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Who says individualized accounts are a better way to solve social problems? The laws of nature

By William Tucker

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The field of study is fashionably referred to as "complexity science," or "chaos theory." Its academic practitioners use $50 words like "autocatalysis," "self-organization," or "spontaneous order" to describe what they are observing. But Adam Smith noted the same phenomena, and coined his own, more famous, description: "the invisible hand."

Using computers designed to mimic real-life situations, mathematicians and theorists at the Santa Fe Institute and computer science departments around the country are trying to explain how large groups of individuals seeking only their own self-interest regularly arrange themselves into complex organizations that have efficiency, resiliency, and even a kind of aesthetic beauty.

The "complexity theory" they produce delves into the deepest mysteries of the universe. How did living cells evolve? How did one-celled organisms become multi-celled creatures like ourselves? How do large natural systems evolve? And, ultimately, how do humans create the immensely complicated networks of cooperation and competition that we call civilized society?

"The key insight is that such organizations can arise spontaneously without outside direction or control," says Stuart Kauffman, one of the founding members at Santa Fe. "In co-evolving systems, each member is only trying to pursue its own selfish advantage. Yet, as if by an invisible hand, the entire system appears magically to evolve to a poised state where, on average, the players all improve one another's performance. It's a win-win situation for everyone."

Ah, that invisible hand. Although Santa Fe scholars don't seem to realize it (they tend to be left-wingers), they have actually re-created in digital form the theories of the Austrian School of economics. In the early decades of the twentieth century, Ludwig von Mises and Friedrich Hayek argued that central planning could not possibly direct a modern economy. Only the widespread distribution of information among freely acting individuals could coordinate the billions of intelligent decisions necessary to make modern prosperity possible. One of their favorite terms was "spontaneous order."

What complexity theorists have done is illustrate this seemingly mysterious process on the computer. By creating "digital organisms" and turning them loose in a silicon ecosystem, they have been able to illustrate aspects of spontaneous order in a way that von Mises and Hayek could only dream about. Like fractal geometry, which has enabled movie illustrators to create remarkably lifelike landscapes, the computer models of complexity theory have mimicked the undirected natural organization that springs up in multi-unit social systems.

Take "boids" as an example. Boids are digital blips on the computer screen programmed to imitate the flight of bird flocks. Each boid is given only three instructions: 1) maintain a minimum distance from other boids, 2) try to match other boids' velocity, 3) always move toward the perceived center of the flock. On the screen, flocks of "boids" twist and turn in

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riverene formations exactly like the swooping and darting of real birds across the sky.

According to complexity theory, efficient, self-organized systems like these emerge only at the "edge of chaos"—at a place somewhere between a rigid order that is unresponsive to new information, and a system that is so overloaded with new information that it dissolves into chaos. Such "complex adaptive systems" take on a life of their own, responding to altered external conditions while maintaining an inner integrity that keeps them whole. The result is a "higher level of order"—a flexible system that can continually adapt in ways that benefit its members.

He may not know it, but by reforming Social Security, George Bush will be attempting to create just such a "complex adaptive system." And the genius of his proposal is that the full weight of natural, spontaneous order will be on his side.

The problem with Social Security

In the 1930s, when Social Security was launched, old age was for many a certain path to poverty. Only a small minority of Americans had any provision for retirement, and "people feared growing old more than anything," as the late Senator Daniel Patrick Moynihan put it. "It meant being left without income or resources."

The elderly were the very poorest sector of our population. Responsible families assiduously parceled out the task of caring for aging parents. Often they picked one child—usually a daughter—to stay home with the parents, caring for them well into her spinsterhood. In less responsible families, old people frequently lived in cruel want and isolation.

The Social Security Act of 1935 was the crown jewel of the government activism of the New Deal. In its day it was a great innovation. Besides creating a government old-age pension, it fostered a sense of national unity. Everyone had a "Social Security number." Each week the government deducted a small portion from every worker's check and deposited it in a Trust Fund in Washington. When a worker reached age 65, he could expect a payout of his own. Social Security seemed to prove the government's ability to organize society in ways that would meet people's needs much better than private enterprise.

