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THE LAUCKS FOUNDATION

from time to time calls attention to published material that might contribute toward clarification or understanding of issues affecting world peace. The accompanying reprints constitute Reprint Mailing No. 63.

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The following is a passage from Wendell Berry's Standing by Words, as quoted in "As It Were", from MANAS, June 27, 1984:

Whether I believe that the Lord is my shepherd or that progress is my shepherd is a matter of practical consequence and makes a difference. The truth or value of such an "opinion" may not be provable, but it is not for that reason impotent or without effect. . . .

That is, it is possible for an idea accepted on faith to produce worldly results that are demonstrably bad or good. If some Christians make it an article of faith that it is good to kill heathens or Communists, they will sooner or later have corpses to show for it. If some Christians believe, as alleged, that God gave them the world to do with as they please, they will sooner or later have deserts and ruins in measurable proof. If some Christians really believe that pride, lust, envy, anger, covetousness, gluttony, and sloth are deadly sins, then they will make improvements in government that will sooner or later be tangible and quantifiable.

That it is thus possible for an article of faith to be right or wrong according to worldly result suggests that we may be up against limits and necessities in our earthly experience as absolute as "the will of God" was ever taken to be, and that "the will of God" as expressed in moral law may therefore have the same standing as the laws of gravity and thermodynamics. In Dryden's day, perhaps, it was still possible to think of "love one another" as a rule contingent upon faith. By our own day such evidence has accumulated as to suggest that it may be an absolute law: Love one another or die, individually and as a species.

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Alternatives in Agriculture

Nature's Wisdom or the Scientists' Cleverness?

Two Biological Emphases in Agricultural Research

by Wes Jackson

Since World War II, there has been a tremendous change in the structure of agriculture worldwide, mostly because of yield increase. In the 60's and 70's, the so-called "Green Revolution" took place in Mexico, India and in Asia, and yields of wheat and rice soared. The establishment of the international research centers, the growing sophistication of some of the major seed houses, and the interaction of those companies with the geneticists and agronomists in the land grant universities brought on this revolution. More researchers, employing the statistical models of Sir Ronald Fisher and others, devised more efficient means of selection, increased the number of inbred lines, marker genes, etc. The implementation of this knowledge was accompanied by relatively low oil prices and by an enormous increase in the use of commercial fertilizer, pesticides and irrigation.

In the mid to late 70's, the revolution seemed to be over as an increase in the use of fertilizer was not proportionally met by an increase in yield. The fertilizer curve line was going up and the yield line was flattening. Moreover, farm yields were coming closer to the yields in experimental trials. In other words, research results were no longer far ahead of field results.

It was inevitable that these converging lines would be noticed. Agricultural researchers would coast for a while on their past dramatic achievements, but the good observers among them would point out that the technology which breeders had employed to bring about the record yields was about milked dry and that we should start now to implement the new science and technology which had been established in biology. This field, called molecular biology, would give us a new knowledge base to exploit for the purpose of feeding an increasingly hungry world, and it would shore up our ability to produce for a future export market. The fact is that yields are still increasing at the rate of about 1% per year using conventional breeding, but that isn't impressive enough.

This move to upgrade agricultural research through the application of molecular biology is now gathering momentum. Land grant universities are pleading for money and receiving it-legislatures and private foundations are appropriating millions of dollars to construct biotechnology labs and begin programs in genetic research.

The "New" Biology

The whole field of molecular biology began in 1944, the year that Avery, MacLeod and McCarty published the results of their experiments, which suggested that DNA and not protein was the chemical responsible for heredity. In 1953, James Watson and Francis Crick reported that the structure of the DNA crystal was a double helix. They won the Nobel Prize they were after, and DNA and double helix became household words.

These discoveries caused a revolution in the structure of biology departments and the direction of biological research. Molecular biology became the prestigious field, and graduate students flocked to enroll in it. Descriptive botanists were not replaced at retirement; the "new" biologists who were hired had more background in chemistry than they did in traditional biology. The budgets for scientific hardware went sky high. Electron microscopes, which can now cost a half million dollars, became absolutely essential, as did fast and accurate weighing equipment, growth chambers controlled by computers, etc. "Cutting edge" science became very expensive.

