

THE PROGRESSIVE

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The H-bomb secret

How we got it—
why we're telling it

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The 'secret' revealed

The front cover of this magazine was designed for the April 1979 issue. Only the date has been changed. Howard Morland's article, "The H-bomb Secret," and all of the material on Pages 14 through 23, was set in type for the April issue. Not a word, not a comma has been changed.

For more than six months — from March 9, when Federal District Judge Robert W. Warren issued, at the Government's request, a temporary restraining order barring publication of Morland's article, through September 28, when the U.S. Seventh Circuit Court of Appeals vacated Judge Warren's injunction — the cover design and reproduction proofs were locked in a bank vault, "protected" from public scrutiny by an unprecedented act of censorship.

It is not a perfect article, and had it not been the subject of a historic prior restraint case, we would make some changes in it today. Howard Morland has learned that his article contains some technical errors; it is one of the many ironies of the case that the Government's attempt at suppression resulted in the disclosure of far more technical information than is contained in "The H-bomb Secret." In rereading the proofs, we have found at least one typographical error and one inaccuracy we should have caught in the first place: We put Representative Ronald V. Dellums in the wrong Congressional district.

But what makes publication of "The H-bomb Secret" in this issue of *The Progressive* important is that the article appears *exactly* the way Morland wrote it; *exactly* the way we intended to publish it last spring, and *exactly* the way the Government of the United States attempted to suppress it. Its publication is a triumph for the First Amendment.

Early last March, we could have acquiesced in the Government's offer to "rewrite" Howard Morland's article in a form that the U.S. Department of Energy would not find "objectionable." We wasted few words in declining that magnanimous offer.

We could have simply and quietly acceded to the Government's demand for censorship on grounds of "national security" — as other publications have. We refused.

We could have complied with the entreaties of many of our friends that we submit the matter to "mediation" by a panel of "experts," thus avoiding enormously costly litigation and, perhaps, heading off an adverse court decision. We

patiently explained to our friends that the Founders, in their wisdom, had not written a "mediation" process into the Bill of Rights.

We discovered that some of our fellow citizens (and some of our colleagues in the media) believe the First Amendment to be obsolete — a scrap of paper rendered useless by the demands of "national security." We discovered that our own Government believes the First Amendment was exploded by the bomb dropped on Hiroshima in 1945 — or at least rendered "inoperative" by the Atomic Energy Act of 1954.

We were determined to disabuse our fellow citizens, our colleagues in the media, and our Government of these unfortunate, undemocratic notions. We were prepared to throw all of our resources into the fight, and to find resources we did not even know existed. We were resolved, of course, to protect and preserve this magazine — but we were prepared, if necessary, to sacrifice even *The Progressive* for the principle at stake.

Prior restraint — the lawyers' term for censorship — has always been regarded as an especially obnoxious abuse of governmental authority. It has been despised — and rightly so — in the American constitutional tradition and, for that matter, in the Anglo-Saxon legal tradition, for centuries. The reason should be obvious: When the State imposes prior restraint, it places its own conduct beyond public scrutiny; it deprives the citizenry of its right to form an independent judgment as to the justice or injustice of its conduct. Censorship is an indispensable device to those who would wield power unchecked.

In 1643 the British parliament enacted a law conferring on a Committee of Examinations the power "to regulate printing: that no book, pamphlet, or paper shall be henceforth printed, unless the same be first approved and licensed by such, or at least one of such, as shall be thereto appointed." It was against that law that Milton directed his famous *Areopagitica*. "Henceforth," he wrote, "let no man care to learn, or care to be more than worldly wise; for certainly in higher matters to be ignorant and slothful, to be a common steadfast dunce, will be the only pleasant life and only in request."

What we learned last spring is that the Government of the United States is convinced it must keep the people of this na-

tion ignorant and slothful so that they can lead the only pleasant life while the world marches toward nuclear Armageddon.

But we also learned that the spirit of freedom still flourishes in our country — even after three decades of Cold War, witchhunts, and obsession with a kind of “national security” that seems to grow more elusive the more relentlessly it is pursued.

We learned, to be sure, that freedom has many fair-weather friends. But we also learned that it has devoted and unwavering defenders. Among them are citizens who had never heard of *The Progressive*, did not share its political perspectives, did not care about the nuclear issues involved in our struggle, but were simply outraged by the very idea of censorship.

We learned, to be sure, that a Federal judge would violate 200 years of legal precedents against prior restraint. But we also learned that we could receive a fair and full hearing in the appellate courts, and that we could muster a formidable array of legal talent in our behalf and in behalf of the First Amendment. We believe we would have won the right to publish Howard Morland’s article in the courts if the Government had not aborted the case by moving to vacate the injunction. We believe that is *why* the Government moved to vacate the injunction.

We learned, to be sure, that the costs of defending freedom can be astronomic, and could easily destroy a publication like *The Progressive*. But we also learned that among our readers and outside our readership there are people willing to help defray those costs. We have found some of those people, and we hope to find the others whose help we need.

We learned, most significantly, that our country still provides *the promise of freedom* — and that the promise grows stronger when it is put to the test.

Some fundamental questions raised by *The Progressive* in its First Amendment fight remain unresolved as this issue goes to press. We asked the Seventh Circuit Court of Appeals to rule that Judge Warren had acted improperly in doing what no Federal judge had ever done before in the history of this Republic — impose a prior restraint on grounds of “national security.” We asked the Court to find that secrecy provisions embodied in the Atomic Energy Act are so broad and vague as to be patently unconstitutional. We asked the Court to open the records of this case, which have been, themselves, subjected to heavy-handed Government censorship.

We do not know how the Court will rule. We *do* know we have already achieved some significant objectives — to expose the secrecy in which the nuclear arms race has been en-

veloped for a third of a century; to open that system of secrecy to public discussion and debate, and to engage in that debate far more of the American people than we could ever have hoped to reach through the pages of *The Progressive*.

We hope that debate will be a beginning — a beginning of a process in which all of the nuclear policies pursued by our Government will be held up to public scrutiny and review. We hope that the process will end in a reversal of those policies and an end to the suicidal nuclear arms race in which we have been unwitting, uninformed participants. We hope, of course, that when Americans know the facts they will share our views — but most of all we hope they will come to *know the facts*. We are willing to take our chances with the judgments of an *informed* people; that is called democracy. People who want to be ignorant and free, as Madison observed, want that which never was and never will be.

Read Howard Morland’s article, “The H-bomb Secret.” Feel free to challenge his facts, or the conclusions he draws from them. Feel free to question our editing of the article, our judgment in publishing it. But most of all, *feel free* — more free than any of us were for the six months and nineteen days when the article could not be printed by us or read by you. And feel more free than any of us were even before March 9, for we are certain we have made it more difficult for the Government to be a censor, and less likely that its next attempt at censorship will succeed.

A principle to be safeguarded

The following statement supporting *The Progressive* and the First Amendment was endorsed by the editor or publisher of *The Nation*, *Columbia Journalism Review*, *Society*, *Village Voice*, *Harper's*, *The Atlantic Monthly*, *Ms.*, *Scientific American*, *Seven Days*, *Working Papers*, *The New Republic*, *Mother Jones*, *Inquiry*, *Win*, *In These Times*, *The Witness*, *Texas Observer*, *Science for the People*, *Dollars & Sense*, *The Black Scholar*, and *Politics Today*, and by organization spokesmen for Committee for a SANE Nuclear Policy, Critical Mass Energy Project, War Resisters League, Friends Peace Committee, and American Friends Service Committee:

“In 1971, the Government of the United States moved against *The New York Times* and *The Washington Post* in an unprecedented attempt to assert a right of censorship and prior restraint. This gross violation of the First Amendment was promptly and unequivocally rebuffed by the courts.

“Now the Government has mounted a similar attempt against

a small publication of political commentary.

“We believe that *The Progressive* is fighting to protect the First Amendment rights of every publication in America, including those with which we are associated.

“In a time when military policy is closely linked with technological capabilities, debate about military policy that uses technical information is part of a vigorous system of freedom of expression under the First Amendment. The Government’s tendency to hide widely known technical processes under a mantle of secrecy in the national interest and prevent press commentary on these matters can only result in stifling debate, not in protecting the physical security of Americans.

“The facts at issue in the Government’s dispute with *The Progressive* will be determined in the courts, but the principle of freedom of the press is one to be vigorously safeguarded by all of us. That is why we are pledging our full support to *The Progressive* in its fight against censorship and prior restraint.”

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The H-bomb secret

To know how
is to ask why

Howard Morland

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What you are about to learn is a secret — a secret that the United States and four other nations, the makers of hydrogen weapons, have gone to extraordinary lengths to protect.

The secret is in the coupling mechanism that enables an ordinary fission bomb — the kind that destroyed Hiroshima — to trigger the far deadlier energy of hydrogen fusion.

The physical pressure and heat generated by x- and gamma radiation, moving outward from the trigger at the speed of light, bounces against the weapon's inner wall and is reflected with enormous force into the sides of a carrot-shaped "pencil" which contains the fusion fuel.

That, within the limits of a single sentence, is the essence of a concept that initially eluded the physicists of the United States, the Soviet Union, Britain, France, and China; that they discovered independently and kept tenaciously to themselves, and that may not yet have occurred to the weapon makers of a dozen other nations bent on building the hydrogen bomb.

I discovered it simply by reading and asking questions, without the benefit of security clearance or access to classified materials. There may be some missing pieces here and there — some parts of the puzzle that eluded my search — but the general accuracy of my descriptions and diagrams has been confirmed by people in a position to know.

Why am I telling you?

It's not because I want to help you build an H-bomb. Have no fear; that

would be far beyond your capability — unless you have the resources of at least a medium-sized government.

Nor is it because I want India, or Israel, or Pakistan, or South Africa to get the H-bomb sooner than they otherwise would, even though it is conceivable that the information will be helpful to them.

It isn't so much because the details themselves are helpful to an understanding of the grave public policy

'A complete one-megaton bomb ...would fit under your bed'

questions presented by hydrogen weaponry — though they may well be essential.

I am telling the secret to make a basic point as forcefully as I can: Secrecy itself, especially the power of a few designated "experts" to declare some topics off limits, contributes to a political climate in which the nuclear establishment can conduct business as usual, protecting and perpetuating the production of these horror weapons.

The pernicious effects of hydrogen bomb secrecy are well illustrated by an incident that occurred in Washington five months ago.

On October 24, 1978, Representative Ronald V. Dellums, a member of the House Armed Services Committee, sent a letter asking the Department of Energy to explain publicly why it expects a shortage of plutonium in its nuclear weapons production program.

Would the neutron bomb, which was then going into production, require more plutonium than the standard tactical nuclear weapons it is designed to replace?

Had the shortage been induced by the plutonium requirements of a new generation of multiple-warhead ballistic missiles — the Navy's Trident (successor to Poseidon), and the Air Force's M-X (successor to Minuteman III)?

What were the weapons specifications that had led the Department of Energy to contemplate a massive industrial retooling: the rebuilding of its old plutonium production plant at Hanford, Washington, and the restarting of a standby reactor at Savannah River, South Carolina?

"Each of these options will involve both financial costs and environmental costs," the letter stated. "The American people need to know the reasons for the anticipated plutonium shortage in order to have informed opinions on the cost-benefit aspects of the plutonium shortage issue."

As chairman of the Subcommittee on Fiscal and Government Affairs, and as a Congressman whose California district includes one of the nation's two nuclear weapons laboratories,

Dellums had more than a casual interest in such questions.

Three weeks later he received the Energy Department's reply:

"...It is not possible to respond to most of the questions in an unclassified manner. The enclosure to your referenced letter contains 'secret/restricted data' and should be so classified." The enclosure was the list of questions. *It is now a secret.*

Had Dellums invoked the security privileges available to Representatives and Senators with a "need to know," he could readily have obtained the answers. But he did not choose to do so. The response he received demonstrates the lengths to which the keepers of the secrets are prepared to go in dealing with the public: They do not simply withhold the answers; *they can also confiscate the questions.*

Such tactics have served since the dawn of the atomic age to shield nuclear weapons policies from public scrutiny and debate, giving an advantage to those who formulate the policies and have a stake in their perpetuation. And yet the advantage is one gained mostly by default. It results as much from the self-imposed restraint of those who are not members of the classification elite as from the weapon makers' own complicated security system. The importance of looking behind "secret/restricted" curtains, the relative ease of doing so, and the value to be gained from the exercise are lessons we have still to learn.

The self-serving purposes of official secrecy — not the least of which is its paralyzing effect on the spirit of public inquiry — can best be understood by examining the most momentous official secret of them all: the mechanism of a hydrogen bomb.

Of all the world's nuclear weapons secrets, none has eluded publication more successfully than the secret of the H-bomb. In the twenty-five years since its first successful field test in the South Pacific, no description of how it works has ever been made public.

The diagrams that accompany this article are a close approximation of that process. They show the progression of events that occur during the detonation of a hydrogen weapon. The energy of

an exploding fission bomb, the circular object near the top of each drawing, is transferred by means of radiation pres-

sure to the hydrogen part of the weapon. Radiation pressure — a term never mentioned in the open literature — is

Somebody talked

"Does anyone know the secret of the H-bomb?"

Howard Morland didn't really expect an answer when he threw the question out half-seriously one night a year ago in a dormitory at the University of Alabama at Tuscaloosa.

About thirty students had gathered to see his traveling slide show on atomic power and the arms race; in the discussion that followed he was explaining that his next project would be to find out more about nuclear weapons.

"Sure, I know," said a young man in the back of the room. "The secret is in the radiation reflectors."

The student went on to explain that he knew some of the people who worked at the big Union Carbide plant in Oak Ridge, Tennessee, where most of the components for hydrogen weapons are built, and that they had told him the reflection of x- and gamma rays was the key to how the weapons work.

The explanation made little impression on Morland at the time, and he didn't even bother to get the student's name. But later on it helped him crack what the weaponmakers consider to be one of their best-kept secrets.

Such chance remarks were part of the mosaic of information from which Morland, a thirty-six-year-old peace activist, constructed the report on these pages — a report confirmed by people who are knowledgeable about the hydrogen weapon program but are not at liberty to discuss it openly. He undertook the project on as-

signment from *The Progressive* to demonstrate that official secrecy in this area serves no useful public purpose.

A 1965 graduate of Emory University in Atlanta, Morland has had only a smattering of science education: two courses in physics, two in chemistry, and one in quantum mechanics. As a journalist, it was only this winter that he published his first article ("Tritium: the New Genie," in the February issue of *The Progressive*). What knowledge he has of military affairs comes largely from the two years he spent piloting Air Force cargo planes between California and Vietnam.

But Morland put his training and experience to use in an intensive six-month self-education project in which he read virtually every scrap of information available on the subject, visited every production plant to which he could gain access, and interviewed scores of scientists and engineers in and out of the weapons program.

Every technical fact was double-checked; none was printed unless it could be authenticated by at least two knowledgeable sources. His diagrams and descriptions received widespread review in the scientific community prior to publication. Copies also were submitted to the Department of Energy for verification as to technical accuracy. The Department declined to do this.

Morland's research was supported by donations to *The Progressive's* arms race investigation fund. He also received research assistance from a colleague, Louise Franklin Ramirez.

the essence of what remains of the H-bomb secret.

This description and the details that follow are the result of six months' investigation of the nuclear weapon production complex in the United States. It is a mosaic of bits and pieces taken from employe recruitment brochures, environmental impact statements, books, articles, personal interviews, and my own private speculation. A number of reliable sources have confirmed that the information fragments are correctly assembled.

The simple facts are deducible from

the A-bomb secret from the world. The Army had already told where the factories were, what they did, who designed them, and who ran them. The disclosures came in a report by Princeton physicist H.D. Smyth, written before the weapon was ever tested, to protect the Army's bureaucratic flank in case the \$2 billion Manhattan Project turned out to be a dud. It was published immediately after the war. Foreign scientists wishing to build fission bombs could learn from the Smyth Report about the materials required, the nature and the scale of operations needed to obtain the mate-

supplement his job teaching physics at Cornell, he had been doing consulting work for the AEC.

When the first prototype hydrogen weapon exploded in the South Pacific on November 1, 1952, the public had no idea how it worked, except that some of its energy came from hydrogen fusion. No one outside the U.S. and Soviet governments knew that five of its ten megatons of explosive energy had come from fission, not fusion, and that 5,000 square miles of ocean surface had, therefore, been contaminated with lethal levels of radioactive fission products. The evidence sank to the ocean floor.

Sixteen months later, when the second bomb went off, that part of the H-bomb secret was revealed. A hundred miles downwind, the entire population of Rongelap Island and the crew of a Japanese fishing boat called *The Lucky Dragon* were dusted with powdered coral containing enough radioactive fission products to blister their skin and make their hair fall out. One fisherman died. Japanese scientists analyzed the deadly ash on the fishing boat deck and concluded that the bomb was as much a uranium bomb as a hydrogen bomb. Half its energy had come from the fission of uranium-238, as had most of its deadly fallout.

The bomb designers had felt no obligation to warn the world that their new invention was anything more than a bomb with a super-powerful blast — that, in fact, its radioactive fallout could lethally poison a far greater area than its blast could destroy. Indeed, the hydrogen weapon had been publicized as a "clean bomb." Edward Teller and J. Robert Oppenheimer, weapon designers whom the press routinely called "brilliant," kept the faith with the nuclear weapon priesthood and kept their mouths shut. They would not divulge weapon design information merely to discuss such moral issues as fallout.

The dangers of fallout from nuclear testing soon became a national preoccupation, but when American and Soviet nuclear testing went underground in 1963, radioactive fallout ceased to be a public issue. Nuclear weapon production entered a golden age of public apathy. Multiple warhead missiles were designed and deployed

'...Workers...look like astronauts on a training exercise'

careful journalistic inquiry and from well-known physical principles. If weapons proliferation is to be controlled, the availability of this information must be recognized by policy makers, who presently prefer to believe the information is unique to the weapons states.

A discussion of nuclear weapons secrets might well begin with Albert Einstein's memorable comment: "There is no secret, and there is no defense." He offered as a corollary, "There is no possibility of control except through the aroused understanding and insistence of the peoples of the world."

Nuclear energy, Einstein concluded, "cannot be fitted into outmoded concepts of narrow nationalisms." But America had emerged from World War II as the sole possessor of nuclear weapons — and those who had capitalized on Einstein's mathematical genius had no use then for his political equations. Less than a year after the Hiroshima bombing, Congress passed the Atomic Energy Act, extending wartime information control into the indefinite future and creating the illusion that it was possible for one nation to keep nuclear secrets from another.

By that time, it was too late to keep

rials, the enrichment and production techniques that worked best, and the names of people to contact for further information. Atomic spies could read the Smyth Report like a manual telling them where to go and what to look for.

Smyth's exhaustive account, later regretted by the security-conscious Atomic Energy Commission, was the first of many flaps over secrecy.

On March 15, 1950, *Scientific American* went to press with an article by Cornell physicist Hans Bethe about thermonuclear fusion, the process that lights the sun and other stars. The AEC, sensitive about anything having to do with the H-bomb, ordered the presses stopped. Three thousand copies of the magazine were destroyed, and the presses were restarted with several sentences removed. At that time, the H-bomb had not yet been invented. The concept was still under study, and a feeble — and ultimately abortive — public debate was starting over the issue.

