out its responsibilities under the Protocol prevented further action on that bill. Passage of this bill today brings to a close a long, arduous process in which all of the parties mentioned above have finally reached agreement.

The bill Senator HOLLINGS and I introduced is supported by all the parties engaged in this somewhat lengthy, but ultimately successful, consensus-building process. The Commerce Committee held a hearing on S. 1645 in June and ordered the bill to be favorably reported. During committee consideration of the bill, members agreed to work with Senator STEVENS on a floor amendment addressing polar research and policy. That amendment offered today to S. 1645 requires the National Science Foundation to report to Congress on the use and amounts of funding provided for Federal polar research programs. There is no opposition to this amendment.

Mr. President, S. 1645 builds on the existing U.S. regulatory framework provided in the Antarctic Conservation Act to implement the Protocol and to balance two important goals. The first goal is to conserve and protect the Antarctic environment and resources. The second is to minimize interference with scientific research. S. 1645 amends the Antarctic Conservation Act to make existing provisions governing U.S. research activities consistent with the requirements of the Protocol. As under current law, the Director of the National Scientific Foundation (NSF), would remain the lead agency in managing the Antarctic science program and in issuing regulations and research permits. In addition, the bill calls for comprehensive assessment and monitoring of the effects of both governmental and nongovernmental activities on the fragile Antarctic ecosystem. It also would continue indefinitely a ban on Antarctic mineral resource activities. Finally, S. 1645 amends the Act to Prevent Pollution from Ships to implement provisions of the Protocol relating to protection of marine resources.

As one of the founders of the Antarctic Treaty System, the United States has an obligation to enact strong implementing legislation, and is long overdue in completing ratification of the Protocol.

In closing, Mr. President, I would like to thank Senator HOLLINGS for all of his assistance in getting agreement on this legislation. The House passed similar legislation, H.R. 3060, by a vote of 352–4 in June. I urge my colleagues' support for final passage of the Antarctic Science, Tourism, and Conservation Act of 1996.

## HENRY A. WALLACE

• Mr. HARKIN. Mr. President, I would like to take this opportunity to bring to the attention of the Senate a notable speech by one of our colleagues, and one of my fellow Iowans, Senator John C. Culver. The subject of Senator Culver's speech is that of another prominent Iowan, Henry A. Wallace. Both these men embody the wisdom and insight of the residents of the great State of Iowa.

Senator Culver's distinguished speech, given March 14 at the Carnegie Institution of Washington, marked the inaugural of the Henry A. Wallace Annual Lecture. Sponsored by a research center named after Henry A. Wallace, the annual lecture will address agricultural science, technology, and public policy. Senator Culver's speech, entitled ''Seeds and Science: Henry A. Wallace on Agriculture and Human Progress,'' held listeners spellbound as he described the life and times of a pragmatic farmer from Iowa.

As many of you know, Henry A. Wallace served our country in many ways: as a farmer, editor, scientist, Secretary of Agriculture, Secretary of Commerce, and Vice-President. As a farmer, Wallace realized the importance of environmental stewardship. As he once wrote, ''The soil is the mother of man and if we forget her, life eventually weakens.'' While Henry A. Wallace made many contributions to this Nation for which we thank him, it is perhaps Mother Nature who thanks him the most.

I ask that the text of Senator Culver's speech appear in the RECORD.

SEEDS AND SCIENCE: HENRY A. WALLACE ON AGRICULTURE AND HUMAN PROGRESS—GUEST LECTURER: SENATOR JOHN C. CULVER

Sometime in 1933, while he was battling to rescue American agriculture from its greatest crisis, Secretary of Agriculture Henry Agard Wallace was invited to be the featured guest at a swanky party in New York City. It was not the sort of thing Wallace enjoyed. A quiet, cerebral man, Wallace often found such social functions uncomfortable. He wasn't good at flattery or small talk, had no interest in gossip and disdained off-color humor.

Gathered around him that evening was a group of writers, planners, technicians and other members of the New York intelligensia eager to take his measure. Wallace was still something of a mystery to them, as he was to most of the nation. At age 44, he was the youngest member of President Roosevelt's Cabinet. The son and grandson of prominent Iowa Republicans—his father had served in the Harding and Coolidge cabinets—Wallace was still a registered Republican himself. He was, by background, an editor and corn breeder; he had never sought public office and had accepted his current position with considerable reluctance.