Then, almost without notice, the era of discovery moved smoothly into the era of manipulation, until we had new household words and phrases such as "gene splicing," "gene stitching," and "DNA surgery." We were told that this new biology would cure cancer and other diseases, that we could produce super plants and animals.

During the past twenty years, the molecular biologists who were taking their post-docs during the sixties have professionally cloned themselves. The modern day descendants of the new breed in the sixties, like their predecessors, may never have had a field biology course, never milked a cow, maybe never have driven a tractor. But they are looking for work. There are only so many pharmaceutical

... what they are trying to do is write large the last 50 years of agriculture.

houses, only so much interferon to be made, only so many who can work at tricking bacteria to make insulin. There they are, credentialed, knowledgeable of the equipment, toned up on the literature, and ready to transform agriculture.

What they have in mind is currently limited, but the future is boundless. They plan to turn grasses, for example, into plants that will fix nitrogen as readily as some of the major legume crops. They hope to introduce genes for resistance to various insects and pathogens. They hope to boost yields. It all sounds so good, and it is difficult to argue with their agenda. But it is clear that what they are doing is trying to write large the last 50 years of agriculture. They are offering the "specific problem-specific solution" approach as the infallible recipe. This approach assumes that everything outside the specific problem for which they intend to splice in a solution can be held still, that nothing else will wobble, or if it does, that they can splice in a correction for that, too.

All of this is high tech research, and we can be sure that any outfit which gives us a crop with a spliced-in gene is going to demand a patent and some kind of a royalty payment. It is doubtful that their primary concern will be the high energy cost of American agriculture. One also doubts that they will care greatly about the national and global soil loss problem.

The Other "New" Biology

Another kind of change has been going on in biology, a change that has been scarcely noticed, but one that is extremely important to the future of agriculture. This is not a revolution; it is a synthesis. Biologists in the fields of taxonomy, ecology, genetics and evolution have been putting together a new field that might be called, for want of a better name, population biology. The primary contributors to this field have been plant ecologists and population geneticists, people with interests in evolutionary biology. They study species strategies like r and K selection--whether a species emphasizes seed production or protection of a plant once it is established. They study source-sink relationships in the production and allocation of energy in plants: does a plant send the harvested sunlight to the seed or to the root to over-winter? They study senescense in plants, the mechanisms of interaction among plant species, the diversity and natural dynamics of populations. They are interested in weeds as colonizing species, insect interactions and the role of pathogens.

The work of these plant population biologists or ecologists is admittedly still at the "knowledge-for-its-own-sake" level. Few have ever considered how the knowledge could be applied beyond its usefulness in publications, promotions and tenure at the universities. But what they have accumulated and what they have to offer is what those of us interested in a sustainable agriculture need to pay attention to,

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for the sustainable agriculturist begins with the notion that agriculture cannot be understood on its own terms—that it comes out of nature. The test for this is the question: should a crop plant be regarded more as the property of the human or as a relative of wild things? If it is viewed primarily as the property of the human, then it is almost wide open for the kind of manipulation molecular biologists are good at. If, on the other hand, it is viewed as primarily a product of nature, as a relative of wild things, then we acknowledge that most of its evolution occurred in an ecological context, in a nature that was of a design not of our making. I want to underscore the fact that the scientists who study this are at the other end of the spectrum from the molecular biologists. They may admit that humans learn faster than nature but they also acknowledge that nature is hard to beat because she has been accumulating information longer. Most of the mistakes of nature have been corrected over time.

Rather than embrace gene splicing, "cutting edge" agricultural research can benefit more from this inherently broader tradition. A new agriculture must come from people who are students of nature at the ecosystem level. For after all, a natural ecosystem, like a prairie, sponsors its own fertility, recycles its nutrients, avoids the epidemic from both insects and pathogens, and does not lose soil beyond replacement levels. People who make it their lifetime occupation to study the kinds of ecosystems that feature all these elements of sustainability must be pried loose from the perches where they discover and accumulate "pure" knowledge. We need to get some of them to take the knowledge about ecosystems that has been accumulating for the last 30 years or so, and work with us in the development of a sustainable agriculture. Molecular biologists can also have a role, but they must follow, not lead.

