

Counter c. 23 (Beginning of Reel occurs at end of Reel #2 material)
Reel 3-A (First Retype, October 25, 1965)
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Question 31: Caryl Haskins' over-affability;
Executive control and administrative
gift

Naturally I'm not going to answer your question 31 directly. It does however impel me to make a few comments about the attitude of managers. There's one type of manager who tries to operate by having everybody in the outfit afraid of him. I think that Henry Ford (Senior) was that type, and I think he was a bum manager. Now this of course is heresy. He made a lot of money, but he also had an awful lot of luck. I think his method is going out in American industry. The martinet, who keeps everybody afraid to look in his office and so forth, just cannot take advice. The two things don't go together. Anybody trying to run a complicated business today, who tries to make all the decisions himself, and who doesn't dare to take advice from subordinates, is

- 1) EXECUTIVE CONTROL
- 2) HENRY FORD

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bound to make error after error. He can't possibly understand the full scope of the business, and he can't possibly be skilled at all its aspects. So I think this is obsolete.

At the other end of the scale, of course, is that chap who's so anxious not to be a martinet; so anxious to be kind to those about him that they begin to forget who's the boss, and he's likely to lose control. When a chap like that operates, and gets to the point where he has to assert himself, he's likely to do it so violently and suddenly that he may get into trouble physically by overemotion. I've seen that type too, but I won't name anyone.

The real art, I think lies in the combination of the two. In a small outfit in particular, I think it's highly important that the staff should come to realize that the big boss is genuinely anxious to further the welfare of the individuals under him,

1) EXECUTIVE CONTROL
(CONT.)

2) FIRMNESS BUT
UNDERSTANDING

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that he will go out of his way to do this, and that in particular if one of the subordinates makes a mistake, his attitude is to get him out of the trouble the mistake caused, and to do it without causing him any injury. This, with care to make sure everybody knows who's boss, I think is a combination that's all right. I remember one time in CIW affairs, one of the staff came in to see me about something, and I didn't get to first base with the chap. When he'd left, I said to Paul Scherer, "What the matter with that guy?" and Paul said, "He's afraid of you." This was a startling thing, and I said to Paul, "I think that's impossible; I don't think there's anybody in the outfit who'd afraid of me." And he said, "You'd be surprised," and I was surprised. I think this came about because quite unconsciously, I was occasionally making it quite clear that I was running the show.

1) EXECUTIVE CONTROL
(CONT.)

2) C.I.W. - SOME
AFRAID OF BUSH

(ital)

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Some of the chaps hadn't got to understand that nevertheless I wasn't forgetting that I wanted to bring those fellows along, keep them out of trouble, keep them happy if I could. Incidents are the things that count. Talking about it doesn't really make the difference.

One of the most difficult things in the world, of course, is to get rid of a chap in the organization who isn't any good. If this is done with an effort to avoid injuring him, it's one of the best morale builders there is. When I took over CIW, I had some deadwood. Quite a few members of the staff never should have been in that kind of organization. They were scientists, but mediocre ones. They were in an organization which had to be tops, or else it had no reason for existence. I had to get rid of a number of them.

- 1) EXECUTIVE CONTROL
(CONT.)
- 2) C.I.W. - SOME
AFRAID OF BUSH
- 3) THE ART OF FIRING
SOMEONE

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I remember one -- one of the most devoted hard-working men you could imagine. He was so loyal, and he devoted himself so thoroughly to his efforts, that it was pretty pitiful, because he just did not have the stuff; did not have the intellect to carry on as a scientist of the calibre the Institution demanded. Well, he'd been working with a little college from time to time. They thought he was great, and indeed he was for their environment. So he went out there on a leave, gave lectures, and after a while got some research going. I said to him, "Why don't you conduct that at such and such a university, and I'll back you up so they'll have the funds to carry it on. The net result of this was that he went out there and stayed permanently. He was perfectly happy, the people that got him were happy, and I was certainly happy.

- 1) EXECUTIVE CONTROL
(CONT.)
- 2) THE ART OF FIRING
SOMEONE

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The point is that I got rid of him without damaging the cuss. Just as importantly, the rest of the staff knew, 1) that he was not up to CIW calibre; 2) that I moved him out with some care not to injure his career. This did morale a lot of good. If I'd merely moved him out, it would have been regarded as cruel by some people, and it would have been. If I'd let him stay, that too, would have been cruel -- in a different way. The only possible thing was to move him out and use some care doing it.

I had several such instances. The other side of that is, you'll occasionally have a chap who'll defy you. I had one such chap, who was one of the directors. He was pretty skillful at it; he was a tough egg. I had to handle him without gloves, and I did. Again, the staff knew that that fellow had been working a bit of a racket. He was getting things that he wanted simply by being unmanageable. Bringing him into line was necessary, and doing it

1) EXECUTIVE CONTROL
(CONTINUED)

2) THE ART OF FIRING
SOMEONE

rigorously helped morale.

There was one such instance at MIT soon as I took over under Karl Compton. We had a Head of Department who had been using the Institute merely as a place to hang his hat while he conducted a consulting business downtown; all he wanted was the Institute's reputation and address. He neglected his classes; he didn't do any work on the faculty committees. After Karl took over, we moved him out. This was fairly easy to do. He was near retirement age, and we merely said that we were going to remove all of his classes. We didn't say we were going to fire him, no, but we were going to take all his work away from him and get it into younger hands. Of course he couldn't stand this for his reputation in the field, because all the people that worked with him would know doggone well what we were doing. So he promptly resigned a few years before retirement age.

- 1) EXECUTIVE CONTROL
- 2) DISCIPLINE HELPS MORALE
- 3) FLASHBACK -- MIT, COMPTON

The staff at MIT probably began to perk up and go places after Karl took over for many reasons: one, because they had a leader who was a scientist who they respected; two, they became very fond of the man; but three, undoubtedly because we cleaned up a racket or two. The staff began to think that they had an administration that was not going to tolerate being walked on.

One more story and I'm through. There are men in the world who classify the people they meet into two categories: one, of their peers, the other, all of the people they can step on. They proceed to act with these two classes accordingly. With the first, they're genial, and try to work along in a reasonable way. The second class, they proceed to step on. When they meet a new individual, in their own organization or anywhere else, they classify him. Old

1) EXECUTIVE CONTROL
2) DISCIPLINE HELPS
MORALE

3) SEPARATING PEERS
FROM THOSE THAT
CAN BE STEPPED ON

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William Cameron Forbes was such an individual,
and my relationships with him were very simple.

When I first went to work at Carnegie, he was
anxious to find out in which category I
belonged. (X-REF BACK TO PAGE 83) He found
out in a hurry, and after that we got along
very well indeed.

I have no use whatever for this approach.
It jars me and it makes me mad. I don't see
it often, and I think also that it's a product
of the older generations. This is the way
things were in the days when, in New England
at least, a few leaders built the industries
of the time. There was a group of the elect
to which one belonged. It was not exactly
the group of Boston Brahmins -- their classi-
fications ran differently. But it was a
group of the elect who ran the industries.
It was very important for these chaps to know
who belonged and who did not. The ones who
belonged were the ones they tested out and
found they could not step on.

