

F. A. S. NEWSLETTER

Volume 19, Number 8
October, 1966

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Letter to President on CB Weapons

Following is the text of an open letter to President Johnson urging a clearer and more restrained policy regarding chemical and biological weapons. The letter is not an FAS statement but it has the support of the FAS Council, and has been circulated to all FAS members so that they and others may sign it if they wish.

Dear Mr. President:

We, the American scientists whose names appear below, wish to warn against any weakening of the world-wide prohibitions and restraints on the use of chemical and biological (CB) weapons.

CB weapons have the potential of inflicting, especially on civilians, enormous devastation and death which may be unpredictable in scope and intensity; they could become far cheaper and easier to produce than nuclear weapons, thereby placing great mass destructive power within reach of nations not now possessing it; they lend themselves to use by leadership that may be desperate, irresponsible, or unscrupulous. The barriers to the use of these weapons must not be allowed to break down.

During the Second World War, the United States maintained a firm and clearly stated policy of not initiating the use of CB weapons. However, in the last few years the U.S. position has become less clear. Since the late 1950's, Defense Department expenditures on CB weapons have risen several fold—and there has been no categorical reaffirmation of the World War II policy.

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EDITOR'S NOTE —

Beginning with this issue, I'm the new Editor of the Newsletter. I don't know exactly how long my own time situation will let me carry on the job—I'm obliged to assemble at least my first two issues more hurriedly than I'd like. But while I have the job, I'll do my best to maintain the high standards set by my predecessors and to see to it that the Newsletter continues to serve FAS members and other readers as well as it has in former years. I hope it may be possible—beginning, probably, two or three issues hence—to include some special articles, book reviews, more news from FAS chapters and branches, and other contributions in each issue. In the meantime, I'll be grateful for comments and suggestions on the Newsletter, sent to me via the FAS office.

HARRIETTE L. PHELPS

Signs of Progress Toward A Non-Proliferation Treaty

As this is written there are encouraging signs that the long impasse between the U.S. and the Soviet Union over a treaty to stop the spread of nuclear weapons may be broken. (New York Times, October 5, 12, 21; Washington Post, October 11.)

After a meeting on October 10th with Secretary of State Rusk, Soviet Foreign Minister Gromyko told newsmen: "We discussed questions relating to disarmament problems, among them the question of non-proliferation of nuclear weapons. It looks like both countries, the United States and the Soviet Union, are striving to reach agreement to facilitate the conclusion of an international agreement on this question. We agreed that the exchange of views on this question will be continued." Earlier the same day Gromyko had apparently had a fruitful discussion with President Johnson on the non-proliferation treaty.

Negotiations toward a treaty have long been stalled partly by Soviet charges that the U.S. has been hindering agreement by insisting on giving West Germany a voice in the control of nuclear weapons in Europe, through the much-debated multilateral nuclear force, or some other arrangement. Presumably, the U.S. has now altered its position somewhat, and it is reported that President Johnson recently ordered a search for "compromise" language on the treaty. Although a non-proliferation treaty has been a declared goal of the U.S., the U.S.S.R., Britain, and most of the non-nuclear countries, the two newest nuclear powers, France and China, may oppose it. The question of military guarantees to non-nuclear signatories, e.g., India, remains—although a lack of completely satisfactory guarantees would probably not prevent most such countries from signing the treaty.

In the United Nations on October 20th, the U.S. and the U.S.S.R., in major statements, held out promise for a non-proliferation treaty. Opening the annual arms debate, Soviet Delegate Fedorenko said that there were no insurmountable obstacles to a treaty. U.S. Delegate Goldberg remarked on the "new and promising situation" following Gromyko's meetings in Washington. But Goldberg noted that the discussions were still in an exploratory stage and that "important differences remain." There is some expectation that private talks may be resumed soon between William C. Foster, head of the U.S. Arms Control and Disarmament Agency and Chief U.S. disarmament negotiator, and Aleksei A. Roschin, his Soviet counterpart. But even if all goes smoothly it is not expected that any non-proliferation treaty could be ready for signature for at least several months.

