

RECENT DEVELOPMENTS IN THE ATOMIC ENERGY COMPLEX

12 October 1953

625

CONTENTS

	<u>Page</u>
INTRODUCTION--Rear Admiral W. McL. Hague, USN, Commandant, Industrial College of the Armed Forces.....	1
SPEAKER--Mr. Eugene M. Zuckert, Member of the Atomic Energy Commission.....	1
GENERAL DISCUSSION.....	11

NOTICE: This is a copy of material presented to the resident students at the Industrial College of the Armed Forces. It is furnished for official use only in connection with studies now being performed by the user. It is not for general publication. It may not be released to other persons, quoted or extracted for publication or otherwise copied or distributed without specific permission from the author and the Commandant, ICAF, in each case.

Publication No. 154-39

INDUSTRIAL COLLEGE OF THE ARMED FORCES

Washington, D. C.

Mr. Eugene M. Zuckert, Member of the Atomic Energy Commission since 25 February 1952, was born in New York, N. Y., 9 November 1911. He was graduated with a B.A. degree in 1933 from Yale University. In 1937 he received his LL.B. degree and a certificate of completion of a combined law-business course given jointly by Yale Law School and Harvard Graduate School of Business. His first Government appointment was in 1937 as attorney for the United States Securities and Exchange Commission. In 1940 he joined the faculty of the Harvard Graduate School of Business as an instructor in the relations of government and business, advancing during a four-year association with the school to assistant professor and later to assistant dean. During the same years, 1940-44, he was special statistical consultant to the Commanding General of the U. S. Army Air Force. While teaching at Harvard University, Mr. Zuckert was the author of publications on the subjects of venture capital and indemnification of corporate directors. He retains his connection with the Harvard Graduate School of Business as a member of its executive council. In September 1945 he was appointed assistant to W. Stuart Symington, head of the Surplus Property Administration. When Mr. Symington became Assistant Secretary of War for Air in February 1946, he named Mr. Zuckert as his special assistant. Following the passage of the National Security Act, which in September 1947 established the Air Force as an independent unit of the armed forces, Mr. Zuckert was appointed Assistant Secretary of the Air Force, which position he held until appointed to the Atomic Energy Commission early in 1952. This is his first lecture at the Industrial College of the Armed Forces.

RECENT DEVELOPMENTS IN THE ATOMIC ENERGY COMPLEX

12 October 1953

ADMIRAL HAGUE: Our speaker this morning is Commissioner Eugene M. Zuckert of the Atomic Energy Commission (AEC). Obviously, no detailed introduction of Mr. Zuckert is necessary. You all have a thumbnail sketch that was handed out with the schedule. There is only one thing wrong with that sketch--it leaves out a very important fact.

I think that almost everyone assumed that when the Army Air Force set up shop for itself, it was content to get along with the personnel that constituted the Army Air Force. That was not exactly true. The Air Force, even in those days, had been alive to talent and it reached out into the Navy ranks and grabbed off as a special assistant to Mr. Symington, as assistant secretary of the Air Force, one of our bright and shining figures in Mr. Zuckert. The Navy was big hearted about it and was very glad to see Navy talent recognized.

There is only one trouble with sequestering talent of that character and that is that here in the great white city of Washington there are many individuals, agencies, and departments who are on the qui vive for outstanding talent. So it was no surprise to us in the armed forces when the President reached out and named Mr. Zuckert to the AEC.

Of course, from our standpoint, it was a very satisfactory selection, for the importance of atomic energy to the military was well recognized. But, in addition, one could foresee that before too many years atomic energy would not be a military monopoly. It would become available to industry, and a whole host of complex and difficult questions would immediately arise, first, to insure sufficient fissionable material for the military; and, second, from the security angle. So we were all glad to see Mr. Zuckert named commissioner. His topic this morning is "Recent Developments in the Atomic Energy Complex."

It is with great satisfaction and pride that I introduce to you a brother naval officer, Mr. Eugene M. Zuckert.