1) SEPARATING PEERS
FROM THOSE THAT
CAN BE STEPPED ON

2) CIW - WILLIAM
CAMERON FORBES

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When we think of the Brahmins we think rather of the group bound together intellectually. Here the shibboleth, the password, the open sesame, is a knowledge of the classics. There isn't any doubt that, particularly in England, for many years, the ability to quote a Latin phrase or the like distinguished the elect from the hoi polloi**. Of course, if you want to get at it in this way, it was necessary because the British democracy would never have worked as it did if it had not been for the fact that there was a class of the elect which governed, and which governed particularly because they played the game together. There had to be a way in which they could recognize one another. I could enlarge on this a great deal, but I hardly think it's worthwhile. [X-REF FORWARD TO P. 314]

1) BOSTON BRAHMINS,
CLASSICS AND
BRITISH DEMOCRACY

** [EH Remarks: HA! SO HERE VB USES A GREEK PHRASE YET!
"He warn't no saint; them engineers is pretty much
all alike." (John Hay; Pike County Ballads)]

[VB Remarks: TOUCHE']

Question 32: On artificial harbors

I don't remember any such conversation in 1939, and as a matter of fact, I don't remember that I was directly engaged in the Artificial Harbor thing at all. But I do know how such ideas as this originated. Any number of people began to think about it. Now they didn't think about it very intensely in 1939, certainly, but as the time approached when there might be an invasion across the Channel, a lot of people undoubtedly began to conceive the idea of Artificial Harbors. This is fairly typical. The idea is an obvious one, and there was no one originator of it. Certainly Churchill didn't originate it; I'm sure he was only one of many who had had the thought and who worked on it from various angles.

1) ARTIFICIAL HARBORS

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The British not only did the work but planned the thing. They did a good job of making these big concrete affairs all over Britian with an enormous amount of concrete. Under the circumstances (they were badly pinched for labor, and they were pinched for supplies which they had to import) they did a fine job. As a matter of fact, the harbors worked out very well indeed. If it hadn't been for that freak storm that occurred a couple of weeks after Normandy D-Day, those harbors would have gone on and been useful for a long time to come.

No one could have foreseen that storm. I've just read Omar Bradley's book about it again. We certainly had some luck with us. I hesitate to think what the world would be like today if that enormous storm, which no one could have foreseen, had occurred not after we'd become established at Normandy, but just after we'd landed, and only part of our troops were ashore. It could have

- 1) ARTIFICIAL HARBORS
- 2) THE BRITISH ROLE
- 3) THE STORM AFTER
D-DAY

been a catastrophe of the first order. I'm also enormously impressed by Eisenhower's resolute decision to go ahead, when he had before him the weather reports that told him without the slightest doubt that in going ahead, he was taking a great risk. I only wish that he still made decisions and stuck to them. (EH TO VB: i.e. during his presidency? VB TO EH: Yes, for example on the population explosion)

The origin of ideas, the invention -- so often the same idea occurs to a lot of people at the same time. During the war, at the Radiation Laboratory, for example, a large number of new ideas were introduced on such things as Loran, and on hundreds of details. We had a patent group which was busily filing the patent applications to cover these things, so that in the postwar world there wouldn't be a scramble. It had to be done this way, because any number of universities were

- 1) THE STORM AFTER D-DAY
- 2) EISENHOWER'S DECISION TO GO AHEAD
- 3) IDEAS, INVENTIONS, PATENTS

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represented in the Radiation Laboratory.

Quite naturally, we couldn't have an invention assigned to one of these universities with the possibility that this university might make considerable income out of it after the war. So we filed patent applications assigned to the U.S. Government. The government gave general licensing after the war without royalty payments. In effect, the patents were destroyed. (X-REF BACK TO PAGE 69 AND FORWARD TO 501) I suppose from this point of view I probably have destroyed more patents than any other man living. I can't substantiate that, obviously, but I must be in that class. It was the only thing that could be done.

The point I'm coming to is this: at that time, and under war conditions, nobody claimed inventions. Things came along and became important, such as blind landing systems, Loran, and so on. Nobody said

- 1) WWII
- 2) IDEAS, INVENTIONS
(RADIATION LABS)
- 3) VB "DESTROYS
PATENTS"

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to me, "So-and-so in the Radiation Laboratory has invented a very important thing." It never happened that way. What they said was, "At the Laboratory we've got something we think is pretty hot and here it is," and inside the laboratory I'm sure that was also the case.

Around the outskirts, particularly on the matter of atomic energy, a few were trying to make something, postwar, out of personal inventions during the war. They were not regarded as really members of the team. Within the team itself, nobody cared who invented what, and the basis for this was undoubtedly the realization among the group that if one chap didn't invent a particular thing on a particular day, undoubtedly three or four people would have that idea before very much time went by. The inventions came out of needs, and out of realizations of what would be useful. As soon as a group of

1) WWII

2) IDEAS, INVENTIONS
(RADIATION LAB)

men realized what would be useful, and that group had access to all of the techniques necessary to carry it out, any number of individuals in that group were bound to make the necessary invention before long. This however does not mean that it is not well to have a patent system in this country for the purpose of advancing industry. The object of the patent system is not to reward inventors. The object is to make it possible for venture capital to be used, to bring into use devices that will be of value to the public.

We made all sorts of gadgetry in the general field of guided missiles during the war. Some of them of course were not guided missiles at all. They were the simplest kind of barrage rockets of which thousands were thrown from a ship onto a beach prior to a landing. Then there are missiles that are sound-seeking. One of these was the torpedo that could be dropped near a submarine that would proceed to turn around

- 1) WWII
- 2) INVENTIONS COME FROM NEEDS
- 3) PURPOSE OF PATENT SYSTEM

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and run into it. Then there were bombs with heat-seeking devices on them, and some of these were used down in the Pacific, but very little. I told you the story of one of these that I'll repeat later. (X-REF FORWARD TO PAGE 173) In the Mediterranean, the Italians introduced a guided bomb that they controlled by a wire that it left trailing behind as it dropped. Then of course there was all the business of missiles such as the V-1 and V-2 that the Germans introduced during the war. We introduced none like them, of course, because we had command of the air pretty well at that time. These were not guided, they were merely aimed. The V-1 had a timer so the motor would stop and the missile would drop, presumably at the right point.

1) WW II

2) MISSILES, ROCKETS

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Admiral Leahy had no use for rockets and guided missiles. He never took the trouble, as far as I know, to find out much about them -- at least he certainly never asked me any questions. He was grossly ignorant, of course, of the whole field, but this didn't prevent him from telling the Joint Chiefs, and telling Mr. Roosevelt, that the rockets were no ^{doggone} ~~good~~ good for anything.

(X-REF AHEAD TO PAGES 821-822) At one time there was a subcommittee set up in the Joint Chiefs' organization on this general subject, and as I remember it, Bradley Dewey was chairman of it. I called it the Guided Missiles Committee, and after this "guided missiles" came to be a rather generic term for all sorts of things. Probably the term had been used before I applied it to the committee, or I may have thought it up just at that moment, I don't know. At any rate, I put that label on the

- 1) WW II
- 2) ADMIRAL LEAHY
IGNORANT OF
MISSILES, ROCKETS
- 3) THE GUIDED MISSILE
COMMITTEE -- BUSH
COINS TERM

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thing to avoid using the term "rockets". Leahy's criticisms in remarks which kept coming back to me finally annoyed me enough so that we made a motion picture of all sorts of rockets, of one kind or another, and guided missiles. We showed it to the Joint Chiefs. I sat beside Admiral Leahy as we did so, and when we got through he turned to me and said, "I had no idea this development had gone anywhere near as far as this." Note that this didn't prevent him continuing to tell Roosevelt that the program was no good. This didn't do any great harm. I don't know whether Roosevelt mentioned it to me or not. He undoubtedly didn't use Leahy's name if he did. If he did mention it, and if I said, "Hot stuff, and they're going to be very important," that would have ended it. That was the reason the name got attached.

