

RIVALS, BUT NO "RACE"

by *Albert Wohlstetter*

According to a principal element of post-Sputnik doctrine on the strategic "race," systematic overestimation of future adversary strategic forces is the driving engine of the arms spiral on our side: We invariably expect the Russian programs to be larger than they turn out to be; we compound this overestimate by "worst case" analysis, cautiously overdesigning our programs to meet a Russian threat greater even than the one we expect—only to find, when the Russian threat turns out to be less than expected, that we have irrevocably committed ourselves to new and higher levels of spending on strategic forces. So according to the received doctrine.

But not in reality. The first part of this article showed that after the brief period of the "missile gap," a theory of regular overestimation grew with the fact of underestimating the size of future Soviet offense forces. In annual presentations of programs and budgets to Congress by two Defense Secretaries, 51 predictions go beyond the observable to include expected changes in offense deployments that had not yet been visibly started. In general such extended predictions are most relevant for Americans' decisions

This is the second of two articles by Albert Wohlstetter. The first, "Is There A Strategic Arms Race?" appeared in FOREIGN POLICY 15. For the detailed data from which the charts and tables in the first article were derived, see the appendices to the longer version of the article published by the California Seminar on Arms Control and Foreign Policy under the title "Legends of the Strategic Arms Race, Part I: The Driving Engine." This article, as the first, is based on the forthcoming Competition or Race? Innovation and the Changing Size of Strategic Forces by Albert Wohlstetter, Fred Hoffman, David McGarvey, and Amoretta Hoerber. Comments on the first article, by Paul H. Nitze, by Joseph Alsop, and by Morton H. Halperin and Jeremy J. Stone, appear on pages 82-92.

about development and deployment, since these take many years to come into effect. Such predictions that go beyond observation moreover leave the most room for the exercise of judgment or prejudgment, and so room for any tendency to exaggerate or understate Soviet force plans. In 49 out of 51 cases the eventual Soviet deployment exceeded the mid-range of the Secretary's estimates. In 42 of the 51, it exceeded the Secretary's high.

Moreover, the underestimates were substantial. If one considers not the cumulative deployments predicted, but the expected change from what had already been observed, the difference between the reality and the estimates was very large indeed. The actual increase in missiles was, on the average, double the expected number or more.

But the trouble with received doctrine on strategic action and reaction lies not only in its factual error about regular overestimation. It has even more to do with the reasoning that presumes that overestimation means inevitably overreaction; that if one side, say the United States, expects a large increase in adversary capability, it will decide to meet or exceed that added capability. The iron law that is supposed to govern strategic action (For Every Action, There Is An Opposing Equal Or Greater-Than-Equal Reaction) is made in fact of plastic. Even if the United States had overestimated or merely correctly estimated the rapid rise in Soviet strategic forces, it might or might not have responded by rapidly increasing its own strategic forces. That would depend on whether the effort seemed worth the sacrifice of other goals. To take one major case, it was the growing substantial size and potential further expansion of Soviet offense forces that McNamara identified as the reason for *not* going ahead with a thick ballistic missile defense of American cities. Here one side anticipated major action by the other; and chose inaction.

And there are also cases where anticipating adversary inaction leads to action. So a

government that prefers a favorable force ratio compared to its adversary, but does not regard this as a good beyond price, might undertake programs to achieve it if the price is right—which it might be if the adversary (perhaps through fear of an arms race?) was expected not to offset the numerical advantage. (Opposing sides may not equally fear an arms race, as can be documented in the case of the British and the Germans in the 1930's.) This might in part explain the Russian decision to increase their missiles beyond the numbers deployed by the Americans.

But we have less speculative examples. A historic case where Americans plainly discounted future Russian capabilities and where that low estimate led to large-scale spending is the massive continental defense programs we undertook in the 1950's. These were based, among other things, on understatements of the future significance of adversary fusion and strategic rocket technologies. The initial influential studies assumed that our continental defenses would not have to cope with ICBM's before the late 1960's, and that fusion weapons had little or no strategic importance for either side. Fusion weapons were assumed to be strategically redundant (not merely morally questionable), since it was believed that (a) they were usable only against cities, (b) except for the very few largest cities, they exceeded in destructiveness what was needed for their demolition, and (c) any one of these large cities could be leveled in any case by a small number of fission weapons.

Those who were for large continental defense programs and against fusion weapons clearly premised their judgment on underestimates of the importance for an adversary offense of fusion and also of rocket technologies. However, the political-military significance of such technologies is complex and uncertain, and the difficulties are not partisan matters. It is an interesting fact that those who felt that deploying fusion weapons was important nonetheless shared some

of the same mistaken beliefs as to what their role was to be. They also believed that fusion technology meant essentially much bigger bombs. (In fact it made medium- and low-yield bombs smaller, lighter, and cheaper, and this in turn made it feasible to use them in missile and other systems more easily capable of surviving attack and penetrating defenses.) So far as strategic rockets were concerned, some initial and transient limitations in their physical performance, in particular their great inaccuracies, shaped some of the basic presuppositions about the alternatives for strategy and arms control that are still very widely held.

It is worth elaborating somewhat on these early expectations—as to the technical facts of rocketry and fusion—since they were the premises from which most men, even those of widely differing predispositions, derived quite durable judgments as to whether there are policy alternatives. The premises have eroded steadily over time, but the policy inferences drawn from them persist.

The Initial Debate . . .

The initial debate on fusion weapons inside the government talked of weapons with an explosive yield equal to 40 or 25 million tons (megatons) of chemical explosives. A traditional strategic target like a steel mill might be destroyed by a 40 megaton weapon if it were anywhere within a circle of 87 square miles; and brick houses not targeted would collapse within an area of 416 square miles around the point of detonation. "Like it or not," even its proponents were in the habit of saying, "the H-bomb is a city buster." No one, of course, for or against it, really "liked" it. And specifically no one liked what seemed to be its inevitable indiscriminate destructiveness.

Even if powerful first impressions about the implications of a technology were easier to change than they are, the initial inferences about targeting as well as collateral damage drawn from the debate on fusion weapons might not have altered with im-

provements in our understanding of fusion technology. For the inferences were soon reinforced by the apparent implications of the inaccuracy of strategic rockets. The U.S. strategic rocket program in the mid-1950's was made feasible by a drastic loosening of the requirements imposed for accuracy. The inaccuracies then permitted greatly exceeded those of manned bombers dropping gravity bombs. We expected median delivery errors in our ICBM's of three to five nautical miles, which would have meant that, out of a large number of bombs so aimed, half would have fallen outside of a circle of 28 to 80 square miles—and *this neglecting "gross errors."* The initial design for Polaris implied that half its shots would lie outside of a 50 square mile area. And at the end of the decade, while we were overestimating the initial Soviet ICBM deployment, we were still understating its initial accuracy. We assumed an 80 square mile median circle of error for the Soviets.

Even the first American and Soviet strategic rockets were more accurate than we had expected. It is clear now from public information that the area of the median circle of error for strategic rockets has long been measured in tenths of a square mile; it will, I believe, soon be measured in hundredths, and in the long run, in thousandths or less.

Nonetheless the first impressions of enormous inaccuracy and wholesale destructiveness most powerfully influenced our views as to where we have political choices and where we face a bare unalterable technical condition. We need now to rethink the basic technologies and the developments and the directions that they have taken since our first understanding of them. I believe our present conceptions are in great disarray as to what military alternatives are feasible, the political sense of these military alternatives for alliances, for the control of arms, and for the long-term interests of world order. Not the least affected by the transient technical context in which it was formed is the characteristic doctrine of the strategic

arms race that has flourished since Sputnik.

The "invariable overestimate," "worst case" dynamic is only one of three distinctive components of recent strategic arms race theory. Perhaps the most remarkable and uniquely new element of the post-Sputnik doctrine, distinguishing it from the arms race theories of the 1940's as well as those of the interwar period, was the idea that an exponential race could be avoided only by tying strategic forces to the destruction of population rather than to opposing military forces. The origins of this paradoxical view are visible in a study issued one month after Sputnik by the Naval Warfare Analysis Group, then at the Massachusetts Institute of Technology; and in its 1960 follow-up study. According to the 1957 study, the objective of strategic forces should be to destroy "the softest target system that will do the job of deterrence, *viz.*, at present population." Enemy population targets, according to the authors, are "a particularly easy, and possibly the only practical, form of targeting for long-range missiles." (And indeed they were, given the inaccuracies then anticipated.)