Perhaps most intriguing to the people in the room was the depth and breadth of Wallace's intellectual interests. Wallace was not only a geneticist and journalist, he was one of the nation's leading agriculture economists, an authority on statistics and author of the leading text on corn growing. His interests ranged from diet to religion, from weather to monetary policy, from conservation to Native American folklore. Somewhere along the line, he also found time to start the world's first—and still the world's largest and most successful—hybrid seed corn company.

So his small audience had much to ask Wallace about and they peppered him with questions. Finally one of them inquired: ''Mr. Wallace, if you had to pick the one quality which you thought most important for a man to have in plant-breeding work, what would it be?'' The man settled back to enjoy a long scholarly reply but Wallace's response was brief and startling. Without a moment's hesitation he said: ''Sympathy for the plant.''

For Wallace, the failure to understand the nature of plants and animals—their structure and purpose, their needs and cycles—was symptomatic of modern man's inability to understand life itself. ''When you sweat on the land with a purpose in mind you build character,'' he wrote. ''Watching things grow, whether plant or animal, is all important. One of the wisest of the old Anglo-Saxon sayings is, 'The eye of the master fattens the ox.' How, he wondered, could man grasp the essence of life without taking into account the totality of living things: plants and animals and human beings and the spirit that animates their existence? He later acknowledged that he usually liked plants better than animals, but he appreciated the latter because ''they gave [the] manure that nourished the plants.''

Wallace had nothing sentimental in mind when he used the expression ''sympathy for the plant.'' Rather, he viewed ''sympathy'' as an outgrowth of rigorous observation and exacting employment of scientific principles. Throughout his life, beginning at an unusually early age, Wallace placed great store in the value of scientific understanding. By training and temperament, he was an unusually unsentimental man.

About 1904, when Henry Wallace was in his mid-teens, he attended a young farmer's ''corn show'' and watched as ears of corn were judged by their appearance. The ''beauty contest'' winners, based on their uniformity, shape, color and size, were deemed to be the superior breeding stock. Professor P.G. Holden, part crusading scientist and part flamboyant showman, was the great evangelist of corn, and he was undoubtedly the best-known corn show judge in the United States. He was also a personal friend of the Wallace family. Young Henry's grandfather, the beloved preacher-journalist known to thousands of midwestern readers as ''Uncle Henry'' Wallace, had been largely responsible for bringing Holden to his teaching position at Iowa State.

The story of what happened at that corn show was later written by Paul de Kruif, author of a colorful book on the great food scientist called The Hunger Fighters:

Gravely, for the instruction of youth, [Holden] held up a great cylindrical ear that was not so good to his learned eye. ''This ear, boys, shows a marked lack of constitution!'' cried Holden. ''And look at this one for contrast,'' said he. ''Observe its remarkably strong middle!'' And such is the folly of teaching—that every boy, hypnotized, could do none other than see what Holden wanted him to see. Solemnly the professor judged and awarded the medal to the very finest ear of all those hundreds of ears of maize, and pronounced it champion.

A mob of disappointed farm boys straggled out of the room. Henry stayed. The professor unbent. ''Now young man, if you really want proof that I'm right, why don't you take thirty or so of these prize ears? Then next spring plant them! Plant them, one ear to a row of corn. Then harvest them next fall—and measure the yield of them.''

The next spring Henry Wallace took those 33 fine ears, shelled them into separate piles, stuck them under the soil, four kernels to a hill, in 33 rows, one ear to a row, on a little piece of land his father gave him. What he learned from those 33 rows of corn, of course, was that Holden and his corn shows were all wet. The ten ears of corn judged fairest by the good professor were among the poorest yielders in the test, and some of the ugliest

ears produced the highest yields. Conventional wisdom or not, Holden's personal friendship with the Wallace family notwithstanding, the scientific experiment showed the appearance of corn had nothing whatever to do with its yield. As Wallace himself put it succinctly: ''What's looks to a hog?''

