[nd]

Horn's two points

A. Scientists and Military Science

1. Story of A-bomb
2. 1945 Desertion
3. 1948. Call for H-bomb by Teller — Teller offered because of failure to stand up for Oppie
4. Opposition to H-bomb. Opp. Role of Security ~~the~~ Secrecy more important
5. Project Lincoln, Summer Study etc.
6. Missile work – gov't reluctance
7. Scientists and War Work in Peace Time
8. ~~At~~ Keeping ahead in Arm's Race –

B. Scientists in Political Life

1. 1945 – Franck report – FAS – Bulletin – ~~Ath.~~ Sciences etc. "Int Control", not the result of illusions
2. ~~Why~~ Common Points with Scientists in Russia?
3. ~~Pugwa~~ History of London ~~Pugwash~~, ~~At~~ English and Americans
4. ~~At~~ Sov. Acad etc., Am Sci. Questionnaires, Pauling Appeal

Conclusions: Horn's "sophistication" out-of balance

ANTIHOOK

In the article "Missing Link in American Science", Professor Sidney Hook makes two points. The first one is that if America is now behind the Soviet Union in the development of long-range missiles (and the launching of satellites), this is due primarily to the lack of political education of American scientists: they have failed to recognize in time the danger of communist aggression (as they did in 1939 the danger of Nazism), and have therefore not shown sufficient active interest in war research. Hook's second contention is that because of this lack of political understanding, conversations between American and Russian scientists on political subjects, (such as have been attempted at Pugwash last July and which the Soviet Academy of Science now wants to be expanded), are likely to end in a "rape of political virgins."

I believe Hook is wrong on both points -- or, to be more exact, he sees only one -- and not the most important side of the situation. American scientists -- at least, many of them -- did share with the American people certain illusions about the Soviet ally during (and immediately after) World War II; but this has not been the main reason for the slowness of progress of American missile research. And American scientists are not political babes-in-the-woods, neither are they blind to the pitfalls of political conversations with the Soviet scientists, and able to take care of themselves.

* * * * *

American Scientists and Military Research

Arms development is applied research, and applied research is carried out, as a rule, at the initiative of those interested in the product. In the case of arms, that means the military. Only on rare occasions does a scientist become so convinced of the practical importance of the result of pure research, that he goes out of his way to persuade industry, or the government, to give it a practical try. This applies particularly to physicists (or chemists) in the front lines of pure research, whose motivation is interest in the workings of nature, and not concern with practical applications.

A unique exception to this general rule occurred in 1939. Physicists working on completely "impractical" problems of nuclear transformation suddenly recognized the possibility of utilizing the phenomenon of nuclear fission for the creation of a new type of explosives of unimaginable power. On their own initiative, they went to the military -- and found them little interested. They then went -- through the intermediary of Einstein -- directly to President Roosevelt. What followed is history.

The fear that Nazi Germany would be the first to build an atom bomb was one important reason that caused scientists to take the initiative in the development of atomic weapons. One must remember that that was after Hitler's invasion of Austria and Czechoslovakia, at a time when war in Europe threatened to break out any day. Even then, it was the refugee scientists from Germany, Austria and Hungary who started the ball rolling -- the vast majority of native American scientists were but little concerned with the matter, and had to be prodded into action.

The combination of circumstances was unique. There was the greatest break-through in experimental physics in history; the penetration of man from the world of atoms into the world of nuclei, offering the prospect of mastering forces X million times greater than those at the disposal of mankind since the discovery of fire. There was a group of scientists -- the flower of European theoretical and experimental physics -- aware, from first-hand experience, of the terrible threat of the Hitler war machine. And there was, in Washington, a political leadership of sufficient imagination to listen to their fantastic ideas and gamble two billion dollars on their success.

** * * * * * *

In 1945, after Hiroshima and Nagasaki, there occurred a great exodus of scientists from military laboratories back into academic research

and teaching. It is not true, as Hook suggests, that this migration had anything to do with the political attitudes of American scientists -- their was due to indifference to, or perhaps even a vague sympathy with, the communist totalitarianism. The American people, as well as its political leadership, hoped at that time for peaceful cooperation with the Soviet Union, and the majority of American scientists shared this hope. Another war seemed an impossibility, particularly after the discovery of atomic weapons. The Soviet Union was exhausted by the war ~~This was the time when~~ while Republicans clamored louder than the Democrats that the American military establishment in Europe (which alone could have assured the restoration of political freedom to central Europe) and an effective international control of atomic energy should be dismantled as speedily as possible. The disconcerting experiences of the American military command in wartime alliance with the Soviet Union, has been kept secret from the American people. It was the time when President Roosevelt thought that he could influence Soviet policy by making Stalin laugh at the expense of Winston Churchill. It was the time when the suggestion of Bertrand Russell that the Soviet Union should be induced to accept effective international control of atomic energy, if necessary by the force of arms, was generally considered a bad joke.