Deterrence in these documents meant not simply a second strike capability, as that concept was originally defined years before Sputnik and offensive missiles. It meant retaliation in a sense that made it inappropriate to direct strategic weapons at anything other than population. Moreover it enabled one to fix a definite ceiling on requirements:

Retaliatory (revenge) war force requirements: at most 1,000 megatons. Target: enemy population. Revenge against inanimate objects is senseless, hence, people are the target of retaliation. Urban concentration strongly reduces attack force requirements for decimation and complete social disorganization.¹

But, the study said, if one aimed strategic weapons at opposing strategic forces (typically it conceived only these two al-

¹ *Study 5 of the Naval Warfare Analysis Group, November 1957, p. 12.*

ternative targets: population or strategic forces), the *floor* under requirements would be at least 10,000 megatons. And the follow-up study suggested that there would be no ceiling. Attacks on enemy striking forces would "require practically unlimited forces and practically unattainable Intelligence information for their meaningful implementation; and they guarantee an unstable arms race by tying our own offensive force requirements to the enemy's." ² The only way out is to cut the tie to opposing enemy forces and to aim strategic weapons exclusively at populations.

That this link to the destruction of population rationalized an apparent inability of the initial strategic rockets to do anything else is suggested by the fact that for every other variety of military force the studies called for a policy of graduated deterrence based on "possession of a spectrum of nuclear weapons down to the lowest yield and/or improved conventional weapons." Postulate I of the study concerned massive retaliation. Postulate II, on graduated deterrence, had it that "either opponent can meet the application of limited destructive force with effectively equal or with greater force." Clearly Postulate II "ties" this extremely broad spectrum of American military force to the kind and size of opposing military forces. Such a connection, of course, is traditional. One might just as well have reasoned that (in parallel with Postulate I) if we bought conventional military forces to destroy adversary military forces, our adversary could always buy additional forces to offset our increased capability, and we in turn would have to buy more forces to offset these, and so on ad infinitum. Interwar arms race theories did presuppose an explosive connection between the decisions of two states to acquire arms, leading to just such a non-nuclear arms spiral. However, the theory had little relation to reality, and never before or after Sputnik did it lead stra-

² *Study 62-60 of the Naval Warfare Analysis Group, July and October 1960, p. 3.*

tegrists and opponents of arms races to the extraordinary suggestion that opposing theater forces should be aimed exclusively at villages rather than at each other.

The Naval Warfare Analysis studies were done by able operations analysts. Yet it is easy to identify parochial bureaucratic elements in their work. The expected shift in the pattern of warfare, according to Study 5, implied "a growing importance of the 'old-fashioned' services. The burden of supporting national policy falls again (or still) on ships and soldiers, which must be available in adequate strengths to implement Postulate II." However, in the aftermath of Sputnik, the support for population bombing as a way to avoid a strategic arms race came from a very wide range of persons. There were Army versions of the argument (that made an exception for Nike missiles) and versions in the Weapons Systems Evaluation Group of the Joint Chiefs. A National Planning Association study group presented essentially the same view in *1970 Without Arms Control* (1958). The group was headed by Col. Richard Leghorn, formerly an Air Force Development Planner, and included three senior members of RAND, W. C. Davidon (a Quaker physicist), Norman Cousins, John Loosbrock (editor of *Air Force*), and David Riesman. And the view continues to underlie a very wide range of opinion on arms races today.

Quality vs. Quantity

The third essential element in the post-Sputnik arms race doctrine is the peculiarly destabilizing role assigned to technological innovation. It is qualitative change especially that is supposed to set off a new round in the race, leading to new and higher force and budget levels. In a kind of reversal of the Hegelian dialectic, Quality, so to speak, Becomes Quantity. This idea is not quite as unique as the notion that targeting anything other than a fixed number of population centers would generate an arms race. However, in the post-Sputnik version, the two

are closely related. For it is innovation in weapons aimed at other weapons that is supposed to be peculiarly dangerous. This applies with particular force then to innovations in active defense, such as ABM, since unlike offense vehicles, these can *only* be aimed at incoming weapons, not at population.

In fact, actual American practice has always included strategic targeting of military forces, and it has never abandoned technical improvements in the ability to effectively destroy opposing military forces. According to the theory then, this practice should have generated exponential increases in arms, at least on the American side, if we were racing with ourselves in the guise of imaginary Russians. And on the Russian side too, unless they had adopted the policy of targeting only a small number of population centers, as used to be suggested in the mid-1960's. The results of this exponential race, according to the theory, should have been not only (a) an increase in U.S. strategic budgets, but also (b) a steady increase in the sheer indiscriminate destructiveness of our strategic weapons, (c) a decrease in our security, and (d) an increase, driven by a technology that has lost all relation to human purpose, in a tendency of our forces to get beyond political control.

Some variants of bureaucratic theories of the arms competition discount any tight interconnection between U.S. and Soviet weapons choices of the sort posited in the standard action-reaction theory; but do suggest exponential increases, at least on our side, as the result of an explosive intramural race among the services. In fact, the extreme variant is at the opposite pole from the standard action-reaction theory (even though the two are sometimes held by the same person simultaneously). At the extreme, the "race with ourselves" is taken to mean no connection at all between our weapons decisions and Russian behavior. According to Congressman Aspin, "The competition, always, in our Defense Department is never the Soviet Union. It is the offense vs. the

defense; it's the Army vs. the Navy. That's where the real competition is."³

There is no doubt about the great importance of bureaucratic factors in understanding decisions to develop, buy, and deploy military forces. However, the importance of bureaucratic factors does not imply an exponential—or in fact any—rise in strategic spending. Many other parts of the defense and nondefense bureaucracy compete for the budget and some are devoted to cutting it. Nothing in the fates decrees that advocates of increased rather than decreased strategic spending invariably or usually win that competition. Moreover, I know of no well-established part of bureaucratic theory that suggests hyperresponsiveness, or mad tossing about of funds, or systematically innovative behavior rather than sluggishness and resistance to change.

In any case, whatever the explanation offered for the strategic race, there is a prior question as to whether there has been a race to be explained. To justify the term "race," any side that is racing has at least to be rapidly increasing its strategic budgets and forces. Even if the increase does not proceed at an increasing rate, for the name "race" to make any sense at all, there would have to be at the very least an increasing trend. An examination of American strategic budgets and forces since the mid-1950's suggests that on the principal relevant measures the trend is down. And an examination of the net effect of qualitative innovation in the strategic forces over the same time period equally refutes the stereotype.

A Quantitative Spiral?

Total Explosive Energy And "Overkill": The total explosive energy that could be released by the strategic stockpile is a measure frequently used to compare U.S. and Soviet forces by conservative organizations, such as the American Security Council. It also

³ *Telecast on the Public Broadcasting Service, "Firing Line," May 26, 1974. Copyright Southern Educational Communications Association, transcript p. 7.*

appears in the popular vivid comparisons of the total explosive yield of all the bombs dropped in Korea (200,000 tons) or in World War II (5,000,000 tons) with the explosive yield (measured in tons of some non-nuclear chemical explosive such as TNT) of a single nuclear warhead, several of which might be carried in one vehicle today. However, the drawbacks of such a measure are clear and most obvious in the vivid compar-

“It implies that . . . what is wrong is not the killing of populations, but their overkilling.”

isons. A single bomb releasing five million tons of explosive energy (i.e., a five megaton weapon) is incapable of doing anything like the damage done worldwide from Japan and Burma to West Europe and Russia by the many tens of thousands of bombs exploded in World War II, even if the total energy yield were the same. In general, one large warhead with twice the energy yield of two smaller weapons, unlike them, cannot be used to attack two very widely separated targets.

Moreover it was understood at the dawn of the atomic age that, even though the Hiroshima bomb had roughly one thousand times the explosive yield of one of the largest World War II blockbusters, it would not do structural damage to an area one thousand times the size, but roughly one-tenth that. By comparison with the smaller bomb, some 90 percent of its energy would be “wasted” in “overhitting” or “overdestroying” or “overkilling” the nearby area.⁴ For that comparison then, not 1,000, but its two-thirds power, 100, is a roughly correct approximation for determining relative structural damage. And even in comparing the destructive effect of stocks of bombs that

⁴ For an early appreciation of this point, see, for example, P.M.S. Blackett, *The Political and Military Consequences of Atomic Energy* (London: Turnstile Press, 1948).

are less varied in yield, some such adjustment is essential.

However, it is not only conservative polemic that exploits the misleading measure of gross "megatonnage" of explosive energy. Some of the crudest polemical uses are by opponents of increases in military budgets. In talking of "overkill," they usually divide the total population of the world into the aggregate explosive energy in the stockpile to arrive at some such figure as 10 tons of TNT equivalent for every man, woman, and child in the world. Such a measure makes exactly the confusion that the original discussions of overhitting or overdestruction of the area near the target were designed to avoid. And it adds several other more potent confusions besides. It implies that the purpose of stocks of weapons is and should be exclusively to destroy population, that what is wrong is not the killing of populations, but their overkilling. It is not strictly related to hypotheses about a spiraling increase in total explosive yield, or still less a spiral in the damage that might be done. However, by suggesting that the stocks are now far too large, it makes plausible the notion that there has been a steady exponential increase. In fact, nuclear weapons are directed at any of a large variety of military targets, and there is no simple rule for deciding whether one has too many or too few. That is a problem we need not address here.⁵ The question we are asking is whether on this measure there has been an exponential increase.