MR. ZUCKERT: Admiral Hague, thank you for that introduction. I am sure there were many times, both at the time and since, when the Navy was very happy that it had parted with my services. But

lieutenants in the USNR were not a particularly scarce commodity at the time and I doubt if there was very much sense of loss, with considerable justification.

Six years of working in the Pentagon with military people--I want to say this at the outset--left me with a tremendous admiration for the job that you and your fellows have done since before World War II.

There is a careless tendency to criticize you in cliché terms. In peacetime that criticism is intensified when the military expenditures are high. The critics find it easy to see things to criticize because almost every single aspect of the military job is a big job, and the critics' standard is perfection. When the sum of the pieces is considered--and the total job is almost too vast to be grasped--I think the military services have done one of the most magnificent jobs in the history of large-scale organization.

As a reasonably close observer of the military and military management, I am filled with admiration for the way in which our military management was able to build up from almost nothing before World War II to the tremendous wartime establishment, carrying out operations of combat or logistics on every continent of the world.

Also, I admire the fact that the resiliency of military men and their organization cushioned the effects of the tragic demobilization. I doubt whether any industrial establishment could have endured an analogous period without losing its effectiveness and the morale of its management. And I doubt whether many organizations would have remained cohesive and effective through any period such as we have seen since the 1945 demobilization.

Since then, the ebbs and floods in national emphasis upon security have followed each other in swift and chaotic succession.

It is a tribute to the wisdom, resiliency, and devotion of our military leadership that our armed forces do possess a real effectiveness, powerfully demonstrated in such actions as the Berlin airlift and the Korean conflict.

I count it among the truly great privileges of my life to have known our top military leaders and to have worked with the men, like yourselves, who have supported them.

Beyond this wholehearted respect for the accomplishments of the military, this is a pleasant opportunity to see the faces of old friends. For instance, your capable Commandant, Admiral Hague, and I fought on

the same side of many Pentagon battles in which the issue, as we saw it, was true unification; this, to me, meant the healthy functioning of the individual military services under a unified top structure.

As for today this speech has one serious disadvantage--I wrote it myself. It has another--that is, it was written last week; I felt a little bit like the sparrow in the badminton game--I would wait and see how things were going to turn out. The speech represents my own views, but as it appears in text, I believe it can fairly be said also to represent the views of the Commission. I hope that the speech will only serve as a teaser for an interesting and profitable discussion which might come with the question period.

The whole subject of atomic energy, of course, is one of the most fascinating in the world. Diplomatically, atomic energy holds the key to the lasting peace or destruction of the world. If the answer is to be peace, and the continued survival of this world as we know it, atomic energy has a great potential for developing a more abundant world. As to how we attain this, the specifics will become clear to us only gradually. But we know that this is a dramatically new field, with the surface barely scratched. It is only 10 years old. There are many answers about the peacetime potential of atomic energy that we don't know.

Today, in a good part of the prepared portion of this session, I am going to discuss matters bearing mostly upon the military aspects of the atomic energy business. Later, I will invite you-- and Admiral Hague tells me that I need not fear that you will decline--to question me as closely as you wish on any problem of atomic energy that you feel would be profitable. I will certainly do my best to give you informative answers.

Let me just--for the benefit of those who are not familiar with the Commission's work--sketch some of the salient facts about our operation.

Compared to the military establishment, we are peanuts, but by business standards, we are pretty sizable enterprise. Using one measure, the amount of our capital invested in plant and equipment currently totals about 5 billion dollars. When we complete our present expansion program, that figure will be approximately 7.5 billion. Our annual operating budget in this fiscal year is about one billion dollars. When we are operating at a steady rate following the completion of our expansion program, our annual budget requirements will be in the neighborhood of 2 billion dollars.

We currently have about 6,500 employees on our Government payroll. This small number in relation to our total expenditures is the consequence of our use of contractors, rather than direct operation, to perform our construction, operations, and research activities. The total of our

contractors' employees comes to about 150,000, fairly evenly divided between construction and operations functions.

The AEC has a fascinatingly diverse and complicated job. Our primary concern has been, of course, the production of more and improved weapons for our national stockpile, and the major share of our effort is directed toward that serious but necessary job.