The return of scientists to their academic laboratories had nothing to do with such political attitudes, as Hook suggested. It was the natural and justified resumption of the interrupted pursuit of scientific research and teaching. A similar spontaneous demobilization took place on all levels of American society. There was no question of keeping practically the entire body of outstanding American scientists in their wartime quarters at Los Alamos, Oak Ridge, the Radiation Laboratory at MIT, etc., endangering the education of a new generation of American scientists, damaging ultimately war research. Nothing of this kind could have been attempted -- either in America, or in the Soviet Union.

And the mass movement of scientists back to universities was a natural part of it. Contrary to Hook's suspicions, it had nothing to do with political attitudes.

What could have been achieved in 1939 was the creation of vigorous centers of military research, in close exchange of ideas and people with academic laboratories. The main reason why this was not done speedily and purposefully -- for a while the very survival of Los Alamos was in question -- was the lack of political leadership in Washington. With the end of the war, Washington lost its interest in science and scientists; it was returning to its pre-war routine, in which science had no important role. With the exception of Senator McMahon, who became deeply convinced of the crucial importance of atomic energy for our military security and the whole future of America and mankind, Congress and Administration were but little impressed by the education which Ed Condon and other "atomic scientists" have tried to dispense in Washington. Hook deplores the insufficient political education of American scientists; more important was -- in 1945 as now -- the lack of scientific education of American politicians. A large fraction of the American scientific community may have started way back before the Second World War as political illiterates; some, disinterested in world affairs, have carried this political naivete through the early post-war years; but very few have not become educated by now. The lack of understanding of science and of its role in public affairs, on the other hand, remains widely prevalent in American government and American public opinion -- including many so-called political scientists. Is it hardly necessary to quote some of the famous sayings of Secretary of Defense Wilson to prove the point?

We will later in more detail of the postwar political education of American scientists. We only mention that already the first statements of #atomic scientists", such as the so-called "Franck Report" of June 11, 1945, sounded a realistic and note, were foresaw the acquisition of atomic weapons by the Soviet Union within four or five years, an arms race between America and the Soviet Union, "starting the day when the existence of the bomb was revealed" and the possibility of the latter Russians catching up with the American technological lead in ten or fifteen years. (many years later, Long afterward, political Washington still lived in a fool's paradise, believing in American monopoly of atomic weapons, and listened to #authorities" such as General Groves, who assured them predicting that Russia will not would

be able to build an atom bomb in 25 years, if ever.

At the same time, the military minimized the revolutionary significance of atomic weapons. When scientists fought the May-Johnson bill, which would have given the military a preponderant influence in the peacetime management of the atomic energy enterprise, one of their concerns was that in the hands of the military, even the development of atomic energy as a military weapon would be likely to get into a rut.

Their main argument was, however, the necessity of establishing an international control of atomic energy, preventing its military use by any nation. Leaving atomic energy in America in military hands was not a good start toward this aim. Because of the paramount necessity of elimination of atomic weapons as a threat to the security of our own country and to mankind as a whole, a group of scientists have in June, 1945, counselled against the use of atomic weapons in Japan.

The scientists' opposition against the use of the bomb in Japan, and then against military control of atomic energy, and their propaganda for international control of atomic energy, have been widely misunderstood.

to page 6

~~chemists) in the front lines of pure research.~~ They have been accused of an urge to disclose the "secrets of the atomic bomb" to ~~the world and to~~ Russia ~~in particular~~ either as a "show ~~our~~ good will" or ~~in the opinion of~~ more suspicious critics, out of sympathy with ~~the Soviet Union~~. This misunderstanding ~~has~~ found its way into the memoirs of some ~~of the most~~ prominent political leaders of that time, such as Secretary Forrestal. Yet, Senator McMahon -- who ~~has~~ had more contact with scientists than any other American political leader after the war, said that he ~~has~~ never heard a single American scientist asking for gratuitous revelation of atomic bomb secrets.