The answer indicated in Figure 1 is "clearly not." After an initial sharp increase, the total explosive energy yield declined from a peak two-and-a-half times the 1972 figure. And 1972 was about at the level of 1955. While this aggregate includes, appro-

⁵ *I address it briefly in Pacem in Terris III, Vol. II, The Military Dimensions of Foreign Policy (eds.) Fred Warner Neal and Mary Kersey Harvey (Santa Barbara: Fund for the Republic, Inc., 1974). I favor a U.S.-Soviet reduction to equal lower totals. That is quite independent of the question as to whether the U.S. totals have increased exponentially or at all.*

Figure 1
Combined strategic offense and defense megatons
Years 1945-1972

Vertical index relative to 1972, 1972 = 1.0

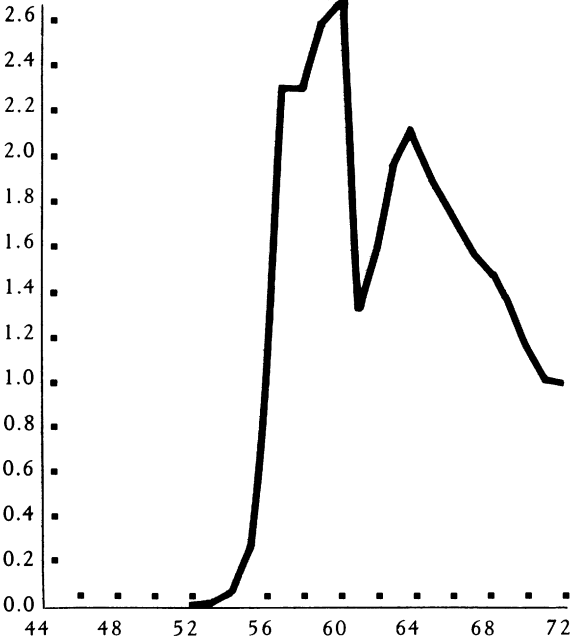


Figure 2
Combined strategic offense and defense warheads
Years 1945-1972

Vertical index relative to 1972, 1972 = 1.0

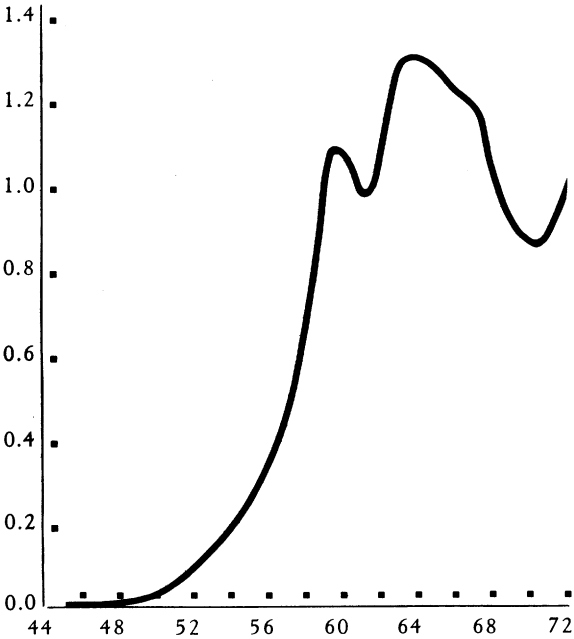


Figure 3
Number of strategic offense warheads
and their average yield
Years 1945-1972

Vertical index relative to 1972, 1972 = 1.0

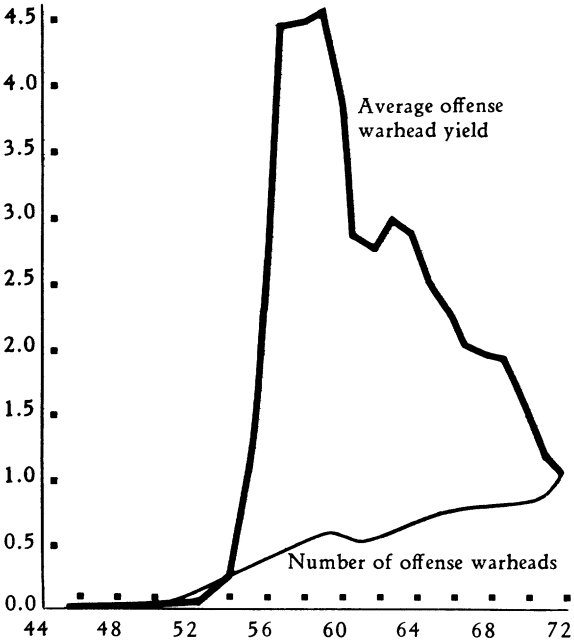


Figure 4
Strategic offense equivalent megatonnage
Years 1945-1972

Vertical index relative to 1972, 1972 = 1.0

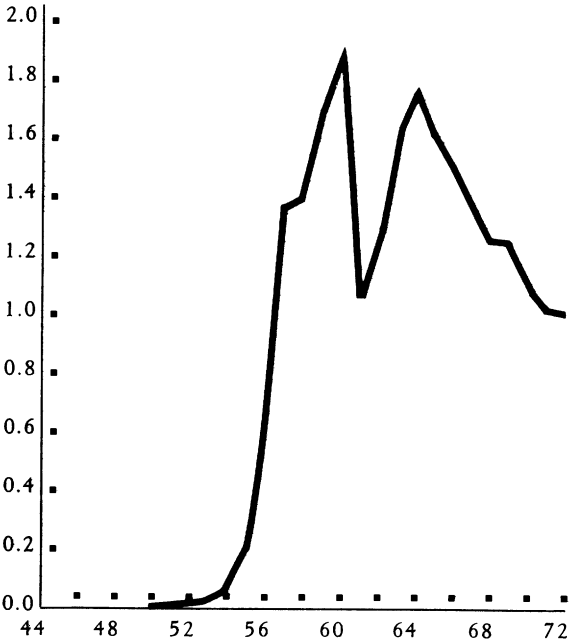


Figure 5
**Combined strategic offense and defense
obligational authority**
Fiscal years 1956-1974
Vertical axis in billions of dollars

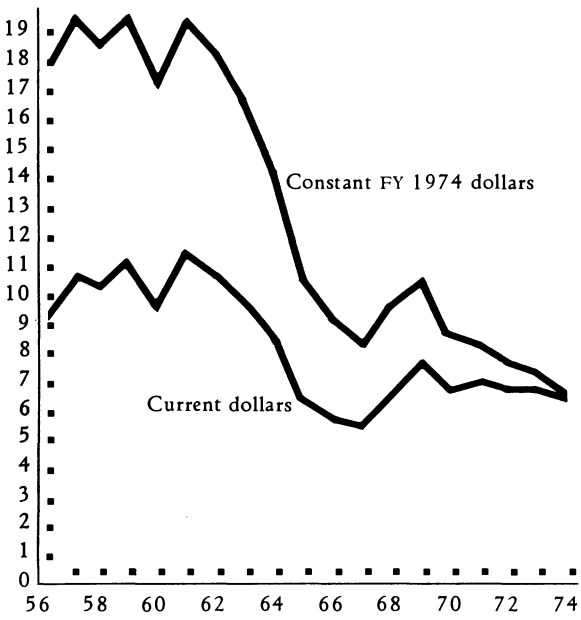
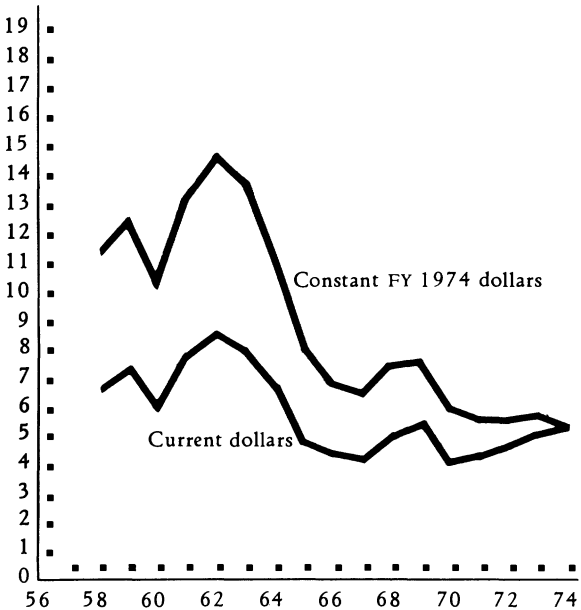


Figure 6
Strategic offense obligational authority
Fiscal years 1956-1974
Vertical axis in billions of dollars



priately for contemporary arms race theories, strategic defense as well as offense warheads, the decline is about the same for the aggregate explosive yield of the offense warheads alone.