Henry Wallace's first lesson in agricultural experimentation came from his mother, May, a woman endowed with strong religious convictions and a great love of plants. May Wallace taught her young son how to crossbreed pansies, to his great delight. ''It happened that in that particular outcome, the flowers were not as pretty as either parent, but I attributed to them unusual value simply because they had been crossed.'' His mother also frequently said, ''Henry, always remember, you are a Wallace and a gentleman.'' Wallace never forgot.

From his father and grandfather he inherited his first and last names, a tradition of progressive thinking and an intense belief in the value of ''a distinctive and satisfying rural civilization'' that offered ''nothing less than the comforts and the cultural elements of the best city life blended with the individualism and the contact with nature that the country gives.'' His father and grandfather had founded the family's influential farm journal, Wallaces' Farmer, and summed up their philosophy in six words that appeared on the cover of every issue: ''Good farming, clear thinking, right living.''

Another important influence on young Henry, as he was called in the family, occurred when he was a very young boy. Wallace had moved with his family to Ames, Iowa, where his father completed his degree at Iowa State and taught for a few years as a professor of dairying. There the shy boy was befriended by one of his father's students, a gangly black man by the name of George Washington Carver, who had been born in slavery. Together this unlikely duo—one who became the nation's greatest secretary of agriculture, and the other who gained international fame as a botanist and chemist—tramped through the woods and fields around Ames exploring nature in intimate detail. Six decades later, it was said, Henry Wallace was still able to impress agrostologists with the minute knowledge of grasses he learned at Carver's feet. His lifelong fondness for grass was later evidenced by a national radio address he made while Secretary of Agriculture entitled ''The Strength and Quietness of Grass.''

It was Carver, Wallace said, who introduced him to the ''mysteries of botany and plant fertilization'' and who demonstrated that ''superior ability is not the exclusive possession of any one group or class. It may arise anywhere,'' Wallace noted, ''provided men are given the right opportunities.'' He also learned from Carver an approach to science: ''Carver's search for new truth,'' Wallace later observed, ''both as botanist and chemist, was a three-pronged approach involving himself, his problem, and his Maker.'' He earnestly believed that God was in every plant and rock and tree and in every human being, and that he was obligated not only to be intensely interested but to call on the God in whom he so deeply believed and felt as a creative force all around him. ''There is, of course, no scientific way of proving Carver . . . right or wrong,'' Wallace noted. ''But we can safely say,'' he added, ''that if a corn breeder has a real love for his plants and stays close to them in the field, his net result, in the long run, may be a scientific triumph, the source of which will never be revealed in any statistical array of tables and cold figures.''

As a boy growing up in Des Moines, there was always available to Wallace a small plot of land on which to experiment and ample encouragement from his family to let his curiosity range free—provided, of course, that he had milked the cows, fed the chickens and completed his other routine chores. As a student at Iowa State he worked on experimental farms operated on the county's ''poor farm'' and learned first hand that progeny from one ear of open-pollinated corn could yield twice as much as progeny from another ear of corn of the same variety.

Having proved that ability to yield is more important than appearance, he was receptive to the concept of hybrid corn. He carefully followed scientific reports and experiments relating to its development while graduating first in the agricultural class of 1910, at Iowa State College.

Throughout the 1920s, Wallace worked intensely on his own breeding projects and to promote the development and use of hybrid corn. In the early years of that decade, he had been influential in founding the Iowa Corn Yield Contest, which he saw not only as a scientifically valid replacement of the ''corn shows,'' but as a means to demonstrate to farmers the superiority of hybrid corn.

Wallace knew even then that a revolution—his word—was coming to the Corn Belt. It was a revolution which he predicted and, more than any other individual, led. In 1933, six years after he started his own little company to develop and market hybrid seed, only one percent of the corn planted in the midwest was grown from hybrid seed. Ten years later, more than three-fourths of corn grown in the Corn Belt came from hybrids. Today, of course, virtually all commercial corn comes from hybrids. Yields grew from less than 25 bushels an acre in 1931 to 110 or more bushels today. The corn revolution stimulated an agricultural revolution throughout the world and transformed American agriculture from an art to an applied science.