What those of us interested in sustainable agriculture need always to keep before us are the questions: How are we going to run agriculture and culture on sunlight? What are we going to do when the oil is gone? What are we going to do to stop soil erosion? Ecosystem agriculture has answers to all of these questions. Molecular biology has few or none.

It might be argued that since the fields of population biology and ecology are so complex and so little is known of living things and the physical-chemical world which surrounds them, concentrating at the ecosystem level, rather than at the population or organism level, will be impractical. Work at the ecosystem level could get argued down even if our goal is to save soils, prevent chemical contamination of

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the countryside and get farms to sponsor their own fertility and energy. The argument could be made instead that molecular biology is mature now, and that the payoff from the likes of gene splicing is more promising for solving the immediate problems of agriculture. Conventional wisdom may hold, in other words, that we should go with our long suit.

I do not think molecular biology is our long suit. The synthetic field of population biology and ecology is just as mature. It hasn't received the same amount of media coverage. It hasn't been featured in Time and Newsweek. But consider the barriers molecular biology must overcome to be able to deliver on the promises—promises which have to do with production only—promises which never include the notion of sustainability.

Barriers to Genetic Miracles

With few exceptions (and they are exceptions because of certain anomalies) the gene splicing work to date has featured the relatively simple prokaryotic organisms, the bacteria and their associated viruses. Such organisms are several orders of magnitude simpler than the kinds of cells nature has used to make redwoods and lions, lilies and people, and with the help of humans, corn plants and Holsteins. For gene splicing to be useful at this level, there must be a method of incorporating the gene into the entire genetic complement of the recipient species. This will be no small trick, but let us assume that it can be done.

First off, the team of molecular biologists must know what gene or genes they want to transfer from one creature to another. Next, they must find a source. Then they have to be able to extract the small amount of DNA representing that gene or genes out of the rest of the DNA in a complex cell. So far, maybe so good. What if the transferred gene fails to work in the new environment? They will have to find out why. Most of the requirements necessary for that gene to function in its new and alien world will be unforeseen and unforeseeable. Furthermore, it is unlikely that the newly-modified genome (all of the old gene material of the host cell, plus the newly-introduced material) can be easily propagated.

So much for the easy part. I call it easy because it involves the most straight-forward kind of manipulations imaginable so far. Now for the hard part, the more formidable problems. Because all genes interact to some degree, the traits which are strongly influenced by several genes working together will stand as a barrier to the gene splicer. They are still beyond the current "state of the art" for gene splicing. Professor Dick Richardson, geneticist at The University of Texas at Austin, pointed out to me that some traits such as "growth rate" are affected by many hormones, including episodal ones that are present for short periods of time in low concentrations. Many of these are only now being discovered. When their existence is known, isolation may begin, but if the genes are from widely divergent organisms, their regulation may differ in the new host and fail to work as planned.

A gene is often separated into several pieces and located in widely separated places on the chromosome or perhaps even on another chromosome. While this is a tricky problem to overcome, it is no more tricky than isolating the various genetic components which regulate a particular gene in question. Once a complete gene and all of its regulators are isolated, there is the problem of the entire assembly becoming precisely incorporated into the genetic material of the recipient organism. If it isn't incorporated early enough in development and misses being transferred into the germ line so it can be transferred to the offspring, for all practical purposes, it is a dead end.