True, the catch word "let's give the atomic bomb to the United Nations" (which meant, in practice, "let's divulge its construction to the whole world") was ~~found~~ out by some communist-front organization (such as the "Committee of Art, Sciences and Professions"), but it found no support among scientists. What ~~they~~ asked for was effective international control of atomic energy either by inspection, or (as suggested in April, 1946, in the Acheson-Lilienthal report), by international ownership and management of all atomic enterprises in the world. This plan was accepted by non-communist nations and vetoed by the Soviet Union; but suspicious politicians insisted on considering it a diabolical attempt to betray American atomic know-how to the communists. Senator Taft, during the Congressional investigation of the AEC in 1947 (?) spoke of the Baruch proposal for the internationalization of atomic energy ~~whose motivation is interest in the~~ as if it ~~was~~ were the Soviet plan, and of Gromyko's plan of national ownership, restricted ~~only~~ by occasional UN inspection, as if it ~~were~~ was the American proposal!

The slowing down of American military research during the first four years after Hiroshima ~~was~~ resulted from two factors: The lack of clear ~~planning~~ leadership and leadership in the top civilian and military administration; and

the predominant concern of American scientists with the resumption of normal research and teaching. The "atomic scientists" in whom the atomic bomb experience has left with an intense concern with the future of mankind in the atomic age, -- they who could be called the "political avantguarde" of the American scientific community -- had no illusions about the gathering atomic arms race; but their predominant concern was with stopping the race, not with winning it. They were trying to prod the government into more vigorous action for international control, and to make the public understand the full implications of an atomic war. The concept of "saturation" -- even now insufficiently understood by the public -- according to which quantitative advantage in atomic arms loses its importance when both sides approach the capacity to thoroughly destroy each other, made them relatively unconcerned about America losing the atomic arms race, but deeply concerned with the impossibility of winning it. They foresaw the advent of "atomic stalemate" with two (or more) powers able to destroy each other at a moment's notice. In the armaments field, many scientists were alarmed by the lack of national effort in active and passive defense against atomic weapons. Civil defense, dispersion of industry and population were extensively discussed by the BAS, without awakening notable public or official response. Studies on active defense, pioneered by spontaneous scientific groups such as the Lincoln Project and the Summer Study Group in Cambridge, Project East River, in New York, Project Vista at Caltech, had an almost equally hard time to impress their conclusions on military officialdom, and accused of meddling with the nations strategic planning. The SAC command considered any attempt to allot a slice of the shrinking defense dollar to active or passive defense a threat to its function of protector of American security by threat of "massive retaliation."

Individual scientists with such experience and ideas, who tried to convince Washington of the military importance of missiles and rockets, also had a difficult time ~~in~~ getting a hearing ~~and encouragement~~.

In contrast to the ~~idea of the~~ atomic bomb, which appeared ~~clear and~~ overwhelmingly important to a large number of scientists in 1939, all these other military areas had no universal appeal to the scientific community as a whole; and in the face of complacency and inertia in Washington, only small groups of scientists remained actively interested in them.

There was, however -- or rather, there could have been -- once exception: the thermonuclear bomb. The one scientific possibility of immense destructive power which could be appreciated by scientists at large, was the "super bomb"; its possibility had occurred to many physicists before Hahn's discovery ~~has~~ made the fission bomb possible -- and ~~has~~ made the attainment of the cosmic temperatures needed to maintain a hydrogen fusion reaction feasible on earth. The history of ~~the~~ H-bomb development in America after 1945 is the one case to which Hook's accusation has been at all relevant. The American scientific community, with the exception of Dr. Teller, Dr. Pfitzer, and a few of his colleagues, did not press for the exploration of the weapon, although its theoretical feasibility ~~has been~~ was discussed at Los Alamos during the war. The General Advisory Committee of the AEC, consisting mainly of scientists unanimously opposed to a crash program in this field because of doubts as to chances of its success, but in part undoubtedly because of moral and political considerations. They were reluctant to initiate a development which could multiply thousandfold the destructive power of the Hiroshima bomb. The first Soviet A-bomb test in summer of 1949 and proof of the relatively easy feasibility of the "dirty" ("fission-fusion-fission") thermonuclear bomb, combined to silence the opposition.