Wallace viewed this revolution not in the raw statistics of yields-per-acre, certainly not in bottom-line sales and profits, but in an intimately personal way. ''Every living thing, whether it be plant, animal or human being, has an individuality of its own,'' he wrote at the height of his corn breeding work. ''Some are pleasing, some repulsive, but all are interesting to whosoever tries to understand them. For fifteen years, I have tried to understand corn plants, until now the individuality of corn plants is almost as interesting to me as the personality of animals or human beings.''

It has been said that Henry Wallace was the only genius to have served as Secretary of Agriculture. The period 1933 to 1940 was the golden age in the Department's history and the creation of much of the intellectual dynamism of the New Deal. Agricultural programs and policies were enacted which remain the basic framework today. Under Wallace's creative stimulus, soil conservation, to protect what his grandfather called ''the voiceless land,'' was promoted. The ever-normal granary, to ensure against famine, an idea which Wallace derived from reading Confucius and the Bible, was established. These food reserves later proved of critical value in World War II. In addition, the REA, food stamps, the school lunch program, and ''food for peace'' were all begun.

He was responsible for the Yearbooks of Agriculture in 1936 and 1937, which were the first devoted to agricultural research and plant genetics. He was proud that he had not succumbed during this period to the pressures to have the scientific work of the department reduced. He wrote: ''Science, of course, is not like wheat or cotton or automobiles. It cannot be over-produced. It does not come under the law of diminishing utility, which makes each extra unit in the stock of a commodity of less use than the preceding unit. In fact, the latest knowledge is usually the best. Moreover, knowledge grows or dies. It cannot live in cold storage. It is perishable and must be constantly renewed. Static science would not be science long, but a mere junk heap of rotting fragments. Our investment in science would vanish if we did not freshen it constantly and keep training an alert scientific personnel.''

Secretary Wallace was also directly involved with the expansion of the Beltsville Agricultural Research Facility. He noted in his diary on April 5, 1940, just prior to the fall of France:

''President Roosevelt was very emphatic about moving the Agricultural Department out of the farm at Arlington [where the Pentagon now sits]. He wanted to bring in the rest of an army battalion and a regiment of cavalry. The President has the War of 1812 in mind and doesn't want some foreign nation to come in and burn up Washington. Perhaps his ideas are sound, although responsible people seemed to be inclined to pooh-pooh them. The President wanted Agriculture to get in touch with the Budget Bureau and the War Department and get prepared to move out at once.''

President Roosevelt had developed great respect for Wallace's counsel as a Cabinet member for eight years on a great variety of subjects beyond agricultural policy. He referred to him as ''old man common sense,'' and selected him as his vice presidential candidate in 1940 because, according to Eleanor Roosevelt, he could best carry out Roosevelt's domestic and foreign policy if something should happen to the president.

In December 1940, Wallace, recently elected vice president, was sent to Mexico by President Roosevelt to attend the inauguration of its new president. While there, Wallace, who had learned Spanish a few years before, asked to tour the rural areas and saw the desperate need for better agricultural methods to improve food yields. He was impressed by the prominent role of corn in Mexican agriculture, as well as the reverence the people had for it. Upon his return to the United States, he persuaded the Rockefeller Foundation to establish the first of a series of highly successful international agricultural research centers. The Wallace proposal was timely because the foundation had begun to realize that its global public health programs, while controlling diseases such as hookworm, yellow fever and malaria, might be saving people from disease only to have them experience slow starvation due to inadequate diets. He was also responsible for the establishment of the Institute of Tropical Agriculture in Costa Rica and took an active part in the plans which led to the creation of the Food and Agricultural Organization of the United Nations.

A fellow Iowan, Norman Borlaug, who received the Nobel Prize for his work with the ''Green Revolution,'' once remarked that the award should have gone to Henry Wallace, whose leadership and inspiration was the moving force in these efforts.

Wallace was the first vice president in American history to be given formal executive branch responsibilities as head of the Board of Economic Warfare. This agency was charged with the critical task of obtaining and ensuring the availability of vital raw resources from Latin America and elsewhere after the United States entered World War II.

Wallace, in implementing the procurement contracts with countries from whom materials were obtained, required the commitment that they would in turn provide improved wages and living conditions for the workers. His objective was two-fold: healthy workers would best provide the supplies

needed, and, in Wallace's view, such economic and social developments within the society would help advance democracy, ensure better post-war trading opportunities and good relations with the U.S. This approach was vigorously opposed by conservatives within the administration and the U.S. Congress, and the practice was therefore discontinued.

