marschak became the leading apostle, had two facets. It offered, through the magic of data-processing, a means by which corporations could reduce the "uncertainty" of doing business and increase their profit share. Defining "information" as a factor of production along with capital or labor, Marschak added to the usual marginal cost curves a "cost of information" curve: a corporation might buy additional information, e.g. econometric models or market surveys, and thereby increase its profits. But it would suffer diminishing returns as it bought more and more infor-

mation. Eventually its cost-of-information curve would intersect its benefit-from-information curve, and the corporation would have reached an "equilibrium" position in the information economy. Meanwhile, Marschak's student, Adolph Loewe at the New School, postulated that the "economic knowledge" industry would suit the Malthusian requirement that unproductive spending must rise to prevent excess accumulation.

Marschak's triumph before the economics profession came in 1968, where he delivered the inaugural lecture to the convention of the American Economics Association. This extraordinary speech began with a declaration that information business would soon dominate all others:

> We hear much of today's "informational revolution." We are also told of the rapid growth of the "knowledge industry." Informational revolution is exemplified by TV pictures of the moon surface and also by robotized stock market transactions and, hopefully, by computerized professors. [Austrian School economist] Fritz Machlup defined the knowledge industry to include education and research as well as publishing and broadcasting. He estimated its share in the gross national product of 1958 at 23 percent to 29 percent, and its growth rate at about 10 percent, or twice that of the GNP. Projecting to the present, the share of the knowledge industry would then appear to straddle the 40 percent mark!
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> There is a suspicious overlap between these activities and those which Adam Smith and Karl Marx called "unproductive" and which include the work of kings and professors, none of whom add to the vendible and visible stocks of the nation.

But, Marschak argued, the old productive/non-productive distinction was no longer relevant after the "information revolution:

> A growing proportion of both manhours and machine-hours is not employed for using large amounts of energy, muscular or otherwise, to transform or transport matter. Instead, so-called "brains" (human or otherwise) are employed to manipulate symbols. A sequence or network of such symbol manipulators uses up a minute amount of energy to eventually release, trigger-like, large amounts of energy through the more brutal medium of generators, muscles, and machine tools.

Since Marschak's principle concern was, as noted, to steer investment out of "productive" and into "non-productive" functions, the last statement is in the order of a hypocritical gloss. He proceeded to describe the relation of "utility" of information to the "disutility" of its cost through such conventional issues as inventory control, asking, "Is this not classroom economics? Yes indeed. But it should include the more advanced parts of it which allow for oligopoly, uncertainty, and other such things, mildly called 'imperfections.' " Unlike hard commodities, which may be assumed to have a statistically meaningful average "utility" for all consumers, information is much more subject to the vagaries of personal taste:

> The economic problem of organization is that of allocating numerous kinds of tasks, symbol manipulating as well as physical, to numerous transformers, arranged in a complex yet efficient network. And further complications, of a different kind, arise when a single organizer is replaced by several. Their beliefs and utilities are not the same. They engage in a nonconstant sum game. The economist's problem is then shifted from the search for optimality to the search for stability. . . .
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> The criterion of survival, viability, stability guides the social scientist who describes, and tries to explain, the existing institutions. . . . Along with the stability criterion, the economist uses a weak collective optimality criterion, a modest common denominator on which people might agree in spite of their divergent utilities and beliefs: an arrangement of tasks and incentives is optimal in this modest sense if there is no feasible arrangement that would be better or at least not worse for all members of the organization.

As Wesley Clair Mitchell had argued two generations earlier for a monetarism that imposed its rationality on the market, so Jacob Marschak announced that information economics would be arbitrary unless the information-economists imposed a consensus among managers as to what the "utility" of information might be. But as Marschak addressed the AEA convention, his colleagues at RAND Corporation had already taken steps to ensure this.

Under the sponsorship of the McNamara Defense Department, the Marschak gospel in its various forms took the corporate world by storm. McNamara and his chief aides at Ford Motor Company had started in Air Force Operations Research production teams, and came out of the same pool that fed the RAND Corporation. After nearly ruining Ford (by insisting on poorly produced, mass-marketed, and heavily advertised cars like the Falcon), McNamara brought to the Kennedy Defense Department the entire RAND armamentarium. Joining him were Daniel Ellsberg and Henry Rowen, among other veterans. The damage to the American military due to the random application of "cost-benefit" analysis to weapons systems, and the "body count"

approach to war-fighting, are sufficiently known to permit only mention here. Less well known is the spectacular impact of McNamara methods played back into the corporate sector, where they had had their first gestation period during the 1950s.