Let us assume that all of the barriers to the present have been overcome. We are now faced with a problem somewhat similar to what geneticists confronted nearly forty years ago, during the heyday of radiation genetics. This was a time in which numerous geneticists believed we could improve crops and speed up evolution by irradiating the germ plasm and then selecting the desirable products. What that generation of geneticists and plant breeders learned is that they had on their hands the same problem as the previous generation of geneticists who had believed that some biological wonders could be pulled out of the progeny of some very wide crosses. The problem they had was how to get rid of all the variation they suddenly found on their hands, and how to re-optimize the desirable traits against such a scrambled genetic background. The background of spliced in genes may not be so scrambled, but the problem of re-optimization is still there. In other words, even if all the steps are taken successfully up to the point where the spliced gene and its regulators from a distant plant family are successfully transferred, an untold amount of breeding work remains before the genetic background is shaken down enough to accommodate the newly-introduced trait and its regulators.

The Ecosystem Level Alternative

The ecosystem level of biological organization is complex, much more complex than the DNA level of any species, but it is not necessarily more complicated for the human to work and deal with. For that matter, the level of the molecule is more complex than the atomic level, but molecular biology as a field is no more complicated than physics as a field. At the ecosystem

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Ecosystem researchers will simply be dealing with huge chunks of what works.

level, if researchers and farmers take advantage of the natural integrities which have evolved over the millions of years, they may be dealing with great complexity. But it may be much less complicated for the human than gene splicing at a much less complex level of biological organization. Ecosystem researchers will simply be dealing with huge chunks or blocks of what works.

The point is, if we continue to lose soil, if our soils and groundwater supplies continue to be polluted because of our single vision focus on production, the day will come when few will care whether molecular biology ever existed as a discipline. There is enough "on-the-shelf" knowledge now, all in the area of population biology, evolutionary biology and ecology, to begin to meet the needs of the land and the needs of this species of ours which was shaped by the land.

Why have we been so slow in getting started? Well, such an ecological agriculture was really not possible until the last ten or fifteen years, until the great synthesis began to emerge, until sufficient knowledge about the workings of natural ecosystems had been discovered.

We still have a great opportunity to do something about the problem of agriculture, but we have little time in which to take advantage of that opportunity. Right now, the average age of the agricultural researchers is around 57, about the age of the average Kansas farmer and pretty close to the average age for the farmer in America. This means that in the next five to fifteen years, a lot of agricultural researchers are going to retire. 60,000 professional slots will open in agriculture next year and there are only 52,000 people trained to fill them, a deficit of 8,000. There will undoubtedly be deficits in subsequent years, as well. What this means is obvious—if we can get people trained in ecological agriculture, we can change the structure of American agriculture very fast, for in another ten to fifteen years, many of these people would move into positions of responsibility. If we fail to produce enough students of ecological agriculture, then students of molecular biology will fill the positions.

The final consideration has to be the land and the people on it, the farmers and their families. Experts who simply have technological tricks they want to play with on the American landscape, with farmers standing by in a more or less passive role, should not be tolerated. I propose that scientists who have been studying natural ecosystems begin to talk directly to farmers and agronomists about the application of their research to ecological sustainable agricultural systems. We will need all three of these groups working together if we are to learn how to produce food from the land in a sustainable manner.

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NOTEBOOK

Hotel America

By Lewis H. Lapham

Maybe I still cherish overly fond expectations, or maybe I have read or listened to so many campaign speeches over the last twenty years that I have become indifferent to their poetics. Whatever the reasons, I find it increasingly difficult to guess at what the candidates hope to accomplish if and when they arrive in office. They run through the lists of their policy positions (on foreign and economic affairs, racial prejudice, education, weapons, the deficit, etc.), but they never set forth, at least in a language that I can understand, their visions of an ethical or decent society. I know what they say they will do about taxes or El Salvador, but what dreams of justice do they pursue through the long and exhausting months of photo opportunities, airport press briefings, and noon appearances in suburban shopping malls? If all their promises could be redeemed, and all their good intentions changed into the currency of law, what sort of society would they build in what they describe as a wilderness made desolate by the folly of their opponents? How would they arrange the hierarchy of moral and commercial truth? How would they define a happy man or an exemplary life?

The questions seldom get asked because the answers tend to blur the distinctions between candidates of theoretically antagonistic views. Although slight, these distinctions cost so much to promote and take up so much space in the media that it is thought rude, especially by the grand pooh-bahs of the opinion-making community, to dismiss them as negligible. Jesse Jackson stands for freedom and fairness, but so do Walter Mondale and President Reagan, and it is hard to imagine any of those gentlemen conceiving of a system of values other than the one already operative

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in the Defense Department and the stock market.