The composition of the General Advisory Committee precludes the interpretation of this attitude as stemming from communist sympathies or even of indifference to communist danger. Dr. Oppenheimer's convictions ~~have~~ had, by 1949, developed a long long way from his youthful communist affinities; and all his colleagues on the GAC ~~take~~ with a widely different political past, supported his opposition to a crash H-bomb program. It is very difficult to estimate now the strength and validity of their arguments -- for the simple reason that none of them have ever been revealed. The pall of secrecy is still hovering over the whole area. The scientific community at large was ignorant of the controversy. Since 1945, mentioning the "super" in conversation or print was out of the question. The decision whether the H-bomb ~~is~~ was technically feasible and whether American scientists think it should ~~be~~ have been developed, rested with a few scientists "in the know" -- competent but fallible, and not able to consult with their colleagues outside. The American scientific community ~~has~~ abdicated its role in influencing national armaments policy to the scientific members of this General Advisory Committee of the AEC -- and if the convictions of the latter were proved wrong by history, scientists at large cannot disclaim responsibility.

But have they been proved wrong? Again, secrecy makes fully informed judgment impossible. The construction of the H-bomb proved possible; and it is clear now that if no crash program ~~would have~~ had been initiated in 1948, the West would have been confronted, in 1950, with a Soviet monopoly in hydrogen weapons -- a passing state, of course, but a highly uncomfortable one, a state of "imbalance of terror" which would have had catastrophic consequences. However, unofficial history has it that the American governement was advised, by a group including among others Oppenheimer, Vannevar Bush, and Alan Dulles of the CIA, that before embarking on a crash program for the construction of thermo-nuclear weapons, an approach should be made to the Soviet Union suggesting an agreement not to test such weapons.

The government and the American public opinion at large had very little understanding for this kind of suggestions. Until the advent of the Soviet satellites it seemed axiomatic that in the power contest between the Soviet Union and the United States American strength resided in its unquestionalbe technological leadership, whilethat of Russia lay in its supposedly unexhaustible reserve of brute manpower. Consequently all attempts to stop or slow down the race in military technology was considered as playing into the hands of ~~the~~ Russia. In several articles of in the BAS I have tried to criticize both parts of the postulate: the quality of Russian science particularly in the fields such as applied mechanics and aerodynamics was such that , combined with the capacity to concentrate on militarily important projects and stifle the development of gadgets for ~~home consumption~~ the use of the consumers, the Soviet Union had all chance to draw ahead or even overtake American leadership in weapons technology. (In the rocket field, the leadership has always been on the Russian side.) On the other hand , the Soviet advantage in population numbers was relatively small compared to America and nonexistent compared to the NATO block as a whole; and the possibility of reckless use of human masses for war was a thing of the past once industrialization has made a large proportion of the manpower needed in plants and factories. With the lower productivity of the Soviet workman and farmer, Russia must in fact be in more pinch for manpower than the West.

Finally, the political and economic structure of the West made it more vulnerable to atomic warfare and more susceptible to the threat of this war as means of political pressure than the economically more dispersed and politically monolithic Soviet Union.

For all these reason s, it was in the interest of America , at least as much as that of Russia, to freeze the technological arms race short of the development of the thermonuclear bomb. Of course this could be done only under conditions safeguarding the compliance of both sides. There is, however,

no doubtthat the explosions of megaton bombs can be discovered by remote monitoring outside the country and that all doubts about violations of the test ban through underground testing or through the use of low yield gadgets could be discovered by rather limited system ofmonitoring stations scattered over all countries in a network which would prevent any tests being carried out at a distance larger than a few hundred miles from the nearest monitoring station. In any case, this seems to bethe conviction of the majority of scientists the world over. The possibility of evading such a control system is vaguely hinted at by some spokesman for the AEC, but the only concrete thing distinguishable behind this smoke screen seems to be the possibility of shooting thermonuclear gadgets into the stratosphere and exploding them there--a possibility which was certainly not acute in 1950 and against which adequate methods of detection probably can be found now.

In any case, proposals to prevent the testing of thermonuclear weapons, short of their successful development either by America or Russia, found no acceptance then --and similar proposals have been looked askance at ever since, not so much because of the apprehension that the ban can be evaded, as because of the conviction that it is to the American interest to let the technological arms race go ahead full speed, thus guaranteeing America's continuous advantage over the backward Soviet Union.