What later spread to boardrooms in the form of the "Delphi technique" made its first appearance in a September 1964 study, declassifying a military project entitled, *Report on a Long Range Forecasting Study,* RAND paper P-2982. A copy was mailed to every Fortune 500 corporation. "The press and publicity in the corporate planning field was explosive," reported Futures Group founder Wayne Boucher in a recent interview. "This study revolutionized corporate planning in the United States. Hundreds of corporations began thinking of setting up their own groups." Ted Gordon, now president of the Futures Group, and Hal Becker, the Group's treasurer, were both consultants to the original study. Corresponding in the study abroad were H. G. Wells' protégé Denis Gabor, the author of *Inventing the Future,* then at Cambridge; Bertrand de Jouvenal; and, according to Boucher, Soviet official Dzhermen Gvishiani, soon to found the IIASA jointly with the American systems analysts.

Corporate nibbles at futurology were hooked in the following year, through the General Electric-Institute for Life Insurance symposium. Wayne Boucher and other futurologists look back to the GE-ILI Symposim as their Council of Nicea. "The press coverage of the ILI symposium alone was huge," Boucher said, "and guaranteed the tremendous corporate attendance." A majority of Fortune 100 corporations sent their planning chiefs to the weekly GE-ILI meetings held in New York City through most of 1964-65. Among the seminar leaders were Ian Wilson, GE's head of strategic planning, now at the Stanford Research Institute; Arnold Brown, now at the commodities firm ACLI, just acquired by Goldman Sachs; Morton Darrow, special futures consultant to the Chairman of Prudential Life Insurance, just retired; Ken Craver, Research and Development director for Monsanto Chemicals; Robert Barmeier, director of corporate planning at Sears Roebuck; Robert Ehrlich, treasurer of AT&T Long Lines; René Zentner, director of corporate planning for Shell Oil U.S.A.; Bill Simmons, director of long-range planning, International Business Machines; Christopher Liu, chief of planning of Weyerhauser Paper; and Fletcher Chan, chief of planning at Bank of America, among many others.

What actually transpired inside corporations in consequence is reported by a former Chase Manhattan officer who worked with the futurists from the early 1960s on. Chase Manhattan's International Department was dominated, from the early 1960s, by former World Bank and Chase Manhattan President Eugene Black, whose small back office was the effective center of planning for the bank's international portfolio. Black picked up a small group of Naval Intelligence types around Hugh Stokely, who proceeded to introduce "McNamara methods" into Chase operations (McNamara himself was to succeed two Chase CEOs, Black and John J. McCloy, at the World Bank in 1968). Stokely introduced the first "country risk analysis" computer model, starting a fad which has since spread to other big American banks. The model was primitive, even silly. It assigned scores of risks on various accounts, such as political, military, sociological, and so forth; a simple computer program then added up the-plusses and minuses and told the operator whether a country was a fit participant in Chase Manhattan's loan portfolio. "None of these people believed their B.S.," reports then Chase economist Michael Hudson, who later worked with the Futures Group and the Hudson Institute. "All it did was print out pre-conceived conclusions" specified by Black, Stokely, and the World Bank mafia in place at the bank. "But it had the marvelous effect of taking the bank lending officer off the hook. He didn't have to make a decision. If the loan went bad, it was the computer's fault, not his. Who was going to blame the computer? It rewarded the stupidest possible bureaucratic mediocrity."

In 1975, this writer chanced to dine with the then-reigning futurologist Herman Kahn and with Kahn's close friend, Columbia University Professor Robert Mundell, the guru of what later became known as "supply-side economics," and the inventor of Arthur Laffer. Mundell, whose transparent blue eyes and toneless speech have sent shivers down the spines of two generations of graduate students, said, "Herman, I have a new cycle theory. My theory is that there is a great plague every four hundred years that destroys half the human race, and according to my calculations, one is due in 1980."

Kahn, a 350-pound behemoth who was occupied with a plate of *sashimi* squid, returned in his machine-gun chatter, "I-don't-believe-a-word-of-it. When-I-was-at-the-National-Bureau-of-Economic-Research-I-used-to-give-my-staff-random-data-all-the-time-and-ask-them-to-come-up-with-cycle-theories-and-they-could-always-come-up-with-a-cycle-theory-no-matter-how-random-the-data-was-so-I-never-believed-in-cycle-theories."

Kahn devoured another raw squid. Nonplussed, Mundell returned, "Well, Herman, perhaps you're right. But I only make up these theories for fun."