- 1) WW II
- 2) LEAHY'S OPPOSITION
TO MISSILES,
ROCKETS

There's another part of the question here 1) WW II
that I think is more important, and it's about
the V-1's. The German program on the V-1's
involved putting a lot of launching sites on
the Pas de Calais. A special section of Army
Intelligence was attempting to find out all
about these sites, and some of my chaps were
attached to it. We had in the United States
a French contractor who had built some of
these sites for the Germans. (EH TO VB: How did
you get him? VB TO EH: Military intelligence
-- British or American -- brought him over, and
I never knew how they did) We had the plans of
the buildings and the whole thing seemed to
be pretty clear. We knew about what type of
thing the V-1 was, but there was one building
on those sites that we could find no explanation
of whatever. And we never did. We didn't find
out why they had that particular building,
which didn't seem to be necessary for the rest
of the operation.

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We also knew the German program-- that is, the date they proposed to introduce the V-1's and the numbers they intended to shoot when they got to full capacity and full production. I think it was 3,000, but I don't know whether it was per day or per week -- it may even have been 3,000 a day -- at any rate it was a very large number. When Ike was named the Supreme Commander for the Normandy invasion, he came to this country, very secretly. I met with him and briefed him on the threat. We thought the Germans would introduce the V-1's before D-day, and that if they were directed to Plymouth and Bristol, they could pretty well break up our invasion plans. I told Ike how the things worked, how many launching sites there were in the Pas de Calais, and what we thought the German schedule was, and so forth. When

1) WW II

2) WARNING EISENHOWER
OF V-1 THREAT
"Well you've scared
the hell out of
me"

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I got through telling him, he sat back and said, "Well, you've scared the hell out of me. What do we do?" I said I thought there was nothing that could be done except to bomb those sites at the appropriate time, and this was, as you know, done very effectively. (EH TO VB: Were the "antipersonnel" raids at Peenemunde in this connection made by the British? VB TO EH: Yes)

The Germans did not succeed in getting their V-1's rolling before D-day. And when the V-1's did start coming over, their numbers were far below what had been feared. When the first V-1's started, it was quite a time of strain. Since we didn't know the use of that particular strange building, we feared that these V-1's had a very unusual warhead, and this was the building in which it was prepared. There were several possibilities. One was gas. We were very much afraid of what Germany might have done on gas, particularly because we knew about some

1) WW II

2) WARNING EISENHOWER
OF V-1 THREAT
"Well, you've
scared the hell
out of me"

(ital) of the things we'd done. Gases could have been very terrible if they had been introduced. There was also the possibility, somewhat remote, but possible that the Germans might be going to introduce biological warfare. I don't think we took this too seriously, because if they had been going to introduce it, I doubt that this would have been the method. There was also the vague possibility that the Germans had gotten far enough on their atomic bomb program so that, out of the pile, they might have a lot of radioactive waste that they could drop around, and thus bar a region to any personnel. We really didn't know, but we thought that gas was the most probable thing. We were hardly ready to cope with it.

On the day the first V-1 dropped, I was going up on Capitol Hill for something with Secretary Stimson, and we got

- 1) WW II
- 2) V-1's AND SOME OF THE THREATS (GAS, BIOLOGICAL WARFARE, RADIO-ACTIVE WASTE)

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the news just before we started. As we were riding along in the car, Mr. Stimson put his hand on my knee and said, "About this V-1 business, Van, how do you feel now?" and I said, "I feel damn relieved." For the first bombs that were dropped had merely high explosives. My meaning here was that the damage the V-1's did was secondary compared to their other possible uses. Also, if the Germans had put the effort into jet interceptors or proximity fuzes, or various other things that they'd put into the V-1 and V-2 program, they would have gotten much further. No doubt the reason they pushed the V program was that Hitler must, in one way or the other, hit Britain. The damage they did, while serious of course, was not great. The nervous strain was very great indeed.

1) WW II

2) NEWS OF FIRST V-1
DROPPED & RELIEF

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Incidentally, I was down near Verdun at one time, and slept in an old French inn that had been knocked half over, and when I joined some of the officers at breakfast, I asked them what was the strange noise I'd heard early that morning. "Why," they said, "that's a V-1." I said, "What was it doing down here?" "Well," they said, "they come down here once in a while." Obviously these buzz-bombs were pretty erratic. When the Allied 90 millimeter guns carrying proximity fuze shells were set up along the coast of Britain, the V-1 show was pretty nearly over, because of course they were sitting ducks for guns of that sort.

The V-2's were vastly different. There was no good countermeasure against them. The Allies tried to get at them by bombing the launching sites, but the Germans constructed a mobile launching site that could be set up on a road crossing that would fire a V-2 and promptly get out of there. By radar, a V-2 could be detected as soon as

- 1) WW II
- 2) V-1's ERRATIC
- 3) V-2's MORE
EFFECTIVE -- NO
COUNTERMEASURE

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it was launched, and it could be triangulated so that we would know just about what cross road was involved. But by the time a fighter plane could get there the launching crew would be away. So it was pretty hard to do anything about the V-2, which was much more destructive of course.

Quite a lot of work was done during the war on the guided missiles to be used against aircraft; really target-seeking missiles. We had no great problem, by that time, against German bombers, and it was only against the bomber that such a thing would have been much use. The real counter to the Japanese, of course, with their kamikaze affairs was the proximity fuze.

(X-REF FORWARD TO PAGES 188 AND 441)

- 1) WW II
- 2) THE PROXIMITY FUZE
A COUNTER TO
KAMIKAZE

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Question 34: DDE, "Now you've got me scared."
Interpreting photoreconnaissance
pictures. What we didn't know
for sure until Strasbourg

- 1) STRASBOURG -
GERMAN A-BOMB
PROGRAM
- 2) GENERAL WALDRON OF
ARMY REQUIREMENTS

I've answered the first part of Question 34 in the preceding record. The second part of it had to do with the thing we didn't know for sure until we got to Strasbourg. This has to do with what we knew about the German A-bomb program, and we knew quite a lot, but not enough until we got to Strasbourg. When I went to Europe on the proximity fuze affair, I went in to see Bedell Smith. (QUERY: APPROXIMATE DATE) General Waldron, who was head of Army Requirements at that time, came with me. Waldron was the man who took the artillery into Buna, where, you remember, we were held up for a long time until we finally got some artillery over the mountains. (X-REF FORWARD TO PAGES 444 AND 757) General Waldron took a piece of shrapnel in his shoulder during that process, and was hospitalized for six months or so. He got out and was restored to active duty, but he

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couldn't raise one arm very far, and I had to help him get on his shirt. But he was a very fine chap, and we went together.