SCIENTISTS, MONEY, AND POLITICS

(Following are excerpts from an article entitled, "Why Our Scientists (sic) Are about To Be Dragged, Moaning, Into Politics," which appeared in the September 1966 issue of *Harper's Magazine*. It's John Fischer's "Editor's Easy Chair" contribution for that issue. I think it's not unfair to say that Mr. Fischer oversimplifies and generalizes somewhat. He might have taken more explicit note of the FAS. Some scientists will probably be amused and/or irritated by his article. Yet he raises, in a trenchant way, issues that should be of particular interest to FAS members at this time.—H.L.P.)

... Ever since the early days of World War II it has been broadly true that whatever scientists want, they get. Like an indulgent bridegroom, American society has rushed to satisfy their every whim, and damn the cost. Did they yearn for the world's biggest solar telescope? We promptly built it for them, at Kitt's Peak in Arizona. When they hinted that a two-mile-long electron accelerator might be nice, Congress answered, "Why of course darling," and thumbed \$114 million out of the public wallet. (It is true that a few uncouth taxpayers asked what an electron accelerator was supposed to produce, but such ungallant ignorance was shushed immediately.) Meanwhile, every forward-looking industry has been expanding its research program; and the universities, however niggardly they might be with the humanities, have been stealing prestige scientists from each other with shameless offers of plush laboratories and \$100,000 professorships.

The result has been a spectacular and prolonged rise in the nation's outlay for research and development. In 1940 the total came to a mere one third of a billion dollars, of which about one-fifth was supplied by the federal government. By last year it had climbed to \$21 billion—roughly a sixty-fold increase—and about two-thirds of it was government money. The federal contribution has been rising steadily by something like 20 per cent a year.

However passionate our love affair with science, we obviously couldn't go on like this. At some point the spending had to level off. That point was reached this June, when two things happened. In its budget for the 1967 fiscal year, the Administration announced a slight cutback in its research-and-development funds—the first in many years. (It still plans to spend nearly \$16 billion.)

FAS NEWSLETTER

Published monthly except during July and August by the Federation of American Scientists, 2025 Eye St., N.W., Washington, D. C., 20006. Subscription price: \$2.00 per year.

Chairman.....Marvin Kalkstein

The FAS Newsletter is prepared in Washington.

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The FAS, founded in 1946, is a national organization of scientists and engineers concerned with the impact of science on national and world affairs.

Sources of information (given at the end of articles in parentheses) are for further reference. Items reprinted directly from other publications are designated as such in an introductory paragraph.

Even more significant was the President's meeting on June 27 with a group of top bureaucrats concerned with research, especially in medicine. He demanded that they reexamine all their programs to determine "what are the payoffs in terms of healthy lives for our citizens." And he added that he would like to know just how much research was being carried on "for the sake of research alone."

To any scientist, those questions sound peculiarly ominous.

... Most ordinary people—and the politicians who speak for them—naturally think of science in terms of "payoffs." They have been willing to support it lavishly because for the last quarter of a century, it has paid off handsomely in scores of things, from atomic bombs to penicillin and plastics. It has, in fact, become the fountainhead of American technology, and therefore of American wealth and power.

Consequently to the layman science clearly has seemed a good investment, even when it costs more than 3 per cent of the gross national product every year.

But the scientist looks at his calling in a very different way. To him the whole idea of "payoffs" is distasteful. He prefers to think of science as a purely intellectual pursuit, a disinterested search for truth. If his exploration of, say, the nucleus of the atom happens to result in a revolutionary weapon—well, that is a mere by-product and not an altogether welcome one. For in his social hierarchy, the "pure" researcher stands a good notch higher than colleagues engaged in "applied" research; since the latter are seeking new gadgets rather than new laws of nature, their standing in the scientific community is hardly above that of mechanics.

So research "for the sake of research alone" is indeed what the scientist prizes most. In his ideal world, society would provide *all* competent scientists with all the money, equipment, and staff that they want; let them use these resources in any way they choose; and never ask what the payoff would be, or when. (Moreover, the competence of anyone who claimed to be a scientist would be judged by his peers alone.)