The Number Of Strategic Warheads: At the opposite extreme from totting up the energy releasable by all strategic warheads is a measure that ignores the yield altogether and counts simply warheads. The smallest strategic defense warheads differ from the largest strategic offense warheads by many orders of magnitude, but even if we were to limit ourselves to strategic offense warheads, merely counting warheads while neglecting yield involves an heroic distortion. In fact, the largest offense nuclear warhead is roughly a thousand times the smallest offense nuclear warhead⁶—the same as the difference between the Hiroshima bomb and the largest non-nuclear blockbusters of World War II! Counting the largest and the smallest each as one—with evenhanded justice—would then be exactly like dismissing the first two nuclear weapons as of negligible importance since they increased the stocks of “blockbusters” by only a fraction of a percent.

While there is no adequate single common measure for so heterogeneous a collection of vehicles and weapons, clearly something better is possible than a simple count of warheads.⁷ That the latter is used so uncritically is one of the intellectual scandals of the current debate on SALT. Nonetheless one may ask whether the number of strategic offense and defense warheads has spiraled.

⁶ *Even this fact (and not merely its implications for the incomparability of the elements in the aggregate of offense warheads) is not always recognized. It is sometimes said that U.S. strategic warheads in general are in the megaton range. See, for example, Arms Control: Readings from Scientific American (San Francisco: W.H. Freeman and Co., 1973), p. 179.*

⁷ *One argument for simply counting warheads is the notion that the dangers of an accidental detonation increase linearly with that number. However, this is plainly false. The probability of an accidental, unauthorized detonation depends among other things on arrangements for weapons safety and for the centralization of control and command over these weapons.*

And as Figure 2 shows, for this disparate aggregate, the answer is that it has not. It peaked in 1964 at roughly 30 percent higher than in 1972 which was about the 1960 level.⁸

The sense of post-Sputnik arms race doctrine with its central strictures against all weapons aimed at weapons and therefore against active defense as particularly destabilizing, plainly calls for including the Spartan, Sprint, Nike-Hercules, Falcon, and all other defense warheads in the total. However, given the opportunism of the current debate, it is hardly surprising that, when convenient, the distortion involved in counting warheads is compounded by excluding the supposedly most destabilizing—the defense warheads. In fact, one great oddity is that in spite of all the fire leveled at active defense, the debaters hardly notice that U.S. defense warheads, interceptor aircraft, surface-to-air, and air-to-air missiles have decreased drastically. The number of offense warheads has increased over time, but their average yield has decreased even more. From 1958-1960 to 1972 they increased by roughly half. But their average yield was divided by four-and-one-half (Figure 3). It is essential then to consider some measure in between counting megatons and counting warheads. We turn now to a measurement widely used for that purpose in the defense and arms control technical community.

Measures Of Relative Destructive Area ("EMT"): No single number adequately measures the destructive power of military weapons, still less other important attributes of military forces—their susceptibility to attack, their safety from "accidental" or mistaken or unauthorized use, their political controllability, their capability for discriminating between nonmilitary and military targets, and between friend and foe, their flexibility in a variety of political-military

⁸ The curves on numbers of warheads (Figure 2 and bottom of Figure 3) are smoothed in order to approximate the calculated data points, but closely enough so that deviations from the trends discussed are not significant.

contingencies, etc. Nonetheless, as we have said, it is not hard to do better than counting warheads or counting megatons, and for comparing highly varied stocks of weapons at two different times or in two different countries, an index known (misleadingly) as "equivalent megatonnage" (EMT) has come into widespread technical use. It counts the number of weapons and their yields but makes a rough adjustment for the relative waste of explosive energy by the larger weapons through overconcentration near the target. Taking a one-megaton weapon as standard, it measures any given stock in terms of the number of such one-megaton weapons that under a variety of relevant conditions would do structural damage over an equal area.⁹

EMT, like all other indexes, has its limitations, but it captures some essentials missed in simply adding unadjusted megatons or warheads. Figure 4 shows a dramatic decrease since 1960 in the relative destructiveness, so measured, of the U.S. strategic force. At its peak it was nearly double the 1972 figure; and 1972 was roughly at the 1956 level! In any case, no spiral. This measure is relevant among other things to test the arms race argument that the uncontrolled destructiveness of U.S. strategic forces has increased. It has not. The area that might sustain structural damage has been halved and there has been a similar decline in potential fallout.

Offense And Defense Budgets

I could reinforce these results using curves on further physical measures. Instead I turn now to measures of the resources used in deploying a strategic force. Since these resources must be diverted from important alternative civilian uses, such measures are properly at the heart of the defense debate. In any case, they are central to arms race doctrines. Expenditures on strategic forces are most frequently identified as the vari-

⁹ The EMT of a weapon is computed by raising its yield, expressed in megatons, to the two-thirds power.

able that is supposed to be accelerating.

Figure 5 shows the total strategic budget as measured in the Defense Department Program I,¹⁰ extended as far back in time—to FY 1956—as could be done using available unpublished computer runs. The top curve which corrects for inflation in military pay, materiel, retirement benefits, and the like, is the relevant one. It shows that the strategic budget in 1974 dollars declined from the very high levels of the period 1956-1961, which included three peak years well over \$19 billion, to a 1974 level of \$6.77 billion. In short, in real terms the strategic budget was nearly three times as high at the end of the Eisenhower Administration as in 1974! This scarcely looks like an exponential increase in strategic budgets. Rather more like an exponential decrease. For the 13 years from 1961 to 1974 the average rate of decline was about 8 percent per year.

How is it possible for the constantly expanding literature on ever-accelerating strategic budgets to ignore this increasing divergence between doctrine and reality?

First, exponents using the doctrine as a weapon in budget battles, handle rather carelessly the familiar distinction between real and inflated dollar costs. This can hide somewhat the drastic extent of the decline, but not the decline itself. Even in current, depreciating dollars the budget dropped from generally high levels in the 1950's and a peak of \$11.5 billion in 1961 to \$6.77 billion in 1974.

Second, the curves show minor local peaks and dips. Men concentrating on the immediate budget fight may easily take an ant's eye view. Looking forward from the bottom of a shallow local dip, the future looks all uphill. This opportune but myopic focus has tended to obscure the very trends that any arms race doctrine would have to confront. Such doctrines after all do not pretend to be concerned only with the brief

¹⁰ *Program I* refers to *Strategic Forces*; *Program II* refers to *General Purpose Forces*. See below for what costs are included.

rise, say, from 1960 to 1961. An intense focus on the current year's budget battle also leads to a related confusion: comparing the new budget request not with last year's request, but with the actual amount approved by Congress in the prior year—which can be considerably less. For example, for the defense budget as a whole, the total obligational authority approved in 1973 was \$3.6 billion less and, in 1972, \$4.1 billion less than the amount requested. For the FY 1974 strategic program the net difference between the requested and total obligational authority appears to be about \$.5 billion.

Third, the drastic fall in strategic budgets measured in Program I may be partially obscured by adding in a rising but quite arbitrary "overhead" figure.¹¹ The program budgets for strategic or for general purpose forces aim to include all the costs of equipment, materiel, and personnel that can be directly attributed to the program mission, including all support costs that "follow directly from the number of combat units."¹² Overhead allocations, whatever their accounting uses, are by definition arbitrary, and those now current have little or no causal relation to past or future reductions in the number of strategic combat vehicles. These arbitrarily allocated costs have tended to remain the same or to rise even though the strategic forces and their direct costs have been greatly reduced.

The formula that the Brookings Institution uses when dealing with past or current budgets¹³ would assign to the strategic forces an amount of overhead equal to less than half their direct costs in the late 1950's, and over one-and-a-half times their direct costs in 1974. Meanwhile, direct costs of general purpose forces have varied in size from less

¹¹ See, for example, "The Advocates" WETA-TV, Washington, D.C., February 14, 1974.

¹² Martin Binkin, "Support Costs in the Defense Budget" (Washington, D.C.: Brookings Institution Staff Paper, 1972), pp. 45-46.

¹³ The Brookings Institution has a second method for estimating the effects of future reductions in the strategic combat forces.

than one-and-two-thirds to nearly five times the direct costs of the strategic forces, and the formula, year after year, splits the Intelligence and Communications budgets evenly between them. Of course, it has always been clear that some of these "overhead" costs may vary inversely with direct costs. Take Intelligence for example. Large SALT (or unilateral) reductions might call for greatly increased national means of monitoring variations in adversary forces, since marginal absolute changes make a larger proportional difference in small forces. (Dr. Wiesner in the past has suggested that inspection might have to double if the forces were halved, and so on linearly.) But then one should expect future cuts in the direct costs of strategic forces to be partly offset by increases in Intelligence costs.

If one considers not merely what causes changes in "overhead," but also what the effects are of increases in overhead on an adversary, it is hard to see how these programs, many of which could well be classified under Human Resources or Social Welfare, would strike terror in the heart of an enemy. For example, CHAMPUS (Civilian Health and Medical Program of the Uniformed Services) includes such items as medical care for retirees, their dependents, and survivors. A drastic cut in the number of strategic combat vehicles would hardly decrease these costs and their increase should hardly seem menacing to the Soviet Union.