- 1) WW II
- 2) PROXIMITY FUZES
- 3) BEDELL SMITH

We had just gotten the clearance from the Joint Chiefs after a long struggle. (X-REF FORWARD TO PAGES 191-192 AND 443-444) When we were going in to see Bedell Smith, I said to Waldron, "All right, you present it, (EH TO VB: Precisely what it are you speaking of? VB TO EH: The proximity fuze program in Europe) and I'll just back you up on the technical affairs"; and he said, "Not at all; I'm your aide on this trip, and I'm just here to be of such assistance to you as I can." So I presented it. (X-REF FORWARD TO PAGES 193, 413, 445) When we came out Waldron said it was fortunate that I did, because he hardly could have talked to Smith the way I did. When I went in I knew him pretty well because he'd been attached to the Joint Chiefs over here -- Smith said, "Well now, what in the hell are you doing over here? Haven't we got enough civilians in this theater already

without you coming over?" and so forth. I said, "I came over because you people are so damn dumb that you're about to spoil one of the best weapons of the war." The conversation having started on that plane, we got along very well. Finally, he said, "All right, all right, what do you want me to do?" I told him I had certain orders I wanted him to issue to G-1, certain orders to G-4, and so forth, to get the proximity fuzes into effect. He said, "All right, I'll do that, now will you get the hell out of here and let me do some work or is there anything more you want?"

I said, "I have one more thing: I want an automobile to get up to the front. Tell your ordnance office or something about it." And he said, "OK," and sent me out of there.

He let Waldron go out first, and then he drew me aside and said, "Look, Ike wants to know whether German progress on the A-bomb

1) WW II

2) BEDELL SMITH &
PROXIMITY FUZES

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is such that it ought to interfere with our plans, and I want to get you to tell me where they stand." (X-REF AHEAD TO PAGES 413, 446) I said, "Will it be all right if I tell you a week from now?" He said, "Sure that's OK". So I left him. (EH TO VB: Where was meeting with Bedell? VB TO EH: Versailles)

Goudsmit's group was in town, and I met with them that night. (X-REF BACK TO PAGE 118) Just about that time came the fall of Strasbourg. When Goudsmit's gang moved in, they found that, as usual the Germans had pulled the scientists out with them. They'd taken their files or destroyed them, but they'd left behind a German stenographer whose brother had been killed in a gas chamber, I think. She had kept her stenographic notebooks. (X-REF AHEAD TO PAGE 414) So she sat

1) WW II

2) BEDELL SMITH &
INQUIRY ABOUT
GERMAN A-BOMB
PROGRESS

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down with Goudsmit's group, and would start to read from a letter, and they'd say, never mind that, and then after a bit she'd strike one and they'd say, "Oho! Type that one out." The people in Goudsmit's group, most of them, had studied in Germany, they knew the German scientific group personally, and they also knew the subject they were investigating. When they got through there, there wasn't the slightest doubt as to where the Germans stood.

The next day I saw Bedell Smith, and Bedell laid out the timetable for the balance of the campaign. (X-REF AHEAD TO PAGE 414) to the end of the war. He included, incidentally, German counterattacks, though he didn't say where, and probably didn't know where. This wasn't long, you know, before the Battle of the Bulge. When he got through, he said, "Now, we could

1) WW II

2) THE GERMAN
STENOGRAPHER
FROM STRASBOURG

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shorten this timetable at the expense of a good many casualties. But we don't want to shorten it unless the A-bomb threat is very serious. I told him, "You can string it out for another year if you want to, and have no fear of the German A-bomb for they are so far behind us that there is no chance whatever of their getting one into use inside of two years." And I could say this with utter confidence at that time, whereas I would have had to hedge a bit a week before. So that was that instance, which was just a bit striking as a way in which Eisenhower kept himself informed. I don't think he did, except through Bedell Smith and by such methods as that. (LAST PART OF PARAGRAPH SOMEWHAT OBSCURE)

- 1) WW II
- 2) THE ANSWER TO
BEDELL SMITH'S
A-BOMB QUESTION
- 3) THE WAR TIMETABLE
- 4) EISENHOWER'S
SOURCES OF INFOR-
MATION

* * *

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Question 35: Did we use a less effective proximity fuze at first? The fuze totally demoralized the Germans.

When we introduced the proximity fuze in France, we purposely introduced the first model of the fuze. This was relatively easily countered by radio jamming. We did this rather than throw these shells away, and also because we thought it would take some time for the Germans to get their gear in shape to counter by jamming. We followed this first set of shells by the second model, which was much harder to jam. We hoped, therefore, that the Germans would get all ready to jam the first, and then find out that their jamming rig would not work against the second. We also placed observation teams along the front, in vans with a lot of radio gear; it was their job to watch, or listen to, rather, the Germans attempts at countermeasures. In other words they were to find out when the Germans first started

- 1) THE FIRST PROXIMITY FUZE AND GERMAN JAMMING
- 2) SECOND MODEL OF PROXIMITY FUZE AND NO GERMAN JAMMING

Reel 3-A
Page 171A

(ital) to jam the shells, and by what methods they were doing it. These boys kept a 24-hour watch, but never detected any German countermeasures.

It was not until the end of the war [X-REF FORWARD TO PP. 193 & 448 that we discovered why the Germans never used jamming against the proximity fuze shell. When the first shells fell, the German commanders reported to Berlin that the Americans had introduced a shell with a proximity fuze. This was at the time of the Battle of the Bulge. Berlin replied that this was impossible; that there couldn't be a proximity fuze shell of the type described. The argument went back and forth, with Berlin claiming that this was something else; better time-fire, for example. Apparently that argument never ended in time for the Germans to put together jamming equipment. So the fuzes, as far as I know, were never jammed.

- 1) WWII
- 2) GERMANS DENY
POSSIBILITY OF
OUR PROXIMITY
FUZE SHELL

Reel 3-A
Page 172

Before the fuzes were released on the front, Admiral King had been very hard to convince that they should be allowed for use over land at all. He was afraid the Germans would get a dud, and reproduce it; that then Japanese would get it, and so on. That is an entirely different story which I can tell you somewhere. (X-REF FORWARD TO PAGES 188-189, 190, 441) But if the Germans were so disorganized in the way they did technical things during the war, that they couldn't even jam such a thing as a proximity fuze, I think there wasn't the slightest danger that they could have reproduced it.

Question 36: Heat-seeking device that found the Japanese kiln

Now Question 36 is on a thing that might well come up in connection with the guided missiles. We did very little during the war on target-seeking devices except

- 1) WW II
- 2) PROXIMITY FUZES
- 3) ADMIRAL KING'S
DISSSENT

Reel 3-A
Page 172A

the very successful job against the submarines. We made some air-dropped missiles. They didn't get into real use, so they had no great effect. One gang did make a bomb which was heat-seeking. In other words, it had a detector on its nose sensitive to infrared radiation so that it steered itself just a bit to go in the direction of anything it thought was hot. The only use of them I know of was when four or five or six were dropped on a Jap harbor out in the Pacific. I've never seen the actual reports, but the story, as it was told to me was this. A number of ^{Jap}~~German~~ ships were in the harbor, and all but one of the bombs either sought out a ship and hit it, or dropped close to it, and made quite a fuss. But one of the bombs went way off course and into the woods. They thought that this was simply one whose mechanism had gone out of whack. But we captured the Japanese harbor shortly afterward,

- 1) TARGET SEEKING
DEVICES
- 2) HEAT SEEKING
DEVICE DROPPED
ON JAPANESE
HARBOR

Reel 3-A
Page 173

and in that spot in the woods, it was found that the Japanese had set up some kind of a kiln, or a heater of some kind. And the bomb had gone looking for it. (X-REF BACK TO PAGE 161)