Publisher Gerard Piel charged the Commission with "suppressing information which the American people need in order to form intelligent judgments," but Bethe declined to complain about it. "These people can cause me all kinds of trouble," he said. To

without serious complaint, and arsenals grew enormously. By removing their products from sight, the weapon makers were able to continue to refine their weapons without protest.

Few people remember that nuclear weapon secrets were the underlying issue in the witchhunts and blacklists of the Joseph McCarthy era. In ways sometimes subtle, sometimes direct, the continuing challenges to civil liberties in America today are traceable, in part, to widespread belief in the need for *some* secrecy. People assume that even if nothing else is secret, surely hydrogen bomb designs must be protected from unauthorized eyes.

The puncturing of that notion is the purpose of this report.

The hydrogen bomb secret is now more than twenty-five years old. Five national governments have built industries to produce H-bombs, and there is little reason to think that any other nation that wanted to build them would have trouble finding out how to do it. Pieces of the secret have been declassified and published in what weapon makers call "the open literature," which is accessible to you and me. But enough of the secret has been kept from the general public to perpetuate the mystery and discourage inquiry. Weapon makers can still hide behind their solemn duty to secrecy when hard questions are asked about what they are doing.

Congressman Dellums's questions are a case in point.

They concern a predicted shortage of plutonium in the weapons program — a shortage that calls for hundreds of millions of dollars to be spent upgrading production reactors and fuel reprocessing facilities in Washington state and South Carolina. Why?

Is the nuclear warhead and bomb production rate scheduled to increase dramatically? Do the latest weapon designs call for more plutonium than older designs? (Enriched uranium, which is used together with plutonium, remains abundant.) Is the plutonium shortage really a tritium shortage in disguise, caused by the neutron bomb's high requirement for tritium? (Tritium and plutonium production operations compete for space in the same South Carolina reactors.) Is the Energy Department's proposal really a

porkbarrel project for South Carolina, where nuclear weapons production is the state's largest industry? Or for Washington state, home of the powerful and military-minded Senator Henry M. (Scoop) Jackson?

The Department's assertion of secrecy protected it from having to provide public answers. The answers, as we shall see, would have raised profound questions of public policy.

Before considering technical details, it should be noted that for most people there will always be an H-bomb secret, just as there will

problems of nuclear waste disposal and the biological effects of radiation — can also understand the technology of nuclear weapons, if provided with the necessary information. The growing scientific and technical expertise which has strengthened worldwide opposition to nuclear power is equally vital to a revival of effective public concern over nuclear weapons.

Knowledge of the basic principles of hydrogen weapon design is helpful in understanding the structure of the nuclear weapon production system. It provides insight into the purposes of continued nuclear testing, the nature of

'Understanding the product is necessary to understanding the system'

always be, for most people, a radio secret and an automobile secret. Not everyone is interested in how things work. But millions of people in our highly technological society are amateur experts on gadgets as varied as the electric doorbell and the nuclear power reactor.

Anyone familiar with elementary principles of college physics — such as those underlying the technical

new developments in nuclear weaponry such as the neutron bomb, and the devastating effects of nuclear war.

Paying attention to the details is also a way of reminding ourselves that the weapons are real. The most difficult intellectual hurdle most people encounter in understanding nuclear weapons is to see them as physical devices rather than as abstract expressions of good or evil. The human mind

'No defense'

The following is from a letter from Albert Einstein, signed January 22, 1947, appealing for support for the Emergency Committee of Atomic Scientists:

"Through the release of atomic energy, our generation has brought into the world the most revolutionary force since prehistoric man's discovery of fire. This basic power of the universe cannot be fitted into the outmoded concept of narrow nationalisms. For there is no secret and there is

no defense; there is no possibility of control except through the aroused understanding and insistence of the peoples of the world.

"We scientists recognize our inescapable responsibility to carry to our fellow citizens an understanding of the simple facts of atomic energy and its implications for society. In this lies our only security and our only hope — we believe that an informed citizenry will act for life and not death."

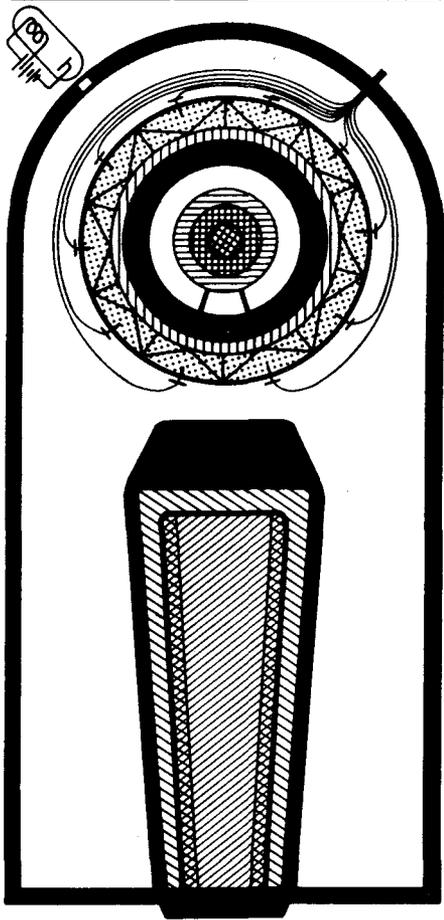


Figure 1. Schematic diagram of a 300-kiloton thermonuclear weapon before detonation. Concentric spheres near the top make up the primary system, or fission trigger. The rest is the secondary system.

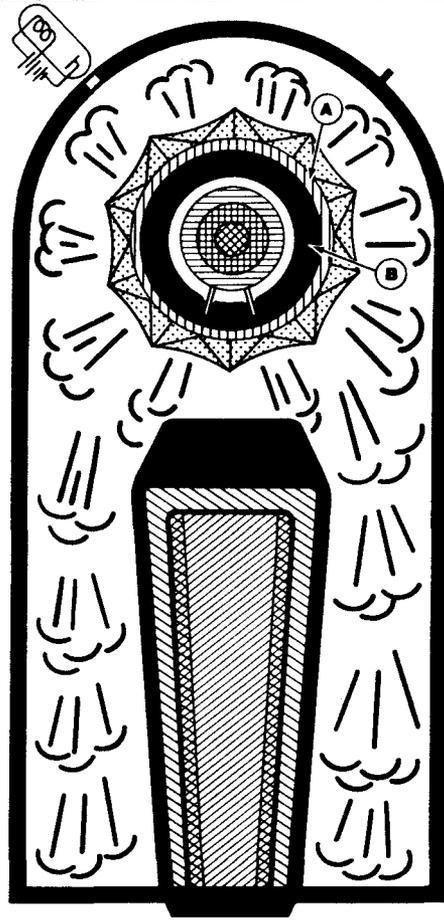


Figure 2. High explosives in the primary system begin to burn, driving beryllium neutron reflector (A) and heavy Uranium-238 tamper (B) inward toward the fissile core. The space between the tamper and the core allows the tamper to develop momentum before hitting the core.

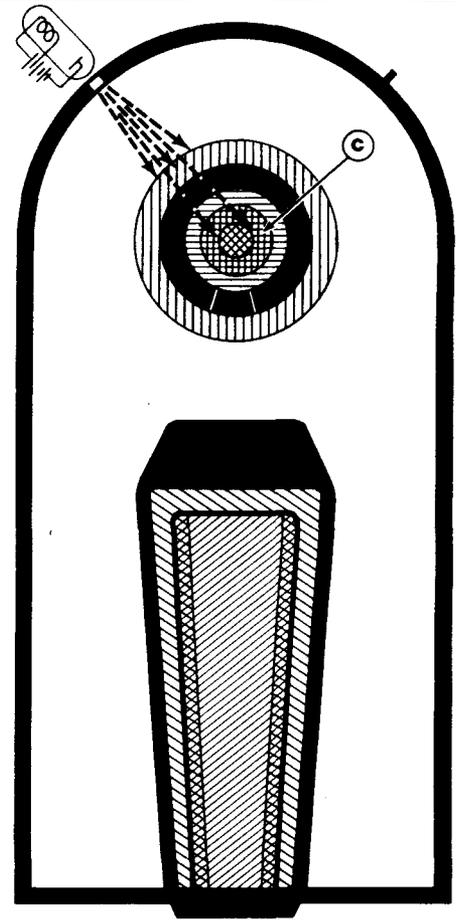
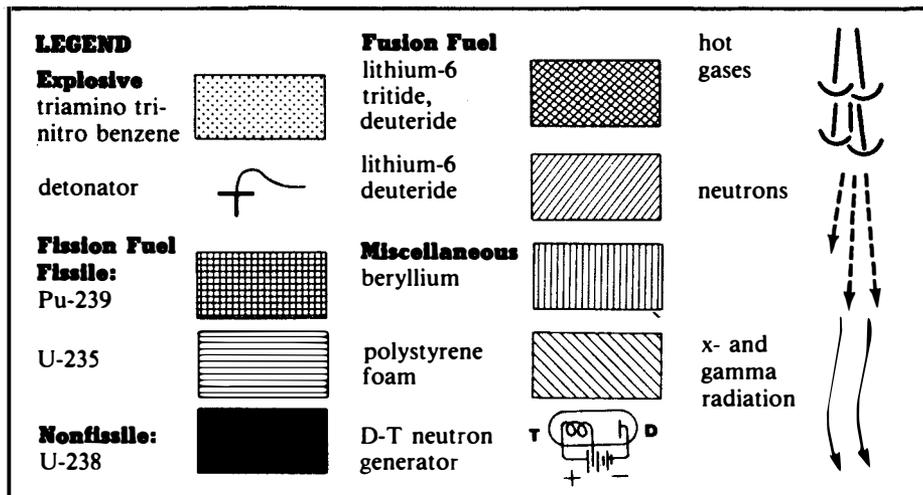


Figure 3. The fissile core is squeezed to more than double its normal density, going supercritical. Neutrons fired from a high-voltage vacuum tube start a chain reaction in the fissile material. The chain reaction concentrates first in the fast-fissioning Plutonium-239 (C).



boggles at gadgets the size of surfboards that can knock down every building for miles around. But these are devices made by ordinary people in ordinary towns. The weapons are harder to believe than to understand.

There are three stages to the detonation of a hydrogen weapon: fission, fusion, and more fission. Although one event must follow the other for the weapon to work, they happen so rapidly that a human observer would experience only a single event — an explosion of unearthly magnitude. Within the bomb, however, fission — the splitting of uranium and plutonium nuclei — comes first.

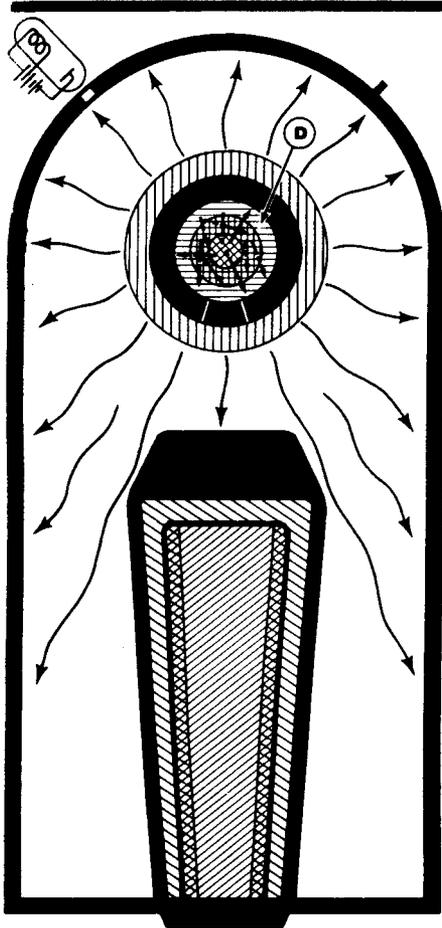


Figure 4. The chain reaction spreads to slow-fissioning Uranium-235 (D). Fusion fuel at the center of the core showers the core with neutrons, "boosting" fission efficiency. As the core expands to its original size, reaction stops, completing the first stage of the detonation. Energy release so far: forty kilotons. Prompt gamma rays and x-rays travel outward at the speed of light.

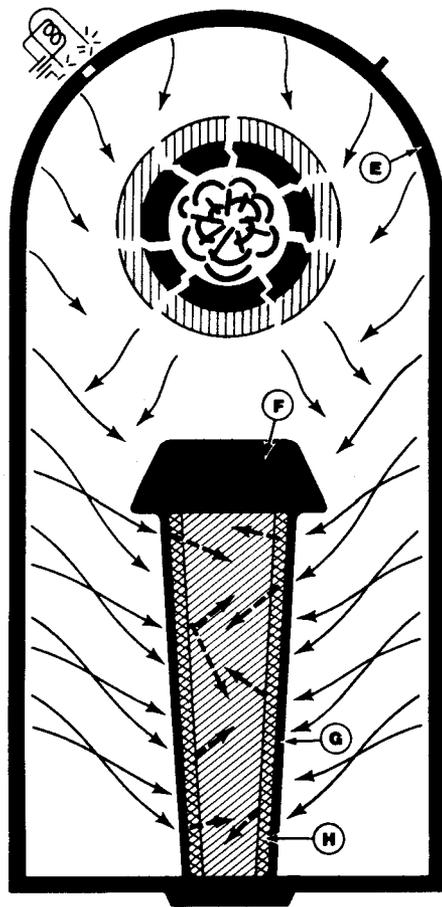
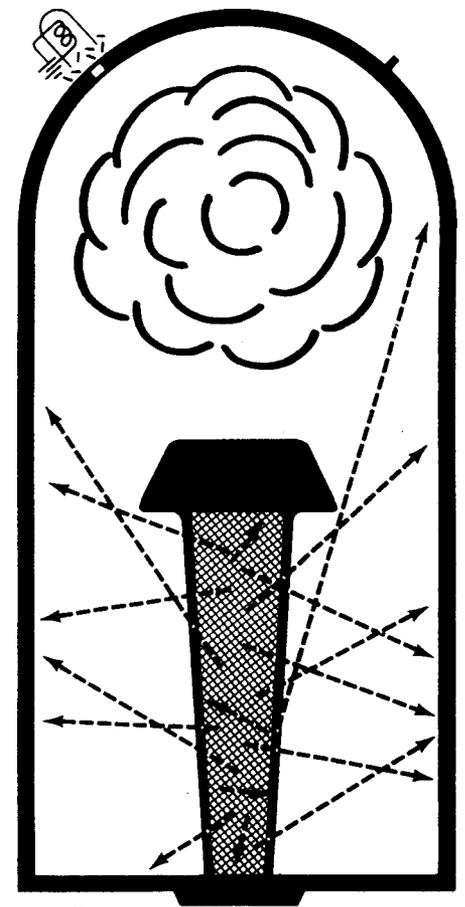


Figure 5. The weapon casing (E) reflects radiation pressure around the thick radiation shield (F) and onto the sides of the fusion tamper (G), collapsing the tamper inward. Heat and pressure of the impact start fusion in the tritiated portion (H) of the fusion fuel "pencil." The precise location of the tritium within the pencil depends on where the designer intends the fusion reaction to begin. Neutrons from this fusion activity breed tritium throughout the pencil.



(Copyright © 1979, Howard Morland.)

Figure 6. Fusion fuel reacts virtually simultaneously throughout the pencil, releasing 130 kilotons of energy to complete the second stage. High-energy neutrons from fusion are absorbed by Uranium-238, which has so far served as a fission tamper, radiation shield, radiation reflector, and fusion tamper. Now it serves as fission fuel.

The mechanism for the first fission stage is a miniaturized version of the Nagasaki bomb. It has roughly the same explosive power as the World War II weapon, but it measures less than twelve inches in diameter. This fission "trigger" vaguely resembles a soccer ball, with the same pattern of twenty hexagons and twelve pentagons forming a sphere. Detonator wires are attached to each pentagonal or hexagonal face. When its full explosive energy is realized, this oversized cantaloupe becomes the source of the radiation pressure which ignites the fusion stage.

Weapon designers call this miniature

A-bomb the "primary system." The rest of the nuclear part of the weapon is called the "secondary system." In published accounts, the primary system is often referred to as the "trigger." By itself, it could level a small city, but in a hydrogen weapon it merely provides the energy necessary to ignite the second stage, which releases energy by fusing hydrogen to form helium. A fission bomb is the only force on Earth powerful enough to provide the compression and heat needed to detonate a fusion bomb.

The secondary system is the mechanism which captures the fission energy of the primary system and puts

it to work in the fusion process. The design of the secondary system is the H-bomb secret.

The challenge in designing a hydrogen weapon is to make the secondary system finish its task of fusion before the expanding fireball of the primary systems engulfs and destroys it. About a millionth of a second is all the time available for doing the job. Pure radiant energy, in this case the energy of x- and gamma radiation, is the only thing fast enough and manageable enough to be harnessed for that purpose.

X- and gamma radiation travel at the speed of light, more than a hundred

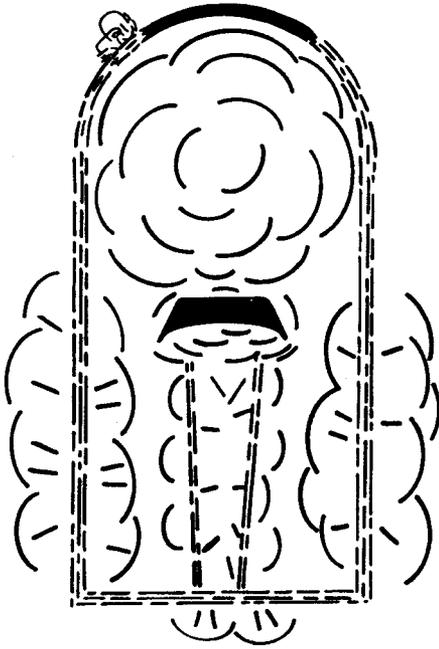


Figure 7. Uranium-238 fissions, adding another 130 kilotons of energy to the explosion and generating enough fission products to kill everyone within 150 square miles with fallout. This is the end of the third stage. A fireball begins to develop....

times faster than the expanding debris from an exploding A-bomb. If the primary system and the fusion fuel are located some distance apart, say twelve inches, the radiant energy of the primary system will have time to race ahead of the expanding nuclear debris and reach the fusion fuel first.

The cylindrical shape of most hydrogen weapons plays an important role in determining how this radiant energy will be distributed inside the casing. The primary system is located inside one end of a three- or four-foot-long hollow cylinder casing, and the fusion fuel is located inside the other end. The cylinder is normally eighteen inches in diameter, large enough to contain the soccer-ball sized primary system inside one end and leave a few inches to spare around the sides. A complete one-megaton bomb (having the explosive power of one million tons of TNT) would fit under your bed.

The cylindrical casing is more than just the package that holds the nuclear parts together. It is also a radiation reflector designed to capture radiation

from the primary system and focus it on the fusion fuel. It is the largest and heaviest component of any hydrogen weapon, and one of the most important.

The reflector-casing is usually made of uranium-238, a heavy, shiny, metal called "depleted uranium." In the last stage of the weapon's detonation sequence, the depleted uranium explodes with the power of many Hiroshima bombs, producing most of the weapon's deadly fallout. However, the first function of uranium-238 in the secondary system is to serve not as an energy source but as a finely engineered energy reflector.