Wallace typically, like his forebears, was concerned not only with the problems of his generation, but also with those of his grandchildren. Painfully mindful of the errors in U.S. policy, which he felt lost the peace following World War I, Wallace, as early as 1941, predicted with typical vision: ''The wisdom of our actions in the first three years of peace will determine the course of world history for half a century.''

On May 8, 1942, Vice President Wallace delivered his most well known public address entitled ''The Price of Free World Victory,'' but known to millions throughout the world as the ''Century of the Common Man'' speech.

The speech represented Wallace's effort to inform World War II with a moral purpose: ''This is a fight between a slave world and a free world,'' he declared, ''and the free world must prevail.'' His remarks, however, went far beyond a call for the defeat of Germany and Japan. Wallace saw the war as a struggle against oppression everywhere. ''Victory for the allies,'' he said, ''must lift the men and women of all nations from the bonds of military, political and economic tyranny.'' In short, Wallace envisioned a worldwide revolution against the old order.

''Some have spoken of the 'American Century,'' he said, referring to an earlier address by Henry Luce of Time Magazine. ''I say that the century on which we are entering—the century which will come out of this war—can and must be the century of the common man.'' In Wallace's mind the postwar situation should be a world free from want and deprivation in which nations traded freely and where lawful international order superseded national militarism. Wallace wrote:

''When a political system fails to give large numbers of men the freedom it has promised, then they are willing to hand over their destiny to another political system. When the existing machinery of peace fails to give them any hope of national prosperity or national dignity, they are ready to try the hazard of war. When education fails to teach them the true nature of things, they will believe fantastic tales of devils and magic. When their normal life fails to give them anything but monotony and drabness, they are easily led to express themselves in unhealthy or cruel ways, as by mob violence. And when science fails to furnish effective leadership, men will exalt demagogues and science will have to bow down to them or keep silent.''

Wallace preached that Americans must be prepared to support decolonization, international demilitarization and economic cooperation if victory was to have any true meaning. He was, however, frequently frustrated in these objectives. The voice of the common man, he complained in his diary, was not heard by the powerful elitists who ran foreign affairs. ''So long as the foreign affairs of the U.S. are allowed to be controlled as the sacrosanct preserve of one social class only, the weight of this country will continue to be thrown on the side of the 'proper' people in other countries, all lip service to democracy notwithstanding * * *.'' In an earlier speech responding to Hitler's claim of the superiority of the Aryan race, Wallace said that, ''As a result of my study of genetics . . . there is nothing in science to interfere with what might be called a genetic basis for democracy. The seed bed of the great leaders of the future, as of those of the past, is in the rank and file of the people.''

As the cold was developed in March 1946, Wallace said, ''The common people of the world will not tolerate a recrudescence of imperialism even under enlightened Anglo-Saxon atomic bomb auspices. If English-speaking people have a destiny, it is to serve the world, not to dominate it.'' In light of his scientific background, Wallace had been designated by President Roosevelt as his personal liaison to secretly work with the group proposing the development of the atomic bomb. It has been said that the explosion of the atomic bomb ''changed everything but man's thinking.'' Not true with Wallace, for he immediately understood the threat now represented to human survival and rededicated all his efforts from that point forward to the cause of world peace.

On September 21, 1945, in his last Cabinet meeting as Secretary of War, Republican patrician, Henry Stimson, proposed that information about atomic energy (not how to make the bomb) should be shared with other members of the United Nations, including the Soviet Union. Failing that, Stimson argued, the Russians would view atomic energy as another weapon in the Anglo-American arsenal that must—and would—be matched. Wallace sided with Stimson and, in a follow-up letter to President Truman, joined those U.S. atomic scientists who warned that, in attempting to maintain secrecy about these scientific developments, we will be indulging in ''the erroneous hope of being safe behind a scientific Maginot Line.''

Wallace was also acutely aware that another bomb was ticking—the growing global discrepancy between rich and poor—and that dramatic population growth, accompanied by even greater human misery and suffering, would lead to an explosion even more probable than the bomb itself.