Nonetheless, even if these arbitrary costs are added on, they can only partially obscure the drastic decline. From 1962 to 1974, using one Brookings formula, there is a decline of about \$12 billion. Using Brookings' second method, the decline would be \$15.5 billion from a peak nearly double that of the 1974 budget.

Fourth, in spite of the fact that arms race theorists take strategic defense along with counterforce as the villain in the piece and the principal force driving the race, they sometimes look for exponential increases in strategic budgets that cover only offense and

allow for no compensating decreases in strategic defense. However, in 1962 the budget for offense taken alone was nearly three times its 1974 level.¹⁴

Fifth, I suspect the major reason for failure to observe the decline is that public debate usually concentrates intensely on the initial decision to buy and deploy a new system; much less on the operation and maintenance of the system once in; and hardly at all on its phasing out. In particular, the present exponents of arms race doctrines have had their gaze focused on the introduction of new systems—in line with their dominant preoccupation with innovation. As advocates they have been very much in on the beginnings, in favor of the new systems in the 1950's and generally against them in the 1960's. But the phasing out seems to escape their attention.

Systems starting from zero or near it are likely to grow very rapidly in the initial phases; they can scarcely go down. It is easy apparently to slip into the belief that there has been an "across-the-board growth of our own strategic forces."¹⁵ However, an examination of the components of the strategic budget and an analysis of the entry into the force and the exit of various combat vehicles suggests the broad solution to the puzzle as to how this popular impressionistic doctrine can fit the facts so poorly.

U.S. strategic forces have not grown "across-the-board." On the contrary, as new systems were brought in, many others, including some very expensive ones, were taken out. At the end of FY 1956, for example,

¹⁴*Arms race theorists, faced recently with the divergence of strategic budgets from their theory of how they should behave, have suggested that the decline in the total strategic budget since it includes defensive forces merely displays the benefit of SALT I, which limited ABM. But the May 1972 agreements could hardly have affected anything before FY 1973, and the strategic defenses declined drastically many years before that. See, for example, "The Advocates" WETA-TV telecast cited above.*

¹⁵ Nancy Lipton and L. S. Rodberg, "The Missile Race—The Contest with Ourselves," in *The Pentagon Watchers* (New York: Doubleday and Co., 1970), p. 301.

the strategic force included nearly 1,500 B-47 and RB-47 medium bombers, some 270 B-36 and RB-36 heavy bombers, a remnant of the B-50's and B-29's, and nearly 850 KC 97 and KC 29 tanker aircraft, all of which have since made their exit; along with or preceded by a drastic reduction in overseas strategic operating bases and a multibillion dollar cut in overseas stocks for strategic forces. Between 1956 and the late 1960's the B-58 supersonic bomber, the Snark intercontinental cruise missile, the Atlas ICBM, and the Titan I ICBM have come and gone. So also has the Bomarc area defense missile, and most of the Nike-Hercules and fighter interceptors. In fact, air defense vehicles, promoted so vigorously in the 1950's by many who oppose them today as destabilizing, show an exponential decline from a peak of over 8,000 in 1959 to a force less than one-seventh as large in 1972; and to less than that now.

There is an amusing paradox, intelligible only in political debating terms, about the one-eyed vision displayed by exponents of arms race doctrines. On the one hand they fail to observe the increasingly obvious fact that in spite of their theory of invariable American overestimation of the size of Russian strategic forces, these forces have for many years systematically exceeded our expectation. Their one good eye in this case is focused on any momentary pause in the continuing deployment and expansion of existing strategic weapons systems. They turn a blind eye when the Russians start new systems. They see the Russians stopping; seldom starting. On the other hand, when it comes to U.S. strategic forces, they can barely preserve their belief that the American strategic budget is rising at an accelerating rate by fixing their gaze narrowly on the phasing in of new systems or their continuance and by neglecting the phasing out of the old. For the Americans, it seems, they notice the starts, not the stops.

However one explains the failure of arms race theorists to note the deviation of reality

from their theory, it is quite plain that reality has diverged massively. Not only in the facts of *underestimation* that destroy a principal element of the supposed dynamics of the arms race, but also in the plain fact that the United States has not been running a quantitative strategic race.

It would be possible to present similar results for many other measures: for example, while strategic defense vehicles have declined for a decade and a half from a peak more than *seven* times their present number, offense vehicles have remained roughly the same for many years. The total of strategic vehicles therefore has gone down. The point should be very clear. There is no serious evidence of a quantitative strategic spiral.

That's quite a different point from saying that as a result of these declines, we are uniformly worse off. While I have differed with many specific development and deployment decisions, on the whole my view is that the net effect of changes over this long period, from the mid-1950's through the 1960's to the present time, has been an improvement in our force in key respects. *My view is indeed the opposite of the commonplace about the exponential arms race which has it that as we have spent more and more on our strategic forces, our security has steadily declined.* To evaluate the commonplace we need to consider the nature of the major qualitative innovations in strategic forces and their net effect.

The Net Effect Of Qualitative Change

Theories of the quantitative strategic race are an extraordinary muddle of errors and self-deceptions. Yet notions about "qualitative races" may be even worse off. In fact the Secretary of State recently expressed a longing for a "conceptual breakthrough" that would bring our understanding of qualitative races up to the present standard on the quantitative strategic race. Heaven forbid! The modesty of this desire, however, may measure the current confusion about qualitative competition.

Though discussion is far from rigorous, the kinds of changes usually thought of as "qualitative" are alterations in some relevant unit performance characteristic. The most obvious historic example is the 1,000-fold increase in the average unit explosive yield accomplished by the first A-bombs. A second almost equally famous example is the introduction of the H-bomb in the 1950's which, as originally envisaged, was expected to multiply the yield of a single A-bomb again 1,000-fold. Another equally crucial case is the increase in the average speed of a strategic vehicle from about 500 to 13,000 miles per hour, made possible by the development of intercontinental rockets. Other unit performance characteristics affected by innovation have been mentioned earlier—blast resistance, concealability, accuracy, reliability, and controllability, or resistance to "accidental" or unauthorized use.

Some technical changes, it seems obvious, might worsen the position of everybody. Indeed, many now think that not rare but typical even of civilian technology, which is increasingly assigned all the hyperbolic traits recently attributed by the Secretary of State to military technology: it has "developed a momentum of its own," is "at odds with the human capacity to comprehend it," is, in brief, "out of control." Shades of Friedrich Juenger. Or Jacques Ellul who holds: "Technique itself . . . selects among the means to be employed. The human being is no longer in any sense the agent of choice," and "everything which is technique is necessarily used as soon as it is available, without distinction of good or evil. This is the principal law of our age."¹⁶ The use of the A-bomb for Ellul only illustrates this law and is a symbol of "technical evolution" in general.

For environmentalists today, as for Juenger, a civilian technology out of control is the source more typically for polluting than humanizing the environment. We owe the

¹⁶ *The Technological Society* (New York: Vintage Books, 1964), pp. 80, 99.

environmental movement a debt for stressing that it is important in choosing among technologies to take into careful account the indirect, long-term, and public costs as well as the direct, immediate, and private costs of technical change. It has unfortunately also encouraged the revival of a more general Luddite view of technology as a threat to us all. The Luddite view moreover is particularly tempting when it comes to military technology. Most of us have little affection for weapons; and weapons improvements are likely to arouse a good deal less enthusiasm than technical advances in general. It is easy to believe that such "improvements" might make things worse all around.

However, just as in the civilian case one can only choose *among* technologies and it is highly unlikely that existing technologies are ideal, so also in the military case it is extremely implausible that current technologies are optimal, that they fit our political purposes beyond any possibility of improvement. We have to choose and we do. But the conditions of thoughtful choice are only obscured by the immoderate rhetoric, characteristic of Ellul, and also typical of the arms debate in the post-Sputnik era. So Lipton and Rodberg talk of the "mystique of technological progress within the defense establishment, where feasibility is equated with obligation, where if we can build it, we must."¹⁷ A purple passage of that sort is expressive. But what is its meaning? It has no plain application to the real world in which a very long list of development projects were cancelled after much spending, but before deployment.¹⁸ And many more development ideas were stillborn before any

¹⁷ *Op. cit.*, p. 302. Cf. Richard Barnet, "The National Security Bureaucracy and Military Intervention," delivered at Adlai Stevenson Institute, June 3, 1968, p. 27.

¹⁸ Nuclear propelled aircraft, started in 1951 and cancelled 10 years later, the XB-70 bomber started in 1958 and cancelled in 1967, the Hard Rock Silo project, started in 1968 and cancelled in 1970, the SCAD Armed Decoys begun in 1968 and cancelled in 1973, the Navajo ramjet intercontinental missile begun in 1954, cancelled in 1957, the Rascal, the Skybolt, the mobile medium range ballistic missile, Regulus II, the Manned Orbiting Lab, and so on.

substantial money had been spent in their pursuit.