All the major components of the secondary system are made by Union Carbide, the chemical company, in the foothills of the Great Smoky Mountains of Tennessee. The 500-acre bomb factory where the work is done still bears the code name, Y-12, assigned it by the World War II designers of the atomic bomb. The Oak Ridge buildings where scientists enriched uranium for the Hiroshima weapon now house the world's most sophisticated H-bomb production line. When an American hydrogen weapon explodes, most of the explosive power comes from components made at Y-12. Half the equipment in the country's far-flung nuclear weapon production complex is concentrated there.

Few residents of Oak Ridge and nearby Knoxville are aware that such products come from their peaceful valley. A chemistry professor who occasionally lectures at Y-12 told me he didn't know what went on at the plant; he sometimes wondered, but he didn't think it was the production of bombs. A woman whose husband is an Oak Ridge radiologist expressed outright disbelief that Oak Ridge was still in the weapons business. And yet the weapons role of the plant is not secret; it just isn't mentioned in public.

Much of the H-bomb secret is in a form that can't be written down. It exists in the hand-and-eye coordination of the skilled workers who operate machine tools at the Y-12 plant, or in the quality of the machines themselves. One of the high-precision tasks is the squeezing of large blocks of

uranium-238 metal into thin sheets and the machining of those sheets to make radiation reflectors.

The raw material for this process arrives by truck or rail from Fernald, Ohio, where gaseous uranium-238 hexafluoride has been chemically reduced to pure metal blocks. At Y-12, the blocks are fed like cordwood to a giant rolling press which flattens them into sheets five-and-a-half feet wide and one inch thick. The sheets are then fed through smaller presses which reduce their thickness to as little as five-thousandths of an inch. When a sheet has reached the proper thinness, the weapon part is cut from it the way cookies are cut from a sheet of dough. The rough-cut parts are then machined to final dimensions.

A graduate student at the University of Alabama, who knows people who work in Oak Ridge, told me the reflector-casing is composed of thousands of finely machined reflecting surfaces. Jack Case, Union Carbide's manager for the plant, says some parts made at Y-12 are so thin and delicate that special techniques for "fixturing," or attaching rough-cut parts to a lathe, had to be developed. Normal fixturing techniques would mar the parts or allow them to sag and be distorted by their own weight. Y-12 pioneered in the use of chemical adhesives and suction in fixturing. The reflector-casing may be composed of many thin pieces of uranium-238 sandwiched together into an exotic metal plywood.

Radiation reflectors for the H-bomb arsenal enter the Oak Ridge Y-12 plant as great blocks of uranium-238 metal and emerge as finely engineered canisters the size of household garbage cans. When war comes, the canisters will reflect and focus the radiation that sets off hydrogen fusion.

Fusion is called a thermonuclear process because heat makes it happen. Temperatures of several hundred million degrees Celsius are needed to start the process. However, the *rate* of fusion is determined by the *density* of the hydrogen fuel. In a weapon, the rate of fusion must be extremely rapid. For a useful amount of fusion fuel to fuse in the allotted millionth of a second, it must first be greatly compressed. Without tremen-

dous compression, the fusion fuel would not fuse fast enough to add much energy to the explosion before it was scattered uselessly by the expanding fireball of the primary system. In a hydrogen weapon, radiation pressure is what compresses the fusion fuel sufficiently to make the device destroy a city's suburbs as well as its center.

Radiation pressure, the principle by which the secondary system works, is normally too weak to be detected by human senses. You cannot feel the physical push of a flashlight beam, for instance. There are no examples in the human environment of radiation intense enough to move solid objects with more than barely measurable force. But the primary system of a hydrogen weapon is a nuclear power plant that generates twenty million kilowatt-hours' worth of thermal energy in a few billionths of a second, all inside a lump of metal compressed to the size of a baseball. Its radiant energy can exert enormous force on an object located only inches away.

In fact, the radiation pressure inside the weapon casing can theoretically be as high as a million million times greater than atmospheric pressure — about eight billion tons per square inch. Physicists would describe the radiation as a "gas of photons," a dense cloud of highly energetic pulses of electromagnetic energy, pushing violently against anything it touches. For the briefest moment, the inside of the weapon becomes an x-ray oven, similar in principle to a microwave oven, but with unearthly temperatures and pressures.

As any science student can tell you, heat is the enemy of compression. The greatest densities are achieved when a substance is compressed cold: Heat tends to make it expand. Because fusion fuel in a weapon must therefore be compressed *before* it reaches ignition temperature, the fusion fuel of the secondary system is not exposed directly to radiation from the primary system. It is protected on the end nearest the primary system by a large radiation shield.

Around the sides of the fusion fuel is a tapered cylinder called the fusion tamper. Radiation from the exploding fission trigger is reflected around the large shield, or pusher, in the center of

the weapon and onto the sides of the fusion tamper. The fusion tamper then collapses inward with enormous force, driven by the pressure of x- and gamma radiation from the primary system. The fusion tamper compresses the fusion fuel and simultaneously heats its perimeter to ignition temperatures.

An important part of nuclear weapon design is the judicious use of empty spaces inside the weapon. The empty space between a raised hammer and a nail allows the hammer to strike the nail with much greater force than could be mustered if the hammer were

pressing the fuel; the empty space between the fusion tamper and the fuel is used to produce maximum compression. In addition, the delicate ceramic-like fusion fuel must be firmly cradled and supported from all sides during the weapon's possibly rough ride to the target.

A key ingredient in the design of this aspect of the secondary system is the polystyrene foam that keeps the fusion fuel centered inside the fusion tamper. By holding the fuel and the tamper apart, the foam allows the tamper to develop momentum before it strikes

'Continued...testing...is a paradox unless you know the secret'

placed against the nailhead before pressure was applied. In a hydrogen weapon, the fusion tamper serves as a hammer that strikes the fusion fuel simultaneously from all sides, com-

the fusion fuel. Polystyrene foam is thus both a packaging material and an empty space, protecting the hydrogen fuel during weapon delivery and collapsing into nothing during detonation.

The price of secrecy

Ten years ago the Pentagon appointed a nine-member "Task Force on Secrecy" to investigate the effectiveness of the nation's security system. This was one of its findings:

"With respect to technical information, it is understandable that our society would turn to secrecy in an attempt to optimize the advantage to national security that may be gained from new discoveries or innovations associated with science and engineering.

"However, it must be recognized, first, that certain kinds of technical information are easily discovered independently, or regenerated, once a reasonably sophisticated group decides it is worthwhile to do so.

"In spite of elaborate and very

costly measures taken independently by the U.S. and the U.S.S.R. to preserve technical secrecy, neither the United Kingdom nor China was long delayed in developing hydrogen weapons.

"Also, classification of technical information impedes its flow within our own system, and may easily do far more harm than good by stifling critical discussion and review or by engendering frustration. There are many cases in which the declassification of technical information within our system probably had a beneficial effect and its classification has had a deleterious one."

One of the task force members was Dr. Edward Teller, father of the U.S. hydrogen bomb.

The foam is made in Kansas City, Missouri, by the Bendix Corporation, in a factory that manufactures most of the non-nuclear parts for nuclear warheads and bombs.

Only the heavier isotopes of hydrogen serve as fuel in a hydrogen weapon. Hydrogen-2 and hydrogen-3, known respectively as deuterium and tritium, are the fuel which explodes with the force of many trainloads of TNT. Tritium is expensive and highly radioactive. For practical reasons, most of the tritium is

the windows of their dry rooms, they look like astronauts on a training exercise.

When the charge of lithium-6 deuteride for a single weapon is assembled, it makes a column one or two feet high and several inches in diameter. It is tapered to fit inside the fusion tamper the way the core of a carrot fits inside the carrot.

When this charge of fusion fuel is struck simultaneously on all sides by the imploding fusion tamper, it is compressed and heated. Fusion begins in the perimeter where some tritium is

thermonuclear weapon technology, Rapoport completely overlooked the Oak Ridge Y-12 plant, the most important factory in the system. The significance of the role of Union Carbide and the Energy Department's Oak Ridge Operations Office cannot be explained without knowledge of the importance of lithium-6 deuteride and uranium-238 to nuclear weapons manufacture. Understanding the system's product is necessary to understanding the system.

Another example:

Continued nuclear testing underground in Nevada is a paradox unless you know the secret. Underground nuclear explosions are never higher in yield than a few kilotons, despite unofficial acknowledgement that our latest strategic nuclear weapons are in the 100 to 500 kiloton range. The widespread belief that the weapon makers are testing only the primary systems, or triggers, is incorrect.

The primary system can be tested without an actual nuclear detonation. The fissile material, plutonium-239 and uranium-235, can be replaced with electronic sensing devices, and the high-explosive charges detonated. Instrument readings and high-speed photographs tell the designers most of what they need to know about the primary system. Such tests are conducted frequently, above ground, at the nuclear weapons laboratories in Los Alamos, New Mexico, and Livermore, California. The explosion is about as powerful as that of an ordinary mortar shell (but far more dangerous, because it scatters a cloud of uranium-238 and beryllium dust).

The secondary system, on the other hand, cannot be tested without the intense radiation that comes only from an exploding fission weapon. The primary system must actually be detonated with a nuclear yield in order for the secondary system to be tested. The fusion fuel in the secondary system can be replaced with electronic sensing devices. The second and third stages of the explosion need not occur, but the primary system must explode in all its fury if useful information is to be had about the rest of the weapon. Hence the weapon makers' compulsion for underground testing.

As refinements in radiation reflector

'People who make the weapons enjoy talking shop'

stored in the weapon as lithium-6, a less expensive, non-radioactive material which is converted instantly to tritium once the fusion process begins. Conveniently, lithium-6 bonds chemically with deuterium to make a gray powder, called lithium-6 deuteride, that is much easier to manage than either pure deuterium or tritium in gaseous form, although it must be kept dry.

The fusion fuel in a hydrogen weapon, except for a small amount containing tritium, is made at the Oak Ridge Y-12 plant. Metallic lithium-6 is chemically bonded with deuterium, obtained from the Department of Energy's Savannah River plant (operated by DuPont), and compacted into a chalk-like solid, resembling a large aspirin tablet in consistency. The pressed powder is then baked and machined to final dimensions. The result is a ceramic material so unstable chemically in the presence of moisture that it must be assembled in "dry rooms."

Dry-room workers in the Y-12 plant wear air-conditioned waterproof body suits with sealed fish-bowl helmets to keep their body moisture from causing the lithium-6 deuteride to decompose spontaneously. When viewed through

present. The lithium-6 is converted to tritium throughout the charge, while the exploding perimeter further compresses the center and the bulk of the fusion fuel fuses and explodes.

The third and final stage in the explosion of the weapon is virtually an afterthought. In fact, it is optional, although in most hydrogen weapons it is a highly desired option — it provides roughly half the total energy release of the weapon and most of the fallout. In this third stage, the uranium-238 casing which was used to capture and focus the radiation undergoes fission as a result of bombardment by the high-energy neutrons released by the second-stage fusion process.

The result can be an explosion a thousand times more powerful than the blast that destroyed Hiroshima.

Do we need to possess this technical information? Yes. Without it, there is little hope of understanding the vast industrial complex that turns out three new nuclear weapons a day. The only book about modern nuclear weapon production, *The Great American Bomb Machine*, written eight years ago by Roger Rapoport, illustrates the point. Because of an inadequate understanding of

design have allowed more of the energy of the primary system to be captured and focused, smaller fission explosions have become adequate as triggering events. One result of fifteen years of underground tests is a reflector that will set off half a kiloton of secondary fusion explosion with as little as half a kiloton of fission energy. Enter the neutron bomb. The neutron bomb radiation reflector has to be made of high-density metal other than uranium-238, so there will be no dirty fission explosion following the fusion. The metal is probably tungsten alloyed with nickel, iron, and, perhaps, rhenium. Underground testing was part of its design procedure.

Unofficial sources say that a neutron weapon with a total energy yield of one kiloton, one-twentieth of the Nagasaki weapon, must contain more radioactive tritium than a full megaton weapon of more conventional design. The reason is that the deliberately weak neutron weapon is unable to generate much of its own tritium; more of it must be provided ready-made. Since the country's only supplier of tritium is also the sole present supplier of plutonium-239, an increase in orders for tritium is one plausible explanation for the plutonium shortage about which Congressman Dellums inquired.

How could I, a journalist with no formal training in nuclear physics, learn things the Government has kept out of public print for a quarter of a century? It was surprisingly easy. People who make these weapons enjoy their work. Like most of us, they enjoy talking shop. They also promote their activities in order to raise funds from Congress and to recruit employees. They learn to talk and write without using classified words, but they can't live in a vacuum.

In fact, any persistent investigator with the time, inclination, and determination to learn the underlying scientific and technological principles, to pierce the jargon and euphemisms of the industry, to examine the voluminous public record, to look and listen carefully, and to put two and two together, can discover the findings and inventions of others.

In the business of nuclear weaponry, as in science and technology itself, no

secret, once discovered, can long endure, as Einstein observed. Attempts to limit knowledge may succeed temporarily, but ultimately they are no match for a determined investigator.

The more practical effect of secrecy is to discourage and inhibit public participation in the formulation of public policy — in this case not only nuclear weapons policy but also a broad spectrum of related policies (national security, energy, environmental protection, natural and human resource allocation) with which it is inextricably intertwined.

of nuclear fission bombs became available long ago in the Smyth Report. Subsequent Atomic Energy Commission declassifications and the accumulation of mountains of data and experience with the growth of the worldwide nuclear enterprise have eliminated the secret of fission bomb construction. Credible designs and instructions for these have been prepared by college-level physics students.

The building of a hydrogen bomb, which can be ignited only by a fission weapon, is a different matter. It would take millions of dollars worth of spe-

'The effect [of secrecy] is to stifle debate about...nuclear policy'

Since World War II, the process of secrecy — the readiness to invoke "national security" — has been a pillar of the nuclear establishment. As Representative Dellums's recent experience demonstrates, that establishment, acting on the false assumption that "secrets" can be hidden from the curious and knowledgeable, has successfully insisted that there are answers which cannot be given and even questions which cannot be asked.

The net effect is to stifle debate about the fundamentals of nuclear policy. Concerned citizens dare not ask certain questions, and many begin to feel that these are matters which only a few initiated experts are entitled to discuss. This self-imposed restraint only entrenches further those who are committed to the nuclear arms race.

The secret of how a hydrogen bomb is made protects a more fundamental "secret": the mechanism by which the resources of the most powerful nation on Earth have been marshaled for global catastrophe. Knowing *how* may be the key to asking *why*.

Is it dangerous to tell how a hydrogen bomb is made? No. For one thing, the information falls far short of providing a blueprint for nuclear weapon construction. The general features

cialized equipment and hundreds of trained technicians to build a hydrogen bomb — a feat beyond the capability of all but the most industrially sophisticated nations.

Whatever insights these descriptions may provide to nations seeking to perfect their thermonuclear capability — Israel and South Africa, for example — they are at best a trifling addition to the information already available. No government intent upon joining the nuclear terror club need long be at a loss to know how to proceed. Nothing you or I could learn would long elude the nuclear physicists and engineers whose participation would be essential to such as enterprise.

The risks of proliferation of hydrogen weapons, such as they are, must be weighed against the public gain that may come from greater awareness of how and why they are already being produced.

Whether it be the details of a multi-million dollar plutonium production expansion program or the principles and procedures by which nature's most explosive force is being packaged in our midst, we have less to fear from knowing than from not knowing. What we do with the knowledge may be the key to our survival. ■

Wrestling with leviathan

The Progressive knew it would win

Erwin Knoll

“We intend to resist the Government’s attempt at censorship and suppression by all legal means at our disposal. We will appeal Judge Warren’s preliminary injunction to the Court of Appeals and, if necessary, to the Supreme Court. We will somehow find the resources to sustain our struggle. And we will win.

“Watch this space for Howard Morland’s article, ‘The H-Bomb Secret: How We Got It, Why We’re Telling It.’”

— *The Progressive*,
May 1979

The case was called *The United States of America vs. The Progressive, Inc., Erwin Knoll, Samuel Day Jr., and Howard Morland*. It was an uneven match. We had the Government licked from the beginning and we knew it.

These were among the things we knew:

¶That the so-called secrets in Howard Morland’s article weren’t secrets at all — that they were known to thousands of people around the world; that they had been published in books and journals and magazines and the Government’s own reports; that any competent reporter, any diligent researcher, and any capable spy could do what Morland did — and could probably do it better and faster if he had more scientific background than Morland had.

¶That no court in the United States had ever allowed the Government to commit an act of censorship on grounds of “national security”; that when the Government had attempted

such censorship in the 1971 *Pentagon Papers* case, it had been decisively rebuffed by the Supreme Court; that the Court had ruled in 1971 that if a prior restraint on publication were ever permissible, it could only be sustained in circumstances where there was conclusive proof that publication would result in direct, immediate, irreversible harm to the United States; that there was no way the Government could meet such a test with respect to Morland’s article for *The Progressive*.

¶That the Atomic Energy Act of 1954 contained a secrecy provision that was astonishingly broad and vague and sweeping, conferring on the Government the authority to suppress *all* information (not just the Government’s own information) pertaining to nuclear weapons, nuclear materials, and nuclear energy; that this incredible statute had never been tested in the courts; that there was at least a strong likelihood that it would be found unconstitutional.

¶That for all of these reasons, the Government’s attempt to muzzle *The Progressive* was bound to be an acute embarrassment — not to *The Progressive* but to the Government itself; that it would provide us with an extraordinary opportunity to raise basic issues of public policy — to talk not only about nuclear secrecy, censorship, and suppression, but about the criminal insanity of the nuclear arms race and its menacing half-brother, the nuclear power industry — and that we would be able to raise these issues with a far greater audience than we could ever hope to reach through the pages of this magazine.

All this we knew, and we assumed the Government knew it too. And there we made our first mistake: We thought the Government would recognize the realities and calculate the consequences. We thought it would act in its own self-interest. Even after the Department of Energy had advised us that it would seek a court order to block publication of Morland’s article, we thought it would reconsider and let common sense prevail. “Before the Government actually goes to court,” I told my colleagues at *The Progressive*, “it will be seized by a spasm of sanity.” I was dead wrong.

On March 9, in a Federal courtroom in Milwaukee, the Government found a judge willing to take its “national security” claims on faith. He issued a temporary restraining order against publication of Morland’s article without even bothering to read the manuscript.

We were to encounter many more surprises in the next six months. One of the first and most disappointing was the devotion of many scientists — especially “liberal” scientists — to the mystique of secrecy which had apparently become, for them, an act of faith. As soon as the first press accounts of the Government’s attempt at censorship appeared, we began receiving telegrams, telephone calls, and letters from leading luminaries of such organizations as the Federation of American Scientists and the Union of Concerned Scientists, urging us not to publish the article and not to contest the Government’s unprecedented assault on the First

Amendment. (See Sam Day's article, "Scientists of Conscience: How *The Progressive* Managed to Find a Few," in the May 1979 issue.)

Like Judge Robert W. Warren, these self-anointed guardians of the Government's "secrets" had not read Morland's article, nor had they bothered to acquaint themselves with the facts; the Government's assertions were enough. Their reaction, as Morland observed, was that of fraternity brothers confronted with an outsider who threatened to reveal the secret handshake.