Some, but probably not the majority, of scientists take a more extreme position. The late Leo Szilard, for example, argued that science was the highest flowering of civilization, and that it was not only the duty but the privilege of society to support scientists and their work. He regarded scientists (if I understood his conversations correctly) as an elite class, markedly superior to the rest of mankind. Therefore their privileged position should be accepted gratefully, like that of the priesthood in an-

FAS COUNCIL MEETING

The Council will meet on Sunday evening, January 29, 1967, at 7 p.m. and again on Monday night, January 30, at 8 p.m. The meetings will be held at the headquarters hotel of the APS meetings. Details will be announced by mail directly to the Council members and by further notices in the Newsletter.

cient Egypt or the aristocracy in medieval Europe. And, since the common man was incapable of understanding what they were up to, he had no right to ask what they were doing with his money.

Most scientists, I believe, would put their case in less lordly terms. They probably would be content with Dr. Warren Weaver's argument that "the great ideas arise when you give freedom—freedom to think, freedom from other pressures—to individuals of great intellectual capacity, of imagination, of dedication, and let them be motivated primarily by their curiosity to find out how nature operates." And they would contend, with Dr. Weaver, that too much of our present scientific investment now goes for development and not enough for basic research.

Yet the layman finds even this relatively moderate claim hard to accept. Even if money were no problem, the ideal world of the scientists doesn't sound quite feasible. For what scientist is willing to admit that he is not a man of "great intellectual capacity, of imagination, of dedication?" And if society finances everyone who claims these qualities, wouldn't the field soon be overcrowded? In like fashion, if the government guaranteed freedom from economic pressure to every poet, wouldn't all of us turn to verse?

It seems likely, then, that the country is going to have to make some decisions that we have been evading throughout the twenty-year honeymoon. For example:

1. How can the taxpayer's natural eagerness to get something for his money be reconciled with the scientist's desire both for virtually unlimited money and for freedom in using it, regardless of payoffs?

2. Since the government can't increase its spending on science indefinitely, how do we decide what we can afford? Is 3 per cent of the gross national product about right? Or too little? Or could part of that sum be better spent on education, the war against poverty, or cleaning up our polluted rivers and air?

3. When we decide on a total science budget, how should it be divided? At present about 12 per cent goes for basic research and the rest for development and applied research—such as the devising of new military hardware and industrial processes. Is Dr. Weaver (along with most of the "pure" scientists) correct in believing that a bigger share should go to basic research? Or is the President right in pressing for more science aimed at practical and early results?

Essentially, these are political rather than scientific questions. I have no competence in science but I do have some experience in the way American political processes work; and I mention these questions not to suggest answers, but to indicate how the political machinery is likely to grind out some answers eventually. Whether they are reasonably satisfactory answers will depend largely on how much political sophistication the scientific community develops. At present it has very little.

A few scientists—but lamentably few—do have a firm grasp on the workings of our political system. One of

them is Dr. Alvin M. Weinberg, director of the Oak Ridge National Laboratory, who began discussing such questions publicly about three years ago. He pointed out that "The idea of conflicting and biased claims being adjudicated at one fell swoop by an all-knowing supreme tribunal"—whether the White House, the Budget Bureau, or some committee of scientific wise men—"is a myth." Decisions on public policy and the spending of public money have "always resulted from countervailing pressures, exerted by various groups representing professional specialties, or local interests, or concern for the public interest."

There are thousands of such groups, ranging from the farm bloc and the labor unions to the Negro organizations, the League of Women Voters, the American Medical Association, and the Spearfish, South Dakota, Chamber of Commerce. Rarely is any one of them strong enough to get what it wants. So they plead for public support, using arguments that are sometimes rational, sometimes demagogic. They make alliances, usually involving the classic technique of logrolling: "You support my project and I'll support yours." They argue their cases before government agencies and Congressional committees. And they make friends among politicians, by working in campaigns, contributing money, and (probably the most effective method) simply by taking the trouble to explain their fears and aspirations in terms a politician can understand.

The overwhelming majority of scientists have never wanted any part of this. Typically they regard the political process as something sinister if not dirty; often they treat politicians—and sometimes the ordinary voter as well—with scarcely veiled contempt.

Only once in my memory has a group of scientists carried out a political operation successfully. That was the campaign, just after World War II, by a hastily organized band of nuclear scientists to put the future development of atomic energy under civilian rather than military control. They had little money and less political experience—but they did state their case with candor, lucidity, and an obvious "concern for the public interest." As a consequence they were able (somewhat to their own surprise) to persuade both the key segments of public opinion and a majority of Congress.