That at least was the theory. In reality, the "self-supporting" nature of Social Security was a demographic illusion. In 1936, the average worker lived to be only 62, so many paid in but relatively few collected. In 1950, there were 16 employed people supporting each retiree. Then the system received another huge boost when 74 million members of the Baby Boom generation began entering the labor force in the 1960s.

But lengthening life spans eventually changed the scenario. By 1970 there were only four workers for each retiree. Meanwhile, politicians were raising benefit levels. Social Security suddenly began to run out of money in the '70s and '80s, and had to be "rescued" several times by jacking up the payroll tax. Today, eight out of ten Americans pay more in Social Security and Medicare contributions than they do in income tax.

Instead of being passive tools of political forces, Americans would be players capable of determining their own future.

There are now only slightly more than three workers per retiree. By 2030 that figure will have tumbled to two workers per pensioner. Essentially, Americans will have gone back to supporting their own (or someone else's) parents. If present trends continue, by 2040 working people will need to fork over *nearly half of their total income* to the government just to keep Social Security and Medicare solvent.

Obviously government-run Social Security isn't so magical after all. Contrary to popular assumption, there isn't any real "trust fund" in Washington—although founding politicians did give that misleading name to the in-box where Social Security taxes are collected. Instead, those tax receipts are turned directly over to the Treasury Department for current consumption. All the Social Security Administration (SSA) keeps is a piece of paper—a special bond given only to Social Security's trustees. These bonds are stacked in a locked box on the opposite side of the room at the Government Printing Office in Martinsville, West Virginia. When they come due, there is only one way they can be paid—by collecting taxes.

As currently structured, Social Security is a classic Ponzi scheme. Early enrollees are promised the moon, then paid from money put in by later investors. Eventually those later investors must be paid off as well. The whole scheme works only as long as new investors keep outnumbering earlier enrollees. When the Baby Boomers start retiring five years from now, the math will quickly reverse. By 2017—according to the SSA's own estimates—the system will be in deficit. The pile of IOU bonds in Martinsville will have to be cashed in. By 2030 even the bond supply will be gone and there will be nothing but a yawning abyss of pension obligations—a $145 trillion cumulative deficit by 2075. Either there will be war between the generations, or Social Security will devour our entire economy.

Stalinism versus individualism

Last decade, two of Santa Fe's founding scholars—Stuart Kauffman and John Holland—created a program called "Patches," designed to test how large groups of individuals could seek solutions to problems while exchanging information among themselves. Kauffman and Holland turn groups of blind actors loose in a landscape, with the assignment of congregating around the highest peaks. If there is a single peak, the actors quickly solve the problem by moving upward. But what if there is an irregular landscape that keeps shifting? Individual actors will soon become stymied at some sub-optimal position where they have reached a local peak, but not the highest. Only by exchanging information can they move down from their perch and onto a higher one.

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Running this scenario on a computer, Kauffman and Holland found that if players formed one big group they reached a "Stalinist solution"—a system that quickly froze up at a single, sub-optimal position and remained there forever. On the other hand, if each player remained a completely separate individual, the information exchange overwhelmed the system and chaos ensued. But if individuals bunched themselves into small groups across a Cartesian grid—what Kauffman and Holland called "patches"—communication worked best and the highest points were soon discovered.

"In worlds that are not too complex, Stalinism works," wrote Kauffman in *At Home in the Universe*. But as the landscape becomes more rugged, the best solution occurs only if the explorers break themselves into numerous small organizations and communicate.

What is the optimal number of groups? Experimenting with many different variables, over changing landscapes, the researchers found that there was no way to establish beforehand what the best number of exploring entities would be. Indeed, if the landscape changed over time, instead of remaining constant, there was no "right" number that any grand intelligence could identify. The very best strategy for solving this problem, the programmers discovered, was to *leave the decisions to the players themselves*, letting them adjust as each judgment arose.