We were surprised, too, by the lengths to which the Government was prepared to go to protect its nonexistent "secrets." The Secretaries of State, Defense, and Energy submitted to Judge Warren sworn affidavits which were, to put it gently, not in cor-

respondence with the facts. So did a number of other officials and "experts" enlisted by the Government.

Secretary of Energy James Schlesinger took to the telephone to warn editors of leading newspapers that they should not rise to the defense of the First Amendment in *The Progressive's* case. Secretary of Defense Harold Brown delivered the same message in person.

There was probably no need for them to go to all that trouble: Many of the mass media (though not all) proved themselves pathetically eager to support Government censorship. Their notion was that the First Amendment stopped where "national security" began.

Several months ago, in a conference room at *The San Francisco Examiner*, I listened incredulously as the editor of

that newspaper's editorial page delivered an impassioned defense of censorship. "If I go down to the Rosebud Tavern this afternoon," he said, "and some drunken lieutenant colonel tells me the United States is about to land 100,000 Marines in Saudi Arabia to seize the oilfields, you're goddamn right I want the Government to stop me from printing it."

The Washington Post, which had heroically defended the First Amendment in the *Pentagon Papers* case, urged us to delete "voluntarily" those portions of Morland's article that the Government wanted to suppress. It called ours "John Mitchell's dream case — the one the Nixon Administration was never lucky enough to get: a real First Amendment loser." Fred Graham, the legal correspondent for



CBS News, asserted categorically, "The Government will win this case." They did not lack for company in expressing those views.

Even among those who thought the Government's assault on the First Amendment was totally unwarranted, many implored us not to pursue our rights in the courts lest we "jeopardize the First Amendment" by an adverse court decision. What was painfully clear to us apparently eluded them — that if the First Amendment could only be preserved by foregoing its protection, it was not merely in jeopardy; it was gone.

surfaced in Australia, two U.S. officials, William Grayson, an Energy Department physicist, and Keith Werhan, a Justice Department lawyer, flew to Australia to check the situation. Round-trip fare is about \$1,800."

We were not prepared for the bizarre tactics and exotic arguments the Government was willing to pursue in court. From the beginning of the case, legal briefs, affidavits, and exhibits — ours as well as the Government's — were heavily censored by the Government and excluded from the public record. Our lawyers had to be "cleared" by the Government to ex-

speech protected by the First Amendment. Under that ingenious doctrine, Sam Day suggested, the historic slogan "Fifty-four Forty or Fight" would not be protected speech. More to the point, the Government would be empowered to suppress details of the next nuclear power accident.

Still, our initial assumptions proved to be correct: The case was an acute embarrassment to the Government, and we were well on the way to winning it in the courts.

Shortly after the Government went into court against *The Progressive*, we began hearing rumors about disaffection in the Justice Department's ranks. Later, newspapers reported that a majority of the Department's lawyers working on the case had urged Attorney General Griffin Bell to drop it. The Justice Department, we were given to understand, was in the unhappy position of a reluctant lawyer serving a stubborn and vindictive client — the Department of Energy.

The Government's case — if it ever had a case — deteriorated rapidly. Our attorneys — *The Progressive's* law firm of LaFollette, Sinykin, Anderson, and Munson; the national legal staff of the American Civil Liberties Union, which represented the editors of this magazine; Tom Fox of Madison and Paul Friedman of the Washington firm of White and Case, who represented Morland — worked heroically to defend the First Amendment, to challenge the constitutionality of the Atomic Energy Act, and to compile a factual record that demolished the Government's "national security" claims.

We had other help. Distinguished lawyers volunteered useful advice. Some leading newspapers — *The New York Times*, *The Boston Globe*, *The Chicago Tribune* — joined in "friend-of-the-court" briefs in support of the First Amendment, and so did several dozen magazines and such organizations as the American Society of Newspaper Editors, the National Association of Broadcasters, and the Association of American Publishers. *The Progressive's* readers responded, as they always have, with moral and financial support.

We received invaluable assistance

'...we have won a small...victory in a continuing struggle'

We were not prepared for the costs of the case, which placed (and continue to place) an almost catastrophic strain on the meager resources of this magazine. (See Ron Carbon's "Bonanza" on Page 66 of this issue.) We were not prepared for its duration — it isn't over yet — or for the burdens it would impose on *The Progressive's* small staff.

To the Government, of course, time and money are no object. *The Washington Star* reported:

"It is virtually impossible to compute the cost of the Government's suit against *The Progressive*. Briefs filed by the Justice Department in U.S. District Court and in the Court of Appeals carry the names of twelve Government lawyers. There may have been others who helped prepare briefs and affidavits.

"Mark Sheehan, a Justice Department spokesman, said the commitment was 'not at all unusual' for an important case. Peter N. Bush, assistant general counsel of the Energy Department, said perhaps ten attorneys from his agency had worked on the case. But government lawyers, unlike most private attorneys, do not keep a record of their billable hours, so the true cost is impossible to pin down.

"When a copy of Morland's article

amine these secret filings, and could do so only under conditions that ranged from inconvenient to impossible. They were strictly enjoined from communicating any of these "restricted data" to us — the defendants — or from telling us what had transpired in closed sessions of the court. On June 15, when we asked Judge Warren to lift the injunction he had imposed upon us, he issued a secret opinion which, at this writing, we have still not been permitted to read.

The Government's arguments for abrogating this nation's 200-year-old tradition against prior restraint were no less mind-boggling. The case began with the assertion that nuclear information was "data restricted at birth" — classified the instant it came into being, even if it was based entirely on public sources and on our own creative work.

As the case progressed and the Government's arguments were effectively challenged by our attorneys (and by the increasingly publicized facts), the Government continuously shifted ground. By the time our appeal was argued in the Seventh Circuit Court of Appeals in Chicago in mid-September, the Government had arrived at a novel and frightening notion — that "technical" information was not

from some dedicated nuclear scientists who did not necessarily agree with *The Progressive's* politics — or even with our calculated assault on the Government's mystique of secrecy — but who were outraged by the Government's unfounded assertions in the case.

And then there were the nuclear "hobbyists," determined to prove that what the Government called "secret" was not secret at all. (See Sam Day's "The Other Nuclear Weapons Club" on Page 32 of this issue.) Eventually the Government was compelled to admit that two of the three "secret concepts" it had identified in Morland's article were already in the public domain — and the third, the Government said, was one that Morland got wrong. Furthermore, the Government acknowledged that it had "mistakenly" declassified scores of documents containing information at least as "secret" as Morland's, and placed those documents on public library shelves.

As it became increasingly clear to us that we would win the case in the courts — and perhaps win a ruling that invalidated the secrecy provisions of the Atomic Energy Act — we began to suspect that the Government would seize on its first face-saving opportunity to drop the case and declare it "moot."

We were scrupulously careful — we bent over backwards — to observe the injunction and the "protective order" issued by Judge Warren to prevent disclosure of "restricted data"; we wanted to give the Government no pretext for avoiding a court decision on the constitutional and legal questions we had raised. When an anonymous caller told us he had a copy of Morland's manuscript and would arrange for its publication, we begged him not to do so.

On September 13, our case was argued before a three-judge panel of the Seventh Circuit Court of Appeals in Chicago; the judges — who rebuffed a Government request to hold the hearing behind closed doors — were expected to hand down a decision within days or, at most, a few weeks. On September 15, the Government went into court in San Francisco to obtain a restraining order against a college newspaper — the *Daily Californian* at Berkeley — barring it from publishing

a letter that a nuclear "hobbyist," Chuck Hansen, had written to Senator Charles Percy of Illinois about *The Progressive's* case. On September 16, the Hansen letter was published in full by *The Press Connection*, a newspaper in Madison, Wisconsin. (See "A Nation Beset by Confusion and Fear," by Ron McCrea, on Page 36 of this issue.) On September 17, the Justice Department announced that it "has decided to seek dismissal of the cases against the *Daily Californian* and *Progressive* magazine. . . . The reason for the dismissal was the publication of an article containing restricted data concerning

thermonuclear weapons information by a newspaper in Madison, Wisconsin."

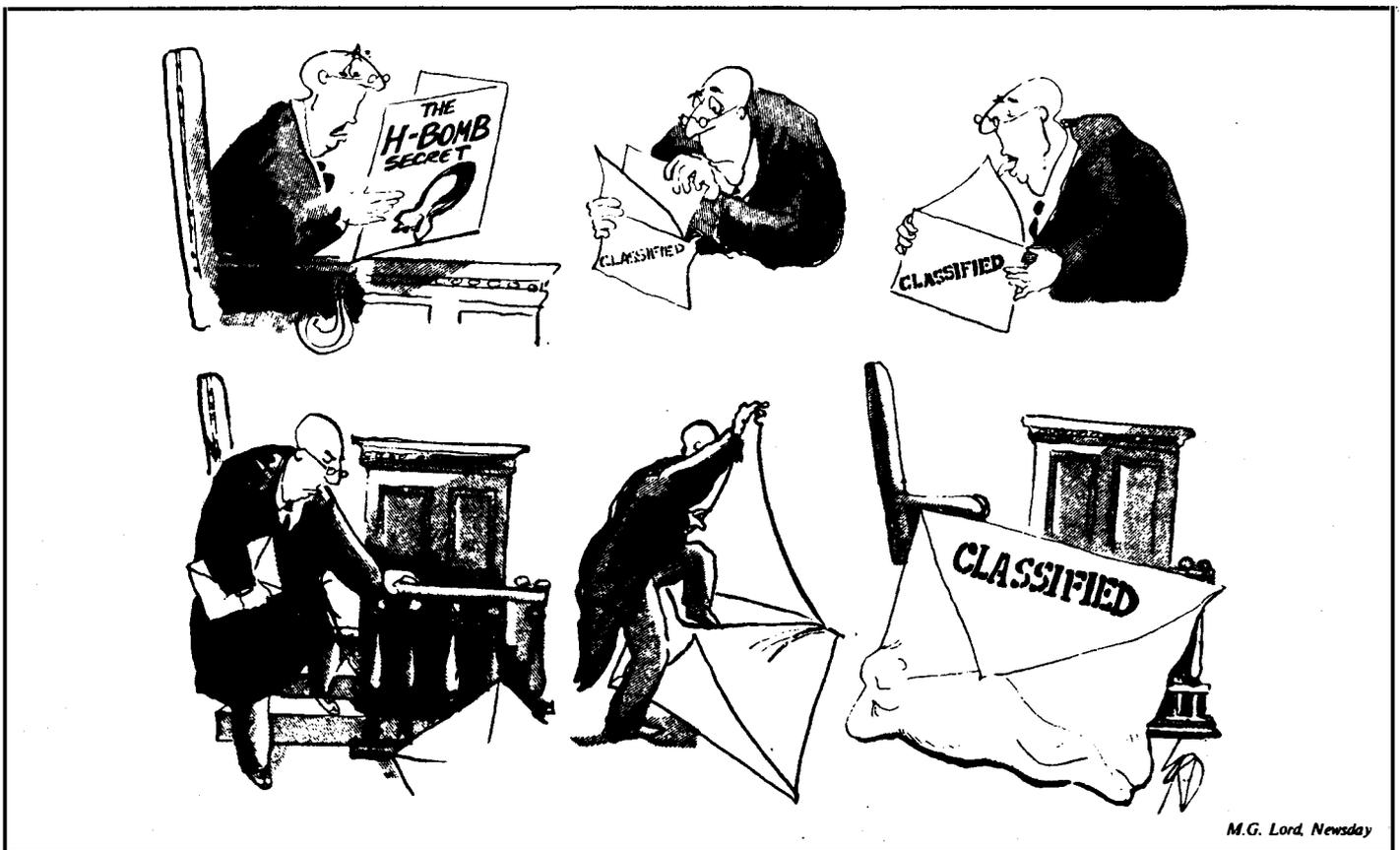
On September 28, the Appeals Court vacated Judge Warren's injunction and left us free to publish Howard Morland's article in this issue of *The Progressive*.

But the case is not over. When it announced that it would "seek dismissal" of the cases against *The Progressive* and the *Daily Californian*, the Justice Department also announced that "the Criminal Division



'I published How To Build an H-Bomb to prove we have freedom of the press'

Le Pelley, The Christian Science Monitor



M.G. Lord, Newsday

will undertake a preliminary inquiry to determine whether any prosecution is appropriate for violation of court orders in the two cases and the Atomic Energy Act.” The Department of Energy has spread the word that it has some of its own scientists under investigation.

And when it asked the court to dismiss the injunction against publication of Morland’s article, the Justice Department also moved to declare the case “moot” and to preserve in perpetual secrecy some of the suppressed legal documents in the case. We are vigorously resisting the Government’s attempt to abort a ruling on the issues we have laid before the courts. In a brief submitted to the Court of Appeals on September 24, *The Progressive’s* attorneys wrote:

“This case clearly is capable of repetition both for these defendants and for others. Yet it will continue to evade review until these defendants, another magazine, newspaper, or individual again forfeits — however temporarily — First Amendment rights to litigate the fundamental issues raised by the Atomic Energy Act and the in-

junctive relief the Government and the district court believe it provides. Moreover, there will always be a very real danger that subsequent cases like this one will become ‘moot’ — either because the Government moves unilaterally to dismiss them at some point, because an article that has been restricted appears in another publication, or because the defendants lack the financial ability, the confidence, or the courage to litigate the case fully in the trial court or on appeal. In the meantime, of course, the defendants will have lost their constitutional rights to a district court’s injunction. . . .

“Until the United States brought this action, it had never formally invoked the Atomic Energy Act to enjoin or to punish political speech. With this action, however, and the suit against the *Daily Californian*, it has demonstrated an apparently newfound willingness to use the sweeping provisions of the Act to do just that. These cases also have provided ample evidence of the potential for the arbitrary and discriminatory use of the Act. There are in the record of this case more than twenty-five publications and

broadcasts that have stated one or more of the three concepts the Government sought to protect in the context of thermonuclear weapons, yet the Government sought no injunction nor brought a criminal action. Arbitrary decisions of the Government to invoke the statute or not may never be reviewed if the Government carefully chooses its cases.”

How these questions will be resolved remains to be determined as this issue of *The Progressive* goes to press. Whatever the outcome, we believe we have already made it more difficult for the Government to mount its next assault on the First Amendment — if only by making some Americans (and some of our colleagues in the media) more aware of the threat.

We believe we have won a small but important victory in a continuing struggle. We are in that struggle for the duration. The late Heywood Broun, who fought his own battles against the arrogance of official power in the 1930s, once wrote, “The underdog can and will lick his weight in the wildcats of the world.”

We think so too. ■

Atomic secrecy: fuel for the cold war

The myth served a powerful few

John Buell

In February 1946, six months after the destruction of Hiroshima established the United States as the world's first nuclear superpower, an obscure British scientist made headlines by admitting that while working in the Canadian atomic energy program he had leaked secrets to agents of the Soviet Union.

His role in America's wartime Manhattan Project had been peripheral. His contribution to the budding Soviet atomic weapons program — offered in the spirit of international science — was negligible. The ten-year sentence meted to him by a British court returned him quickly to anonymity.

But the case of Dr. Alan Nunn May, the world's first known "atomic spy," sent shock waves through the American body politic. And it cast an imprint — as indelible as it was pernicious — on the nation's first formative efforts to forge public policy in the virgin field of atomic energy.

While economic and military elites may not have contrived the May case, they benefited immensely from its contribution to the mystique of nuclear secrecy. The need for protection of the "secret" became the linchpin of the Cold War and a major force in preserving the power of those who profit from that global struggle. The struggle had already begun in the afterglow of Alamogordo, Hiroshima, and Nagasaki.

In the first months after the conclu-

sion of World War II, the scientists who had built the atomic bomb argued that the public should have more information about nuclear matters and that scientists should be freed from wartime constraints on the conduct and publication of their research efforts. None was more cognizant of the need for openness than Henry D. Smyth, author of the Government's official report on the wartime Manhattan Project, which was published six days after Hiroshima:

"Here is a new tool for mankind, a tool of unimaginable destructive power. Its development raises many questions that must be answered in the near future. These questions are not technical questions; they are political and social questions, and the answers given to them may affect all mankind for generations. In a free country like ours, such questions should be debated by the people," Smyth wrote. The Smyth report was not a "blueprint" for the A-bomb, but it presented a wealth of specific detail on how the scientists and engineers had built it.

The Manhattan Project scientists understood that nuclear fission was not a magic potion which only an anointed few had been fortunate enough to stumble upon. They recognized that it was the achievement of scientists from many nations. J. Robert Oppenheimer, scientific director of the project, knew that the Soviets could build their own bomb within a few years should they choose to do so. His assessment was widely shared.

Despite the prevalent view of the scientific community, political leaders preferred to tell the public that the

United States had a secret — one it had to keep at all cost. Secretary of State James Byrnes had a political agenda more conventional than that of the scientists. He argued in October 1945, and subsequently, that too much attention was being paid to "impractical" notions of international control of the atom. He and President Truman pushed a countervailing notion that came to dominate U.S. nuclear policy: They argued that the basic scientific principles of atomic physics might be widely known, but the "engineering" was not. That part, they said, should be kept secret.

Despite the Administration's view, the atomic scientists had a substantial impact on Congressional development of an atomic energy statute. Early drafts accepted the free dissemination of scientific information as the basic principle which should govern legislation in this field. Only information produced by Government laboratories should be restricted. But the atomic spy stories of early 1946 changed the balance of forces in Congress. The emphasis of the bill shifted from information dissemination to information control. The newly formed Special Committee on Atomic Energy decided that because it was not always clear where science leaves off and technology begins, a new category was needed to encompass any scientific and technical information that might require restriction. They called it "restricted data." The new Atomic Energy Commission was given *carte blanche* to determine what kinds of information would fit the category.

The desire of the Truman Adminis-

John Buell is an associate editor of The Progressive.

tration and its supporters in Congress to foster a mystique of secrecy — even against the advice of leading scientists — can best be understood in the context of the emerging Cold War and its budding competition in the political, economic, and military sectors.

As early as the fall of 1945, a scientific panel advised Secretary of State Byrnes that a new weapon even more powerful than the A-bomb was technically feasible. The scientists feared that construction of such a weapon could also be undertaken by other industrially and scientifically advanced nations and that a U.S. decision to develop it might lead to a qualitative and quantitative arms race fraught with the utmost danger. They recom-

mended immediate international control of the atom. Byrnes responded that this new intelligence was all the more reason for American scientists to go back to their drawing boards. Science may have no boundaries, he said, but Stalin did. It was an early presage of President Truman's decision, in 1950, to order development of the hydrogen bomb.

The primary commitment of the nation's political leadership was not to ending the incipient arms race but to preserving and expanding U.S. global power. The legacy of the Cold War, which gave postwar American imperialism its powerful early thrust, lives on today in the form of the Atomic Energy Act.

In 1945, the United States had just emerged from the most severe depression in its history. Following a prolonged period of economic expansion during World War I and the post-war decade, American productive capacity had grown to a point where an underpaid labor force could no longer absorb enough goods to keep the economy moving. In the depth of the Great Depression, unemployment hovered at around a quarter of the labor force and the Gross National Product fell to almost half its 1929 level.