For the last 17 years of his life, Wallace was retired on his New York farm, out of public life and politics, continuing the work he loved most—his experiments with gladioli, strawberries, corn and chickens, as well as his efforts to increase agricultural productivity and improve the nutrition of the people in the less developed world with a special emphasis on Central and Latin America.

In 1963, in a commencement address at the Pan American School of Agriculture in Honduras, Wallace told the young graduates that if any people wished long to survive, they should work at least one-third of the time with their hands and preferably in contact with soil. He urged them to invest ''their personal interest wisely,'' and the ''depth of that interest will draw other people to you. Some of them good, some bad. Eventually some of you will come to understand human beings which is the most difficult job of all.'' He went on to say that ''you are scientists who have learned to use your hands in a practical way. In so doing you will be intensely patriotic, serving your country in the most fundamental way. You will not belong to the right or the left or the center, but to the earth and those who work the earth lovingly and effectively so that it may be preserved and improved century after century.''

What, then, are we to make of this shy revolutionary, this complex genius with such an elusive personality, and what can we learn from his attitude towards plants, science, agriculture—and human life and progress?

We might begin by asking ourselves the question he often asked himself: ''What is worthwhile?'' This is the question at the heart of our inner selves, part of the Presbyterian catechism he learned as a young boy from his grandfather. It is a question of faith. The answer given by the catechism is: ''The chief end of man is to glorify God and enjoy Him forever.'' How is one to glorify God? The Wallaces were believers in the ''social gospel;'' that is, one glorified God by serving one's fellow human beings.

In his oral history, Wallace said that if he were:

To draw conclusions from my life so far I would say that the purpose of existence here on earth is to improve the quality and increase the abundance of joyous living. The improved quality and increased abundance of life is a progressive matter and has to do not only with human life but with all plants and animals as well. The highest joy of life is complete dedication to something outside of yourself. I am convinced that God craves and needs humanity's help and that without that help expressed in terms of joyous vitality, God will have failed in this earthly experiment.

This is the core of Henry A. Wallace. If these views strike you as an odd way for a plant geneticist to talk about his work, rest assured you are not alone. Plenty of Wallace's contemporaries were equally perplexed. ''A senator moves easily from corn to hogs,'' the journalist Jonathan Daniels wrote. ''But he can be disturbed by a grinning Iowan who moves casually from genetics to God.''

Dr. Raul C. Manglesdorf, head of the Harvard University Botanical Museum, said, ''It was Wallace's fate to be often regarded as a 'dreamer' when actually he was only seeing in his own pragmatic, realistic way some of the shapes of things to come and more often than not he was right. . . . Wallace's predictions,'' he further noted, ''were based less on inspiration or intuition than upon an objective evaluation of the available facts in the light of historical perspective. As a student of history he was well aware that history often repeats.''

During his lifetime, political opponents often derided Wallace as a ''mystic,'' a term which they intended to conjure up visions of crystal balls and secret ceremonies. Wallace himself accepted the term ''practical mystic.'' ''I've always believed that if you envision something that hasn't been, that can be, and bring it into being, that is a tremendously worthwhile thing to do.'' Wallace once co-authored a wonderful little book with William Brown on the history of corn, titled Corn and Its Early Fathers, at the beginning of which he devoted an entire page to this quotation from Jonathan Swift: ''And he gave it for his opinion, that whoever could make two ears of corn, or two blades of grass, to grow upon a spot of ground where only one grew before, would deserve better of mankind, and do more essential service to his country, than the whole race of politicians put together.''

Wallace, the ''practical mystic,'' saw a way to make the equivalent of two or four ears of corn grow where one grew before. This, in his view, seemed a ''tremendously worthwhile thing to do,'' precisely because it seemed an obvious way of improving the lot of his fellow human beings.

But there was another component to his vision. This was the hope that hybrids would help bring about the ''distinctive rural civilization'' of his family's dreams. He asked: ''Can we go ahead to create a rural civilization that will give us a material foundation solid enough so that life can be enjoyed instead of being wasted in a chase after enough dollars to keep the sheriff and wolf away?'' Perhaps hybrid seed, and science in general, provided an answer.