Moreover, it is clear that qualitative changes need not affect both sides badly. Some changes might benefit one side primarily (as radar favored the British more than the Germans in World War II). Still others might conceivably help both, since the two sides have some objectives in common. So, for example, fail-safe techniques that prevent a war from starting by mistake through a failure of communication or a false alarm, or Permissive Action Links that prevent local arming of weapons without a release from a remote responsible command center, and modes of protection that make it possible to ride out an attack and depend less on hair-trigger response. Neither side would like to see a nuclear war start by "accident" or through some unauthorized act.

The problem of judging the effect of a specific qualitative change in key performance parameters is complicated by the fact that it may be ambiguous. It may serve the interests of just one adversary in some particular respect and in another respect the interests of both. For example, improvements in reconnaissance may permit more precise location and destruction of a target, but also may reduce collateral damage and serve as a key national means of verifying that alterations in an adversary's force are no more menacing than is permitted by an arms treaty. The SALT agreements would be infeasible without precise national means of surveillance other than ground inspection. No case-by-case analysis of qualitative changes since the mid-1950's can be given. However, it is unnecessary for the purpose of evaluating the Luddite stereotype in the contemporary debate. According to that stereotype, major innovations (1) lead to new and higher levels of strategic expenditure, (2) make strategic forces more destructive, (3) make them less secure, and (4) make them harder to control politically. To test this familiar view, it is important to look broadly at the net outcome of such major technological in-

novations as the development of fusion weapons and strategic rocketry.

Before forming some judgment on this subject, it may provide perspective to observe that the view of innovation as generating an unstable arms race, though widespread in recent times, is by no means universal. One of the few serious studies of arms races, that by Samuel P. Huntington,¹⁹ held that military innovation was fundamentally benign, among other reasons because it enabled the redeployment rather than the increase of arms budgets. Moreover, since it did not increase the share of national resources devoted to defense, it did not produce the strains leading to war, but in fact made war less likely.

Huntington's hypothesis about the effect of technological change, though it runs counter to the present fashion, is by no means implausible. A qualitative improvement has to do with some relevant performance characteristics of a weapon. Painting bombs blue, for example, would not generally qualify as an improvement. Increasing the explosive yield for a given weight or the accuracy of delivery would. Such changes mean that effectiveness per unit or per dollar is increased and this implies in turn that a given task might be done with fewer units or at less expense.

To meet an adverse change in a potential enemy's force, then, a government has the alternative, through qualitative change, to redeploy resources, just as Huntington asserts, rather than simply to multiply them. He also points out that a self-imposed or a treaty constraint on improving qualitative performance may impel a simple multiplication of units—that is, it may generate a quantitative race. Moreover, though it is possible that opposing governments may blindly introduce changes that worsen the position of both sides, and though it is surely

¹⁹ Samuel P. Huntington, "Arms Races: Prerequisites and Results," *Public Policy*, Vol. 8 (eds.) Carl J. Friedrich and Seymour E. Harris (Cambridge: Harvard University Press, 1958).

true that governments make a lot of bad choices, they have plenty of incentives for looking beyond the immediate consequences of a procurement decision. And not all of their choices have been grossly wrong. It is not hard to dig up governmental analyses, good and bad, that look well beyond the next immediate step.

Conventional arms race theory presupposes a totally mechanical or instinctual behavior, that reacts only to the immediate move, never looking forward. But it is by no means clear that governments are as fatally concentrated on the immediate as arms race theorists debating the current budget. Both we and the Russians introduced (in good part independently) the revolutionary technologies of rocketry and fusion weapons. But we made adaptations in our force that exploited these technologies precisely to avoid the kind of deterioration the dogma suggests is automatic.

The main methods worked out in the early 1950's for protecting the strategic force based in the United States for the rest of the decade depended on tactical warning and a rapid, safely repeatable response by our force that did not commit it to war on the basis of substantially uncertain warning. These methods could work reasonably well, so long as the speed of attacking vehicles was that typical of manned aircraft. But it soon became clear that strategic rockets were likely to be a feasible operational component of strategic forces in the 1960's.

Rockets, because of their speed, might, in current jargon, have been described as "intrinsically destabilizing." However, no single performance characteristic taken in isolation, whether speed or accuracy or whatever, can be so established. If one had believed that speed was intrinsically destabilizing, one might conceivably have tried to get an agreement banning rockets altogether; or tried to increase their travel time by getting agreements to use extreme lofted trajectories; or—still more far-fetched—an agreement to orbit them several times before landing; or

(as in the 1958 Surprise Attack Conference) to construct an elaborate international warning system shared with adversaries in order to preserve the possibility of timely, secure response. Instead of trying simply to stop or slow down technology, the tack taken to maintain an improved second strike capability was to make unilateral adaptations that exploited both the initial limitations of the new rockets, specifically their great inaccuracy, and also their substantial advantages for defense penetration and for developing new, cheaper, and better modes of protection against attack, including mobility. Useful adaptations of the new techniques were feasible, even though our understanding of them was only partial and uncertain. Our adjustments to them did not have to be made all at once. They were made incrementally as various pitfalls and opportunities presented by these techniques became plainer.

In short, in spite of the recent as well as the age-old romantic antagonism to technology and the belief expressed by such critics of technology as Jacques Ellul, we are not slaves to technique. We can and do make technical choices, and in doing so sometimes improve matters. The alternative is an indiscriminate hostility to innovation per se, but that rests on the implicit assumption that the point at which we have arrived cannot possibly be improved—a rather odd view for the critics of technology to hold, who otherwise stress the arbitrary and irrational process by which past decisions on development have been made. In effect, an antagonism to all innovation amounts to a sentimental attachment to older technology rather than a hostility to technique in general.

A study of the major changes in technologies from the 1950's to the present and their effects on the strategic force supports the view that whatever the false starts and mistakes in detail, on the whole the outcome was exactly the reverse of the stereotype in the four respects listed on page 74.

Much of this is implicit in the analysis of quantitative changes already offered. So I can be brief. First, strategic spending did not rise to new levels. From the late-1950's it fell almost by two-thirds. Second, the relative destructiveness of our strategic forces as measured by EMT declined. Moreover, in precise contradiction to the standard view, this decline responded in good part to the increased size and effectiveness of actual and anticipated Soviet active defenses. On the whole, the shifts in the American force from gravity bombs to air-to-surface missiles carried on strategic aircraft and to ICBM's and SLBM's themselves were in the first instance basically a response to the formidable growth of Russian air defenses. But these as well as later developments meant a drastic reduction in total and average explosive yield and in EMT. Third, through such devices as placing rockets on submarines moving continuously underwater or in highly blast-resistant complex silos, the strategic forces became less vulnerable than they had been in the 1950's—with a resultant increase in stability. In the mid-1950's our strategic forces were concentrated at a few points, were soft, slow to respond, inadequately warned, and inadequately protected by active defense.²⁰ The Soviet forces were even more vulnerable, and remained so much longer, but greatly improved in this respect in the mid-1960's. Fourth, the controllability of the force was improved by the very methods of protection adopted, which made hair-trigger response unnecessary; also by a variety of fail-safe devices and arrangements permitting positive control, and by improving the protection of the command and control arrangements themselves.

Finally, many of the measures that so improved the strategic force were adopted

²⁰ For a contemporary analysis of the vulnerability of strategic forces in 1956, see, for example, Wohlstetter, Hoffman, Rowen: *Protecting U.S. Power to Strike Back in the 1950's and 1960's*, RAND, R-290, September 1956, pp. 30, 41. For earlier analyses by the same authors see *The Selection of Strategic Bases*, R-244S, April 1953 and *The Selection and Use of Strategic Air Base Systems*, R-266, March 1954.

self-consciously as alternatives to simply multiplying the force and increasing budgets. They did not undertake the hopeless task of stopping qualitative change. Rather, they adapted qualitative change roughly to our purposes, not all of which are incompatible with those of potential adversaries.

Is There A Strategic Arms Race?

The post-Sputnik doctrine of the strategic race is clearly mistaken in all its principal tenets: the dynamics of overestimation (as outlined in Part One of this essay), the supposed accelerating increase in strategic spending and force levels, the steady rise in indiscriminate destructiveness, the decreased security of the force and the increased likelihood of war, the supposed movement of technology beyond the means of political control. In the sense that the doctrine claims, the United States plainly has not been racing.

But isn't there in *some* sense a "strategic" race? Obviously, depending on the sense. As Humpty Dumpty said, if you pay a word enough, it can mean anything you want it to mean. There is surely a military competition between the Soviet Union and the United States in the strategic field. And it is one related to the partially, but sometimes intensely opposed aims of the two governments in many parts of the world. Strategic forces are the ultimate back-up for alliance commitments.

However, that Soviet-American competition has been quite compatible with a rather steady rise in Soviet strategic spending—roughly in proportion to the growth in their GNP—during a very extended period when U.S. budgets rose, reached a plateau by the mid-1950's, and then declined by a factor of nearly three. A "race" in the ordinary sense involves a fast advance by the contestants. It is possible by ironic extension to talk of a turtle race. Or a race between a tortoise and a hare. And even a race in which both participants run backwards. But it is surely stretching it to talk of a "race"

between parties moving in quite different directions. A competition perhaps of some complex and subtle sort, but hardly a race.