The assumptions implicit in the candidates' texts reveal a depressingly uniform conception not only of the state but also of what is meant by the words for freedom, law, and politics. Without even a murmur of dissent, they agree on the landscaping and architectural design of the great, good American place on the far side of election day. Republican or Democrat, liberal or conservative, insurgent or incumbent, the candidates offer almost identical blueprints for Life, Liberty, and the Pursuit of Happiness. They talk about the technologies of government, not about the meaning of society.

The narrowness of their collective political imagination leads them to conceive of the Republic as something very much like a resort hotel, in which the citizens receive the comforts owed to them by virtue of their status as America's guests. The subsidiary ideological arguments amount to little more than complaints about the number, quality, and cost of the available services. Listed under the rubrics of a travel advertisement, the principal characteristics of Hotel America might be advertised as follows:

1. *The Electorate.* Another name for the clientele. The guests expect a good time, and they prefer to leave the making of a moral effort at home with the laundry and the children. Recognizing the popular vote as the personification of will and appetite, even the youngest candidates avoid the mistake of addressing their remarks to the nobler impulses in the crowd. To do so would require tiresome explanations as well as annoying exhortations to sacrifice, renunciation, and self-restraint.

2. *The State.* A fanciful term for the hotel management. Deserving of respect in the exact degree to which it satisfies the whims of its patrons and meets the public expectation of convenience and style at a fair price. The candidates never speak of the state as if it were a cherished ideal embodying the history of the people.

The guests have no obligation to the state except to pay their bills, preferably with a credit card and, if possible, under the heading of a tax-deductible business expense. This commercial definition of the state (as object rather than subject, as inanimate machinery instead of living organism) would have frightened both Aristotle and Machiavelli. It differs only slightly from the Mafia's designation of itself as "Cosa Nostra," i.e., our thing.

3. *The Laws.* The rules of the hotel, subject to seasonal changes in the weather or the presence of trade conventions. The candidates construe the laws not as the permanent ethical code of the society but rather as tools with which to harvest the crops of wealth. It is assumed by all parties that the laws can be written or rewritten as easily as computer programs and that they serve at the pleasure of whatever transient majorities or special interests make the most trouble or pay the luxury rates.

4. *Politics.* A Greek word for the printed forms on which the guests can "take a few minutes" to jot down their complaints or suggestions. Every two years the hotel collects these memorandums about the freshness of the orange juice, the enthusiasm of the staff, and the placement of the tennis courts. After submitting the results to the media and the opinion polls, maybe the management decides to replace the wine steward or change the furniture on the sun deck.

5. *The Good Life.* On sale twenty-four hours a day in the dining room and the lounge as well as in the international shops located in the mezzanine arcade. The management takes pride in its ability to maintain an Old World atmosphere that reflects a state of being rather than a state of becoming. The latter condition implies movement, which requires change, which creates friction, which causes pain, which is unconstitutional.

6. *Freedom.* Invariably celebrated as the supreme good and almost always confused with the license to exploit. The candidates never mention the use of freedom to create a higher order of responsibility or love. Every guest enjoys the inalienable right to indulge his or her holiday lust for goods and experience. The guarantee of happiness is included in the price of a room. Soon after their arrival, guests receive different grades of accommodations (first-class, economy, immigrant, etc.), but these may be revised upon payment of an appropriate fee.