It is now clear in retrospect that an agreement not to test thermonuclear weapons, if it could have been reached at that time, and made stick by adequate by an adequate monitoring system, would have been of the greatest advantage to the United States. It would have effectively prevented the threat of intercontinental ballistic missiles because they have become dangerous only in combination with thermonuclear weapons,because of the wide radius of destruction and radioactive contamination the latter can provide.

It is therefore understandable that American scientists who advised

the government in 1950? against ah all out development of hydrogen weapons felt a reluctance to embark on this fateful development without full understanding of its implicationfor the future of America and of mankind, and without at least one serious effort to stop short of the plungeinto a hydrogen arms race. This aspect of the conflict over the H-bomb development, like its technological aspects, was veiled with deep secrecy. The American scientist at large had only a vague idea of the controversy which raged behind closed doors at the AEC and the Pentagon. Vague hints could be gathered from articles by former AEC scientists--ex-Commissioner Bacher in the BAS for the "anti-H-bomb" faction and ex director of research Pfitzer in Chemical and Engineering News on the "pro-H-bomb" side, but most readers could not fully understand what it was all about. The secrecy is what prevented the American scientific community at large from taking any position either on the technological possibility of thermonuclear weapons or on the political advisability of an all out development. and the chance of stopping this development before its fruition by a test ban agreement. When the H-bomb controversy exploded in the accusations against Oppenhaimer, the overwhelming majority of American scientists took his side--not because of their endorsement of his advice in the H-bomb development, but because of indignation over the way in which a possible error of judgment was converted , by dragging in past associations, into evidence of doubtful loyalty and made a subject vehicle for personal defamation. of a prominent American scientist. What has poisoned the relations between the majority of scientists and the group of Dr. Teller and his friends as well as between the American scientific community and the American government was not the perfectly legitimate desire of the latter to substitute for Dr. Oppenheimer and his friends scientific advisors with in whose political judgment they had a better trust, but indignation over the use of innuendo of disloyalty as tool in achieving this purpose. Many scientists were and still are indignant over Dr. Teller's attitude and in this conflict, not because of his disagreement with Oppenheimer on the technical feasibility

and political advisability of the H-bomb development, and his passionate fight to make his beliefs prevail, but because of his refusal to clearly dissociate himself from such suspicions. A single sentence to this effect in his testimony would have made all the difference.

HOOK 3

Mr. Hook at taches great importance to the question of political sophistication, and its absence with many American intellctuals, in particular scientists. It is true that people I he and his colleagues, who have had a closer acquaintence with the devious ways of Soviet political activity, and and the utilization of all shades of opposition in every country for the purpose of Soviet propaganda and policies have acquired a unique understanding of these operations, and rightly look at the average American intellectual of good will as a babe in the woods, essily operated by hidden Soviet strings.

However, political sophistication has also another aspect which in the opinion of this writer Mr. Hook does not possess. This is the proper weighting of the different factors in the s tuation against each other. I submit that one can fully understand all the hidden Soviet purposes behind such phenomen events as the participation of Russian scientists in the ugwash confer ence or the reslutions of the Soviet academy but weigh these factors against others which are at least equal importance, because they are derived from objective facts of the arms race situation and not from twisted idological schemes of the Kremlin ideologists. I submit further that many American and Western European liberals without sophisticated understanding of either the mechanisms of Soviet propaganda and political expansion nor of the tehcnicaliti s of the atomic rms race nevertheless have a better bilanced judgment of the necessities of the present moment than Mr. Hook.

Whether one should call American scientists naive or not depends whether one calls so the large part of the American people from Roosevelt and Eisenhower on top to the average colle ge professor or journalist at the bottom. After th end of the war the vast majority of Americans believed in the poss bility of peaceful relations with the Soviet Union, and this included even military and political leaders who have already had their share of disappointment in t ei Soviet ally during the war which were concealed frm the Ameri can public.

in noncommunist societies, but also in proper balancing of ~~the importance of~~ the diferent factors of which ~~this~~ political guile of communists is ~~one~~, against each other. This is where Hook's nalysis of the weapons stuation between the United States and the Soviet Union fails ~~completely~~. This failure is dangerous because it suggests that the situation can be remedied without addressing oneself to its most essential ~~roots~~. This root is the ignorance by the Western political thinkers as well as b Western political leaders of ~~the way of~~ what science is, how it works, and what is its importance for the nation. Mr. Hook displays this ignorance when he implies that the majority of American scientists could have decided in 1945 to stay with war research. Military research is not something which can preoccupy the majority o or even a large fraction of