But, besides that, we have many other responsibilities. For example, there is the supervision of a vast research and development program which is concerned with a variety of interests. We are spending sizable sums of money and effort to investigate further the secrets of the fundamental nature of matter. We don't know what may be the eventual practical use of these studies. But we do remember that the research scientists, who 20 years ago, discovered the first secrets of the atomic nucleus, had no idea of the applications of those discoveries. Yet, all we have been able to do in the field of atomic energy has followed directly the path of those scientific discoveries.

But the fundamental nature of matter is only one of our research jobs. We are also supporting research relevant to atomic energy in such diverse fields as chemistry, metallurgy, biology, medicine, and a host of others. All of this is in addition to the millions of dollars we are spending in research and development to improve our processes and our products.

Besides the production of weapons and our research program, we have a great many other tasks almost too numerous to mention. We are developing and building mobile reactors--those for submarines. We are pushing the development of atomic furnaces to provide power for our economy. We are producing radioactive isotopes to act as tags for the diagnosis of disease; still others we manufacture to alleviate dread diseases. Sometimes these isotopes prolong life; on some few cases they are recognized as cures. The isotopes, too, find a growing place month by month in agricultural research and industrial research and process control.

The range of our interests is also extremely diverse. It covers a large portion of the world. We get a good share of our uranium-bearing ore from Africa; soon sizable quantities will come from Australia. In addition we search the world for new sources of ore. We operate an overseas test base in the Marshall Islands of the Pacific. In the United States our plants and laboratories are spread across the country.

Another fascinating aspect of this job is the fact that it combines in almost infinite variety factors that are unbelievably large and factors that are unbelievably infinitesimal.

As an example of the large, our power requirements at our new gaseous diffusion site at Portsmouth, Ohio, will be the equivalent of the entire power presently used by the city of New York.

As an example of the infinitesimally small, a single atom is about one one-hundred millionth of an inch in diameter. The nucleus of the atom, which is the source of the energy we use, is about one ten-thousandth of the size of the whole atom.

Let me put it this way: Suppose we took an ordinary drinking glass of water and magnified its size until the diameter of the glass reached from here to the sun. A single atom of the hydrogen in the water would then measure 30 feet in diameter. The nucleus of the hydrogen atom, in this case a single proton, would then be about the size of the dot on the "i" on a standard typewriter. As for the single electron which completes the hydrogen atom, it would still be many times too small to see.

Another example of the big and the small, we measure the flow of neutrons in our reactors by numbers like 10^{13} per square centimeter per second-- 10^{13} being scientific shorthand for 10 trillion neutrons passing through a square centimeter in a second.

Another, to me, fascinating aspect of this job and one that we would expect many of when the materials we work with are in such minute quantities, is the extreme precision required in our operations. Let me give you just one example.

One day I went into one of the labs where a scientist was working on some kind of instrument. Obviously, I couldn't identify it. I asked what he was doing and he told me that he was trying to develop a more sensitive instrument to measure traces of boron in metal. We have to be careful because boron absorbs neutrons and comparatively little boron will spoil a nuclear reaction. I asked how exact we had to be and was told that our present instruments would detect .05 parts of boron per million parts of metal. But, because of the need for more exactness, this particular scientist was working on an instrument to detect .02 parts of boron per million parts of metal.

The unusual attributes of atomic energy don't stop with our job and the nuclei we work with. One of the most important--and important to you--is the statutory manner in which the atomic energy effort is organized and the way in which the essential relations between the AEC and the military services have matured. As senior logistics officers who have been, or will be, responsible for the support of the services' atomic effort, the effectiveness of these relations will, I am sure, be a vital concern to you.

The AEC operates under the 1946 act as a civilian commission, independent of the military establishment, but directed to work closely with it.

I am sure that there are classical organization thinkers who look with great skepticism on this organizational arrangement because it seemingly places a large part of the responsibility for weapons availability and weapons development and manufacture outside the military establishment.