It may be charged—certainly it was in his own time—that such a vision is utopian. But Wallace was not intimidated by such language. ''Our utopias,'' he wrote, ''are the

blueprints of our future civilization, and as such, airy structures though they are, they really play a bigger part in the progress of man than our more material structures of brick and steel. The habit of building utopias shows to a degree whether our race is made up of dull-spirited bipeds or whether it is made up of men who want to enjoy the full savoring of existence that comes only when they feel themselves working with the forces of nature to remake the world nearer to their heart's desire.''

It is worth reflecting upon this comment, for it encompasses Wallace's answer to both those who would say science must be allowed to work its will regardless of the consequences, and to the critics of science who would rather forego knowledge than cope with change.

To scientists he said this:

''The cause of liberty and the cause of true science must always be one and the same. For science cannot flourish except in an atmosphere of freedom, and freedom cannot survive unless there is an honest facing of facts . . . . Democracy—and that term includes free science—must apply itself to meeting the material need of men for work, for income, for goods, for health, for security, and to meeting their spiritual need for dignity, for knowledge, for self-expression, for adventure and for reverence. And it must succeed.''

In other words, the ends of science must always be mankind. Scientists, no less than the rest of us, must every day ask themselves; What is worthwhile?

To the anti-scientists, Wallace said this in 1933:

''I have no patience with those who claim that the present surplus of farm products means that we should stop our efforts at improved agricultural efficiency. What we need is not less science in farming, but more science in economics . . . . Science has no doubt made the surplus possible, but science is not responsible for our failure to distribute the fruits of labor equitably.''

In other words, the answer to society's problems lies not in blocking progress but in guiding it to serve mankind's ends.

And to everyone he offered this warning:

''The attacks upon science stem from many sources. It is necessary for science to defend itself, first, against such attacks, and second, against the consequences of its own successes. What I mean is this: That science has magnificently enabled mankind to conquer its first great problem—that of producing enough to go around; but that science, having created abundance, has now to help men live with abundance. Having conquered seemingly unconquerable physical obstacles, science has now to help mankind conquer social and economic obstacles. Unless mankind can conquer these new obstacles, the former successes of science will seem worse than futile. The future of civilization, as well as of science, is involved.''

Wallace also once observed ''scientific understanding is our joy. Economic and political understanding is our duty.'' His concept of scientific research was a broad one and included the lifting of the social sciences to the same level as the natural sciences. In turn, he challenged these scientists to have a greater conscience concerning the implications of their work. Applied research would properly involve social planning, which would enable man to have more leisure time and thus better enjoy non-material things, such as ''music, painting, literature, sport for sport's sake, and the idle curiosity of the scientist himself.''

The New Republic, which he served briefly as editor after his retirement from politics, once described his concept of political democracy as ''. . . that of a science which would blend political freedom with the full use of resources, both of manpower and of technologies, for everyone's welfare.''

It is intriguing to speculate about what Wallace might say if he were here today, about the state of agriculture in this country and around the world, about the movement for a sustainable alternative agriculture, about the role of science and the march of human progress. Probably his comments would surprise all of us, as they so often surprised audiences during his lifetime. His was a provocative and remarkably original mind, unfazed by popular opinion and conventional wisdom. The absence of ''corn shows'' testifies to that.

First, on a very contemporary note, we can assume Wallace would be appalled and disgusted by the attack now being made on the nation's conservation programs, especially those related to agriculture. The efforts made to preserve land—to remove marginal land from production and protect the remainder from erosion and abuse—were among his proudest accomplishments. ''People in cities may forget the soil for as long as a hundred years, but mother nature's memory is long and she will not let them forget indefinitely,'' he wrote. ''The soil is the mother of man and if we forget her, life eventually weakens.

Second, Wallace would admonish us to use our abundance more ''virtuously and wisely.'' In the long run, Wallace believed, a healthy democracy could not tolerate the politics of scarcity. In his own time, Wallace saw the devastating consequences of scarcity run amuck; one-third of a nation ill-nourished, ill-clad, and ill-housed. Today, however, we might imagine that Wallace would see too much money, made in unproductive ways, in the hands of too few people, too many people without health insurance or secure and satisfying employment, and far, far too many people leading wasted lives in the poverty and degradation of our major cities. He would deplore the national priorities which call for huge defense budgets while reducing investments in education, environment, and job training. He would be greatly troubled by the lack of concern for the ''general welfare,'' the widespread violence in our country, and the lack of civility and loss of community in our national life. He would urge creative social and economic planning to address these issues.