President Roosevelt had the naivete of thinking that he can work his personal charm on Stalin by teasing Churchill in his presence and ten years later President Eisenhower believed with equal naivete in using his comrade-in-arms relationship with Zhukov to influence the Soviet policies. How could one blame American industrialists who found that some of their counterparts among the managerial class in the Soviet Union are perfectly human and likeable beingsor scientists who have met their Russian colleagues at internationzl conferences or in their laboratories and found them warm friendly and sharing common scientific (and other) interests.

One can even say that scientists are less inclined than all others to see the world political situation under such personal angle . In science they are accustomed to look at facts and logical relationships rather than at pe rsaonalties. If they have tried at all to transfer this scientific attitudes into the world of politics as "atomic scidnitst" have attempted at least to some degree in looking into their crystal ball at the end of the war, they have seen ahead not any ideal of friendly collaboration with the Soviet Union but by the force of facts and inevitable arms race in atomic armaments with all the exacerbations of political relationships which this race is bound to bring in its wake. From 1944 on, the atomic scientists have not ceased to predict the early acquisition of atomic weapons first by Russia and then by tother countries, and the race of destructive power which was bound to follow. When they strongly advocated an agreement with Russia on the control of atmic weapons--it was not out of illusions as to the ease of finding ways toward such an agreement or belief in the good will and reliability of Soviet promises, but out of the clear vision of what an unlimited atomic arms race will mean for mankind and hop that this disastrous development may appear abhorrentnot only to American democracy but even to Soviet totalitarianism.

Hook V

The Political Education of American Scientists

The extremes of political thinking and the of political radicalism reveale by the personal history of Dr. Oppenheimer unfolded at his security hearings have not been typical of American scientists as a group; but undoubtedly before the war and the atomic bomb a large majorty among them has had but little interest in political affairs. Those orignating from intellectual grups in large cities may have had their fling at political radicalism and even communism in common with other groups of American intellectuals.

The large group of European refugee scientists who have played such an important rle in the development of the atomic bomb had an entirely different background. Some of them, particularly those from Germany, have been originally even more apolitical than their American colleagues . I remember vivdly how when I was studying chemistry at the University in Berlin in the late 20's the head of the institutehearing me mentioning the plight of Russian refugees from the Soviet Union asked me "What,are the communists still in power in Russia?" This

This indifference to politics and the associated respect for all government authority was rudely shaken by the advent of the Nazi regime in Germany. I was quite amazed when upon meeting my old german professors in America I discovered the active interest they have acquired in political affairs . Since scientists on the average have a rather acute analytical minds and are incli ned to look at the facts fist hand before making rather than taking readymade conclusi ns from others, they are inclined--once they become interested in politics-- to apply at least some of their critical capacities also in this area. They are scientists and prom nent onces who have swallowed some political dogma hook, line and sinker but they are the exception. One Nobel prize winner has been quoted perhaps maliciously as having declared upon joining the communist party that frm now on he will not have to think about anything but science--opinions in all other areas will be thought through for him by others.

But such cases are a rare exception;.

In any case, when "ato mic scientists" first emerged from the secret laboratories of the Manhattan Project into thepolitical arena they were not at all naive in respect to political realities, in particular in respct to the totalitarianism of any kind. They were well aware that communistic propaganda was continuously trying to exploit all intellectual movements in its own interests; that it has largely dominated the associations of scientific workers in Europe; that the Committee of Arts , Scieces, and Professions was an attempt to mobilize for communist purposes also American scientists. At first large groups of scientists have joined this committee, and they possibility existed that they could impress their way of thinking upon the whole organization. It s on turned out, however, that the wirepullerswho startee this committee were only interested in a sounding board for their own poli ical moves and proclamations and not in a democratically run associations of intellectuals and with very few exceptions scientists soon left it. In the ir own organizations the emergency Committee of Atomic Scientists, the Federation of American Scientists, and in their organ the BAS they have been very careful of preventing the procommunist/or fellowtraveling elements from exercising any influence--which the latter often achieve not so much by any Machiavellian infiltration methods but simply by the dint of being more ready than any ody else to devote their time and energy to orgahizational and political matters.