By contrast, the only group of scientific professionals which consistently has engaged in politics over a long period has been a hilarious failure. The American Medical Association has poured out cascades of money and propaganda in opposing virtually every piece of public-health legislation in the last half-century. Yet, as Richard Harris pointed out in a recent series of articles in *The New Yorker*, it not only lost every major battle; in most cases its ineptitude actually helped the other side.

... On the assumption that the scientific community is not about to sprout even rudimentary political skills very soon, one can predict with reasonable confidence a few things likely to happen during the short-range future:

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Scientists, Money, and Politics

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1. The government probably will scale down, slowly but steadily, its spending for research and development. The Vietnam war, the poverty program, and expanding aid to education all will press heavily on the federal budget; and their demands may well sound more urgent than those of science.

2. Of the total money available, the share allocated to "pure" research is likely to shrink. Senator Warren G. Magnuson, long a generous supporter of science appropriations, probably spoke for most of his colleagues when he complained that "we don't seem to receive much help from the scientific community on the question of priorities." So long as this remains true—so long as each group of scientists fights for its own pet project, regardless of its place in the overall national research effort—then the priorities will have to be fixed by the politicians. And, as we have noted, they are naturally biased toward projects that promise quick and tangible benefits.

3. Within the field of "pure" research, the projects most vulnerable to budget cuts will be those costing very large sums of money—such as Mohole and the 200-bev accelerator—with little foreseeable benefit, either to the ordinary citizen or to other branches of science. The accelerator, for instances, would be the most costly single scientific installation ever built. Its construction would take \$280 million, and its operation would cost about \$50 million a year. Moreover, several thousand highly trained scientists and technicians would be needed to run it, thus draining scarce talent away from teaching and from other research projects.

What could we expect to get in return? So far as I can discover, nobody really knows. The most its sponsors claim is it might produce important new information about the makeup and behavior of the smallest particles of matter. Like anything that furthers our understanding of the fundamental laws of nature, this information might someday lead to practical benefits, of a wholly unpredictable kind. For the immediate future, however, the findings of high-energy physics don't seem to be particularly relevant, even to other branches of basic research.

Why, then, should we be in such a hurry to build this vastly expensive piece of specialized equipment—especially at a time when the economy is overheated, the budget strained, and scientific talent in short supply? Why shouldn't it be downgraded on the priority list—to be considered again in a few years, or decades? I am unable to find convincing answers to these questions in recent scientific literature.

4. In contrast, "Little Science"—those branches of inquiry, such as biochemistry and cryogenics, which don't require a lot of costly equipment—need not expect much trouble in getting money. The politicians are more willing to take basic research on faith when the price tag isn't too high; and they are well aware that the best science isn't always the most expensive. After all, Einstein did his work with a pencil and pad of paper.

5. From now on research-and-development money is likely to be spread around the country more evenly.

So far the big helpings have gone to the Northeast and the West, for two reasons. First, scientists are a gregarious crowd; they like to flock together. Consequently, so long as scientists had the main say about where the money should go, most of it naturally flowed to places like Cambridge and Southern California which already had big scientific establishments. Moreover, the scientists serving on the government agencies which parcel out the cash—the President's Science Advisory Committee, the National Science Foundation, the Atomic Energy Commission, and a few others—have usually been chosen from a few institutions in these same areas. Indeed, it is hardly an exaggeration to say that the money valve has been controlled for the last twenty years by a little group dominated by men from Harvard, MIT, Princeton, Berkeley, California Tech, and Los Alamos.

Now all this is changing. Johnson's recent science appointments have gone largely to Midwesterners, who presumably will see to it that their part of the country gets a better break. Then, too, as Congress takes a more aggressive part in scientific decisions, it is likely to wonder why big research installations shouldn't be located to suit national needs, rather than the convenience of researchers. If the 200-bev accelerator is ever built, for example, why shouldn't it be put in some such place as Appalachia, which desperately needs an economic boost?