World War II showed that high levels of Government spending could keep the economy from such downturns. Though economists in the tradition of John Maynard Keynes argued that Government spending could be focused on such social purposes as public housing or mass transit, economic and political leaders feared that spending for these ends would undermine the social structure by fostering greater equality and removing important sources of private investment. The postwar solution to that problem was to foster a demand for the products of U.S. capitalism without threatening its political underpinnings. Dean Acheson put the problem in a nutshell when he wrote in 1945:

"We cannot go through another depression like the Thirties without far-reaching consequences for our economic and social system. The problem is one of markets. We can't consume everything we produce without changing our fundamental social structure."

As if in confirmation, headlines in *Business Week* summarized the prevalent business view in early 1946: "U.S. Drive to Stop Communism Abroad Means Heavy Financial Outlays for Bases, Relief, Reconstruction. But in Return, American Business is Bound to Get New Markets Abroad."

An "international Communist conspiracy" helped justify efforts to keep the "free world" open to U.S. exports. It also justified a permanent arms race, which meant lucrative cost-plus contracts for two-thirds of the fifty largest corporations.

Secrecy has helped sustain that process by narrowing the circle of decision-makers. The most basic decisions about the development and deployment of new weapons systems have



'Begone! What we do with your First Amendment rights is none of your business'

Konopacki, Madison Press Connection

been made by a select few. One of them, Herbert York, now a critic of the process, points out that fewer than 100 scientists and political leaders made the fateful H-bomb decision. The General Advisory Committee of the Atomic Energy Commission had felt that the H-bomb question was "so filled with serious implications" that it should be decided only as part of broad national policy, and that much of the information needed for a judgment could and should be made public. But the Committee's deliberations were never opened to the public. No arms control advocates were present for its debates because none had received the necessary Government clearance.

The mystique of secrecy also has allowed the atomic weapons establishment to conceal the consequences of its decisions. The test of a large atomic bomb in Nevada in April 1953 led to unexpected radioactive fallout as far east as New York state and to the ingestion of high levels of radioactive iodine by children in southern Utah. Despite knowledge of these dangers, Government scientists withheld the facts and ridiculed the concerns of local residents.

In a similar fashion, the mystique of secrecy has allowed the Government to withhold information on the safety hazards of nuclear power, an offshoot of its secret weapons program. And the technological connections between nuclear power and nuclear weapons have been consistently shielded from public view. The mystique of secrecy has thus deprived Americans of information and perspectives which would seriously have undermined public consent to the arms race, the Cold War, and related domestic policies.

In the domestic arena, the atomic secrecy mystique intensified the Cold War mentality of political repression. Alan Barth, an editorial writer for *The Washington Post*, observed perceptively in 1949:

"The myth of monopoly immeasurably aggravated our sense of vulnerability and insecurity. It created something worse than a 'Maginot Line' complex. It made us feel somewhat as though we were a community hidden away in some remote mountain fastness approachable only through a secret pass, and thus immune to attack

so long as the location of the pass could be kept hidden from strangers. As a result, all strangers seemed to be dangerous enemies. Even members of the community were potential enemies, those who know the location of the pass most of all, since through treason or indiscretion they might reveal the secret."

Within such a psychological climate, the Soviet A-bomb test that broke the American monopoly in September 1949 — years before it was expected by political leaders, if not by scientists — along with the arrest of Klaus Fuchs, a British scientist who admitted

'Lifting the veil . . . is not an end in itself'

passing atomic information to the Russians, helped foster an obsessive concern with secrecy. Although the value of Fuchs's contribution to the Soviet atomic weapons program was questionable, his case helped reinforce the popular notion that atomic secrets are embodied in a mysterious formula that can be scribbled on pieces of paper and quickly converted into weapons of mass destruction.

The trial, conviction, and execution, some years later, of "atom spies" Ethel and Julius Rosenberg, also accused of passing atomic secrets, drove such anxieties deep into the consciousness of millions of Americans.

Public fears of treachery and treason were easily played upon to foster hysterical intolerance of those whose ideologies questioned the social order. The political formulations of Senator Joseph McCarthy were rooted in the early policies of the Atomic Energy Commission.

Today, the secrecy mystique continues to limit the civil liberties of those who would challenge U.S. nuclear policy. Throughout its case against *The Progressive*, and in subsequent threats to investigate scientists who aided the magazine in its effort to publish "The H-Bomb Secret," the

Government has jeopardized those liberties anew in its impassioned defense of the doctrine of "restricted data."

The success of the United States, the Soviet Union, China, Britain, and France in crossing the thermonuclear threshold made it clear that the data were not really restricted from those with the will and capacity to make H-bombs. As Howard Morland's article demonstrates, the principal barrier to the development of thermonuclear weapons is not ignorance of a secret but the lack of the necessary scientific and industrial capacity. Had the mystique of secrecy not beclouded the public's understanding of that elementary fact, no judge could have held that any article — no matter how accurate or detailed — would give Idi Amin the H-bomb.

If there is no secret, and if the Department of Energy knew that, why did the Government assert the opposite so strenuously? Perhaps it is because the secrecy myth serves to sustain the notion that the key to preventing nuclear weapons proliferation is keeping a "secret" out of the hands of other nations. And that notion serves to disguise the fact that our Government is the real nuclear proliferator.

When President Eisenhower broached his "Atoms for Peace" plan in 1953, the Government hoped to market more than 3,000 nuclear reactors by the end of the century. This goal has been scaled down, but nuclear technology exports are continuing to boom. There are now more than 200 reactors around the globe, most of them American, and each produces about 500 pounds of plutonium — enough to make about twenty-five atomic bombs.

Lifting the veil of secrecy from the nuclear weapons program would show how the notion of atomic secrecy has been manipulated since the beginning of the nuclear age to chill public debate. But lifting the wraps from the policy of secrecy and the interests it serves is not an end in itself. It is no more than an essential first step in the search for an alternative to the arms race as a basis for U.S. prosperity and security. A basic ingredient of that alternative must be the redistribution of economic resources and economic power. ■

The other nuclear weapons club

How the H-bomb amateurs did their thing

Samuel H. Day Jr.

Last winter, as it was preparing to take *The Progressive* to court to suppress “secret/restricted data” about the hydrogen bomb, the United States Government chose to ignore the fact that the same material had just appeared in much greater detail in a political magazine written for a technical readership specializing in the science which underlies the design of thermonuclear weapons.

The lawyers and experts who defended our right to publish “The H-Bomb Secret” are still legally restrained from saying whether they complained about the Government’s double standard and what they tried to do about it. But the painstaking efforts of others to bring the material to light eventually forced abandonment of the case.

The secrecy rules laid down by Judge Robert W. Warren last March, at the insistence of the Government, made it impossible for participants in the case to draw public attention to “The Secret of Laser Fusion,” an unsigned article in the March issue of *Fusion* magazine, published and distributed unbeknownst to us before publication of Howard Morland’s article for *The Progressive* was blocked on March 9.

The editors of *Fusion*, oblivious to our plan to publish Morland’s article in our April issue and to the Government’s plan to prevent it, had drawn provocative attention to their own article in an editorial “Note to the Reader”:

“We fully expect that with the ap-

Samuel H. Day Jr. is managing editor of The Progressive.

pearance of this issue of *Fusion* magazine, Energy Secretary James Schlesinger and his staff will begin circulating the story — if not attempting legal prosecution — that the information in ‘The Secret of Laser Fusion’ is classified. Therefore, we want to make it clear that this article is based on information made public by the Soviet Union and readily available in Soviet and other international scientific circles, as well as upon information contained in a scientific paper published by Bernhard Riemann in 1859.”

Rather than prosecute *Fusion*, Schlesinger chose to suppress *The Progressive*, whose author, by coincidence, had selected some of the same “secret/restricted” material to make the same point that information of this sort is readily available to people who know how to look for it.

The three scientific concepts specified by the Department of Energy as “secret” were set forth by Morland in layman’s terms and by *Fusion* in more technical language.

Although there was no way for others to know what the Department of Energy found objectionable in the Morland article, the relevance of the *Fusion* article to the case gradually became apparent to a few outsiders.

The first to make the connection was a *Milwaukee Sentinel* reporter, Joe Manning. Hoping to duplicate Morland’s feat, he wrote an explanation of the workings of the hydrogen bomb after spending a week reading library sources, one of which was the *Fusion* article. Manning’s condensation of “The Secret of Laser Fusion” was remarkably close to the pertinent Mor-

land descriptions. His speculative linking of the two gave a helpful clue to other amateurs in pursuit of the H-bomb “secret.”

Another hint came with the filing of a “friend-of-the-court” brief by the Fusion Energy Society, publishers of *Fusion*. In arguing that the principles of thermonuclear weaponry are already well known (though classified in the United States), the brief repeated the substance of the *Fusion* article and thereby spread on the open court record a virtual paraphrase of what the court was holding in secret.

By this time, the Department of Energy was putting out unintentional hints of its own.

In the earliest days of the case, three Argonne National Laboratory physicists, Alex DeVolpi, Gerald Marsh, and George Stanford (our scientific advisers for the Morland article), filed a “friends-of-the-court” affidavit documenting public sources from which design principles for the H-bomb could be learned. A fourth Argonne scientist, Theodore Postol, also an adviser, submitted two defense affidavits in the same vein.

Under the secrecy rules of the case, the Department of Energy had an opportunity to censor all materials. In the case of the Argonne scientists, the Department let several helpful references slip through, the most valuable of which was a ten-year-old *Encyclopedia Americana* article by Edward Teller, father of the hydrogen bomb. Diagrams accompanying the Teller article explicitly detail the H-bomb’s unusual configuration.

At about the same time, the

Government submitted an affidavit by a nuclear weapons design consultant, Jack Rosengren, depicting Morland's design as not just an ordinary H-bomb (as the author had described it) but as a representation of the most efficient weapon in the U.S. stockpile. This affidavit, too, escaped censorship.

The Argonne scientists reasoned that a careful investigator could conclude from this that the Government had accidentally identified Teller's encyclopedia diagrams (which themselves had never been cleared for security) as the key to the design of the most efficient H-bomb.

Incensed by what they regarded as security breaches by the Government itself, they spelled this all out in a letter to Senator John Glenn of Ohio, chairman of a Senate subcommittee that oversees national security matters. The scientists asked the Senator to investigate the Department of Energy. The Department responded, a month later, by classifying their letter.

Glenn and another subcommittee member, Senator Charles Percy of Illinois, had already tangled with the Department of Energy on another matter involving *The Progressive* case. Seeking evidence to bolster the magazine's contention that H-bomb design information is readily available, an investigator for the American Civil Liberties Union, Dmitri Rotow (himself an amateur nuclear weapons designer), visited the Los Alamos Scientific Laboratory public library and pulled from the open shelf a highly sensitive and highly technical H-bomb report, UCRL-4725. The Department promptly closed the library and reclassified the report and an equally sensitive companion document, UCRL-5280.

Glenn and Percy both expressed amazement. The Government later admitted in court that the two documents would have been as valuable to an H-bomb designer as anything in the Morland article.

Among those who followed these developments with an eagle eye was Charles Hansen, a California nuclear weapons hobbyist. Hansen, a Palo Alto computer programmer, had spent five years writing a book about nuclear weapons. Fascinated by

the case and enthusiastic in his support of the magazine's cause, he quickly became a sidewalk superintendent, orchestrating his own campaign of harassment against the Department of Energy.

Enlisting the support of his Congressman, Representative Pete McCloskey, Hansen bombarded Department of Energy officialdom with letters challenging their conduct of the case. Throughout the spring he drove the Department's chief classification officer, John Griffin, to distraction by organizing an "H-bomb design contest." The first entry to be classified by Griffin would be the automatic winner. (The Department threatened to refer the matter to the FBI.) But Hansen's heaviest ammunition was still to come.

Before the Department of Energy declared the Argonne scientists' letter to Senator Glenn to be "secret/restricted data," Hansen already had moved into high gear. He had secured a copy from one of the half-dozen sources to whom the scientists had sent copies, made copies of his own, and mailed them around the country. One of the recipients, the student-run *Daily*

Californian at Berkeley, defied a Department of Energy warning and printed the text of the letter. Six other college newspapers later followed suit.

Proliferation of the forbidden Argonne letter re-ignited Senator Percy's interest in the case. Toward the end of the summer an aide contacted Hansen and asked to be kept informed. That was all the encouragement Hansen needed.

Within days, eighteen pages of single-spaced type were on their way to Senator Percy. For openers, Hansen drew up a bill of particulars against three Government weapons experts — Edward Teller, George Rathjens of the Massachusetts Institute of Technology, and Theodore Taylor of Princeton — saying they, not *The Progressive*, should be charged with spilling nuclear secrets. But the meat of the letter was in what Hansen called "a brief history... of some of the theoretical ideas which led to the concepts now at issue in *The Progressive* case."

The "brief history" consisted of a puzzle into which Hansen had carefully fitted pieces from *Fusion* magazine, the "amicus curiae" brief of the Fusion



Sanders, Milwaukee Journal

Energy Society, the Teller diagram, and the Rosengren affidavit. For good measure, he included a diagram drawn with the aid of a tuna fish can and some jar lids.

Hansen thoughtfully mailed copies to a half-dozen newspapers — and to the Department of Energy.

On August 30, his home-town newspaper, *The Peninsula Times-Tribune* of Palo Alto, printed a story about his charges, reproducing the crude diagram he had provided but making no effort to decipher his physics. Other newspapers — *The Oakland Tribune*, *The San Jose Mer-*

Publication of Hansen's letter by *The Press Connection* in Madison, Wisconsin, the following day, coupled with a threat by the *Chicago Tribune* to do the same unless taken to court, ensured the final triumph of the H-bomb amateurs.

On Monday, September 17, the Justice Department announced it was abandoning its case against *The Progressive*.

Morland's purpose in writing the article, and *The Progressive's* purpose in publishing it, was to dispel the secrecy mystique that pro-

ress, notably in fusion energy, which is the society's pet project.

Thus, by spilling "The Secret of Laser Fusion" in an article spiced with thermonuclear fusion concepts they knew to be "secret/restricted data," the *Fusion* editors hoped to challenge the Department of Energy's classification program. The article, drawn mainly from the international literature (some of it 120 years old), focused tantalizingly and explicitly on the same supposed secrets that were to be at issue in the Morland article.

When the Government ignored *Fusion's* published report and concentrated instead on suppression of Morland's unpublished article, the magazine concluded there was a conspiracy between *The Progressive* and the Department of Energy to set up an easy test case that would establish the Government's right to suppress scientific research and industrial development in the field of fusion energy. (In the Fusion Energy Society's view, we and Energy Secretary Schlesinger were in the same despised environmentalist, anti-technology camp.)

Denied a test case of its own, the Fusion Energy Society jumped into *The Progressive* case in hopes of upsetting the "conspiracy" by ensuring a victory for *The Progressive*, not the Government. The society's unsolicited "friend-of-the-court" brief, filed in the open record and loaded with "secret/restricted data" culled from scientific journals, was a loaded cannon pointed at the Government's case.

For all their paranoid overtones, the Fusion Energy Society's article and brief were persuasive indictments of the irrationality of the Government's classification program and of the Government's heavy-handed influence on freedom of scientific inquiry and freedom of the press. These were considerations which also weighed heavily with other H-bomb amateurs.

None of the four Argonne scientists shared *The Progressive's* conviction that publication of the Morland article would serve a useful purpose. (Most of them counseled vigorously against publication because they thought Morland's science was sloppy and his political point dubious.) But the Government's act of suppression made them defenders of our right to publish it.

'Tell Howard I'm sorry if I spoiled it for him'

cury News, *The Milwaukee Sentinel*, and *The Wall Street Journal* — sat back and wondered whether they had a story.

At the *Daily Californian*, editor Tom Abate and his staff also wondered. They had their answer a few days later when, on September 12, word came that the Hansen letter — like the one they printed three months earlier — had just been classified "secret/restricted data."

On the same day, a Milwaukee nuclear weapons hobbyist, Jerry Fass, interviewed by the *Sentinel's* Joe Manning, checked in with another successful description of the H-bomb "secret," but already the fat was in the fire.

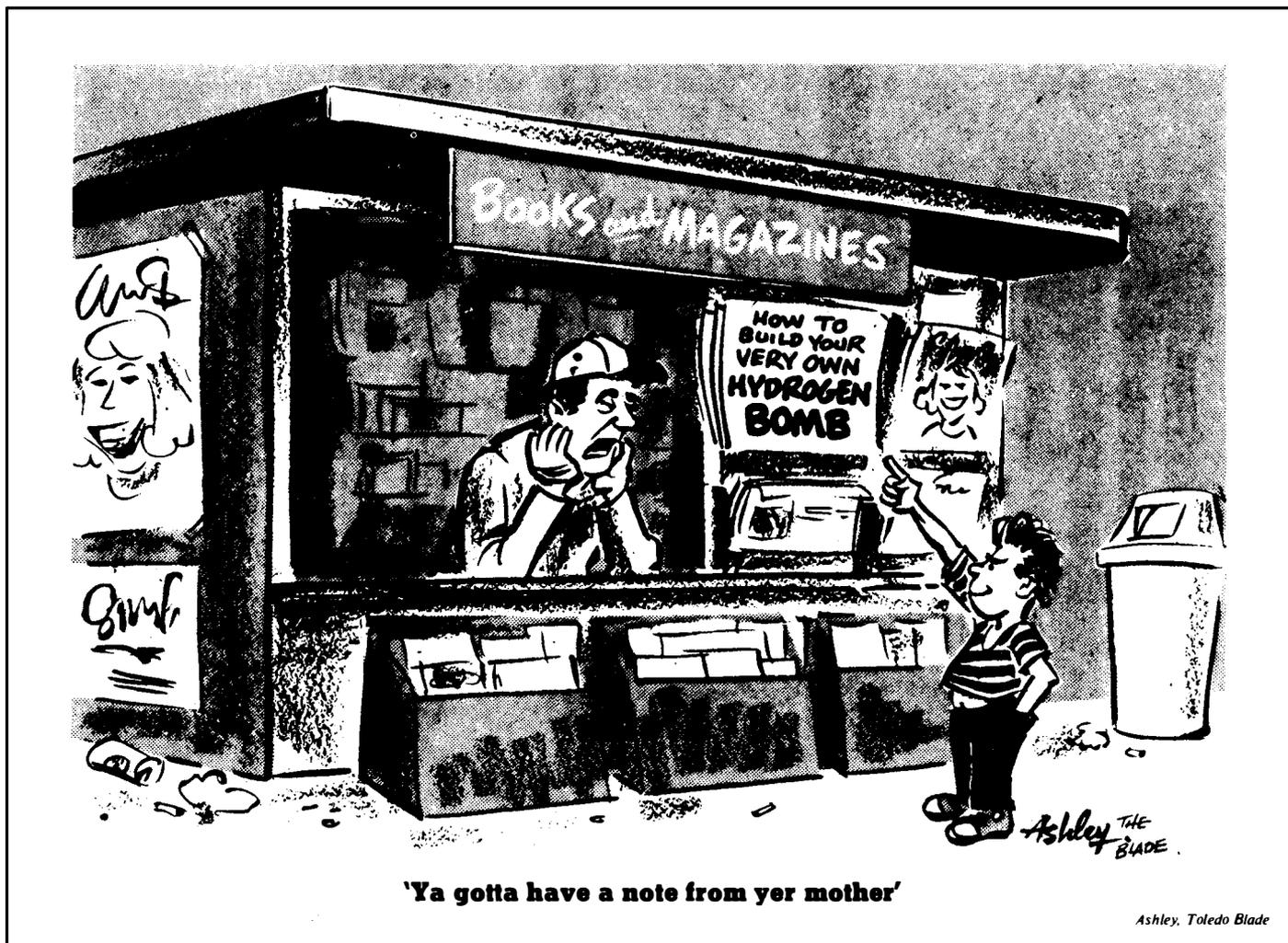
For a few hectic days the Department of Energy scurried from newspaper to newspaper, attempting to retrieve its "secret." But by then it was too late. Already the Hansen letter was multiplying — as were the consequences. Unsure of the *Daily Californian's* intentions, the Department rushed into Federal court in San Francisco on Saturday evening, September 15, to secure an injunction against the student newspaper. Before the ink was even dry the presses were preparing to roll 2,000 miles away.

fects and nourishes the nuclear weapons program. The weapons, not the "secrets," were the prime target. Demonstrating that hydrogen bomb design information could be readily obtained from public sources, and then revealing and commenting on it, was for us a means to an end. We wanted to raise the level of public consciousness about America's continuing preparations for nuclear war.