Chase introduced one of the first Delphi programs, a "decision-making" process dreamed up at RAND for eliciting a "corporate consensus" out of whatever conflicting opinions were hanging around. Chase senior Vice-President Barry Sullivan, who went on to the

chairmanship of First Chicago, pioneered the use of the "consensor," a computerized device first developed by Bill Simmons of IBM, one of the aforementioned seminar leaders for the life insurance programs of 1964-65. Marketed by Ted Gordon, who in 1967 left RAND to found first the Institute for the Future and then the Futures Group, the consensor worked as follows. Each executive (or military officer—the device is also in use at the Joint Chiefs of Staff) is given a remote hand-held terminal with a scale of one to ten; he may privately rate any proposition on that scale, and a mini-computer with a display device will instantaneously graph the distribution of opinions. Not much different from the "participatory democracy" then coming into vogue in the Students for a Democratic Society organization: use of the device permitted the dialogue-leader to rig virtually any concluion he wanted.

Vienna positivism had come into its own. Piero Sraffa had insisted that an economy not describable in the language of logical positivism either could not exist or was in crisis, and therefore insisted (along with von Neumann) that the condition for economic stability was an eternally fixed capital-intensivity of production. Now the systems theorists proclaimed that if they could reduce all deliberation to the language of systems analysis, they could control the minds of decision-makers on all issues.

It was predictable that the center of computer econometrics, the Wharton School at the University of-Pennsylvania, would also become a chief base of operations of the Tavistock Institute—whose founders had been present at the wartime creation of systems theory. A close collaborator of Tavistock's Eric Trist at Wharton, Russell Ackoff, who heads the Busch Center for labor relations, summarized this manic self-conception in his 1974 *Redesigning the Future: A Systems Approach to Societal Problems:*

> The currently emerging intellectual revolution is bringing with it a new era that can be called the Systems Age which is producing the Postindusrial Revolution. . . .
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> . . . what we know of reality is conditioned by what language we use; hence the nature of reality is to be found in the analysis of language. In 1949 Claude Shannon, a mathematician at Bell Laboratories, turned attention to a larger process of which lanaguage was a part, *communication.* He provided a theory that formed the basis for what came to be known as the communication sciences. Almost simultaneously another mathematician, Norbert Weiner, of the Massachusetts Institute of Technology, placed communication into a still larger conceptual context, control. In so doing he founded cybernetics, the science of control through communication. . . .
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> . . . One more step was taken. In the early 1950s science went through an "aha" experience and came to realize what it had been up to in the preceeding decade: it was becoming preoccupied with *systems* [emphasis in original.]

When the Dennis Meadows-Jay Forrester *Limits To Growth* study appeared in 1972, the extent to which it found an audience is accounted for by a generation of such spadework. But the extent to which it rigged its results to suit the Malthusian bias of its authors was so obvious that even the London *Economist,* not unsympathetic to the Club of Rome goals, had to chuckle that by Forrester-Meadows methodology, London would now be buried several feet deep in horse manure through overpopulation of horse-drawn vehicles.

Computer econometrics, the subject for which linear programming was first invented, became only one track of rampant Vienna positivism, albeit a crucial one. The entire economics profession, including all of the 1970s crop of Nobel Prize winners, came out of the "systems" approach first sponsored by the Cowles Commission, including 1981 laureate James Tobin, Herbert Simon (1978), Tjallinbg Koopmans (co-winner in 1975), Paul Samuelson (1970), Milton Friedman (1975), Kenneth Arrow (1972), Ragnar Frisch (1969), Jan Tinbergen (co-winner in 1969), and, most emphatically, the father of modern computer econometrics, Lawrence Klein.

Klein's career summarizes the role computer econometrics had played. He began as Wesley Clair Mitchell's research assistant at the National Bureau of Economic Reseach, and helped construct the first, hand-calculated models of the U. S. economy at the University of Michigan's Institute for Social Research, another Tavistock implant in the American academic community. A member of the Communist Party, Klein fled the United States during the McCarthy period to work at Cambridge, i.e. with Sraffa, Joan Robinson, and Nicholas Kaldor. He was introduced to Michael Kalecki through Mrs. Robinson (hence his contribution to the Kalecki 1960 *Festschrift* cited earlier). His international reputation secure, Klein returned to America to head forecasting efforts at Wharton, with a brief interruption as candidate Jimmy Carter's campaign economics adviser in 1976. Currently, at Wharton Economic Forecasting Associates, the commercial spinoff of the Wharton Academic model, Klein directs the first "world model" for short-term forecasting, Project Link.