The trouble with most arms race theories has been that they start by assuming an accelerating competition and then look about for some mechanism that might conceivably explain it—a simple pair of differential equations with an exponential solution (as in Richardson), worst case dynamics, explosive interservice rivalries, etc. It would be better to start, however, with the actual gross behavior of the parties in the competition. Then a good many factors, each of which has enjoyed exclusive favor in various models, may be found indeed to have a limited role (but frequently a role quite opposite to that usually attributed—as in the case of technological change, which at key times may substitute for quantitative increase).

The gross shape of the U.S. curve of strategic spending, if extended back to 1945, would show a sharp drop after World War II, a surprisingly low level during the late 1940's when "atomic diplomacy" was supposed to have been in full sway, a rapid rise after Korea to a high plateau in the mid- and late-1950's, then another sharp decline beginning at the start of the 1960's. These gross changes in American, and the simultaneous quite different changes in Soviet strategic spending cannot be understood in terms of a closed cycle of tightly coupled interaction between U.S. and Soviet processes of decision to acquire weapons—as is assumed in the usual action-reaction theory. Still less can it be explained in terms of a closed cycle of competition among the services, though bureaucratic factors as well as opposing weapons deployments play a role.

The gross changes in American strategic forces have plainly been affected by political events outside the weapons acquisition process. For example, in the 1940's, the slow cumulative change starting well before the end of World War II in American perceptions, right or wrong, as to Soviet will-

ingness to use implicit or explicit threats of force to encroach on the independence of neighbors; a growing recognition that the Soviets were not very interested in international ownership and control of all "dangerous" atomic energy activities, and so on. And in the 1950's, the gradual recognition, on the basis of actual experience, of the rigorous limitations of strategic (or any other) nuclear weapons as a substitute for classical military force (which changed the relative priorities of general purpose and strategic forces), the cumulative recognition of the limits of strategic defense, given the near term prospective state of the art, and improved technologies and better understanding of the requirements for protecting strategic offense forces. I believe the listed cumulative changes in the late 1940's are some of the things that brought about the reversal of direction after Korea and a sharp increase; and the listed changes in the 1950's are some of those that led to the decline in strategic spending in the 1960's. All that is another story—longer and more complex. However, the current doctrines of an accelerating arms race have little relevance for illuminating this complex competition and in their apocalyptic and millennial character they hinder rather than help thoughtful national choice or agreement with adversaries.

Finally, some technologies reduce the range of political choice; some increase it. If our concern about technology getting beyond political control is genuine rather than rhetorical, then we should actively encourage the development of techniques that increase the possibilities of political control. There will be a continuing need for the exercise of thought to make strategic forces secure and discriminatingly responsive to our aims, and to do this as economically as we can. Agreements with adversaries can play a useful role, but they cannot replace national choice. And neither the agreements nor the national choices are aided by the sort of hysteria implicit in theories of a strategic race always on the point of exploding.

Paul H. Nitze:

I believe that Wohlstetter would agree that another and quite different example would further illuminate the complexity of the actual action and reaction relationship in comparison with the usual oversimplified stereotypes. I have in mind U.S. estimates, year by year, of future Soviet ABM deployments. During the early 1960's, U.S. estimates of future Soviet ABM deployments greatly exceeded what later turned out to be the actual deployments at those future dates. It is my recollection that at one time it was estimated that the Soviets would, in the future, deploy some 2,000 long-range exoatmospheric ABM interceptors, and, in addition, some 6,000 to 8,000 short-range endoatmospheric ABM interceptors. As it turned out, they have to date deployed less than 100 exoatmospheric interceptors and no endoatmospheric interceptors with a specific and identifiable ABM role.

One of the reasons why the United States decided to proceed with a large number of MIRVed RV's on the Poseidon system and to equip the Minuteman III with MIRV's and penetration aids, was to assure penetration against the estimated Soviet ABM defenses in the relevant time period. The high U.S. estimates of the early 1960's were not, however, without justification. The Soviets had originally designed their Griffon system to be dual purpose; it was to have had the capability of intercepting both aircraft and missile re-entry vehicles. The Griffon system was, in fact, tested in both modes; movies of these tests appeared on Soviet television. Subsequently the Soviets decided that this type of system would not be effective against the large number of MIRVed warheads deliverable by the Poseidon system or against the pen aids developed for the Minuteman III. They therefore concentrated on the aircraft capability of such systems and not their ABM capability. They deployed the SA-5 system in a number which approximated the earlier

U.S. estimates. They did not deploy an endoatmospheric interceptor ABM system which, using the existing Soviet technology, would also have been relatively ineffective against the new U.S. systems.

This example would appear to support the thesis that expectation of deployments by one side, on the one hand, can lead to offsetting deployments by the other side (U.S. MIRV's and pen aids offsetting expected Soviet ABM's); but, on the other hand, can lead to the cancellation of planned deployments which the other side's deployments promise to make ineffective.

Joseph Alsop:

What kind of chance of national destruction is it proper to take while refusing to pay the bill for an expensive insurance policy? Is a 5 percent chance allowable? Or a 15 percent chance? Or a 30 percent chance?

This is now the hidden central issue in certain kinds of choices that have to be made by our foreign and defense policy-makers. The issue is hidden—it has never been faced or discussed—for a simple enough reason. In our lifetimes, the historical process has entered a wholly new phase; yet this has hardly been noticed. In the past, national destruction resulting from just one erroneous basic choice was not possible or imaginable, at any rate for a major power. Today the opposite is true, alas, although few professional historians appear to understand this immense and all-transforming change.

To illustrate, the world economy has now developed in a way that gives historically unprecedented strategic importance to the world's oil tap in the Persian Gulf. At present, the incalculably profitable control of the world's oil tap is in the hands of states that are politically fragile and militarily defenseless. Hence, any fool ought to be able to foresee that sooner or later, control of the oil tap may easily pass to other hands, certainly more brutal and probably far more hos-

tile. After the Yom Kippur war's demonstration of the power of oil blackmail, any fool should also be able to see that Soviet control of the world oil tap would be fatal to the United States and the West. So here is a basic choice—or possible choice—involving a serious chance of national destruction. Even more obviously, a chance of national destruction would be involved in a U.S. choice to allow the Soviets, or any other potentially hostile power, to gain an overwhelming superiority in strategic weapons. To illustrate again, suppose for the sake of argument that the nonsensical “assured destruction” theory has some validity. Then suppose that the United States chooses to ignore quite imaginable developments in future defensive weaponry which can cancel out the U.S. capability of “assured destruction.” What would then be easily possible—and probably assured—would be the destruction or subjugation of the United States. Thus, choices about certain classes of weapons now have an importance that is, once again, historically unprecedented.

In Albert Wohlstetter's recent excellent article on the strategic arms race, he had a good deal to say about the famous “missile gap”—a phrase I myself invented. What he said was sensible and to the point; but as usual, the central issue I have tried to pinpoint was passed over in silence. Yet the basic problem throughout the whole period of concern about the “missile gap” was what kind of chance of national destruction it was proper to take. To see this, and also to see how President Eisenhower effectively played Russian roulette with the American future, you have only to consider the history of the problem until President Kennedy took office in 1961, with a considerable boost from votes won by his own sincerely convinced warnings about the “missile gap” in the election of 1960.

In brief, the first Soviet satellite, the Sputnik, took most people in this country and the world almost entirely by surprise in 1957. The Sputnik could obviously be used

to make an Inter-Continental Ballistic Missile; and the American intelligence community promptly restudied the U.S. strategic situation in the light of this proven Soviet power to build ICBM's. (As we already knew from the evidence of the Turkish radars, the Soviets had previously begun to build considerable numbers of Medium Range Ballistic Missiles, or MRBM's.) The first estimates by the intelligence community were made on the basis of "capabilities," and they were virtually unanimous. It was estimated that by 1961, the Soviets would have a fatally large number of ICBM's unless the United States took most expensive countermeasures. By President Eisenhower's request, the problem was also examined by an outside group of trusted veterans including Robert A. Lovett. This group produced the so-called Gaither report (named for the late H. Rowan Gaither). The best summary of the report is still the one given privately at the time by Former Secretary of Defense Lovett, who said "it was like looking into the abyss and seeing Hell at the bottom."

The point was exceedingly simple. The "capability" estimate was that the Soviets would produce about 150 of their ICBM's by 1961. At that period, moreover, there was no antimissile warning system, the U.S. strategic forces were relatively small, and they further had an exceedingly narrow base, presenting no more than about 50 targets in all. Thus if strong measures were not taken to strengthen the U.S. strategic forces, increase the number of targets by dispersal, and so on and on, the Soviets were expected to be able to wipe out American strategic striking power by 1961. There was ample time for the United States to do what was needed. But the Eisenhower White House and Defense Department were then dedicated to the disarmament that produced the second Berlin crisis—which finally required President Kennedy to order partial military mobilization after Vienna, please remember, and was only liquidated in the Cuban missile crisis in 1962. Because of the

Eisenhower budget ceilings, and especially the ceilings on the defense budget, very little was done about the post-Sputnik intelligence estimate or the Gaither report.