Such thinking disregards several obvious facts. First, to say it is outside the military establishment is not a complete answer. The military establishment is not itself a single organization, but rather heavily segmented within. Thus, having these operations entirely within the military establishment would be by itself no guarantee of performance. To me the crux of the problem is not the way in which the effort looks on a simplified organization chart; it is the quality of working relationships that determines whether this is a feasible method of operation.

One fact that justifies the creation of a separate authority for atomic energy is the dual purpose--civilian and military--of the stockpile. In the event of war, the stockpile is committed for our security. But it is also a national asset which in the years to come could provide the basis for a more abundant peacetime economy. It doesn't rust; it does not corrode. It can be refabricated. It is available. It is a tremendous source of energy. One pound is equal to 1,300 tons of coal.

Classicists have sometimes looked with concern upon the AEC's responsibility for storage of weapons. The test of whether the arrangement works is not who has legal title; it depends upon the mechanical arrangements for getting the stockpile where it is needed as quickly as needed. We in the AEC have had as our primary concern insuring the readiness of the stockpile. We believe this is being accomplished--and within the intent of the Atomic Energy Act, which provides that responsibility for the stockpile remain in civilian hands.

We in the AEC believe that the system and working relationships in the entire weapons field must remain flexible and open to continual critical re-examination. We can't be any more doctrinaire on our side than you can on yours. Doctrinaire considerations will not be allowed to determine arrangements in a matter so vital to our national safety and interest.

The test of whether this independent authority has worked lies in the accomplishment. One advantage of the treatment of atomic energy: A special benefit can be found in the way in which the program has been permitted to accelerate without the periodic cutbacks which our military establishment has suffered. As a result, I am sure that the atomic energy program has had a degree of momentum it never could have attained if it had been regarded as purely an instrumentality of our military effort and had been tied into your budget.

As an example, at the same session of Congress in 1949, when military budgets were being reduced, the atomic energy program got through substantially unscathed. In 1952 when military funds were again being cut back, there was no reduction made in the atomic energy production expansion program which started the previous year.

This certainly is one practical demonstration of the value of the separate identity of atomic energy because of its dual role as a weapon and a national resource.

The momentum of the program and its accomplishments are the test.

One evidence of what we have been able to do in this joint effort is the versatility that we have been able to develop in the amazingly short time of eight years since the first bomb was dropped. We haven't just got one weapon that you can drop in one particular way. We have a whole family of them. We have to remember that it is only eight years since the war.

If we look at other developments in the military technology, we get some appreciation of the breathtakingly short time eight years is. We are at the point where the speed of advances in our weapons development can outrun our ability to develop the remainder of the weapons systems seeking to utilize the advantages of newer atomic weapons.

Spectacular increases in the efficiency of weapons have been obtained which have opened vast horizons in the use of atomic weapons. Atomic weapons today are truly the cheapest form of explosive--impact per dollar considered--available to the military. On the basis of what has been done by our scientists, our industry, and the military, it is no exaggeration to say that the efforts of these last few years have brought about a revolution in the way in which wars can be fought.

If we continue to push ahead--and I see no ceiling on development possibilities--we may find the answers through the use of atomic weapons to such critical problems as the manpower superiority of our potential enemy. We may even discover that atomic weapons will eventually substantially reduce the cost of our military establishment so that we may more easily support the great and continuing burden of military expenditures.

Certainly this record of accomplishment should dispel any concern--such as some people had when the act was passed--that an AEC monopoly would stratify weapons development. Because of the way we operate and have operated, there should be no fear that the people who have to plan and fight wars would be doing so with weapons conceived and built by a civilian logistics agency.

It is true that in many instances, military "requirements" set by the Joint Chiefs of Staff have been possible only because of bright ideas that have been developed entirely within AEC laboratories. But other military requirements and their fruition resulted from ideas developed within the services and accepted by us as part of our job of giving the military customer what he wants. Still other advances originate in the intense working level cooperation that exists between, for example, the services and our Los Alamos weapons laboratory.