To the extent that these assumptions underlie the political discourse, the vote-getting image of Hotel America bears an unhappy resemblance to the Marxist advertisement for a workers' resort on the shores of the Black Sea. Conceivably it is the materialist ethos implicit in the design that prompts so many people to shun the polls on election day. Undoubtedly it is true that for the last twenty years, ever since the death of President John Kennedy, the nature of American politics has become increasingly small and mean-spirited. Maybe this is all that anybody has a right to expect of politics; maybe it is a necessary stage in the cycle of death and regeneration. The old beliefs fall like leaves in a November wind; they settle into the compost heap of the society's dreaming mind, and in the new soil of a new spring they burst forth in the colors of a new and growing truth. For reasons I don't yet know how to express, and certainly couldn't begin to explain, I expect the stirrings of a political renaissance to become audible in the not too distant future. Obviously not this year, and probably not in 1988 or 1992, but, with any luck, and if we quit thinking of ourselves as the guests of a hotel management, before the early hours of the next century. ■

SCIENCE
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8 June 1984, Volume 224, Number 4653

And the Clocks Are Striking One

It was a bright cold day in April, and the clocks were striking thirteen.

Thus, George Orwell begins his chilling classic *1984*. "Bright" but "cold," with a "vile wind" and "a swirl of gritty dust" whose presence Winston Smith could not escape no matter how swiftly he slipped "through the glass doors" into the building that contained his flat. An allusion to Big Brother? Very likely. And the clocks were striking an ominous thirteen.

The political winds blowing in the actual 1984 are not as vile as the totalitarian nightmare of Orwell's horror, especially in the "free world." Yet we dare not complacently dismiss the prophetic dangers and self-deluding "doublethink" of *1984* as having meaning only for the Communist bloc. The powerful warning, as Erich Fromm observed, "means us, too."

Fromm was worried about the possibility of a society of automatons who would lose "every trace of individuality, of love, of critical thought" without being aware of what was happening to them (because of doublethink). In *The Sane Society*, Fromm identifies the peril as "managerial industrialism, in which man builds machines which act like men and develops men who act like machines . . . appendices to the process of production and consumption."

One might expect the current enthusiasm for fifth-generation computers and expert systems, which is producing ambitious, well-funded efforts in several countries, to result in machines "which act like men." But progress will not be at a gallop, nor will it generate human automatons. The advances will mostly serve to shift the boundary between the things that biological creatures do themselves and the things that technology helps them do or does for them—just as the steam shovel and the automobile shifted that boundary (only now the shift will be in the domains of information processing and cognition rather than physical labor and transportation).

What then of the danger that people might come to behave like machines, as Fromm feared? That depends not on whether a particular activity gets mechanized but on changes taking place in the functions people continue to perform themselves, on the character of new functions they assume, and mostly on what people do in their relationships with one another. The role of society and the economy is in determining how the options and opportunities are used or not used, as well as misused and misplaced.

In the real 1984, we have reason to take heart. The progress in biochemistry, microelectronics, lasers, and satellites is not the creation of a population of politically repressed automatons. The human species has demonstrated individual ingenuity and initiative at the summit of technological accomplishment, a signal of vital energy, not a moribund system.

Microcomputers, to consider a suggestive example, can be intellectually challenging and fun to use as well as very productive. They are the offspring of creativity and potential contributors to even greater creativity—enhancers of thought and levers to unbounded versatility. This only begins to be reflected by their success in the marketplace. They are stimulators, not stiflers, of imagination and invention.

Society must choose wisely to realize the liberating, ennobling potential of the new technologies. Personal computers are entering homes and offices in the millions. Universities are making plans to provide them to students. Computer manufacturers and software firms with an eye to future uses and users are being extremely generous with educational discounts and gifts. The ground is being laid for what could be a milestone in individual chievement and human fulfillment—a virtual renaissance of the collective irit. We should strive to make that the ultimate significance of 1984.

MARTIN GREENBERGER, *IBM Professor of Computers and Information tems, and Professor of Public Policy and Analysis, Graduate School of agement, University of California, Los Angeles 90024*

The following is a passage from Crisis and Opportunity, by Arnold Simoni (Schocken), as quoted in "Promethean Affirmation", from MANAS, May 2, 1984:

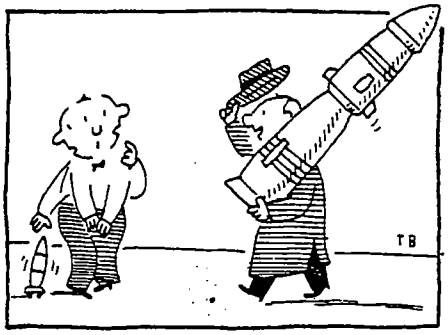
To find oneself suspecting that progress is a hollow doctrine in a world committed absolutely to the pursuit of progress is like learning, high over the Atlantic, that the pilot is an imposter and the co-pilot a drunk. All in all one would prefer not to know. Yet the knowledge can't be put by. The glossy fruits that progress has set out for our delectation are but apples of Sodom after all, ashes in the mouth. World unity is the ramshackle mockery of the United Nations—or worse, it is the fact that everyone drinks Coca-Cola. Peace is a state of stiffened terror presided over by the hydrogen bomb. Justice has been quietly throttled in police cells from Rio to Prague and Johannesburg. The doctrine's so-called higher content has all boiled away; what remains is mere prosperity, and that prosperity is for us alone: if we always are to have as much as we are accustomed to having, then the dream of a decent livelihood for all—Taiwan, Korea, and Singapore to the contrary notwithstanding—is simply a palliative for bad conscience.

Prosperity has been our solace, our recompense, our toy. Prosperity has held our hands through nights when we have wondered if the logic of world wars is like that of fairy tales—everything happens in threes, and after the third event the story is over. Prosperity has inured us to the very penalties of prosperity: the deterioration of nature, the rising empire of vast and inimical institutions, the dangerous resentment of the unprosperous. In fact prosperity can reconcile us to everything except the loss of prosperity itself. But now we confront that too. Our grandfathers had means and ends; we have lost confidence in the means and the ends have turned themselves inside out. Ours is a teleology not of hope but of dread. We no longer expect peace: we merely beg that we won't be blown up. We have abandoned the dream of unity: let the worst befall others so long as it does not befall us! Even the dream of plenty is slipping away: all we can do now is pray that we won't go broke.

Reprinted by permission from Nuclear Times, July 1984

Early Warnings

IS A MISSILE JUST A MISSILE?: Are hormones responsible for the arms race? Dr. Helen Caldicott believes they are, to a degree. In her new book, *Missile Envy: The Arms Race and Nuclear War* (published by William Morrow), Caldicott suggests that a typical man is a "man who never shows any emotion or even admits to having emotions, who is never fallible and never admits to making a mistake, who hides behind his defense mechanisms and builds missiles." Such men hold the reins of power in Washington, D.C., and she diagnoses them as suffering from "missile envy." Caldicott ob-



serves that "hideous weapons of killing and mass genocide may be a symptom of several male emotions: inadequate sexuality and a need to continually prove their virility plus a primitive fascination with killing."

Caldicott tells of being on a Chicago television program with a retired brigadier general. After the show, he told her, "You should go to Russia." Caldicott writes: "I thought for several seconds and decided to let him see the true fear in my soul, and I said to him, 'I fucking want my kids to grow up.' . . . He went wild and almost physicially attacked me. The producer came running out to separate us, and there was nearly a brawl on the floor of the TV studio." What did she learn from this? It made her realize that "a lot of these military characters have an extraordinary amount of anger." And she decided then that it is necessary to "try to uncover these emotions, so we could get to the true etiology of war, and to stop being polite and skating around on the surface of the issue."

In *Missile Envy*, comprised mostly of articulate ruminations on nuclear strategy, the military-industrial complex, U.S.-Soviet relations, and other aspects of the arms race, Caldicott also describes her 1982 meeting with President Reagan. During the 75-minute tête-a-tête, Reagan told Caldicott that the Soviets were evil, Godless communists. When she asked if he had ever met a Soviet, he replied, "No, but we hear from their émigrés." He also attacked the credibility of the former military officials who run the Center for Defense Information and said that Paul Warnke stood for unilateral disarmament. Reagan told Caldicott she was being manipulated by the KGB.