Question 37: Robert Lovett's tribute;
Colonel Cox's letter

There was some sort of a reunion down at Virginia Military Institute to which Colonel Cox went; Eisenhower, Bradley, Johnson, were on the program, and Lovett made a speech. It's from that the quote from Colonel Cox comes, and apparently what Lovett quoted was something along the lines that man may develop new weapons systems, but in the last analysis, it is man himself upon which the nation depends in an emergency. I don't know the source of this -- it's from one of my speeches somewhere I suppose. (EH: QUERY. VB^{replies:}I still don't know)

- 1) LOVETT'S TRIBUTE
TO BUSH AT
REUNION AT VMI
- 2) COLONEL COX

* * *

Question 38: Marshall and Ike seldom asked technical questions. The Germans had no counterpart to our OSRD

- 1) WWII
- 2) BRADLEY'S BOOK
- 3) EISENHOWER AND MARSHALL PAID LITTLE ATTENTION TO TECHNICAL DEVELOPMENTS

If you want a really good estimate of Eisenhower, read Omar Bradley's book again. He also makes an excellent estimate of Patton. Of course his comments on Montgomery caused quite a stir, although I think Brad was pretty fair, and in fact generous to Montgomery at times in his book. (BRADLEY'S BOOK X-REF FORWARD TO PAGE 472) When that comes up I can tell you about my own estimate of Montgomery. (X-REF FORWARD TO PAGES 473-474) Cox's opinion on who won the war and so forth is not pertinent.

The point worth commenting on here is this: neither Marshall nor Eisenhower paid much attention to technical developments during the war. (X-REF AHEAD TO PAGES 410, 449, 469) This is easily understood. Also

it's easily understood why men in the field such as Bradley simply didn't have the time to find out what might be coming along. Marshall and Eisenhower were altogether too burdened to have opportunity to do that sort of thing, although they carried their lack of interest to an extreme.

I remember that when the Dukw proved itself highly successful in landing on the beaches at Sicily, Eisenhower sent a message to Marshall asking him to commend the men in Army ordnance (X-REF AHEAD TO PAGES 409 AND 460) who had developed the Dukw. Well now, Army ordnance hadn't developed the Dukw; in fact Army ordnance had pretty well opposed the development of the Dukw, which was accomplished by a group of wild men in my show. Marshall had here an opportunity to do something rather nice. If he had simply sent his aide over and asked me to have the men who did this job appear in his office, he could have said a few words to them and it would

- 1) WW II
- 2) EISENHOWER, &
MARSHALL PAID
LITTLE ATTENTION
TO TECHNICAL
DEVELOPMENTS
- 3) THE DUKW COMMENDA-
TION

Reel 3-A
Page 175

have given them the lift of a lifetime.

He did nothing of the sort; he simply sent me Eisenhower's message, and I proceeded to commend the men.

Well, I don't want this to be misunderstood. I was an admirer of Marshall. I think he did great things and I think he was a swell chap. But it does show how far men can go in ignoring what's going on in the way of new developments when they are as busy and harrassed as these people were. Ike's lack of real attention to it is shown by the fact that in his book, Crusade in Europe, he has I think just one sentence on the proximity fuze. I suppose he mentions the Dukw -- he must he couldn't help it -- but not in any way that would be regarded as with enthusiasm.

1) WW II

2) EISENHOWER AND
MARSHALL RE
TECHNICAL DEVEL-
OPMENTS

3) 1 SENTENCE IN
CRUSADE IN EUROPE
ON PROXIMITY FUZE

I think the point is that there were two things in the way of men like Marshall and Eisenhower getting abreast of what was going on in the way of new developments. One was that they were altogether too busy. They depended on their staffs to keep them informed as far as was necessary for them to be informed. Thus, for example, in connection with the atomic energy program, although Groves reported to Marshall, or rather through Marshall to the Secretary of War and the President, Marshall never paid any real attention to that program. But I think the two reasons are first, it wasn't merely that they were too busy: the advent of the new weapons or devices, whether proximity fuzes, Dukws, finally A-bombs, dozens of things, completely revolutionized the art of warfare as they had learned it and as they had studied it all their lives. It was

- 1) WW II
- 2) EISENHOWER AND
MARSHALL RE
TECHNICAL
DEVELOPMENTS

impossible for them at that age to switch and take a flexible point of view: to recognize that a very large part of what they'd learned had become obsolete.

- 1) WW II
- 2) NO BRITISH COUNTERPART OF OSRD -- CHERWELL AND CHURCHILL

* * *

Now the second part of this question: the British never had any counterpart to our OSRD. (X- REF AHEAD TO PAGES 202, 426, 452B, AND 724) They did not have a single place where the whole scientific effort headed up -- except, of course, that Lord Cherwell was scientific adviser to Churchill. Churchill continually butted in on the show, but even so Cherwell was not the head of the scientific effort. (X-REF AHEAD TO PAGES 427 AND 724) When he went around and got things done, he did so in the name of Churchill, which of course annoyed the British scientists no end, and quite properly so.

Reel 3-A
Page 176A

In Germany, the organization was so bad that they could do nothing that amounted to shucks. That's why we beat them out on radar and guided missiles and all sorts of things. Of course, the German Air Force, the German Army, and the German Navy were at war with one another. They hated one another fully as much as they hated the Allies. If a scientist was working with one group, he couldn't possibly work with the other. The thing was not organized; it didn't head up anywhere. The whole outfit played Hitler's hunches. It did all sorts of queer things. I think the primary reason that the Germans did so poorly, technically, was just that -- that their organization was very bad indeed.

- 1) WW II
- 2) GERMAN SCIENTIFIC ORGANIZATION IN DISARRAY

* * *

Question 39: VB's illness during the war

I haven't any reason for not wanting to answer this question -- in fact it might be just as well to have it in the record somewhere, though I have a great deal of doubt whether we would ever want to use it in print. During the war, I had very little difficulty from the standpoint of illness. One time a cold did go into pneumonia, but that cleared up. I went down to Florida, had a few days in the sun, and went back to work. Otherwise, I had no interruptions.

I tried to live a reasonably sane life. For one thing I tried not to work on Sundays, and to have at least one day when I got a little relaxation and was out of doors.

(X-REF FORWARD TO PAGE 703) This was hard to do. I suppose Hap Arnold was the worst one from my standpoint, for he'd get hold of me on a Sunday, and I'd go over to the Pentagon for some sort of a conference.

- 1) WW II
- 2) STATE OF VB'S HEALTH

Reel 3-A
Page 177A

I reasoned with Arnold, in fact told him that if he kept on working seven days a week, and right through from morning to late night, he would regret it. I had no effect on him, no doubt, but as you know, he did crack up just after the war.

I wanted to get some outdoor living and exercise. There was no gasoline, or very little, and the usual things one would do were out. So I took up archery, and it gave me a very pleasant time. I actually won a tournament. The way the archery affair was handled was excellent. There are six or eight classes of archers; the beginner is put in the bottom class, and when there's a tournament, the competition is class by class. When someone wins a tournament, he moves up into the next class. So archers are always shooting with men and women of their own skills.

- 1) WW II
- 2) STATE OF VB'S HEALTH
- 3) HAP ARNOLD
"CRACKED UP"
AFTER WAR
- 4) BUSH TAKES UP
ARCHERY

Reel 3-A
Page 178

I managed to win a tournament in the lowest possible class, and moved up one, but that's as far as I ever got.