There is a danger, of course, that the rising influence of the politicians on scientific priorities might have some unfortunate results. Conceivably, basic research might be put on too thin a diet. Or choices between various projects and the selection of their sites might be too heavily influenced by patronage, with the powerful committee chairmen getting the biggest slices of the melon for their own districts.

The best safeguard against these hazards, obviously, is for the scientific community to get into politics itself. That would mean that scientists would have to take enough time off from their laboratories to learn how the political process works. They would have to give some additional time to actual participation in the process—organizing themselves, first of all, to decide upon some common objectives, and then to sell these objectives in the political marketplace.

It also means that the scientific community would have to develop a lot more effective spokesmen—men like Warren Weaver, Caryl Haskins, Carl Kaysen, and Jerome Wiesner, who can speak persuasively to laymen, can have a drink with a Congressman without self-consciousness, and who are transparently concerned, not with some selfish interest, but with the public good. Finally, it would mean that scientists would have to take the trouble to explain their work and their goals to the ordinary voter—learning, in short, to speak and write for a lay audience, even if a few scientific papers have to be postponed.

All this will go harshly against the grain of scientific habit. But eventually, I suspect, it is going to happen—just as, in every lasting marriage, the bride learns soon after the honeymoon to make a budget and explain it to her breadwinner.

Letter to President on CB Weapons

(Continued from Page 1, Column 1)

Most recently, U.S. forces have begun the large-scale use of anti-crop and "non-lethal" antipersonnel chemical weapons in Vietnam. We believe that this sets a dangerous precedent, with long term hazards far outweighing any probable short term military advantage. The employment of any one CB weapon weakens the barriers to the use of others. No lasting distinction seems feasible between incapacitating and lethal weapons or between chemical and biological warfare. The great variety of possible agents forms a continuous spectrum from the temporarily incapacitating to the highly lethal. If the restraints on the use of one kind of CB weapon are broken down, the use of others will be encouraged.

Therefore, Mr. President, we urge that you

- Institute a White House study of overall government policy regarding CB weapons and the possibility of arms control measures, with a view to maintaining and reinforcing the world-wide restraints against CB warfare.
- Order an end to the employment of anti-personnel and anti-crop chemical weapons in Vietnam.
- Reestablish and categorically declare the intention of the United States to refrain from initiating the use of chemical and biological weapons.

The text of the letter, with 22 initial signers, was released on September 19th.

The 22 initial signers were: Felix Bloch, Konrad E. Bloch, James F. Crow, William Doering, Paul Doty, Freeman J. Dyson, John T. Edsall, Bernard Feld, Irwin C. Gunsalus, Robert Hofstadter, Arthur Kornberg, Fritz Lipmann, Robert B. Livingston, Matthew Meselson, Severo Ochoa, Ray D. Owen, Keith R. Porter, Charles Price, Eugene Rabinowitch, E. L. Tatum, George Wald, Paul Dudley White.

In a statement (New York Times, September 20th) accompanying the letter, the 22 scientists said, among other things: "Chemical and biological weapons could be far more dangerous as instruments of mass extermination than anything except nuclear weapons. The United States, along with other nations, recognizes that the use of even the smallest nuclear artillery shell in war would raise issues of extreme gravity. It would break down barriers to the use of more powerful nuclear weapons, and no one could tell where the escalation might end. The use of chemical or biological weapons, even relatively mild ones, involves similar dangers . . . Under the intense pressures of actual war, and without any carefully worked out and internationally recognized guidelines, it is difficult to keep even so mild a substance as tear gas from being used in ways that can set the stage for the introduction of lethal chemicals. For example, when, in Vietnam, we spread tear gas over large areas to make persons emerge from protective cover to face attack by fragmentation bombs or when we use tear gas so that a moving target cannot move so fast, we use gas to kill. Once such use of the milder weapons is widely practiced and generally accepted, the way is paved for a chemical and biological arms race and progressive escalation to the use of increasingly deadly weapons that could be lethal to entire populations. Failure to devise clear and far-sighted national policy now may spoil chances to control chemical and biological weapons in the future."