Nevertheless, the scientists have not been ble to avoid suspicious by those who considered every organization or journal which did not devote itself exclusively to anticommunism activity as suspicious of cryptocommunism. The whole rationale of the scientists participati n in political life required that emphasis be put not on fighting the ideological war between the forces of intellectual and political freedom and the forces of communist totalitarian ism, but in finding a way to lessen the violence of this fight and to av id it ending in a nuclear war. From the beginning scientists have been convinced

4.3

that the development of atomic weapons (even without the construction of thermonuclear "superbombs") will soon convert into a mutual destruction of nations. They had no illusions about the inevitability of the atomic arms race, and of a rapid acquisition of atomic weapons by other nations in particular by the Soviet Union. In the first published document issued from this group --the Franck Report of June 16, 1945--the conviction was expressed that the atomic arms race with Russia will start on the day of the fist explosion of an American atomic bomb in Japan and that the Soviet Union is likely to develop its own bomb infour or five years and draw even with America in its arms capabilities within 10 or 15 years.

Without illusions about the political system of the Soviet Union or the personality of the Soviet leaders. The atomic scientists have set their hopes--as scientists are inclined to do--on the rationality of political leaders of all countries whether totalitarian or democratic. They have hoped that they will all recognize that a nuclear war will destroy their political plans and hopes as well as those of their enemies and that therefore they will be prepared to sacrifice as much of their freedom of action as was rationally needed to make atomic war impossibleby internationally controlled elimination of atomic weapons. They never had great hopes that they would be able to impress American political leadership or the Soviet government of the necessity to put the establishment of this contro ahead of all other world political aims. Some may have even had the dlusion that just because the Soviet Union is run by a small group of people it may be easier to convince them than to transofmr the public opinion in America which has ultimate control over the policies of the American government; but even in this extravagant version there was no sympathy for the Soviet regime or illusions about its totalitarian and arbitrary character--merely a vain hope that this very trais may make it easier for this government to make a radical new beginning in its policies. ~~The~~

The gamble on rationality of political thinking has not succeeded. The American government and the American public opinion has never quite acuired

the same conviction of the paramountcy of the control of atomic weapons over all other political problems; they felt secure in the American monopoly of atomic weapons and in the belief of American technological superiority over all other nations and particularly the Soviet Union. The Soviet leaders on the other hand reassured by the withdrawal of American armise from Europe by the lack of response to Bertrand Russell's suggestion that consent to an effedtive control of atomic weapons should be extracted from Russia if needed by war, andperhaps als o in the belief that the power of the atomic weapons has been exaggerated by Americans for propaganda purposes, took the gamble of dragging the negotions over at mic energy control until their own atomic weapons were developed, so that they cou,d negotiatie "from strength". Indirect symptoms suggest that Stalin really believed that atomic weapons will never decisvely affect the courseof a war and that the real apprehension of the Soviet government about the possible effect o nuclear warfare on the Soviet Union dates from the time from the Sop Soviet leaders witnessed themselves the thermonuclear we apons tests.

The American scientists followed with close attention the UN negotiations on atomic energy controls and were quite clear of the role of Soviet representatives in the endless dragging out and reluctance to give clear answers even to the simplest and most relevant questions. They were asare that the only phase of these negotiations which addressed itself to the real problems at hand and has led to substantial agreement between the representatives of West and of the Soviet Union was the discussion of technical feasibility of fontrols in the scientific expert committee. From the beginning they have hoped that if they will be everpermitted to discuss these ma tters and the general implications of the release of nuclear energy for the future of mankind with their Russian colleagues where they have no difficulty in arriving at a common appreciation of the facts and perhaps even at logical conclusions concerning the minimum necessary eparture from the established national policies,

TLS

needed to elimihate the danger of the mutul destruction in a nuclear war and to stop the inexorable progress of the nuclear arms race--a senseless accumulato ion of more and bigger weapons of masscestruction and more and faster methods o of their delivery everywhere in the world, with the only rational purpose that these weapons will never be used by either side.

Already in 1947 when the deadlock of UN negotiations have begun to reveal itself American scientists have made a weak tentative to contact their Russian colleagues through the intermediary of the Soviet ambassador. After some time they were told that the Russian scientists were "too busy" for discussing such matters. As a prominent Russian scientist said recently, during a visit to America, when this episodewas described to him , "It was true--we were too buxy trying to catch up with you."