The thing about archery that was pleasant was this: there were all sorts of people who were doing it; government clerks and so on, and it was a congenial group. For one thing, if I was shooting at a target, and a real expert was shooting at another target, right next to me, he'd come over and say, "I hope you don't mind, but I could give you a little tip." And he would. If you lost an arrow, people would help you hunt for it. Now there's a reason for this, of course; most men were shooting matched sets of arrows, and the loss of one spoiled the set. But even then, arrows only cost \$1 apiece. If, on the golf links, a man loses a dollar ball and spends more than a minute or two

- 1) WW II
- 2) HEALTH & RELAXATION
- 3) BUSH TAKES UP
ARCHERY

Reel 3-A
Page 178A

looking for it, everyone gets restless.
The way that you lose an arrow is, usually,
that it skids along the ground and buries
in the grass. When that happened people
would come and help you hunt; the women
would take off their shoes and walk around
on the grass. You can find an arrow that
way very quickly: you'll feel it when
you step on it. The general atmosphere
of archery was very pleasant, and it was
a good thing to do to get a little relaxa-
tion. I managed to keep this up fairly
well during the war, and I kept in pretty
good condition.

(EH TO VB: Van, a psychoanalyst
would be fascinated by the archery business
in the midst of World War II and I think
he'd have a point: "Head of OSRD, dealing
daily with A-bomb, proximity fuzes, etc.
finds Sunday relief by turning to the
bow-and-arrow; weapon of the 14th and 15th

- 1) WW II
- 2) ARCHERY FOR
RELAXATION (CONT.)

Reel 3-A
Page 179

century battles of Cregy and of Agincourt;
of the American Indian before the white man
came, etc." Any comments? VB TO EH: Sure
plenty of them if you want them. The
man who modernized archery, Klopstey [sp?]
by raising the efficiency of the bow from
60 to 80% made my bow. The British used
an inefficient bow for centuries, although
the Saracens in the Crusades had efficient
ones, and outranged them.

1) ARCHERY

Examples of military conservatism --
which did not get broken down until World
War II.)

* * *

Now the story after the war is a very
different one. I was chairman of the Research
and Development board; first, of the joint
board set up between the Army and Navy; then,

Reel 3-A
Page 179A

after unification, of the board set up by law. I took this latter post at the urging of President Truman, and the story of my relationships with him will bring out the way in which this occurred.

(X-REF AHEAD TO PAGES 342-343; 463-464)

It was a very frustrating experience.

After Forrestal became Secretary of Defense, I got almost no backing from him, (X-REF AHEAD TO 353) and hence the board meetings became almost no more than just occasions when we conferred on programs. I had no authority and not a great deal of influence, because everyone knew that I didn't get backed by Forrestal, and this was a fairly general experience in the department.

Forrestal of course should never have become Secretary of Defense. When

- 1) POST WW II
- 2) CHAIRMAN OF RESEARCH & DEVELOPMENT BOARD
- 3) NO BACKING FROM FORRESTAL

he was Secretary of the Navy, he opposed unification. Therefore when he took over as Secretary of Defense, he was in quite a spot, and he leaned over backwards of course, but he purposely made it a weak unification instead of a strong one. I think this mistake of his had a good deal to do with his difficulties later. I was working under conditions where I couldn't accomplish much in the Defense Department, although I could accomplish something because Jim Webb, then head of the Bureau of the Budget, would consult me on the research and development programs. (X-REF FORWARD TO PAGE 310) (This business of having the influence in the wrong place didn't help me any in my thinking about the thing.)

Well, along in 1948, I began to have severe headaches -- sufficiently severe so that they were kind of blinding headaches. Doctors in Washington x-rayed me.

- 1) POST WW II
- 2) FORRESTAL & WEAK UNIFICATION
- 3) SEVERE HEADACHES & BRAIN TUMOR DIAGNOSIS

Reel 3-A
Page 180A

They saw something on the film, and they thought that I had some kind of a brain tumor in an inoperable position. I went up to Boston and was examined again at the Massachusetts General Hospital with much the same results -- except that my good old family physician, Dr. Siscoe, told me that he just didn't believe that I had anything of the sort. He said that he thought a bit of a respite might take care of it. So, with Paul Scherer and Caryl Haskins, I took a trip, a pack-train trip out in the Rocky Mountains.

It would have been very enjoyable, except that my headaches didn't leave me, although they did get somewhat better. But I came back from the trip pretty well convinced that the headaches weren't just a matter of having been overtired.

- 1) POST WW II
- 2) SEVERE HEADACHES
& BRAIN TUMOR
DIAGNOSIS
- 3) DISSENTING
DIAGNOSIS &
SUBSEQUENT
VACATION REST TRIP

Reel 3-A
Page 181

So I put my personal affairs in order, I put the affairs of the CIW in order for the moment, and I got Karl Compton, and he succeeded me as chairman of the Research and Development board. Then I went into the hospital in New York, the Presbyterian.

There Robert Loeb took me in hand. He had [CY NOTES: EH HAS XEROXED COPY OF R. LOEB FILE FROM BUSH PAPERS] done great work during the war on the anti-malarial program and I knew him well. In my opinion, he's one of the finest men in the whole field of medicine. He's retired now, and was retired formally (by 1948) from his post at the Presbyterian, but active in all sorts of ways. He had me go through a series of tests. I jumped through about every hoop they had. The reports of tests began to pile up day after day. Loeb would come in to see me, but he never would discuss them. He'd simply say, "Well, let's get all the reports." Finally he came in with the whole pile. We sat down and began going over them together, one by one. We'd gotten halfway through the pile when I said, "Bob, I don't think I've got

- 1) POST WW II
- 2) REST TRIP
DOESN'T WORK
- 3) AFFAIRS IN ORDER
& ENTERED
PRESBYTERIAN
HOSPITAL
- 4) DR. ROBERT LOEB

Reel 3-A
Page 182

any brain tumor, and he said, "I know you haven't, but I thought it was better for you to find it out yourself." I think it was about as fine a job of handling what must have been a somewhat difficult patient as I ever heard of. [VB NOTE CUT HERE]

Then I went down to Honduras, and I spent six weeks on the shore there, acting as a consultant for the United Fruit Company, although I didn't do a great deal of consulting. Hartley Rowe fixed it up for me. For two or three weeks, I just relaxed, and then I became sufficiently alive again so that I went to work writing, and a very large part of Modern Arms was written right there. By the time I came back from there I was fully recovered; there was no recurrence, and no doubt the whole thing was cleared up.

- 1) POST WW II
- 2) BUSH HEALTH
- 3) REST & WORK
IN HONDURAS --
UNITED FRUIT
COMPANY
- 4) MODERN ARMS

Reel 3-A
Page 182A

This is probably as good a case of psychosomatic difficulty as could be imagined. The interesting point is this: why did I have the headaches, and how could I imitate the symptoms of brain tumor as well as I did when I had no such thing? Well, Loeb said that sometimes youngsters have a disease, which they never know about, but which thickens the meninges of the brain; sometimes in x-rays these little scars, which have no real significance, are hard to distinguish from real brain tumors. It's entirely possible that unconsciously remembered symptoms of that early affair influenced my thinking when I got hit. At any rate, the whole episode cleared up, and that was that. Loeb did say one thing to me quite flatly in the way of precaution: "Don't ever get yourself again into a situation such as you were in in Washington, and don't get into

- 1) POST WW II
- 2) BUSH HEALTH (CONT)

Reel 3-A
Page 183

the government service again." I've adhered
to this all right, and I intend to.