Given the opportunity to rearrange themselves into different group sizes in different places, self-interested players would ultimately settle into the best plan. The "best solution," in other words, could not be engineered in advance. It could only be found through a process of decentralized *discovery*. Moreover, as the landscape kept changing, the players could maintain their optimal position only through an adaptive process of stimulus and response. Local control, trial and error discovery, and continual reformation, the scientists noted, were the key to the formation of "spontaneous order."

"Here we have another invisible hand in operation," concludes Kauffman. "No central administrator coordinates behavior." Yet properly liberated autonomous groups, each acting selfishly, achieve the optimal coordination. "Local autonomy may be a fundamental mechanism underlying adaptive evolution in ecosystems, economic systems, and cultural systems," he concluded.

One size doesn't fit all

The current one-size-fits-all Social Security system was designed at the height of the Stalinist era. It was probably the best that could be done at the time. And for more than half a century it worked well. The question is whether it still fits the needs of contemporary Americans.

In one-size-fits-all solutions, everyone plods along at the same sub-optimal level of mediocrity. At present, workers contributing to Social Security earn less than 2 percent a year on their money over the 40 to 50 years it is held by the government. Simply putting this money into a standard certificate of deposit at a neighborhood bank would earn 50 percent more. Over decades of compound interest, this adds up to tens of thousands of dollars.

In addition, the current system enforces a uniformity that leads to lowest-common-denominator solutions. Some people just want a nice, reliable retirement annuity. Others would like a lump sum that would make it possible for them to buy a retirement home or start a second-career business. Some people want to quit work early, while others want to continue long past 65. (Because of Social Security's perverse incentives, Americans retire five years earlier today then they did a generation ago—despite longer life spans.)

Nearly everyone would like something to pass on to his descendants, yet there is no inheritable property accumulation in our Social Security system. If you die one day short of your retirement, you lose your entire investment. This flaw cuts particularly hard against people with low incomes, since they have more trouble saving and tend to die younger.

The question our nation now faces is how to design a better retirement system that can do all of these very different kinds of things for different people. And the answer is simple: Allow Americans to design it themselves.

The path has already been blazed

In 1980, the free-market-friendly government of Chile faced a crisis in its old-age pension system (which was modeled along lines almost identical to our Social Security program). Milton Friedman and the Chicago school of free-market economists had a pipeline to Chilean leaders during this period, and so it happened that a small Third World regime leapfrogged the rest of the world and installed the most advanced old-age pension system on the globe.

The program has now been operating smoothly for nearly a quarter century. In Chile's Pension Savings Account program, 10 percent of earnings are automatically deducted from every worker's paycheck and deposited into a savings account. This mandate applies only to the first $22,000 in annual income (just as our Social Security taxes are levied only on the first $86,000). But in Chile people often voluntarily contribute more. Taxes are paid only when the money is withdrawn, and at the person's retirement income bracket.

Workers are offered a choice of one of several "Pension Fund Administration" companies that function like mutual funds. Operating under conservative regulations, some are especially cautious and offer lower returns, while others trade higher returns for a little more risk. Like the "patches" in Kauffman and Holland's computer program, these accounts bundle tens of thousands of worker savings accounts into self-guided groups that both compete and communicate among themselves.

The results have been remarkable. Since the system was inaugurated in 1981, the average annual return on investment has been 13 percent—more than triple the 4 percent originally predicted. The average worker in Chile now retires with 78 percent of his or her working income.

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These private accounts also offer remarkable latitude. Workers can retire early or late. Blue-collar workers usually choose the early option, while white-collar counterparts keep going. The pension plan is portable from job to job, and does not discriminate against self-employment. (U.S. self-employed workers now pay a 15 percent payroll tax.) There is even a provision that allows Chileans to make a one-time, taxable withdrawal of "excess savings"—any amount above 70 percent of their previous salary—to spend or invest on some special retirement project.