We in the Commission work on the principle that there is no monopoly on brains in the atomic weapons field. In the first place, each of the services has certain competencies arising from the missions of that service and its own talent and experience. Also, we recognize that each of the services has been training and building to increase its competence in the fields of knowledge essential for working in the atomic weapons field. This is quite different from 1947 when the Commission took over the Manhattan District. Then there was only a small pool of talent in the atomic weapons field. That pool is a growing reservoir which will mean more and stronger sources of ideas. The Commission believes that, as part of its responsibility for the technical growth of atomic energy, we should encourage and organize to utilize all sources of competence in the development of atomic weapons. We are determined that the organizational arrangements will depend upon the most effective division of work and not upon theories of organization. You are probably familiar with what those mechanics are but, if I may, I will take a minute to sketch them.

There is established by statute the Military Liaison Committee of the Department of Defense which serves as the primary source of consultation for the Commission. It has functioned effectively under its statutory responsibilities to advise and consult with the Commission and to serve as a two-way channel of information between the Commission and the military; yet, it has not acted as a bar to direct communication with the Secretary of Defense, the Joint Chiefs of Staff, or the individual services. The Military Liaison Committee has contributed materially to the success of our dealings with the Department of Defense.

As most of you are probably aware, the other organization which was created by the military to do the operating job is the Armed Forces Special Weapons Project which is responsible directly to the Joint Chiefs of Staff and represents all the services on atomic energy matters. This is a fine example of unification in action. AFSWP serves as a technical liaison group between the military and the AEC development centers at Sandia and Los Alamos, and serves on behalf of all the services as an organization for the training of military personnel in the handling of atomic weapons and for the operation of most of the storage sites. It has done an outstanding job in assuring that technical efforts at the operating level

in the atomic energy program have been responsive to military needs, in assuring that military personnel are adequately prepared to make effective use of atomic weapons, and in coordinating military development related to the atomic energy field.

The individual services themselves have done tremendous jobs for us in the field of test activities. The Army, Navy, and Air Force have supported us at Eniwetok; and primarily the Army and Air Force have supported us at Nevada. They have contributed greatly to the success of these tests, which have been one of the cornerstones in our weapons program. We couldn't have increased the fields of atomic weapons to such a great extent in so few years without the intensive test programs that we have carried on and we couldn't have carried on those programs without the support of the military.

The people of the United States have another assurance that the link between the AEC and the military agencies is effective. The statutory Joint Congressional Committee on Atomic Energy has made continual inquiries into many branches of our mutual activities. This scrutiny, coupled with their complete access to information regarding our programs, permits a constant assessment of how well our joint job is being done.

My own conclusion, having been on both sides of this fence, is that the issue of civilian control of atomic energy should not be the cause of crucial concern as it was before the act was passed.

Naturally, you in the military and we in the Commission have to be constantly alert to the proper functioning of these responsibilities of coordination between us. But, both sides, the military and the Commission, have a role in solving problems in the atomic energy business of infinitely more serious moment than debate about the degree of theoretical orthodoxy of a relationship which is both alive and fruitful.

Let me give you a couple of examples. The Russians have the key to the thermonuclear weapon. Whether they got where they did principally by their own technical excellence or as a result of what they "borrowed" from us is not apparent. Nor, would solving this interesting riddle alter our own present uncomfortable situation.

Viewed in the light of long-voiced warnings by such realistic observers as the present Atomic Energy Commission Chairman, Lewis Strauss, this latest achievement by the Russians should cause no surprise, and require no great changes in our national security policies. Under the circumstances of this cold war, we should have anticipated this Russian progress, and our intensity of preparation should not have depended upon some feeling that we possessed a time advantage when we did not control the timetable.

The fact is, of course, that we have not developed an explicit consistent framework of policy and action geared to the new dimension of problems created by the existence of atomic weapons. One good example of that failure, of course, is the way in which our willingness to spend for military purposes has repeatedly oscillated in recent years.