While he would welcome the liberalization of international trade, he would decry the enormous expenditure of scarce Third World resources on arms. He would advocate a stronger U.N. military force and greater foreign assistance through more efficient and reformed multilateral lending institutions.

Third, we might guess that Wallace would look upon the sustainable agriculture movement with considerable affection. This is speculative because Wallace, like all of us, was a man of his times, and no one would say he was close to being ''certified organic'' in his own practices. He used chemical pesticides and fertilizers liberally, and, some would argue, helped pave the way for a highly mechanized, industrialized agriculture through the introduction of hybrid seed to commercial farming.

Still, Wallace was a man who believed in facts. If the facts argued against chemical pesticides, he would have accepted them totally. What he sought, in his life's work, was not prosperity for corporations, but for the men and women living on farms, doing God's work, preserving their land and seeing ''the fruits of their labor raise the living standards of mankind.'' Prosperity, he often warned farmers, was not an end but the means to an end. He wrote: ''Can we remember that prosperity is worthless except insofar as it gives us more freedom and strength to do good work, to love our fellow men and to take delight in the beauty of a world wonderful enough to give pleasure to the Workman who planned it?''

Finally, we can guess that he would say to farmers and scientists: ''Small is good.'' When Wallace began his corn breeding experiments, he recalled, he ''had only a fraction of an acre within the city limits of Des Moines on which to work. An inbred corn capable of unusually high yield came out of [this] backyard garden, which was but ten by twenty feet. . . .'' He was concerned that breeders might substitute masses of data for real understanding and pointed out that James Logan, an 18th Century experimenter, had learned from four hills of corn, and that the principles of heredity were discovered by Gregor Mendel, growing peas in a monastery garden about 15 feet wide and 30 or 40 feet long, and finally, that George H. Shull, one of the inventors and developers of hybrid corn, used no more than one quarter of an acre each season in conducting his experiments.

He deplored that the modern trend in science is in exactly the opposite direction. ''The present emphasis,'' he wrote, ''is directed toward doing things in a big way, toward large numbers and multidisciplinary research. In many of our educational institutions, scientific progress seems to be measured in terms of the growth of departments and the number and size of financial grants that can be obtained for support of the work. . . . The great scientific weakness of America today.'' he said, ''is that she tends to emphasize quantity at the expense of quality—statistics instead of genuine insight—immediate utilitarian application instead of genuine thought about fundamentals. . . . True science cannot be evolved by mass-production methods.''

At 75 years of age and in outwardly remarkable physical condition, Wallace became afflicted with Amyotrophic Lateral Sclerosis, or Lou Gehrig's disease. This disease affects the nervous system and causes muscular atrophy. There is no cure. An experimenter to the end, he kept a careful record of his symptoms and reactions in a memo entitled, ''Reflections of an ALSer.'' In the final weeks of his illness, in September 1965, Wallace was visited by a friend while a patient at NIH. The visitor noted that the flowers in his room had been sent by President Lyndon Johnson. Wallace, who, given the disease's progression, could no longer speak, wrote on a notepad, ''I hope they think about decentralization as the hope of the future. Big cities will become cesspools.''

Wallace always rose very early on his Farvue farm and, as long as his failing health permitted, continued to type his own correspondence with geneticists, plant breeders and others around the world before going out to the field in a mechanized wheelchair to work with his research plots.

One of his last letters was to a long-time friend and corn breeder:

''Your 3306 [a hybrid seed corn code] has me all excited. So glad you have 2,000 acres of it. . . . I was feeling rather blue when I got up this morning, thinking the end of the road was not far off. But when I got to thinking about 3306, I felt I just had to live to see how [it] would adapt to the tropical program, the Argentine program, and the South Georgia program. Yes, this is the most exciting letter I have ever received from you.''

That was his message. Think big, plant small, work hard, seek the truth, glorify God, and have sympathy for the plant.●

## ORDER OF BUSINESS

Mr. INHOFE addressed the Chair.