Few of the H-bomb amateurs shared all those assumptions, but their collective efforts helped make our point about the H-bomb secret.

The contribution of the Fusion Energy Society toward cracking the Government's case was rich in irony. There could be few groups more ideologically distant from *The Progressive* or more fundamentally at home with Pentagon notions of "national security."

To the society and to the editors of *Fusion* magazine, the problem was not with the H-bombs themselves but with secrecy as a mechanism for protecting and strengthening the nation's technological lead in H-bombs and other forms of modern weaponry. Not only is secrecy self-defeating in this regard, they argued, but it also retards the nation's general scientific-industrial prog-



Ashley, Toledo Blade

For scientists at Argonne and at the Lawrence Livermore Laboratory who had read the Morland article and knew its publication would be harmless to the national interest, it was easy to support publication on First Amendment grounds. And they did so with dedicated energy. Their prestige as nuclear weapons experts blunted the Government's allegations that national security had been endangered and made the First Amendment fight a safer one for others who were unwilling to take *The Progressive's* claims on faith.

The blunders of the Department of Energy — the closing of a public library and the attempted suppression of citizens' letters to their Senators to cover its own mistakes — vastly weakened the Government's case. Such mistakes demonstrated the absurdities of the classification program and lent credibility to our argument

that the Morland material was already in the public domain. But the Department's bizarre behavior also distorted the issues of the case by suggesting that the answer to the problem lay in *more* secrecy, rather than less. If there was any lesson Senators Glenn and Percy seemed to draw from the case, it was that.

It's a secret

The following footnote from a defendants' brief in *The Progressive* case was at first censored by the Government and subsequently released for public filing in the court record:

"All electromagnetic radiation travels at the speed of light. Any particulate matter must travel at less than the speed of light."

Will the publication of the Morland article strengthen the First Amendment by demonstrating that it can be exercised, albeit at great cost, even in so highly sensitized an area as H-bomb secrecy? Will the exercise of the right accomplish its intended purpose of emboldening others to look more closely at the H-bomb?

The answers will come later. But first there had to be an answer to the question of the H-bomb secret. It was provided by the H-bomb amateurs:

There is no secret.

What hope there may be that human sanity will yet prevail is best reflected by a message from one amateur to another telephoned to *The Progressive* on the night the Government dropped its case.

"Tell Howard I'm sorry if I spoiled it for him," said a jubilant Chuck Hansen. "And tell him that it wasn't my best effort." ■

A nation beset by confusion and fear

Ron McCrea

On September 16, *The Madison Press Connection* published a letter from a citizen to a Senator which contained a general discussion of the design and dynamics of the hydrogen bomb entirely drawn from public sources. The writer's purpose was to underscore the U.S. Government's untenable posture in *The Progressive* case and to argue for a rational revision of the classification policy of the Atomic Energy Act, a law written in the era of nuclear monopoly and unsuited to today's need for open discussion of a runaway technology.

The purpose of *The Press Connection* in publishing the letter was to advance the debate and to demonstrate our own conviction as to the rightness and safety of *The Progressive's* position by putting our very freedom on the line. We also sought to right the relations of press to government by challenging the bizarre theory of "retroactive classification" with a simple act of publication.

Other, larger newspapers were prepared to make the same challenge. But we were the first.

Today, after assessing press and citizen response, I am almost persuaded that it will take an actual nuclear war somewhere in the world to make Americans wake up to the scientific realities of the 1980s.

Even as it took Three Mile Island to explode the myths of safe nuclear energy and expert infallibility and turn mainstream opinion toward energy

alternatives, it seems dismayingly likely that nothing short of a similar "demonstration effect" can shatter American ignorance about the present state of nuclear weapons proliferation and availability.

That may be a premature and overly pessimistic assessment on my part, but I have been stunned to find how many Americans, including many American journalists, are still living in the age of nuclear monopoly, secrets, and the Rosenbergs. The world has changed, knowledge of the means of ultimate

'This experience has left us all shaking our heads'

destruction has become universal, yet Americans are cocooned in illusion.

The irony is that while the focus of discussion is the containment of nuclear weapons information — a futile exercise at this point in history — the urgent issue of containing the spread of nuclear weapons fuels, which are a byproduct of every atomic reactor we export, is largely a matter of public indifference. Not only are we not disarming (as we pledged to do eleven years ago in the Nonproliferation Treaty), we are passing out bullets. And yet it is information that Americans perceive as the threat to their security.

Unfortunately, because this illusion is so firmly entrenched, even a nuclear war might not bring home the proper point. Numerous letter writers have suggested that if the bombs start falling it will be because people like us and *The Progressive* had the temerity to write about forbidden things. They do not realize that the Original Sin was committed long ago, that the apple has been off the tree for decades, that all the world has eaten of it, and that a worldwide act of penance — disarmament — is necessary immediately to redeem humanity from the hellfires of a rapidly impending atomic Judgment Day.

A second sad conclusion I have reached is that another modern technology — the technology of mass media and instant information — has made Americans less, not more, capable of dealing with life-and-death issues of national policy. After thirty years of saturation bombardment by slogans, messages, and thirty-second spots, we have become a nation of headline readers and grabbers-on-the-go, almost disabled when it comes to understanding an event that does not fit into easy categories.

Thus, for many people around the country, the story has been: (1) A Wisconsin "alternative" newspaper published "secret" designs for the H-bomb; (2) The Government dropped its case against *The Progressive* because the "secret" was out; and (3) The Government is now trying to find who leaked the "secret" and deciding whom to prosecute.

As a result of that simple scenario going out across the country as the es-

Ron McCrea is the editor of The Madison (Wisconsin) Press Connection, in which this article appeared in somewhat longer form.

sence of the story, the backlash against us in the mail (and in some editorials) has been predictably furious. In a way, I regret that *The Progressive* chose to title its suppressed story "The H-Bomb Secret: How We Got It, Why We're Telling It." That provocative headline, whose irony has been totally lost in press coverage, set the tone for the whole hysterical non-debate that has occurred in the last several months.

The magazine's idea was to point up the contradictions about a "secret" that is not a secret at all — but mass media do not deal in contradictions. They deal in simple categories and oppositions — good guys and bad guys, patriots and traitors, secrets and stoolies.

I halfway suspect that if *The Progressive* had simply gone ahead and published Morland's article with some homely title like "A Citizen's Guide to the H-bomb" or "Everything You Wanted to Know About the H-bomb (But Were Afraid to Ask)," the whole flap might have evaporated.

The homely headlines would not have expressed *The Progressive's* challenge to the nuclear establishment, which was, of course, the point, and it's probably true that James Schlesinger and Griffin Bell, living in their barricaded worlds, would have taken action anyway.

But pushing the button of "We've Got a Secret" almost guaranteed that the public discussion would spin out into fantasyland. Modern media have destroyed literacy and stripped us of subtlety.

A third paradox is that *The Press Connection* is bearing the brunt of the public's vast bitterness and cynicism toward the corporate media.

Letter after letter accuses us of playing fast and loose with national security in order to work an angle...to milk publicity for dollars and readers...to sensationalize a grave issue for our own gain. Most painfully to me, they say: You probably did it because you had nothing much to lose.

I might add that not only do readers and viewers assume this; virtually every news reporter who came into *The Press Connection* for interviews about the Hansen letter did also. Inevitably,

there was the question about how we expected the fortunes of *The Press Connection* to be affected by all the publicity. Some were blunt enough to ask directly whether our motive wasn't strictly commercial.

This experience has left us all shaking our heads. The country is so cynical, and the press so jaded itself, that no one can deal with the idea anymore that anyone might do something out of simple conviction.

I tried to explain again and again that no one risks a twenty-year prison term for publicity, that the publicity was not something we had asked for or en-

free press has become most critical in explaining and furthering these movements, trust in that press is about at its nadir.

Even more ironically, press treatment of a story like ours shows just how well placed that mistrust is.

My last observation is about liberals and conservatives. In a curious way, some of the most clear-eyed understanding of the action of *The Press Connection* and of the issue of nuclear secrecy has come from conservatives. The only major newspa-

'The liberal Washington Post ...automatically accepted the official line on nuclear secrecy...'

joyed, that people on the staff were close to breaking down because of the pressures of trying to produce a newspaper in the middle of a media zoo.

I told them they were wrong to think that because we were small and strapped we had nothing much to lose; we had *everything* to lose, and we were closer to the brink of losing it than, say, the *Chicago Tribune*, which had announced plans to publish the Hansen letter and eventually did so.

No one seemed especially convinced, and I read in this attitude and the attitude of our letter writers the most profound threat of all.

If the performance of the media has so jaded and embittered Americans as to believe, as they seem to, that the press will go so far as to sell out the country for private gain and hide behind the First Amendment, then the time is not far away when a government that wishes to restrict the press severely will be able to do so with substantial popular support.

The cry of "Too much democracy!" is being heard more and more these days, especially as grass-roots movements pose serious opposition to nuclear power and the corporate perpetration of food, energy, housing, and health-care inflation. Ironically, at the moment when the institution of the

per in the country to throw down the gauntlet over the Hansen letter was the *Chicago Tribune*, long the Mighty Wurlitzer of heartland conservatism. The liberal *Washington Post*, on the other hand, automatically accepted the official line on nuclear secrecy and has called on the Government to prosecute the editors of *The Press Connection* to the full extent of the law.

This turn of affairs makes me wish we had withheld publication and let the *Tribune* go forward first. In this simple-minded society, the two notions of "Chicago Tribune" and "betrayer of national security" could not have fit together in the same peanut-sized compartment. The contradictions would have exploded and people would have been forced, if not to think twice, then to think at least one-and-a-half times about what the hell was really going on.

Unfortunately, we were not thinking tactically but rather ethically and professionally on that sunny Saturday afternoon when we decided to publish the harmless letter of a citizen to a Senator. As a result, the attention has been ours, the backlash has been ours, and the terribly sobering realizations about the state of national consciousness have been ours.

Make them yours as well. ■

THE WAY THE PRESS SAW IT

Here is a sampling of editorial opinion on the Government's abandonment of its First Amendment suit against *The Progressive*:

We need no more such victories

We are deeply concerned by the issue of prior restraint raised by *The Progressive* case, yet we are left with the disturbing conclusion that, if this was a victory for the First Amendment, we need no more such victories. Our form of government rests on freedom of information protected by the First Amendment. Our national security is vital. The missing ingredient in the dispute was a lack of wisdom and responsibility in invoking these claims.

— *Los Angeles Times*

Dispel the cloud

The Government's decision to drop its Federal court action against *The Progressive* leaves unsullied the Warren decision. . . . Warren's drastic ruling was taken without requiring the Government to prove an overriding danger to the nation was involved in an article that was put together from material in the public domain. The public and the press are now left with the Warren ruling. It hangs over the Bill of Rights like a dark cloud. If it is left unchallenged it will remain as a dangerous precedent for future assaults on our constitutional freedoms.

— *The Capital Times, Madison, Wisconsin*

The world will not crumble

Now that the "secret" is out, the Government says it will drop its suit against *The Progressive*. Good. The suit should never have been filed. The story is scheduled to be printed in the November *Progressive*. The world will not crumble. But perhaps some bureaucrats should.

— *Kenosha (Wisconsin) News*

Celebration is premature

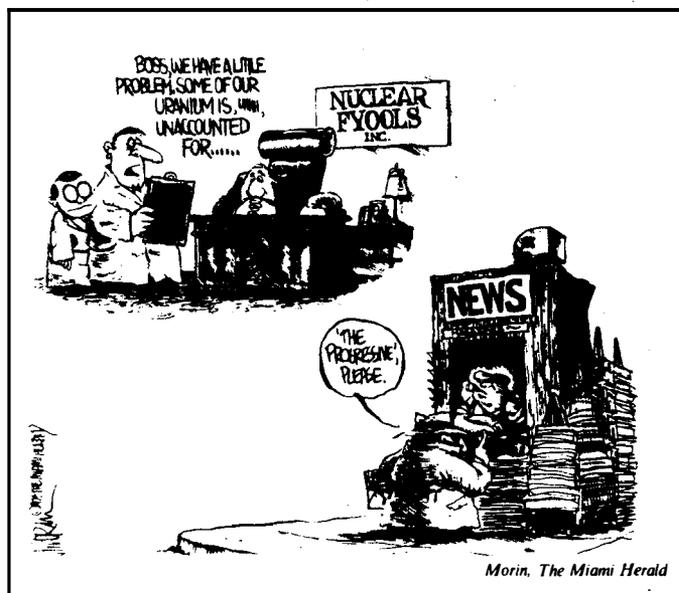
Victory celebrations on the most important issue in the case — prior restraint of the press — are premature. The Government . . . has not given up its claim of the right to invoke censorship of the publication of supposedly classified infor-

mation which might violate laws such as the Atomic Energy Act. . . . The fact is that Government attorneys, in this case at least, insisted that supporting information for their arguments had to be kept secret. This kind of situation places those with the authority to invoke secrecy without justification in possession of power that is potentially more dangerous than a hydrogen bomb. . . . Unless the press challenges the Government under present conditions, censorship can be invoked under the flimsiest pretenses and for purposes that have little or nothing to do with national security or the dissemination of secrets.

— *Milwaukee Sentinel*

The act should be rewritten

The Atomic Energy Act, which tries to make information about nuclear power the exclusive possession of a priesthood of bureaucrats and scientists, should be rewritten, not invoked. The act has been used to keep Americans from making informed decisions about nuclear power and weaponry. . . . *The Progressive* case should spur the Government to come up with new procedures to give the public the nu-



clear information it needs, while denying our enemies the information they want.

— *Chicago Sun-Times*

The Government should prosecute

The only truly effective way the Government can keep secrets is to keep them. Once they get out, they tend to spread quickly — just as this one was. The only real protections then available against publication of such secrets are the moral constraints felt by those into whose hands they have fallen or the deterring effect of the criminal provisions of the Atomic Energy Act. . . . In this case, neither was sufficient to prevent publication — the former because too many people thought the Government was carrying secrecy too far and the latter because some people, apparently including the editors of *The Press Connection*, believe the Government lacks either the will or the ability to prosecute. . . . While a prosecution of those editors could jeopardize the current classification system and, perhaps, portions of the Atomic Energy Act itself, a decision by the Department of Justice not to prosecute could well turn that act's deterring provisions into a sham. In that event, the Government would be tempted to ignore what it should have learned from this affair about protecting its own secrets and to rely even more on a dangerous system of ineffective prior restraints — which it should in fact abandon.

— *The Washington Post*

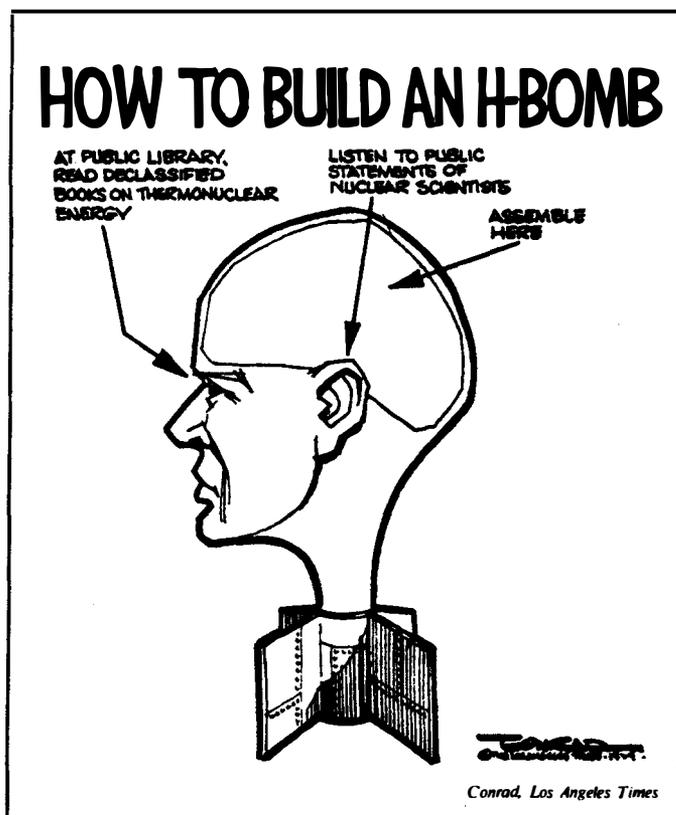
Unload the pistols

We congratulate *The Progressive* and the American Civil Liberties Union for resisting, against the advice even of some customary defenders of a free press. The Government's case simply collapsed when other publications began to print similar H-bomb information, found by other amateur students in public sources. . . . [But] before suffering a technical knockout, the Government had created some pernicious legal theory. Lacking evidence that anyone had stolen H-bomb secrets, it claimed the right to suppress all nuclear weapons information on the grounds that it is "born classified" — even if born in the minds of free men. And lest this reading of the law fall, it then proclaimed that "technical" information — allegedly distinguishable from political ideas — was never entitled to the free speech and press guarantees of the First Amendment. If the courts now avoid ruling on them, these doctrines would lie around, in Justice Jackson's phrase, like loaded pistols. It would be wiser to unload them while they lie within reach.

— *The New York Times*

The specter remains intact

If the news media are to assert that freedom of the press is absolute, then *The Progressive's* case was a poor set of facts. Articles about nuclear secrets tend to shift the judicial burden from the Government to prove irreparable harm — where the burden should lie under the Pentagon Papers decision — to the media to justify its publication. By the dismissal, bad press law has been avoided. The specter of prior restraint of



the media, which is what the First Amendment is all about, remains intact.

— *Wisconsin State Journal, Madison*

A point well made

The real issue is not the need for censorship but the need to get rid of annihilative weapons. By publishing the Hansen letter, *The Press Connection* helped to make that point and to uphold freedom of the press.

— *St. Louis Post-Dispatch*

A threat to our freedom

The threat of proliferation, this assault on the First Amendment reminds us, lies not just in the physical destruction that may someday occur from the spread of weapons technology, but in the police state psychology that develops as Government strives to "protect" us from accidents, disasters, or terrorism. In a world dominated both by the arms race and by the growing attachment to nuclear power, the threat to our freedom is as great, or greater, than the threat to our security; and that may be the most important lesson *The Progressive* has forced on us.