It is quite understandable that a tremendous adjustment in thinking is required to bring home to every person in the United States a clear understanding of the degree to which our security has suddenly disappeared. I am confident that the great resiliency and intelligence of the American people will permit them to make the adjustment if they are told the cold facts. Some people would give the impression that an essential of this challenging job of education lies in disclosing details about atomic weapons, such as the size of our stockpile and the state of our development in advanced weapons. To my mind this would be a dangerous type of disclosure which would not help the American people to understand the problem and weigh the solutions. It would be dangerous because it would give prize intelligence information to a potential enemy--if he did not discount it because he could never bring himself to believe that we would be naive enough to publish it.

The essentials of the information have been, and should continue to be, told to the American people in as forceful a manner as possible. What are the facts? The facts are basically pretty simply stated: That we have a potential adversary capable of waging an effective atomic war; that an atomic war could be disastrous to our industrial cities and population; that our defense is and will remain, so far as we can see into the future, inadequate to meet the capabilities of the offensive. That is a summary of the facts. Getting them over is a different problem.

Inherent in all of this is a demand upon us for a willingness to seek new solutions with ingenuity and infinite patience. The search for new weapons systems and unconventional approaches by both the military and the Commission are obvious parts of our job.

This is only one part. We must continually seek to develop all of the possibilities of this great new field of atomic energy to promote the effectiveness of our armed forces, our diplomacy, and the great civilian and industrial economy which is our greatest source of hope and strength.

We must take advantage of every opportunity that atomic energy can be made to give us in the broad spectrum of activities that constitute cold war and our all-out drive for a peaceful, fruitful world. If we are successful in exploiting these opportunities, they must lead to a real disarmament that is the world's sole avenue to lasting peace, and, perhaps, the last hope for the survival of civilization.

Thank you.

QUESTION: Mr. Zuckert, would you like to give us a very personal and candid discussion of how far under the law this operation "candor" can go so far as the President and AEC are concerned?

MR. ZUCKERT: I never got to hate a word so much in all my life as this word candor. It has all the blanks in it. There is no such thing as being partially candid or partly candid. It is wholly candid. This is a h--- of a way to run a business, particularly when you have competition.

I don't think the law is any barrier at all to saying anything you want to because of the provisions in it. I don't remember how the language reads, but there is something in it to the effect that the Commission shall determine that the information may be published and the standard is: Is it beneficial or detrimental to the security interests of the United States? Any issue decided on the side of disclosure was because it was felt more good would be obtained by disclosing than by keeping it secret. I think we could disclose nearly anything. The only prohibition I know is in section 10 under "Giving Weapons Information or Civilian Power Information to Foreign Nations." Those are the only prohibitions I know about. So you can really say anything you decide or that the Commission would decide--the way I read the law is in the security interests of the United States.

We have a primary problem in the Commission and that is that we have no gray classification there. Either information is classified or it can be published. We don't have the gradations or the possibility of gradations that you have in the military.

QUESTION: Commissioner, I was very much interested in your comment relating to research and development and the operations being done by contract, which is somewhat of a departure from the method used by the military. I wonder if you would care to comment on the relative benefits and possibly the control of the direction which you are able to maintain under contract?

MR. ZUCKERT: Actually it is not too foreign to your own operations because you do a lot of your own research--if the services still do it that way--under contract to universities and to industrial concerns. You are more likely to run some of your own laboratories. We do it entirely by the contract system, except for a small raw materials laboratory up in the middle section of New Jersey. I have never found out why we don't do that the same way.

You have a problem of administrative control and program direction, and this is one of the things that you are constantly concerned about--do you have enough control? On the other hand your contractors are always telling you that you have too much control, try to control too much.

I think when you see something happen such as happened at the Bureau of Standards last winter, it needn't be that kind of thing at all, but I think we are lucky to have the laboratory where we can have scientific effort not under the immediate Government restrictions. We can attract people that we can't attract any other way and that does, to my mind, overcome the very real problem of trying to administer a project.

QUESTION: Mr. Zuckert, I wonder if you would discuss the pros and cons of a freer exchange of information with our allies, specifically an ally like England and an ally like France.