CHIPS ARE DOWN: Is the MX missile really a bargaining chip? That was one of the arguments that MX supporters used to pass the Aspin amendment. But on the day the House accepted Representative Les Aspin's compromise, May 16, Ambassador Edward Rowney, chief U.S. negotiator for the U.S.–Soviet strategic arms talks, unravelled this logic. Appearing on the *MacNeil/Lehrer Newshour*, Rowney said flatly about the MX: "It's not a bargaining chip." He explained, "It shouldn't be called a bargaining chip. We need the MX because if we're going to continue to have a land-based leg of the triad . . . the land leg needs to be modernized." Rowney, who speaks for the administration, boldly noted that the MX is not subject to negotiation. "We have no intention," he said, "if we build these MXs, to give them up, you see." When asked if the administration was "committed to giving them up if it was negotiated away," Rowney replied, "No, no. No, we're not—no one is talking about negotiating away the MX." Except for MX supporters on the Hill that day.

Then Rowney was asked whether the "whole principle of American policy" is to "negotiate away everything." He answered, "Oh, yes, yes, down the line. In the year 2006, a little after my time."

ILLUSTRATION BY TOM BLOOM

The following is quoted from "A Nuclearist Heresy", by G. Clarke Chapman, Jr., from Christianity and Crisis, July 9, 1984, p. 272:

"Nowadays the strategy of nuclear warfighting is the latest and most dangerous example of our fevered quest for self-assurance and esprit de corps. Its guise of pragmatic 'can do' optimism is only a masquerade. Actually, as George Kennan says in The Nuclear Delusion, 'There is no hope in it—only horror. It can be understood only as some form of subconscious despair on the part of its devotees—some sort of death wish, a readiness to commit suicide for fear of death...' What presents itself as our preferred mode of 'faith', i.e. self-confidence, is actually the opposite of faith. It is in fact an 'inability to face the normal hazards and vicissitudes of the human predicament,' Kennan continues, indeed 'a lack of faith, or better a lack of the very strength it takes to have faith.'

The following is from a speech by Ambassador George F. Kennan at the Smithsonian Institution's dinner on the occasion of the 50th Anniversary of the establishment of diplomatic relations between the United States and the Soviet Union, quoted from "State of the Relations", East/West Outlook, January 1984 (published by the American Committee on East/West Accord, 109 Eleventh Street S.E., Washington D.C. 20003):

"When I look at this relationship from the historical perspective, what I see are two great powers, only recently elevated to positions of political and economic ascendancy among modern nations. I see these two powers just beginning, in the 1930's and early 1940's, to tackle in all earnestness the difficult but not impossible task of adjustment to each other in a world where new technology was making all men neighbors. And then I see them suddenly overtaken by tremendous new developments in the geo-political and military fields—developments for which they were not at all prepared; and I see them thrown by these developments into a predicament—namely the nuclear weapons race—that had nothing to do with those normal problems of adjustment of earlier years—a predicament from which, as of today, they know no means of escape, and in which they are simply writhing helplessly, at immense danger to themselves and to the world around them.

"I have said it before. I can only say it again. There are no considerations—no aspirations, no ambitions, no anxieties, no defensive considerations—which could justify the continuation of this dreadful situation. The two governments may not be at fault—or at least they may be very little at fault—for its development. It was largely unforeseeable forces of history that thrust them into it. But it is a mortal danger for them both. And precisely because the problem is unprecedented, the effort of leadership required to extract them from it will also have to be unprecedented—unprecedented in determination, in imagination, in courage, and, if necessary, in political self-sacrifice."

The following is a passage in Hunter Brown's article "The Nuclear Mirror and the Will to Identity", from Cross Currents, Fall 1983, p. 352:

"Nuclear war, which from all appearances is a danger of international proportions demanding political resolution at the collective level, is in fact only one manifestation of a will to war which is fully embodied in the aberrations of every individual's quest for identity. The decisive question before humanity at this point is whether there is any power whatever that can stem the destructiveness of this one force at either the individual or international levels. Because the microcosmic and macrocosmic are so deeply related, resolution at one level will say much about the possibility of resolution at the other. Thus the burden of seeking a solution to humanity's perplexity falls not just to negotiators involved in arms limitation but to every individual insofar as each of us embodies the same destructive dispositions."

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