— *Detroit Free Press*

Precious little justification

There is precious little justification for publishing data concerning U.S. weaponry which could seriously harm this country. The right to publish does not necessarily extend to

everything that is not specifically prohibited by the Government. There should be some room for editorial responsibility in the offices of the news media as well.

— *Toledo Blade*

Censorship is not the answer

If governments built nuclear weapons simply because they know how, nations with those weapons would include Canada, West Germany, Japan, Sweden, and almost certainly others, in addition to nations that have built them for motives involving security and prestige. Proliferation of the information in question has been under way for a generation. . . . The responsibility of governments in possession of nuclear weapons is to negotiate and implement serious steps toward getting rid of them. Pretending that this requirement, the most essential one the world is confronting, can be partially satisfied by censorship is an evasion of that responsibility.

— *The Ann Arbor News*

A dangerous option still open

We'd have preferred to win this case on the basis of a thorough airing in court and a judicial determination that the Government has no business trying to prohibit publication of material it had allowed to slip into the public domain over the years. The time to have protected these H-bomb "secrets" was long ago, by keeping a tighter rein on what the Government itself and its scientists made public. We would have liked for a court to have said so. By backing down now without a trial, the Government can leave open its option to try again at a time when the facts don't interfere so much with its effort.

— *Chicago Tribune*

An outdated act

The information needed to build an atomic bomb — less potent than a hydrogen bomb but still immensely powerful — has long been, for all practical purposes, a matter of public

record. It can be argued that once a country has acquired the A-bomb, the damage is done. We would not argue that there are *no* secrets the press should not publish. But the Atomic Energy Act, which actually labels some information "classified at birth," may be outdated and in need of amendment.

— *The Seattle Times*

Escaping a terrible setback

We see the outcome as mainly an avoidance of a terrible precedent that would enlarge the Government's power to engage in secrecy (both justified and unjustified), impair the ability of the press to disseminate information and reduce the public's defense against government by deceit of the governed. . . . Thus, the Government's abandonment of its case against *The Progressive* is no occasion for crowing about a great new breakthrough for freedom of the press, but it is cause for journalists and other citizens alike to breathe a sigh of relief that a dangerous restriction on freedom has been avoided.

— *Milwaukee Journal*

Far from clear

Was the outcome indeed a "clear-cut victory" for the American public? Have the people no vital interest apart from idle curiosity about how thermonuclear bombs are made? If you believe the Government's contention — not yet decisively rebutted by the magazine or its apologists — that certain of Morland's disclosures might accelerate the proliferation of H-bombs, then you must accept that the public's safety, security, and tranquility were also at issue. National "security" can be a slippery justification. . . but the abuse of the security argument does not render it invariably unsound. . . . It. . . is far from clear that we need extensive technical information on H-bombs to debate policies involving their possible use.

— *The Washington Star*

Too many Idi Amins

While Idi Amin has been removed from the roster of terrorist effectives. . . there are still far too many of his ilk. . . . Because. . . this is the political and criminal reality of today, we return to the basic question of the propriety of the publication of thermonuclear how-to-do-it manuals. The possibility. . . is that of terrorists armed with small nuclear weapons holding entire communities hostage on threat of catastrophe.

— *The San Francisco Chronicle*

The real question

The real question is Government secrecy and whether the people have the right to know not only about the bomb but about the technology and economy that support it and the dangers thereof. Our congratulations to *The Press Connection* and *The Progressive*. Only through the bold action of a few will the constitutional rights of all Americans be protected.

— *The Portland (Oregon) Observer*



The Progressive magazine centerfold

D.B. Johnson

LETTERS ON THE H-BOMB CONTROVERSY

Congratulations — and many thanks — are in order from journalists across the country for your successful defense of the constitutional freedoms we all enjoy. Writers and editors like yourselves, who are willing to take chances and do battle in the legal trenches, are the lifeblood of a continuing free press in the United States.

We at *Harrisburg* understand your problems only too well. Following the publication in August 1978 of our article, "Meltdown: Tomorrow's Disaster at TMI" (see *The Progressive*, June 1979), Walter Creitz, then president of Metropolitan Edison Company, wrote Congressman Gus Yatron expressing his concern that an "article of this ilk . . . [a] highly sensationalized and blatantly distorted scenario involving nuclear safety" could appear in a magazine receiving Federal CETA funding. Congressman Yatron forwarded Creitz's complaint to the Department of Labor, which subsequently declared us ineligible to receive CETA funds. This decision is still under appeal.

No matter that Creitz and Yatron bypassed the prescribed procedures for challenging a CETA grant; no matter that only seven months later Three Mile Island Unit 2 was spewing radiation into the central Pennsylvania atmosphere; no matter that the lack of planning for such a contingency — detailed in the article — suddenly became a horrible reality; the nuclear industry, backed up by the Government, was attempting to stifle the truth.

We're looking forward to the publication of Howard Morland's story. Keep up the good work.

*Ed Perrone
Harrisburg Magazine
Harrisburg, Pennsylvania*

You may think you have the right to print articles about the H-bomb, how to put one

together, etc., but you do not have the right to do so.

I ask you to apologize to Almighty God about this sin and that you become Christian. If you don't stop publishing about the H-bomb or any other bomb, you can face arrest. If you are a member of the Communist Party, there is a law against this party since June 23, 1978.

*Mary Elizabeth Humphrey Williams
Grand Rapids, Michigan*

Of course you should not enjoy such liberty as to publish the article on the secrets in the U.S. nuclear weapons program.

But then, let's do away with U.S.-type democracy *first*.

*Alfons Ertelt
Monterey Park, California*

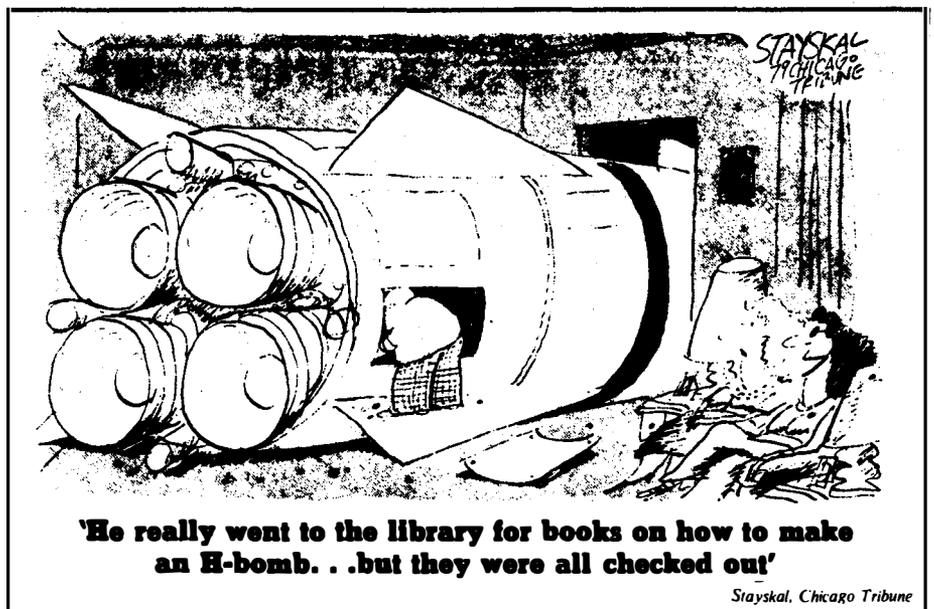
The staff and administration of the Kevin Davis Private Library wish to extend our congratulations to you and your staff upon

the publishing of the controversial H-bomb article.

Our library is dedicated to the infusion and defusion of United States history through scholarly research. We believe your article adds to the annals of American judicial history. For this reason, we would like a copy of the article for our historical archives.

*G. Kevin Davis
Winfield, Illinois*

Unbelievable! I am a graduate of the University of Wisconsin and a strong advocate of third-consciousness idealism, honesty, and a better world. Yet I could not fathom the rationale behind the pursuit of a cause at the expense of your actions. I am all for freedom of the press, but not for possible world destruction, which your article will expedite. Haven't we learned anything from history? There have always been the Hitlers of this world, who will use such tools to meet the ends of



Stayskal, Chicago Tribune

their crazy, power-hungry, and irrational goals. Thanks to you, you've helped that possibility along.

You now probably gloat over your achievement. Was it worth it? Morale of the masses already hangs low from the cloud of doom that hangs over their heads. Many would like to see such weapons gone entirely.

You remind me of my younger days, when radical yet unripened youth thronged the streets, riding their white chargers and playing hero for a day with little wisdom to back up their causes. A fight for a cause is good, but again I say at what expense? You fight for freedom but at the same time

limit my freedom from fear of a World War III.

Congratulations! I feel sadder and more depressed now than I ever have.

*Cristi Currie
West Bend, Wisconsin*

Congratulation, celebration, jubilation!

The Progressive has given a great witness by hanging in there. We are all the better for your conscience and courage.

*Marjorie Murphy
Saxtons River, Vermont*

Congratulations to all of you upon the vindication of your great fight for principles of

peace, freedom, justice, and the people's right to know what their Government is doing about nuclear weapons. Principles must not be lost sight of if a nation is to survive in dignity.

I couldn't be prouder of *The Progressive* than I am. You not only have won your own cause but have also helped the weak-kneed to get to their feet and fight on. I'd think that those who wrote letters saying *The Progressive* shouldn't have printed the article ought to reassess their viewpoint, to put it mildly.

*Betty Daland
Milton, Wisconsin*

Congratulations and best wishes to *The Progressive*, staff, and friends. It is nice to win one. Hang in there.

*Stanley Hamilton
Sebring, Florida*

I am impelled to share with you the excitement I felt when my eye fell on a headline in our *Denton Record-Chronicle*: "Media Cheer End of H-bomb Litigation." Probably the Justice Department is relieved to have an "out" to drop its suit against you.

*Mrs. J.M. Logue
Denton, Texas*

I have yet to be convinced of a reasonable explanation as to why an article on the making of an atomic bomb should be published. On a subject such as this, doesn't my "right" to know seem a little ludicrous? The matter has already been settled that this information could be of use mostly to leading countries such as India and Israel who possess the wherewithal to make the device.

With that in mind, one cannot convince me that these countries could possibly glean any new knowledge from a magazine article. These countries already possess top scientists who surely know all there is to know.

I am sure I am like a majority of Americans who understand nothing in this highly technical data. Maybe I'm terribly naive, but I go back to my original question: Why would *The Progressive* wish, in the first place, to print such data?

*Mary Davis
Valencia, California*

As one who rushed to subscribe to your magazine after hearing of the prior restraint placed against you, let me not only congratulate you on the withdrawal of the censorship suit against you but also subscribe to an additional year's worth of good reading.

I only regret that the case did not go to trial (and inevitable appeal to the Supreme Court) where a definitive decision against



prior restraint and censorship in general would have helped to ensure that our press remains free. As it is, prior restraint *has* been invoked for six months and upheld by a higher court (in that the appeals court didn't instantly overturn Judge Warren). The threat that censorship will again be imposed at a later date remains. Please file suit against the Justice Department on the basis that your constitutional rights under the First Amendment were violated. Ask for \$1 in punitive damages (to establish the guilt of the Government and clearly define that prior restraint is unconstitutional) and for compensatory damages in an amount great enough to cover your legal costs and other expenses incurred in defending yourself against an illegal action. This should make the Justice Department think twice about future actions of this type.

Keep up the good work.

*Taylor Jarnagh
Bemidji, Minnesota*

Congratulations on the U.S. Government's decision to drop its case. The American people owe you a debt for your valiant fight for freedom of the press.

Those who claimed that this case could result in a court decision upholding the Government lacked not only your courage, but also your insight into the heart of the issue: If you are afraid to fight for freedom of the press, then you've already lost it.

*Dick Bauer
Somerville, Massachusetts*

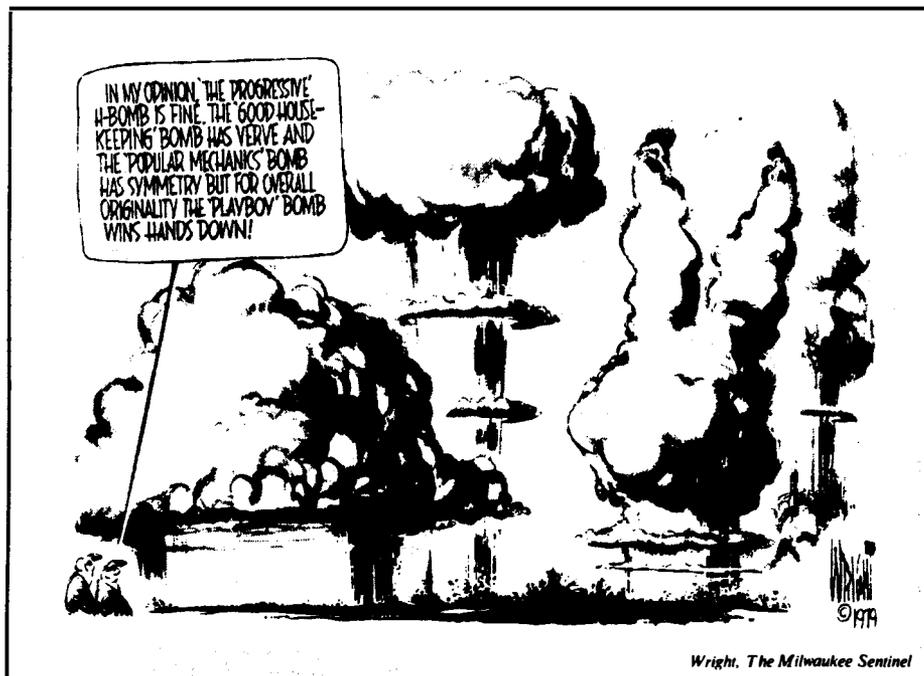
No human being, whether as a Government official or in some other position to exercise control, should ever have more than the most necessary minimum of authority over other human beings. My whole life, its actions and observations, testify for me to the significance of Lord Acton's "Power corrupts. . . ."

No matter what the further developments, you have succeeded. You have made a contribution of exceeding value.

*Wanda Lamade
Twenty-nine Palms, California*

The U.S. Government has done you a great service by giving your voice an influence beyond your wildest dreams. The least you can do for them is to expand your inquiry into the many skeletons that are still in their closets — to do anything less would be a disservice to humanity!

It would be interesting to know how many times the "Born Secret" classification has been used. Around the time that you were in the headlines, a small item was carried by one of the network newscasts about two inventors whose idea for a voice scrambler for CB had just been declared



Wright, The Milwaukee Sentinel

"secret" by Uncle Sam. And if I recall correctly, this same fate befell a physics professor a number of years ago; he made some independent theoretical calculations involving laser energy and its possible use as a trigger for fusion power.

*John Campbell
San Jose, Costa Rica*

There are many good newsmen in the country and there are also the kind that would do anything to get a story — even to the extent of possibly betraying their own country.

Are you really so well informed that you are positive your additional hydrogen bomb disclosure won't aid a foreign country?

Also, have you set yourself up as a self-appointed censor or "uncensor" in opposition to what our Government leadership recommends?

Your kind disgusts me and also scares the hell out of me.

*Fred C. Morse Jr.
Austin, Texas*

You call this a First Amendment victory over Federal censors. I call it irresponsible journalism. In all likelihood you have given birth to some hotshot backyard bomber and we'll all be destroyed.

*Ann McLin
New Orleans, Louisiana*

Congratulations. A victory in the courts would have been sweeter, but a victory is a victory. Even though the Atomic Energy Act still stands, I don't see how the Government will be able to sustain a

prosecution under it in the future. If there is a lesson to be learned from all this (there are many lessons, but this one hasn't been emphasized enough) it is that we owe a great debt to the radical and alternative press — publications like yours and *The Press Connection* — that have had the courage to say the emperor has no clothes.

*Robert Friedman
New York, New York*

Two billion dollars, give or take a few million, might get you a neat family-size H-bomb, if you shop around a bit. That includes the hardware, raw materials, processing, and a copy of *The Progressive* (or a good high-school physics book).

So, man, was I scared today! Not scared about sensible, steady fellers in the Kremlin and the White House, such as the late Stalin and Nixon, of course, but about some dirty foreign refugee nuts right here in Marin County who maybe read that *Progressive* rag and squeeze Oak Ridge maybe into the laundry room of the basement.

*Glenn B. Meagher
Fairfax, California*

Congratulations on your victory and that of decent American people and the free people of the world.

Now I can sleep better, eat better, and work harder to infuse in my students the great spirit of *The Progressive*, which is also the moving force of America as you and I know it.

*Tran Van Dinh
Philadelphia, Pennsylvania*

A postscript

Howard Morland

I hope the world recovers from the invention of radio and television. When radio was new, Hitler and Roosevelt used it to mesmerize their respective nations with frenzied speeches and cozy fireside chats. Its modern variant, television, gives a handful of newscasters the power to tell 200 million Americans what happened in the course of every day, and few people question their judgment about what was important enough to tell.

Although I can hardly stand to watch television myself, I understand that most citizens are so fond of the dancing colored lights on the cathode-ray tube that they can hardly take an idea, person, or event seriously unless it has been covered by the electronic picture medium. When I tell my friends that I have an overriding concern about the imminence of thermonuclear war, they think I'm living in the past.

Years have gone by since any "talking heads" on the CBS Evening News have expressed such a concern. Walter Cronkite has hardly mentioned nuclear warfare since the Cuban missiles went back to Russia, and he doesn't seem a bit worried about the fact that three officers on any one of our thirty-one Poseidon submarines can start a nuclear war on their own. A real danger doesn't become a matter of general concern until Cronkite and his colleagues announce it and describe it in their deadpan, fatherly manner.

And so, for some years now, I have nurtured a television fantasy. In my fantasy the network news producers suddenly rediscover the Balance of Terror and shock the nation with word

that human civilization has no future unless that future includes nuclear disarmament. Sometimes I include a role for myself in the scenario. Walter Cronkite reads the news script:

"A young free-lance journalist revealed today that years ago leaders of the United States and the Soviet Union engaged the civilian populations of both nations in a mutual suicide pact. CBS News has learned that, according to the provisions of the pact, a single act of madness or a simple miscalculation on either side could result in 200 million deaths and the complete destruction of each nation's industrial capacity, as well as radioactive contamination of most agricultural lands. Such destruction could take place at any time without warning, and be accomplished within hours."

The CBS camera slowly zooms in on Walter Cronkite's serious, everything's-going-to-be-all-right face as he explains that a Presidential commission has been appointed to investigate the startling allegations, but we should not waste time waiting for the result. Every American should immediately refuse to pay war taxes, publicly renounce the use of nuclear weapons, and demand the conversion of war industries to civilian purposes.

As they say in New York, "It'll never happen." Any situation we have lived with for years is not newsworthy, and anything as profitable as the nuclear arms race is too important to make the Evening News.

But something almost as improbable did happen last March. An anti-nuclear guerrilla theatre stunt I had worked on

for a year came to fruition. By penetrating the nation's most glamorous nuclear "secret," I accomplished something many people thought was impossible, and my name became part of the national news. My attorney was besieged with calls from newscasters and talk-show hosts. I appeared several times on national television. For a couple of weeks it seemed the whole world wanted to know how I had learned the H-bomb secret and why I wanted to tell it.