MR. ZUCKERT: My own position has been somewhat contorted by people taking one sentence out of context. What I have said, and it still represents my position, is that I am opposed to the exchange of any information with anybody on any basis whatsoever on the manufacture of atomic weapons--and I emphasize "manufacture." To have dual efforts in the building of atomic weapons even among our allies doesn't seem to me to be justified on any basis. Despite the stories you read in the newspapers, it is an expensive business. So long as these nations have economic problems which we are called upon to help solve, I don't think we ought to contribute to the development of a duplicating weapons manufacturing business, which, to my mind, doesn't add anything to the total security.

That is an entirely different question from: Do you tell them facts about the tactical application of atomic weapons? Do you tell the English and the French, for example, what atomic weapons are useful for their size and yields, that type of thing? If our allies develop a doctrine which will be reflected in the composition of their fighting forces and in the way they use their fighting forces, I can see giving that type of information to their planners.

I can also see the utility of giving information regarding reactor technology to these countries overseas which have power shortages as we develop more and more the ability to make power economically. We are going to have to do it for one reason, because we get our ore from these countries that have the great need for power. So there is going to have to be worked out some mechanics of exchange of information in those instances.

QUESTION: I notice that you used the present tense when you said that the AEC and the military are getting along very well. There seems to be some diversity of opinion as to whether or not they did get along very well. There are two new books on the market--one by Dr. Lapp, "New Forces" and one by Gordon Dean, "Report on the Atom." And in there they rip the military up one side and down the other. What I got out of those reports was that--they seemed to indicate that Lilienthal was in agreement with them--the military hampered the AEC in two ways: that

we burdened the AEC with so many demands that the AEC was hardly able to do anything else; and, second, they referred to security measures in regard to scientific information as distinguished from those measures of production about which you were just speaking. We shouldn't give them our production secrets, I will grant you that. But they seem to blame the military for some reason, saying the AEC wanted to please Congress and get by military censorship in regard to scientific information. The third was that we are opposed as a nation to monopolies and the AEC is the greatest monopoly and has hindered civilian use of atomic energy by industry. I wonder if you would care to comment?

MR. ZUCKERT: You have material for a good 25-minute talk there. I haven't read Lapp's book, although it seems I keep reading Lapp all the time. I haven't read Gordon Dean's book either--so we will look at it as a problem rather than, "Is it true what they said?"

I think in any relationship you are going to have difficulties. You are going to have difficulties that come out of the different objectives that the organizations have. To me the determinant is whether those difficulties are not so great that you can work out a productive relationship or whether inherently they become so difficult that you can't work out a solution. It doesn't go back to whether they are two separate agencies.

It would have been incomprehensible to me if the military and the AEC had gotten along perfectly in the, say, first three years of their having to live together. The act was drafted, passed, and started on its way amid considerable heat and a lot of honest doubts as to whether this was the way to work it.

Another inherent difficulty was that this field was new. You had early weapons. Only one of the services could use them, and you had a couple of services that were worried and apprehensive about being technologically unemployed. This, I think, created difficulties, pushing and pushing in the right direction, to do more; and pushing against the inertia of people in the AEC establishment who were convinced that the way they had been going was the right way.

This is an impressionistic picture I am giving you, but I think you had these forces on both sides--there was no excess of virtue on either side--which had to be resolved so this organizational relationship could mature.

I am reminded of the time when Stuart Symington came over to the Air Force from Surplus Property. Some of the people here may remember this. There was a big discussion and a big briefing conducted. The Air Force was trying to get out of the Surplus Property requirement that the military break down and pay for the packaging of a lot of surplus goods that the Surplus Property Administration wanted to sell.

This milk toast problem came to Mr. Symington after he became Secretary of the Department of the Air Force. He said, "Do you mean that the Surplus Property Administration wants us to break down this stuff with our funds?" The Air Force representatives said it did. He told them what should be the disposition of the problem. They said, "But, sir, two months ago you wrote us a letter in which you told us that was what you wanted us to do." He said, "Yes, but I am playing for Brooklyn now."