The hope to open sometime discussions with scientists of all countries not excluding the communist ones on the full impliations of the "atomic age" for the future of all mankind has not died with this first attempt but survived through the years when the cold war became more and mor e violent It is incidentally a one-sided view to look at the problem entirely from a point of view of contacts between Western and Eastern scientists . The rationale is not that of a dialog between East and West but that of unifying the scientific opinion of all countries in a common esti mate of the dangers and a common concept of what science can do for mankind as a whole if the dangers of its destructive use are banished.

Mr. Hook starting with a number of very reasonable statements about the extent and meaning of the Soviet scientific achievements and proceeds from there by an interpretation of the delay of corresponding American achievements which is diametrically opposite to the truth opposite to correct. He concludes that this lag is due to insufficient political education of American scientists, while by a true reason and perhaps the main reason is the insufficient scientific education of American politicians.

This is of coufse not the best formulation of our fundamental weakness, but this is chosen here for the sake of antithesis to Hook's thesis. What is meant is not that the Eisenhower, Dulles, and Wilson and other representative individuals in our political life have not learned enough physics at school, but that they have not acquired either in school nor out of the atmosphere of American life the proper understanding for the importance of science for national strength in our time.

Mr. Hook sees evidence of poor political education of American scientists in their massive walkout from wartime laboratories after the end of the war, in their opposition to the May-Johnson bill which would have vested essential control of American atomic energy program in military hands, and the opposition of the General Advisory Committee of the AEC under Oppenheimers to the development of the Hydrogen bomb, and implicitly in their lack of enthusiasm for the rocket program, which in his opinion must have caued the delay in the launching of the American satellites. He says that the "sad fact is that "manyof our able scientists have abandoned weapons research and allied fields!"; and he believes that this was the result of their lack of understanding frm 1945 up until the current time of the danger of Soviet arms imperialism--as contrasted with the full understanding of the danger of Nazi arms power after 1939.

Political sophistication, the lack of which Mr. Hook deplores in America n scientists, and of which he feels himself possessed, consists not only in sharp understanding of the devious ways in which Soviet political machine tries to turn to its profit a l natural movements of discontent or good will

The reluctance American scientists in universities may have felt about a return to military work at the time when Teller published in the B his appeal "Back to the Laboratories" in May 1950 was sustained by the wave of investigations and purges which Senator McCarthy and his allies have unloosened against scientists in the following years. The affair of the Fort Monmouth was perhaps the most potent single event discouraging scientists from entering military research laboratories. It would be however quite incorrect to say that this reluctance has been the bottleneck which has slowed down the progress of American military research, in particular in the rocket and missile field. Rather, it was during this same period that many leading American physicists began to devote considerable part of their time to advising and doing research at Los Alamos and other atomic weapons laboratories. It was during the same time that at the initiative of university scientists military research laboratories have been created in association with many leading universities--the Lincoln Laboratories at MIT, the Control Systems Laboratories at the University of Illinois, the Porject Midway at the University of Chicago, and many others at Columbia, Princeton, Cal Tech, etc. add Livermore at the University of California Many university professors began sharing their time between their academic teaching research and work in these laboratories. All this development is and remains veiled in secrecy. But it may a statement may be ventured that whatever delays have occurred, for example in the development of the radar equipped network of rockets and more lately of missiles and satellites was caused above all by indecision and under the Louis Johnson and later under the Wilson regime in the Pentagon by budgetary cuts . Several teams in various laboratories were asking for years for a green light to go all out on the development of missiles and satellites. They had plenty of enthusiasm and enough scientific manpower. What was lacking was the green light and the funds from Washington. The resignation of Trevor Gardner because of government reluctance to give proper attention and

financiang to the missile program is well remembered. ; and so is the more recent testimony of General Gavin .

To sum up , the slowness in the development of missiles and satellites cannot be laid to the lack of political consciousness by American scientists. It is much more the result of lack of understanding by those in power (particularly since the victory of the conservative point of view in the 1952 elections) for the full implications of science for national survival.

The insufficient understanding of the role of science in the military technology and the desire to economize on these developments in the smug belief in America's automatic technological lead is one aspect of the more general and less easily curable weakness of our American political leadership. --and of the public opinion on which it depends. This is the lack of understanding of the extent to which science has transformed the traditional political concepts on which America's position in the world could be safely based in the past.