It was flattering suddenly to be taken seriously by strangers — especially by famous strangers whose opinions are trusted by millions of Americans. Many of the interviewers were hostile at first, but their attitude only pointed up the paradox that a magazine which advocates nuclear disarmament was trying to publish an article by an anti-nuclear activist — an article revealing "the H-bomb secret."

My own objective was merely to strip the mystery away from nuclear weaponry. I hoped that demystification of the Bomb would have a therapeutic effect on America's foreign and economic policies. It was a motive too subtle and too convoluted to be believed, and I soon gave up trying to explain it. Instead I tried, whenever possible, to make simpler statements in favor of nuclear disarmament, most of which were edited out of my reported comments. I managed to slip a few purely symbolic messages past the news censors — my basically honest face to show that I'm a nice guy, and a picture of a nuclear weapon with my shoe sitting on top to show the relative

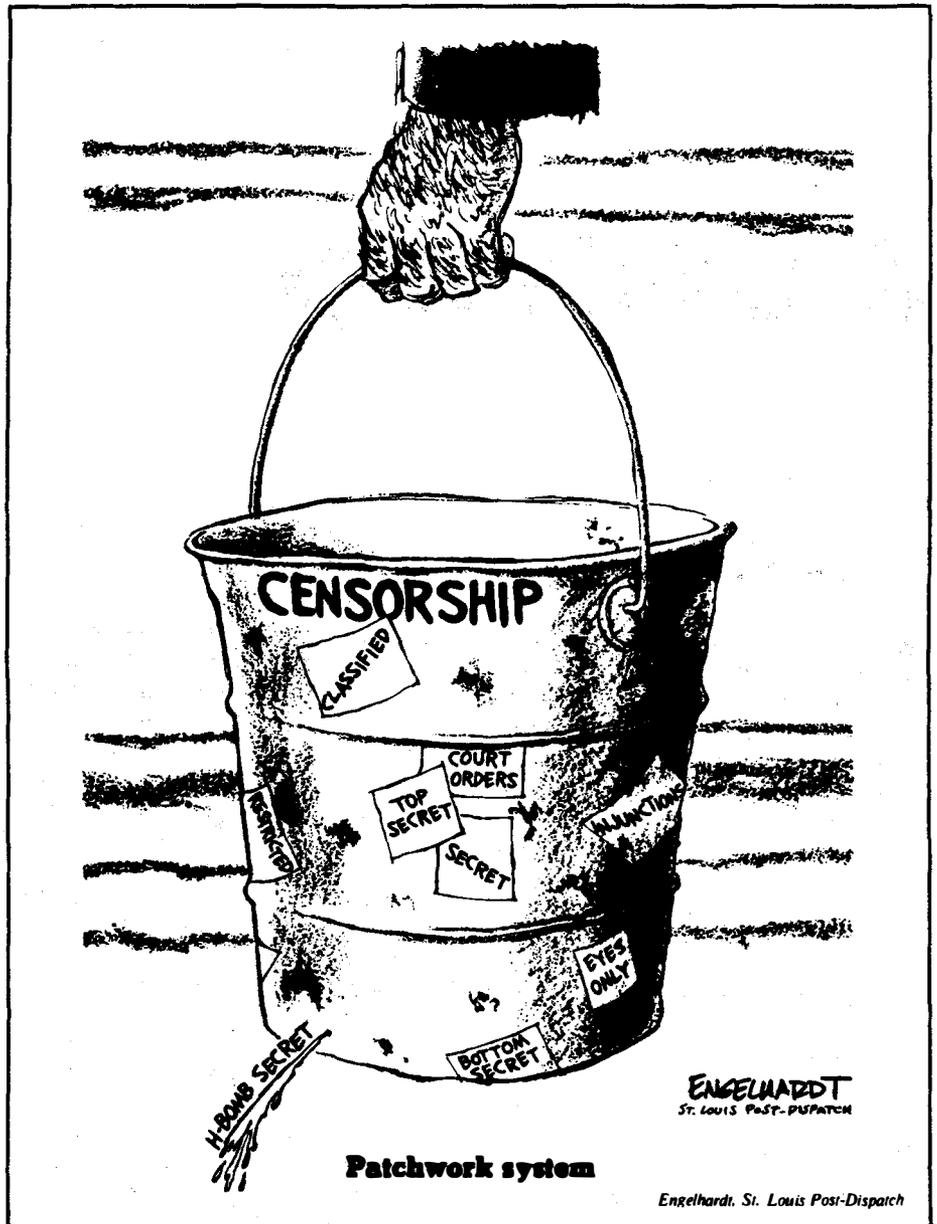
size — and to convey my visceral contempt for the Bomb. The intended message was that nice guys don't like nukes.

I did not set out to prove that the H-bomb secret was already public knowledge. I set out to prove that H-bombs are real — that they have size and shape. The secrecy that keeps them out of sight and mind does not remove them from our lives. They are not score-points in a basketball game between the superpowers; they are industrial products. I would rather have relied on a real H-bomb or a set of official blueprints for my description, and the fact that I used publicly available sources and my own imagination diminishes the impact of my account by reducing its credibility and robbing it of concrete detail.

It was not surprising that the controversy quickly focused on peripheral issues — the Government's power to restrain the press, the sources of my information, how the Government got advance word that *The Progressive* intended to publish my story, whether its publication would provide Idi Amin with an H-bomb.

The real issue was ignored. It was ignored for the same reason that none of the recent feature films about Vietnam has made a serious effort to portray the Vietnamese honestly. If the story of the Vietnam war were told from the Vietnamese point of view, it would say too much about our leaders that the financial backers of feature films don't want to know, and don't want us to know. If the story of the H-bomb is told without censorship, we cannot avoid acknowledging that the blame for the arms race lies with our own government, not with the Russians. America started it, and America bears the primary responsibility for perpetuating it. That fact is too true and too close to home to be news.

Thus, the real censorship in *The Progressive's* H-bomb secrecy case was not the deletion of technical information from my article; it was the long-standing voluntary censorship, especially in the electronic media, which makes it necessary to stage a sideshow in order to call passing attention to the most serious crisis our civilization has ever faced.



The publication of the H-bomb article in this issue of *The Progressive* is certainly a victory for free speech. It is certainly a blow to the mentality embodied in the secrecy provision of the Atomic Energy Act. But there has been no detectable impact on the mad momentum of the nuclear arms race. The SALT II debate hinges on the irrelevant presence of a few thousand Russians in Cuba. No one even talks about getting rid of the Bomb.

Though I have experienced the personal frustration of trying to capitalize on a fleeting notoriety in order to raise a substantive issue, the effort has produced some positive effects. We are

miles ahead of where we were six months ago, and the peace movement has acquired some of the credibility that has traditionally been reserved for the Edward Tellers of this world. Ban-the-bomb people are increasingly refusing to take a back seat to ban-the-reactor people in the anti-nuclear movement. If we keep struggling, some day we may actually hear Walter Cronkite announce a reduction in the number of nuclear weapons. And it may eventually become a "realistic" position to advocate total withdrawal (as in the case of Vietnam) from the suicide pact inherent in the world's nuclear arsenals. ■

Errata

Pressure *generated* by radiation — not the direct force of radiation pressure — is the key to the design of the hydrogen bomb. That somewhat esoteric distinction has apparently been the focal point of *in camera* hearings and court filings in the case of *The United States vs. The Progressive*, the prior restraint case that delayed publication of my article, "The H-Bomb Secret," for more than six months.

In my description last month of how the H-bomb works, I stated that the physical pressure of radiation reflected off the inside wall of the bomb casing compresses the fusion fuel package directly. That statement omits an important intermediate step: X-rays from the fission bomb that serves as the H-bomb trigger are absorbed by an exotic, high density polystyrene-type foam. The foam is transformed into a highly energized plasma which explodes and compresses the fusion fuel package.

Exploding styrofoam is thus an important element in the H-bomb detonation sequence which is entirely missing from my account. My account incorrectly attributes the compression effect to radiation pressure.

In the diagrams accompanying my article, I showed an empty space between the carrot-shaped fusion fuel package and the bomb casing that surrounds it. That empty space should be filled with hard foam material that explodes when it absorbs x-rays, as shown here.

This information was released for public filing on September 24, when a Government brief authorized the restoration of certain passages that had been previously deleted from the public version of the August 31 brief of defendants Erwin Knoll, Samuel H. Day Jr., and myself.

The pertinent passages, on Page 47, are as follows: "Essentially, the x-rays produce a plasma of energized matter which pushes on the fusion fuel tamper in much the same way that boiling water produces steam which pushes on the blades of a turbine. But Morland's discussion of the role of radiation coupling in the compression of fusion fuel is as inaccurate as if he said that boiling water turns the blades of a turbine — he leaves out the

steam. . . . Morland's discussion of the role of radiation pressure is entirely incorrect. . . ."

Even though the quotation is from the defendants' own legal brief, none of the defendants had seen that statement before September 24. A wall of secrecy separates the defendants and their attorneys. The defendants' attorneys were obliged to obtain security clearances in order to read the secret documents the Government was showing to the judge. The defendants refused to apply for security clearances on the grounds that a security clearance is a secrecy agreement which would interfere with the defendants' ability to write about nuclear matters in the future. Thus the defendants have been informed of such discussions about the technical deficiencies of the article only after the censor has approved.

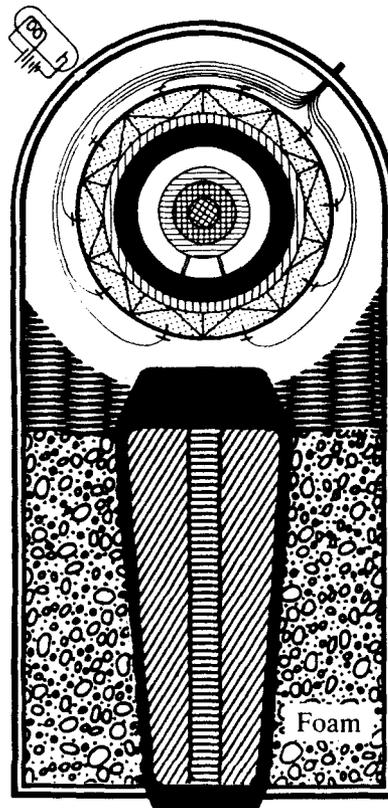
The Government had no obligation to show any secret documents to the judge. The introduction into the court record of technical information that

was not included in my article was initiated by the Government for reasons that are still not clear. It seriously hampered the defense, which may have been part of the reason it was done, and it ultimately resulted in the disclosure of more information that the Government is supposedly trying to keep secret.

In addition to the matter of exploding styrofoam, there are probably technical errors in my description of the fusion fuel capsule of the secondary system. It probably does not contain any tritium, but it probably does contain, at the center, a one- or two-inch diameter rod of highly enriched uranium or plutonium running its length. That rod of fissionable material is compressed to supercriticality as the fusion fuel capsule surrounding it is compressed in on it by the exploding styrofoam. It then becomes the second A-bomb trigger which is often mentioned but incorrectly described. It heats the fusion fuel capsule from the inside while the styrofoam compresses it from the outside. The Uranium-238 which contributes up to 90 per cent of the total explosive energy of the bomb is probably not located in the bomb casing, but rather is probably confined to the casing of the fusion fuel capsule, where its fission by high energy neutrons can further add to the heat and pressure which promote fusion.

Finally, the fusion fuel inside the plutonium core of the primary system is probably a mixture of tritium and deuterium gas under high pressure.

The whole affair illustrates that the secrecy provisions of the Atomic Energy Act are unenforceable, in addition to being an unwarranted interference with the First Amendment rights to unfettered public discourse. When the Government tries to suppress discussion of information that is in the public domain, at the very least it must confirm the accuracy of the information it is trying to suppress. Furthermore, if this case is typical, the Government will eventually reveal publicly more of its "secrets" than are already out if it attempts to take private citizens to court in order to silence them.



(© 1979, Howard Morland)

Howard Morland

Bonanza

Ron Carbon

Last March, shortly after the Government of the United States went to court to muzzle *The Progressive*, a syndicated columnist who shall remain nameless here suggested that our magazine had “goaded and provoked” the Department of Energy into trampling on the First Amendment so that we could reap a “bonanza of publicity.” It was all, he implied, a get-rich-quick scheme *The Progressive* had cooked up.

We didn’t know whether to laugh or cry — and we had no time to do either. The telephones started ringing right away. Reporters all over the country picked up on the idea that *we were getting rich*, and naturally they thought it was a good story.

So let me tell you how rich we got, and are still getting.

Like most political publications, *The Progressive* is no stranger to financial adversity. It was founded in 1909, and in these last seventy years it has experienced two kinds of times — hard times and terribly hard times. Right now it is experiencing desperate times. Defending the First Amendment has already cost us more than \$200,000 — and the end is not yet in sight.

I joined the staff of *The Progressive* six years ago, and in those six years the magazine incurred a total of about \$1,000 in legal costs — an average of \$165 a year. Except in the most extraordinary circumstances, *The Progressive’s* attorney and chairman of the board, Gordon Sinykin, had never sent us a bill for his legal services — or

for any other services rendered in his forty-year association with the magazine.

But an unprecedented First Amendment case *is* a most extraordinary circumstance, and the distinguished law firm of LaFollette, Sinykin, Anderson, and Munson was in no position to tie up most of its time and talent on a *pro bono* basis. Even at substantially reduced rates, the legal fees have been formidable.

The American Civil Liberties Union, which took on the defense of Editor Erwin Knoll and Managing Editor Sam Day, charges no legal fees, of course. But the ACLU has financial problems of its own, and out-of-pocket costs — for travel, telephone, printing, and the like — must be reimbursed.

In April 1978, our travel costs amounted to... zero. Nobody went anywhere. In April 1979, by contrast, our travel expenses for the month came to \$4,909. How did we do it? It was easy. Confronted with the need to collect scientific affidavits in support of our position as quickly as possible, I left Madison at 7:30 one Monday morning and flew to Milwaukee, then to San Francisco, drove first to Berkeley, then to Stanford, back to San Francisco, flew down to Los Angeles, drove out to Riverside and back to Los Angeles, flew on to Denver, to Minneapolis, and finally home to Madison — arriving at 9:15 Tuesday evening. Others made similarly frantic — and expensive — journeys.

What does the plus side of the ledger show? Well, circulation *has* grown — by about 700 subscribers. The problem is that for six months we had neither

the time nor the money to pursue our usual subscription promotion program, which under ordinary circumstances would have produced 3,000 or 4,000 new subscribers.

It *is* true that we have received a few subscription orders that might not have come in were it not for the First Amendment case. Perhaps a dozen or two reporters entered subscriptions after covering the case. And Teri Terry tells me that both the Department of Energy and the FBI have ordered subscriptions.

I could tell you how close we have come on several recent occasions to missing the month-end payroll, or how adept I’ve become at stalling irate creditors.

But I’d rather tell you, instead, about the evening a few weeks ago when several of us had dinner together, a block from the magazine’s office, and how the waitress, when she brought our check, asked us to contribute her tip to *The Progressive’s* Legal Defense Fund.

What else can I tell you? That we are living out of suitcases, drinking too much coffee, not seeing enough of our families, smoking too many cigarettes.

If *that* were all it costs to defend the First Amendment, we’d have no problem; we could afford to pay for months or years, if necessary. But it costs money, too — lots of money. *The Progressive* is \$125,000 in debt right now, and the figure will surely grow larger before it begins to diminish. So what good is your \$10 or \$25 contribution?

Well, right now, as you read this last page of the November issue, you are one reader among approximately 40,000 subscribers, all of whom presumably care a great deal about such issues as nuclear secrecy, the danger of the arms race, and the state of the First Amendment. So it’s simple arithmetic: If you and every one of your fellow subscribers were to send just \$20, we could afford to defend the whole Bill of Rights.

But, of course, not everyone will send a check. A small number of people will. Please be one of that small number. Soon. ■

Ron Carbon is the publisher of The Progressive.

Afterthoughts—March '81

As the cover suggests, this reprint contains all of the material on "The H-Bomb Secret" published in *The Progressive's* November 1979 issue, exactly as it appeared there, along with a brief follow-up piece by Howard Morland, published in the December 1979 issue, which corrects a few technical errors that appeared in his now famous article.

Although our supply of November 1979 issues is depleted, we still have copies of the May 1979 issue, which contains much useful material on the background of *The Progressive's* First Amendment case. Of particular interest are two articles describing the way most of the scientific community—and much of the nation's press—responded to the Government's unprecedented attempt at censorship.

The extremely heavy volume of special orders we have received indicates that many high school history, government, civics, and social studies classes, as well as college and university courses in journalism, mass communications, political science, and law, are studying *The Progressive Case* and the implications it holds for the First Amendment. Please feel free to write to us about this reprint and copies of the May 1979 issue in quantity for classroom use.

More than two years after the Government went into court to prevent publication of Howard Morland's article, two questions are still frequently posed to us: What was the effect of the legal case on *The Progressive*, its circulation, its

finances? And, knowing what we know, would we do it again?

The answer to the first question remains essentially what it was in November 1979—see my "Bonanza" piece from that issue in this reprint. Our legal defense of the right to publish ultimately cost us almost \$250,000—a huge sum for *The Progressive*—and two years later we still owe \$55,000 of it, gradually reducing our indebtedness with the help of contributions from subscribers and other devoted friends of the First Amendment. (Our attempt to recover legal costs from the Government was rebuffed by the same judge who initially restrained us from publishing.)

The Progressive's circulation has increased modestly in the last couple of years, but that is probably attributable less to the H-bomb case than to widespread concern about the Reagan Administration and what its policies portend for the future of the country. (And, if you've read the "Bonanza" piece, I'm afraid I'd have to check the circulation files to tell you whether the FBI or the Department of Energy renewed their subscriptions; we haven't worried much about it.)

When we are asked whether we would do it all again, our reply is unhesitating and unequivocal: Absolutely. We never believed we had any choice but to resist with all our means a totally unconstitutional, illegal, and irrational attempt at censorship. After much reflection, we are more convinced than ever that the Government's claims to secrecy

based on considerations of "national security" pose a grave threat to democracy.

Some of our colleagues in the mass media felt that ours was not a good First Amendment test case, since it involved the emotion-charged issue of nuclear secrecy, and since the highest officials of the Federal Government were prepared to swear—and did swear, to their own subsequent embarrassment—that publication of Howard Morland's article in *The Progressive* would injure the United States. But we know there is no such thing as a "good" First Amendment test case: The First Amendment comes under attack only when someone thinks there is an urgent reason for curbing freedom—and it is precisely in those circumstances that the First Amendment must be upheld.

One of our strongest motives for delivering this reprint into your hands—and those of as many other Americans as possible—is to demonstrate that even a struggling, perpetually hard-pressed enterprise like *The Progressive* can successfully stand up to the mightiest forces in the Government of the United States when a fundamental issue of freedom is at stake. We believe that attempts to undermine the Bill of Rights are bound to intensify in the months and years ahead. We believe it urgently necessary that those attempts be resisted as vigorously as possible, by as many people as possible. We hope our experience in successfully defending our right to publish will prove helpful.

Ron Carbon, Publisher