1) POST WW II

2) LOEB ADVISES VB
TO LEAVE GOV'T
SERVICE

* * *

I don't see any Question 40 anywhere;
(It was answered early in reel 1) it may have
got mixed up with the other cards and in fact
I may have sent it back to you. But there's
quite a lot of tape left on this reel, so
why don't I give you a little story on
the proximity fuze, from which you may be
able to pick out some questions you'll want
to ask me. I'm fairly close to the end of
this reel, so I'll turn the reel over and
begin on the other side and give you some
of that story.

END OF SIDE 3-A

Reel 3-B (Beginning)
Page 183A

About a week ago, the National Broadcasting Company got in touch with me in connection with the making of a "White Paper" on the atomic energy affair. They went at it in the way that broadcasting people are likely to go at things. They called my office; they wanted to have me appear before a camera the following Wednesday; that is, after four or five days. My secretary, instead of giving them my home number called me up, and I told her to tell them that certainly I wasn't going to plan to appear unless I knew what kind of program it was, what kind of questions they wanted to ask, and what they were interested in. So they sent me a batch of questions. These didn't make very much sense; in fact a program along the lines that those questions indicated would have been very dull indeed.

1) JULY 1964

2) NBC WHITE PAPER
INCIDENT

Reel 3-B

Page 184

The next thing, I got a call from New York. I was passed from one secretary to another and they said that Mr. Carling wanted to speak to me. Finally another girl came on the line, and I said to her, "Look, if Mr. Carling wants to speak to me, why doesn't he get on the phone and talk? What goes on here?" She said, "It isn't Mr. Carling, it's Miss Carling, and I'm Miss Carling." So I said, "OK, Miss Carling, go ahead and talk." Her talk wasn't very revealing either. But she asked me if I'd talk to the man who was the producer, a Mr. Freed, who, from his name, is probably Norwegian or something. Well, Freed was evidently the great man who couldn't be bothered to get on the phone, y'know, but I said, "OK, I'll talk to him. He was going to be in Boston Wednesday. So on Wednesday morning he came up to my office. This time also he put an assistant on the phone to talk to me

1) JULY 1964

2) NBC WHITE PAPER
INCIDENT(CONT.)

Reel 3-B
Page 185

and see if I was ready to receive him. So by the time he appeared, I was thoroughly stirred up.

I told him first that his program didn't make any sense whatever, that if that was what they had in mind, they'd bore the public and I wasn't going to help them do it. I also told him that TV people in general gave me a pain in the neck; that he was no exception; that they went on the premise that everyone in the country was anxious to get before a TV camera, and would jump when whistled to, and I told him that I was an exception, I didn't jump. Well, we had quite a little parley back and forth that way, after which he became quite reasonable. I told him then quite frankly I thought that the way they were building up that program, they were just going to rehash old stuff, and I asked him why he didn't put on something interesting, such as the story of the proximity fuze, which has never been well told. It appeared that he was during the war on a

1) JULY 1964

2) NBC WHITE PAPER
INCIDENT

Reel 3-B
Page 186

destroyer in the Mediterranean, where the Germans pasted them once in a while and where the proximity fuze helped enormously in protecting them. This got us a little better onto a basis of understanding and discussion, and so I told him some of the proximity fuze story.

Now the story of the proximity fuze is a fascinating one. It started when four or five physicists came into my office and said that they wanted to start and build one. The reason that they came into my office was because there was no place in NDRC where the program would naturally fit. (EH TO VB: Dates? VB TO EH: '41 I think. Probably Baxter's history gives such dates) So I listened to their story. At the end of it, I said it looked to me either impossible, or to be such a long-drawn-out program that it couldn't be finished during the war. But nevertheless,

1) JULY 1964

2) NBC WHITE PAPER
INCIDENT

3) BEGINNINGS OF
PROXIMITY FUZE

Reel 3-B
Page 186A

I said, "You fellows are intelligent, you know this field, you have come to the conclusion and have assured me that the job can be done. I'm not going to let my judgment on it override yours. Go ahead and try it and I'll back you up. Hence a special section was set up, which Dick Tolman fathered, (CY: I believe this was Division A, NDRC) and the show went ahead.

The reason that I was pessimistic, was simply because of the nature of the problem. What they proposed to do was to build a little radio set, perhaps as large as a small baking powder can, put it in a five inch shell, fire it out of a gun, and expect it to be still in operating condition, yet sensitive enough so that it could close a switch when it approached any other object, an airplane or the ground, within a specified distance. Now this meant

- 1) WW II
- 2) BEGINNINGS OF PROXIMITY FUZE
- 3) DICK TOLMAN

building a radio set, including vacuum tubes (because there were no transistors up to it at that time) which, put into a shell, could stand the heavy shock of impact. I'm not sure that offhand I can give you the exact figures, but if the set weighed an ounce or two it would press down on its supports at the moment of firing with a force approaching a ton. So it looked impossible.

This is pertinent in another connection, because Churchill in his book says that the British developed the proximity fuze and turned it over to the Americans to manufacture. (X-REF AHEAD TO PAGE 437) I think he must have known better than this. At any rate, it isn't so. The British did do some work on the proximity fuze but soon abandoned it; they had plenty to do without tackling that tough one. Furthermore, as soon as we began to bore heavily into something

- 1) WW II
- 2) BEGINNINGS OF PROXIMITY FUZE (CONT.)
- 3) CHURCHILL CLAIMS BRITISH DEVELOPED PROXIMITY FUZE

Reel 3-B
Page 188

it was only sensible for the British to put their attention on something else. Merle Tuve and his crowd went to work and as you know, they produced the fuze.

(X-REF AHEAD TO PAGE 189) It was a tremendous accomplishment.

I saw tests of the fused shells which were really extraordinary. For example, down on the coast of Carolina, I saw a 90 millimeter battery, radar controlled, using proximity fuzes, fire on a robot target plane. (X-REF FORWARD TO PAGES 440-441) The plane came flying across the water, a couple of miles away. The signal was given and the battery opened up, and we waited for the shells to arrive. Well, when they arrived, plunk, plunk, the plane disintegrated. It fell toward the water and all the way down it continued to get hit, or the debris left continued to get hit. When you thought that this could be done even when the plane was obscured by fog, it became more impressive still.

- 1) WW II
- 2) BEGINNINGS OF PROXIMITY FUZE
- 3) TUVE

Reel 3-B
Page 188A

The great things done by the fuze were with the Navy in protection against anti-aircraft attack -- particularly in the Pacific in protection against kamikaze attack.

(X-REF BACK TO PAGE 167 AND FORWARD TO PAGE 441) The Navy said that the fuze increased the effectiveness of its five inch anti-aircraft batteries by a factor of five. I think this was a conservative estimate and that the factor was probably a good deal larger.

The other place where the proximity fuze was extremely important was on the coast of Britain when the V-1's were coming over. When 90 millimeter batteries moved into position to take care of these things, the threat was pretty well over.