Not coincidentally, economic growth in Chile has risen sharply from an historical average of 3 percent a year to 6.5 percent annually since the private accounts were established. And in addition to the economic payoffs there are the cultural benefits of individual independence, control, and personal choice. "The greatest advantage of private pensions is that it restores personal responsibilities and personal rights," says Jose Pinera, president of the International Center for Pension Reform. Three other South American countries—Argentina, Peru, and Columbia—have now followed Chile's lead, as have Australia, Great Britain (to a more limited degree), Poland, and many other countries.

Many American workers also have automatic access to such wealth-building personal accounts. Federal employees and uniformed military personnel in the United States now have a Thrift Savings Plan that offers them five options:

- A Government Securities Fund, which invests entirely in U.S. Treasury bonds.
- A Fixed Income Index Fund, which tracks a Lehman Brothers index of U.S. corporate bonds.
- A Common Stock Index Fund, which invests in S&P 500 equities.
- A Small Capitalization Stock Index Fund, which tracks the Wilshire 4500 stock index.
- An International Stock Index Fund, containing major European, Australian, and Asian stocks.

Younger workers generally opt for the more growth-oriented investments, while older workers tend to want fixed incomes. In all cases, the returns are far ahead of Social Security. Meanwhile, the retirement nest eggs accumulated in these funds are personal property that can be handed down to descendants. This is particularly valuable to low-income families who have few other ways to build capital.

Critics of any move from government pensions toward personal accounts argue that everyday citizens won't be capable of planning for their own retirement. "After all, we're looking at a large portion of the population whose idea of investing in the future is buying a lottery ticket," they sneer. "Some Americans don't even know how to handle a bank account."

Fine. It's time for those people to learn. Expanded personal responsibility—and the new opportunities that real personal options will open up for previously powerless people—are a central part of the appeal of the "Ownership Society."

Left free to choose their own retirement plans, 270 million Americans will do more than discover a solution right for themselves. Over time, they will design the greatest national Social Security system ever created.

Other critics say there really isn't a Social Security crisis—that the Bush administration is exaggerating the problem as an excuse to change the system. The important thing is this: Because of the enormous advantages created by a "spontaneous order" system, Social Security would be worth revising *even if the crisis did not exist*—which it does.

Just do it

The good news is that we needn't design a perfect system right from the launch. Complexity theorists emphasize the importance of "good enough" starter solutions that leave room for continual improvement. Rather than paralyzing ourselves in an attempt to impose a perfect plan at the beginning, we should just begin sensibly and let the system adjust itself.

"Because it is not possible to predict accurately the future of a complex adaptive system, it makes sense to foster multiple experiments," says Jeffrey Goldstein, author of *The Unshackled Organization: Facing the Challenge of Unpredictability Through Spontaneous Reorganization.* "Research has shown that some of the biggest improvements in self-organizing systems come from responding to random or unexpected events. You have to leave room for creativity."

Left free to choose their own retirement plans, more than 270 million Americans will do more than discover a solution that is right for themselves. Over time, they will design the greatest national Social Security system ever created.

The exciting upside wild card is what would happen to private investment. Right now, the Social Security tax is a backdoor method of funding federal deficits and encouraging Congressional spending. Private savings accounts would redirect most of this money into private enterprise instead. As in Chile, this massive redirection of funds from government deficit spending into private investment could raise U.S. economic growth to a new level altogether.

Private retirement pensions would also pave the way for other expansions of individual initiatives. Personalized health savings accounts, homeownership accounts, education accounts, and other instruments would also expand individual autonomy and responsibility. Instead of an impersonal "Social Security number" and the promise of a pension check, even the most humble

continued on page 29

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sidy keeps his wasteful firm in business. If he is a farmer, the subsidy encourages him to raise crops that aren't needed. Every subsidy system involves citizen compliance costs—the jumping through hoops to get the subsidy, the manning of government agencies that disburse the subsidy, the economic friction of red tape, the cases of fraud.