QUESTION: Sir, in your formal lecture you made a remark that was very interesting to most of us here, that was the possibility that atomic weapons development materially reduces the overall cost of national security. To those of us who are familiar with the progress that AEC has made in the development of this family of weapons, it is distressing to see or to feel that our top policymaking in the country is not directed toward that end, at least not so rapidly as we think it could be. They seem to put an inordinate amount of time, effort, and money toward developing the utilization of more conventional weapons. What in your opinion is the possibility of any, we will say, immediate change in our top policymaking toward more effective utilization of this family of weapons to reduce the overall cost of our national security?

MR. ZUCKERT: That one has plenty of potential in it. Immediate change, if I just stick literally to your "immediate change," I would say none, because that is always an easy answer when you talk about policy changes.

The way I could best describe what I think has happened is that any revolutionary change always takes place against a tapestry of inertia, and some people go on doing what they have been doing at the same time other people do the new things, and you have a dual effort. You don't have a complete recognition of the implications of the revolution.

There are a lot of people in the military establishment who are responsible people--this is not said in criticism but just as a fact--but who have not yet grasped the implications of this change in the weapons picture. Why haven't they? One thing is, the revolution was based on a scarce commodity. Five years from now it may not be a scarce commodity.

There is another factor and I think if you looked into the hearts of top military people you would find this: There is a fear that maybe when the chips are down you wouldn't be able to use the advanced weapons. This would be a terrible thing. But these people conscientiously feel, I believe, that they shouldn't be hanged for having given up something before they knew that the alternative would be open to them. The basic policy decisions that you need to produce the optimum recognition of this revolution in terms of action must stem out of civilian policy decisions, not military.

QUESTION: Mr. Zuckert, my question has to do with the peacetime use of atomic energy. Some months ago there were press releases regarding the start of the obtaining of electrical energy directly from the reactor without using the reactor as a heating source. Has this advanced or has it been subordinated to weapons studies?

MR. ZUCKERT: The scientists tell me there is no way they know at present to make energy directly from a reactor without going through the conventional jet turbine generator setup. But whenever scientific opinion is unanimous, you can probably get pretty rich by betting they would change their minds 19 years from now.

To my mind we are in the state on this civilian power business that the automobile industry was in during the early days when they called these things horseless carriages. We are still thinking in carriage terms about the future of atomic power. There have got to be some big scientific breakthroughs before we will lick this problem, but to say that wouldn't come is flying in the face of past performances.

QUESTION: My question, I think, follows the previous one, Mr. Zuckert. How does the Commission determine the nature of the weapons stockpile?

MR. ZUCKERT: That's easy. The Joint Chiefs of Staff tell us what they want. Of course, we may tell them, "You can't get it. We could do better if you adjusted it." It is an adjusted deal but nonetheless the setting of requirements is the job of the Joint Chiefs of Staff.

QUESTION: Maybe I am just phrasing this question a little differently, but we had some information made available to us that the first H-bomb was delivered for one billion dollars f. o. b., and some later information that stated that the source of atomic energy from hydrogen was practically unlimited. I would like to ask two questions: Assuming the same rates of production, what is the relative cost? And, second, is the application of the hydrogen source of atomic energy to other than military uses as promising as other types of atomic energy?

MR. ZUCKERT: I am afraid I will just have to beg off on that. I don't think I can get into that without getting us in trouble.

CAPTAIN HALE: Seriously, you mentioned that people are thinking it is possible not ever to use special weapons and there has been considerable talk about this. With Russia's peace move, do you think there will ever be a move from them to say, "Let us have mutual inspection," or to outlaw such a thing?

MR. ZUCKERT: Ever is a big word and dealing with the Russians makes it even tougher. Nothing would surprise me, but whether the proposal was a genuine proposal with a view of the available fissionable material, whether this would be a bona fide proposal, I don't know. I would have no idea, frankly, because I don't understand what their objectives are. I just couldn't be illuminating.

COLONEL BENEDICT: Mr. Zuckert, on behalf of the Industrial College, I thank you for a most interesting and informative lecture and question period.

MR. ZUCKERT: Thank you. It was a pleasure to be here.

(11 Dec 1953--250)S/mmg