The Navy and the Air Force were both very much afraid that the Germans and the Japanese would get these; if the Japanese could have gotten them, or the Germans,

- 1) WW II
- 2) TESTING PROXIMITY FUZE
- 3) P.F. USED AGAINST ANTI-AIRCRAFT AND KAMIKAZE ATTACKS

Reel 3-B
Page 189

They could have stopped our bombing pretty thoroughly (X-REF BACK TO PAGE 172 AND FORWARD TO PAGE 441) In fact this is another illustration of where the Germans went to work on the wrong thing, because if they'd put a heavy program on this early in the war, they, too, might possibly have solved it.

The ingenuity shown by the crowd in the United States, and the resourcefulness, was perfectly marvelous. The group was headed up by Merle Tuve (X-REF BACK TO [TUVE, HEAD OF SECTION T, DIVISION A, NDRC] 187); his right-hand man was Larry Hofstad, who is now head of General Motors Research. And we had attached a chap from Baltimore who was very helpful in handling business arrangements and whose name we ought to get. (QUERY: I still can't remember)

- 1) WW II
- 2) PROXIMITY FUZE
- 3) INGENUITY OF
U.S. RESEARCH
GROUP -- TUVE,
HOFSTAD

Reel 3-B
Page 189A

When the fuze had been developed to the point where it worked, and when it was ready for pilot plant production, to be followed by all-out production, I got hold of the Navy and said, "OK this job seems to be done. This is where you take over while we continue to work to try to improve the affair." But the Navy asked me to continue to keep it in my organization, and to keep it under Merle's charge. I told them, "Now wait a minute; these are quite wild fellows I've got here, and some day Tuve or one of his people will light into the Secretary of the Navy or jump all over some Admiral or other. What are you going to do when that happens?" They said, "We'll intercept it." Well, I finally told them that I would keep the thing, provided they would give me one captain, whom I would name, who would be my direct liaison with the Navy, who would report to me.

- 1) WW II
- 2) PROXIMITY FUZE
- 3) NAVY JOINS IN

Reel 3-B
Page 190

Through him, all OSRD communications with the Navy would be conducted. After swallowing hard, they finally agreed and I picked Deke Parsons, a grand fellow, who was very important in connection with the atomic energy program later, as you know. (X-REF FORWARD TO PAGE 423) (Then they swallowed hard again.) But they stuck to their agreement, and Parsons came over.

The program operated without the slightest friction or difficulty, while shells were made by the millions in factories all over the country; the Navy placed the contracts and paid the money. The supervision, the inspection, all the technical parts of the contract, the instruction of new manufacturers and so on, were conducted by Merle and his gang. It was a great piece of work.

- 1) WW II
- 2) PROXIMITY FUZE
(continued)
- 3) DEKE PARSONS

Reel 3-B
Page 190A

Now when it came to the time of use, the Navy and Air Force insisted that the shells be fired only where they would land in water, so that no duds could be gotten into the hands of the enemy. (X-REF BACK TO ERNIE KING, PAGE 172) This held for a long time, until -- oh, after the use against the V-1's, where of course the 90 millimeter guns were placed on the coast so that they fired out over the water. I had tried to get the PFs released for ground use, because I knew how important they could be in ground battles. I think I ought to stop for a moment to tell you why this is important.

- 1) WW II
- 2) PROXIMITY FUZE
IN USE

* * *

Ordinarily, when a land battery is firing against personnel, it fires shrapnel, and it uses timed fire, so that the shells will burst at the proper elevation above the ground. Now of course this can be done only if some observer can see the bursts. It can't be done when it's foggy, it can't be done when a hill intervenes, and in any case, it is not particularly precise. The deadliness of a shell depends a great deal on the height of its burst, which determines the shape of the cone formed by its shrapnel coming down onto the earth, (which, incidentally, will get the man in the foxhole). On the other hand, the proximity fuze can be used under all circumstances and it will burst at the right point all the time. Thus it could be very important in ground warfare.

1) WW II

2) WHY P.F. IMPORTANT
FOR GROUND BATTLE

Finally, General McNarney was Deputy Chief of Staff in the Army, (I believe he was then Deputy) I believe -- I don't know, but he was Chief of Staff at that time -- was as enthusiastic about this as I was, and agreed that he'd take care of the Air Force if I'd take care of the Navy, and we'd try to get the thing released by the Joint Chiefs. On the assumption that we might have success, McNarney made the arrangements and shells began to move to France. Well, I tackled King all right -- and nearly got thrown out of his office.

(X-REF FORWARD TO PAGES 443-444 AND 816)

I remember the beginning of the conversation, for as soon as I brought up the subject, he said that this was a military matter and it should be decided by the military; a civilian had no background or basis for judgment. I told him that

- 1) WW II
- 2) ATTEMPT TO GET
JOINT CHIEFS
TO RELEASE
PROXIMITY FUZE
- 3) GENERAL McNARNEY

Reel 3-B
Page 192A

it was a combined military, scientific, and engineering matter, and that on these two latter aspects he was a babe in arms and not entitled to judge. With that start, we got along famously and went at each other pretty heavily. Now, as a backup for this, I had some time before set up a committee of some very good engineers. I'd asked them the explicit question of how long it would take the Germans to develop their own proximity fuze or duplicate ours and get it into production if they were given a dud. After careful study they told me it would take a couple of years. So I sprung this on King, and told him that those fellows knew how to judge that kind of thing, and he didn't. The net upshot of the thing was I finally convinced him.

- 1) WW II
- 2) ATTEMPT TO GET
JOINT CHIEFS
TO RELEASE
PROXIMITY FUZE

Reel 3-B
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I have to be right with King. He was a martinet in a way, but he was also a square shooter. As soon as he was convinced, he turned around completely and said, "When can you go with me to the Joint Chiefs' meeting?" and I said, "Any time." He said, "There's a meeting in an hour," and I said, "All right, let's go together," and we did. In that meeting, he asked the questions to bring out my argument and the Joint Chiefs released.

Forty-eight hours later I was on my way to France, as I've mentioned in other places. (X-REF BACK TO PAGES 167-168, AND FORWARD TO 413, 445) I had my session with Bedell Smith, and we got the shells moving up to the front. We got the chief ordnance officers properly instructed on their use in the hope that if they knew how to use them they wouldn't shoot down their own reconnaissance planes. (X-REF FORWARD TO PAGE 446)

- 1) WW II
- 2) PROXIMITY FUZE
RELEASED BY
JOINT CHIEFS
- 3) BUSH TO FRANCE
SESSION WITH
BEDELL SMITH

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In the Battle of the Bulge, the fuzes came into profound effect; (X-REF FORWARD TO PAGE 446) they caught German divisions in the open, when it was foggy and when the Germans thought they were comparatively safe because time fire could not be used. There's also the story that I've told elsewhere about the German failure to use countermeasures against them, and the reasons for that. (X-REF BACK TO PAGE 171 AND FORWARD TO PAGE 448)

Now if we're going to use any part of this, it would be a very good idea to get hold of Merle Tuve and get more of the story, to get the story accurate on all points. In my opinion the proximity fuze was one of the finest developments of the war, in that it exemplified ingenuity, resourcefulness, and that sort of thing, fully as much as did the atomic energy program. (X-REF FORWARD TO PAGE 436) If it had not been for the A-bomb, it would have been heralded as one of the

- 1) WW II
- 2) PROXIMITY FUZE
IN BATTLE OF THE
BULGE

Reel 3-B
Page 194A

great accomplishments of the war comparable
to the building of centimeter radar. So
we'll let that go for the present, and the
rest of this reel is blank.

1) PROXIMITY FUZE

END OF REEL 3-B