When all costs are combined, the typical waste in a subsidy system is on the order of 125 percent. That is, for Paul to end up with $100 from the government, Peter not only has to pay $100 in taxes, but he and the nation in general give up an additional $125 in lost production and frittered resources. Translate these numbers onto a national scale and the result is staggering.

Why don't citizens know this? Because no one studies it. Legislators who now authorize trillions in subsidies ought to appropriate a few million dollars in order to learn about the overhead costs of subsidies. Economics departments around the country should offer at least one course on the topic. We need scores of dissertations on this subject and dozens of books. As information on subsidy overhead costs becomes known, Congress should require that agencies put it in their reports and promotional material, so that journalists and the public can be made aware of it.

The gush of subsidies left, right, and center does not harmlessly "even out." It destroys national wealth at the rate of about half a dozen 9/11 disasters every year. Once the public understands the appalling waste involved, it may be able to overcome the semantic tricks and childish illusions that have seduced it into embracing the subsidy regime.

***TUCKER** continued from page 33*

citizens would have their own property and choices. Instead of feeling like passive tools of political forces, Americans would see themselves as players capable of determining their own future.

For all these reasons, the debate now dawning over George Bush's proposed Ownership Society is much more than just a political fight, or an actuarial dispute, or a scrap over economic spoils. It is a landmark decision for our future. Will the American government operate with the laws of nature, the logic of problem-solving mathematics, and the power of decentralized freedom on its side? Or will we continue with the mediocrity of a benign but extremely crude Stalinism as our best effort to solve America's pressing social needs?

Our re-elected President is likely to force an answer to that question very soon.

***RILEY** continued from page 25*

personal behavior, who have been given enough freedom to make some decisions on their own, and who are strong enough to go against the grain, if necessary, when they graduate. But making judgments about secular American culture involves much more than simply knowing when to have sex and whether to drink.

In October 2002, Calvin College hosted the Indigo Girls—an outspoken lesbian folk-rock duo who support such extreme left-wing causes as the Zapatista rebels and Leonard Peltier. Surprised? As Calvin's student activities director Ken Heffner explained in the campus paper, "Cultural discernment" (as the administration likes to refer to the policy) means that "Calvin College finds a way for Christians to engage with [secular] culture without becoming of it.... It's a way out of the trap of liberalism...and it's also a way out of the trap of fundamentalism, which leads to separatism."

Navigating the waters between fundamentalism and liberalism is probably the single biggest challenge facing religious colleges today. There are so many ways for the values of secular culture to seep into a religious college, it's hard for these communities not to become overprotective. At Southern Virginia University, a faculty member was forced to write the word "whore" out of a student production of "Man of La Mancha," even though, as one professor points out, the word appears in the Bible. And while one might be inclined to wonder about Magdalen College's banning popular magazines or novels, it's true that publications like *Cosmopolitan* or *Maxim* and even some chick-lit novels read like explicit sex manuals.

The extent of the influence of secular culture cannot be understood completely until you think about what it takes to filter it out. Even something as simple as sports, a staple of university life, has to be rethought. What does it mean to play in the same league as the University of Colorado and Florida State, which offered not only luxury accommodations for their recruits but also promises of sex from young women on campus?

At Notre Dame, of course, the school's athletic programs are an integral part of its identity, with thousands of alumni attending mass together after each home game. But the administrations there as well as at Baylor and BYU must somehow shield the players from the kind of financial, sexual, and drug-related scandals that have come to plague high-level athletics in America. Cultural discernment, that is, teaching students the best of what secular culture has to offer and providing them with the tools for examining it, requires constant vigilance and much forethought from religious college leaders, but the rewards for success are tremendous. Striking the right balance means producing graduates who are unafraid of the world, can participate in some aspects of it, change other parts of it, and all the while maintain their religious grounding.

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