Noting that the relative ineffectiveness of ordinary weapons against guerilla forces in Vietnam was a powerful

NEWS ITEMS

This year's Fermi award went to Otto Hahn, Fritz Strassman, and Lise Meitner for their pioneering work on nuclear fission. Hahn and Strassman received the award from AEC Chairman Seaborg in Vienna on September 23, and a special presentation was made later to Prof. Meitner at Cambridge, England. (*New York Times*, September 24.)

Sterling Cole, the first director general of the Atoms for Peace Agency, proposed a sweeping revision of the IAEA charter to provide for tighter controls on nuclear weapons material. Aimed at slowing down the spread of nuclear weapons to new countries, the Cole proposal would, among other things, require that IAEA member nations place all their reactors under IAEA inspection and handle all transfers of nuclear material through the Agency. (*New York Times*, September 18.)

Cautious cooperation in exchanging photographs from weather satellites has begun between the U.S. and the Soviet Union. The Soviets began sending their pictures unexpectedly on September 11, after the U.S. had suggested the exchange and started sending photos on September 6. (*New York Times*, October 2; *Aviation Week and Space Technology*, September 26.)

Legislation to set up an independent federal institution to support social science research was introduced in the Senate on October 10. The bill was introduced by Senator Fred Harris with 20 co-sponsors. The proposed institution would be modeled along the lines of the present National Science Foundation. The social science agency would be one means of channeling Federal money into research in politically and socially important fields without arousing suspicions of academic impropriety—suspicions of the sort which have arisen over some CIA and DOD supported studies in recent months. (*New York Times*, October 10th.)

The U. S. and the Soviet Union may be moving closer to a treaty on space exploration. The treaty would extend international laws to space, prohibit weapons of mass destruction in orbit and on the moon, and require that celestial bodies be used only for peaceful purposes. A troublesome point in negotiations until now has been a Soviet request that tracking facilities in all countries be usable equally by all countries with satellites in orbit—a requirement which would not be acceptable to many countries already involved in bilateral tracking arrangements. The Soviet Union still hopes that states will generally make facilities on their own territory available "on a basis of equality." Unfortunately, the presently envisioned space pact would not cover liability for damages from or to space vehicles or assistance to astronauts in distress, although it is hoped that a subsequent treaty (or treaties) would cover these issues. (*New York Times*, October 6 and 9.)

Eugene Rabinowitch has received UNESCO's Kalinga prize for the popularization of science. Rabinowitch's con-

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temptation to use chemical and biological weapons, the 22 initial signers of the letter to the President noted that: ". . . If we break down the barriers that bar the use of these weapons, our enemies now or in the future, can turn our own practices against us, with deadly effect. If we continue further our present course, the situation may become irretrievable, and the conviction may spread throughout the world that 'anything goes' once war has begun."

On the basis of a (very limited) sampling, the CB weapons letter and statement seems to have drawn mixed editorial comment. The Washington Star reported (September 20th) that the plea was being studied by the White House. But Defense Department officials said (New York Times, September 21st) that there would be no relaxation of the American defoliation and crop-destruction program in South Vietnam.

NEWS ITEMS

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tributions include his editorship over many years of the Bulletin of the Atomic Scientists, and his leadership in the Pugwash Conferences.

The Townes-Schawlow laser patent has been upheld by the U.S. Court of Customs and Patent Appeals against claims of primacy filed by Gordon Gould. The court ruled that Gould had failed to prove either prior conception or "reasonable diligence in reducing it to practice." (Physics Today, September 1966.)

The United Nation's Food and Agriculture organization reported that last year's worldwide food production showed no gain, while world population increased by about 70 million—resulting in a decrease in available food supplies of about two percent per capita. But for gains registered in North America and Western Europe, worldwide production would have been reduced, and per capital production fell four or five percent in underdeveloped areas of the world. (New York Times, October 14.)

The controversy over who discovered element 102 and what it should be named continues. Prof. G. N. Flerov of the Soviet Academy of Sciences proposed on October 17th that the element should be named Jolium (after Joliot-Curie), on the basis of the 1961 Dubna studies. Previous discoveries of the element (or an isotope of it) were claimed on the basis of results achieved at Stockholm in 1957, Berkeley in 1958, and Moscow in 1958. The element was first called Nobellium (after Nobel). It appears that many scientists are playing it safe and referring only to "element 102."

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Volume 19, No. 8 October, 1966

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