Throughout this period, the principal efforts of the Cambridge group—which had taken America by storm with J. M. Keynes' *General Theory*—concentrated attentions on the East Bloc, and the notion that "systems theory" is a "value-free science." The old Apostles' companions and Communist Party cellmates of the Cambridge economists, Philby, Burgess, Maclean, and Blunt, attracted more attention, but Mrs. Robinson's

assiduous efforts in the East bloc may have had an even more profound effect. Von Neumann's model is standard in Poland, Hungary, Romania, and Yugoslavia, and of great influence elsewhere in the East bloc. Typical of East bloc standard economics texts is *Proportions, Prices and Planning,* by Hungarian planning official Andras Brody. The book sports an introduction by Wassily Leontief, the statistician of the Strategic Bombing Survey. Brody casuistically compares von Neumann's arguments to those of Karl Marx, and concludes that systems theory solves the unsolved problem of capital accumulation in Volume II of *Capital.*

All the networks spun out of the University of Vienna in the 1920s re-entwined in 1971, fifty years after Piero Sraffa came to Cambridge, in the Vienna-based International Institute for Applied Systems Analysis: the Cowles Commission economists, the Wharton eocnometricians-turned-futurists, the MIT doomsday forecasters, the parallel Continental European groups woking out of Royal Dutch Shell and the Science and Technology Committees of NATO and the Organization for Economic Cooperation and Development, as well as their Soviet counterparts—whose systems pedigree goes back as far as the capitalists'.

As the meeting place between the Western (MIT and Yale) and Eastern (Cambridge Communist and Vienna) variants of systems theory, IIASA's status is understandably sensitive. Tjallings Koopman pleaded with a recent interviewer, "Do not write that there is a connection between the Cowles Foundation and IIASA." But he added,

> The Club of Rome is a group of people with a great deal of good will and drive. They have drawn attention in a very important way to the problems of too much population, the environment, and so on. However, their economic model, which claims to prove their points, is not a real economic model. Now the economics profession could act jealous and say that the Club of Rome stuff is no good, because their model is not rigorous. But that would be wrong. So we decided to put the Club of Rome model on a rigorous footing, which is the reason for systems analysis, and helped establish the International Institute for Applied Systems Analysis. Kenneth Arrow [1972 Nobel Prize winner] and I were on the committee that helped set up the initiation of IIASA [through the National Acadamy of Sciences]. So was George Danzig, also of the Cowles Foundation. I was the first head of the methodology department. We looked into population, the allocation of rsources, and so forth.

The "improvements" in the Club of Rome model which the economics profession, such as it is, has proposed are improvements in methods of mass brainwashing. Merely to introduce resource-scarcity constraints on economic growth from the outside, as Meadows and Forrester did, raises some hackles among the victims. The next generation of systems application will seek to persuade the victims to participate in planning their own suicide.

As applied by the Wharton School, econometrics functions like a gigantic "consensor" computer for an entire economy. Wharton Economic Forecasting Associates are now using their appropriately named "Diemex" model of the Mexican economy as such a laboratory. Like the Wharton U.S. model, Diemex is based on the same set of marginal-cost and supply-demand curves that brainwashed a generation of American managers. But its special feature is that the forecasts themselves are based on feedback from the model's users, who are brought together every six months and surveyed in the interim. The victim is told that the Mexican economy cannot sustain the eight percent growth program proposed by the López Portillio government; under conditions of inadequate growth, how would he change his behavior? The responses are then fed back into the central model, to produce a credible "forcast" based on the victims' collective reaction to the earlier, unfounded assertion—based on forged data—that the Mexican economy cannot grow at desired rates. Each victim has "participated" in the formulation of the forecast in the same fashion that the victim of a corporate "Delphi" program has "participated" in the decisions manipulated by the RAND-trained seminar leader.

James Martin, former IBM executive turned star systems consultant to corporations, described a technotronic apocalypse based on this feedback principle in his 1978 book *The Wired Society.* Electronics Fund Transfer and other computer-based payments systems would soon dominate all economic activity, providing an instantaneous electronic information base on the state of the economy. This information would, Martin continued, be collected and put into giant econometric models, which would feed back their results to market participants and enable them to order their decisions accordingly. Martin's vision is not new: it combines the social-control theories that John Dewey taught to Wesley Mitchell and the modern monetarists with the Vannevar Bush plan to construct a single giant computer at MIT with sufficient data to rule the world.

The outcome of the systems takeover would be exactly what the Cambridge Malthusians intended it to be: a means of persuading the world to adopt economic policies that amount to a last cattle-car trip for the human race.

Extensive research for this article was conducted by Richard Freeman, Kathy Burdman, and Carol Cleary.