From 1958 onward, meanwhile, the intelligence community gradually changed the basis of its ICBM estimates from "capabilities" to "intentions." More and more of those involved concluded, in other words, that the Soviets did not *mean* to build the fatal number of ICBM's, although they were admittedly *able to do so*. About the only solid evidence for the new estimates came from the U-2 overflights, which gave no hint that the Soviets were exploiting their capabilities. Both laterally and longitudinally, however, the U-2 viewing-range was limited. Extrapolating what was happening in the whole Soviet Union from what the U-2 actually saw was, in fact, a bit like reconstructing the geography of the whole state of Connecticut from photographs of Greenwich. In addition, there were the enormous gains the Soviets could expect to make by exploiting their ICBM capabilities to the utmost. Thus a strong minority in the intelligence community persisted in fearing a "missile gap." By October 1960, the count was about 70 percent on the optimistic side and 30 percent—but among the 30 percent several of the best intelligence officers—who still feared a "gap." Both sides were passionately persuaded they were right; but both were dealing in *opinion*, not *proof*. In this situation, doing nothing and hoping for the best was precisely like taking a 30 percent chance of national destruction. Or, let us say, it was like playing Russian roulette with a ten-chambered pistol, with three of the ten chambers loaded.

To finish the story, the first U.S. reconnaissance satellite took to the air at the end of November 1960. The ambiguities and uncertainties left by U-2 reconnaissance were therefore promptly dispelled, for the first reconnaissance satellite was naturally programmed to look at the areas of the Soviet Union that the U-2 could not see. By an

amazing mistake of judgment, the Soviets had not in fact exploited their capabilities to the utmost, so there was no "missile gap." Undoubtedly this was because Nikita S. Khrushchev was then imposing his own ceilings on the Soviet defense budget, and the older branches of the Soviet services, seeing their habitual shares of the pie in danger, ganged up against the costly and "experimental" new missile project in the way we know so well in Washington. Later, I asked President Kennedy how he would have responded to Khrushchev's Vienna ultimatum about Berlin if the reconnaissance satellite had instead shown that the "missile gap" was a reality. He answered by asking me not to pursue the subject; whenever he began to think about it, he said, he had too much trouble sleeping.

So there you have it. There is much more to be said about Albert Wohlstetter's article. For example, the evidence that our official intelligence has been far too optimistic about the Soviet defense effort—and about a lot of other unpleasant matters, too—is far stronger than Wohlstetter makes it out. But the main point to note is still the question I asked in my first paragraph. If you are able to pay for an adequate insurance policy, what kind of chance of national destruction is it proper to take? You must always take *some* chance, for there is no such thing as total security. But where do you draw the line—at a 5 percent chance of being destroyed, or a 15 percent chance, or a 30 percent chance?

There are two things to be said about this quite new problem of statecraft. To begin with, the question only arises, thank God, in a very narrow range of cases—*those cases in which an error of intelligence-judgment can literally be fatal*. The first thing to do, therefore, is to separate this class of cases, always strategic in character, far from numerous for the defense planners, and even fewer for the State Department. Cases of this class should then be labeled in large letters, "Potentially Fatal," like poison bot-

bles in a medicine cabinet; and they should be treated on a most special basis, with different measurements of probability, of urgency, and of budget-priority, by everyone in the government from the President to the most academic analyst in the farthest reaches of the CIA. As to the second thing to do, it is never to approach this tiny class of cases without remembering what we all spend on our insurance policies. The real chance that your house or my house will burn to the ground is far, far less than the chance that just about everyone in the CIA will be dead wrong about any given matter. Yet I spend a lot on fire insurance, and so do you if you are prudent. The same rules that apply to fire insurance for our houses ought to apply to insurance against the destruction of the United States. And this is why I still believe President Eisenhower was fecklessly, even wickedly wrong in his dealings with the "missile gap"—although the "gap" finally turned out not to exist, thank God!

Morton H. Halperin & Jeremy J. Stone:

Albert Wohlstetter's article in FOREIGN POLICY 15 erects a straw man which it then fails, in fact, even to demolish.

That straw man is constructed by constant repetition of the incorrect notion that arms race analysts believe in a myth of "invariable U.S. overestimation" of Soviet capabilities. Only one quotation is given for the obviously unlikely contention that analysts believe anything is "invariable." And the use of the word "invariably" is qualified by the word "most":

It is the United States that has invariably set the rate and scale for *most* of the individual steps in the strategic arms race. [italics added]

The quotation appears without citation. Although the sentence is in quotation marks, there is no indication of who, if anyone,

said it or where it may have been published.¹

As the reader will note, the Wohlstetter quotation does not refer to estimates of Soviet capabilities at all. It talks of quite a different matter—who sets the pace in the arms race. Notwithstanding this unpromising beginning, the article flails away at the myth, referring to it constantly either as the myth

In 1970, describing the estimated future capability of the SS-9, Secretary Laird stated:

If the Soviets follow a "Low Force—Low Technology" approach they could have a few soft target multiple RV's by mid-1970 and the first hard target multiple RV's as early as mid-1972. If they followed a "High Force—High Technology" approach they would probably skip the MRV and move directly to MIRV, in which case they could have their first MIRV's by mid-1971 and a very formidable hard target kill capability by the mid-1970's. Even with a "Low Force—Low Technology" approach, the hard target kill capability would be considerable.

In the following year he predicted that the accuracy of the SS-9 would improve substantially by 1975-1976. These estimates served as the rationale for the Safeguard ABM system. They have proven to be inaccurate, although by 1974 the Soviets were testing MIRV's for a new generation of missiles.

—M.H.H. & J.J.S.

of "invariable overestimation" or sometimes "regular overestimation."

In fact, the pattern of U.S. estimates of Soviet capabilities is well known to strategic analysts as being any thing but an "invariable" overestimation. As Wohlstetter

¹ Herbert York, who is cited in a footnote to the paragraph just above this quote, writes in his *Race to Oblivion* a sentence which is strikingly similar but importantly different in its failure to allege an "invariable" mechanism: "Our unilateral decisions have set the rate and scale for most of the individual steps in the strategic-arms race" (p. 230).

points out—and as everybody knows—Sputnik was a surprise. In general, we have been slow to believe that the Soviet Union can make important major R&D advances: atom bomb, hydrogen bomb, Sputnik, ICBM. Then we are often too quick to assume that they would find it easy to mass-produce these same weapons. The bomber and missile gaps of the 1950's are classic examples. Finally, we are often surprised when the So-

The 1967 Posture Statement noted uncertainties about both the Moscow and Tallinn systems but stated that "we must for the time being plan our forces on the assumption that they [the Soviets] will have deployed some sort of an ABM system around their major cities by the early 1970's." This statement was repeated in 1968 and was at least the rationale for McNamara's approval of the American MIRV program.

Within a year it was accepted by almost all intelligence analysts that the Tallinn system had no ABM capability. The Moscow ABM system continued to develop slowly and was never deployed around any other city.

—M.H.H. & J.J.S.

viet Union sustains its long-awaited mass production as long as it does.

It is a single example of the latter phenomenon that Wohlstetter is emphasizing—the fact that Soviet production of ICBM's and retention of obsolete ICBM's have been prolonged past estimates of missile *numbers* made in secret in the mid-1960's. But what does it prove?

It does not prove (as Wohlstetter implies) that the United States underestimated the Soviet ICBM *threat* even during the time period in question. The capabilities of the Soviet land-based ICBM's are the combined product of their missile numbers and their qualitative improvements—especially accuracy and MIRV capability. Since the Soviet

MIRV capabilities have not come into being as quickly as we estimated, Wohlstetter's declassified numbers do not show that the U.S. underestimated the overall Soviet ICBM threat. To ignore the overestimate of Soviet MIRV's and accuracy while highlighting the underestimate of Soviet missile numbers is truly selective analysis. In short, even the straw man of "invariable overestimation" of

The Posture Statement released by Robert S. McNamara in 1967 stated that the Chinese might conduct a space or long-range missile test before the end of that year. In fact, no missile test occurred until 1973.

The prediction McNamara offered on ICBM deployments was that the PRC was unlikely to deploy significant numbers before the mid-1970's. This prediction was repeated in 1968 and was the basis for the assertion presented a few months earlier that the United States needed to begin deploying an ABM then if it was to be operational by the time the Chinese deployed an ICBM force.

From then on, the expected date of the deployment of a Chinese ICBM force began to fade. The statement released by Secretary Schlesinger in 1974 predicts 20-30 ICBM's before the end of the decade.

—M.H.H. & J.J.S.

the threat was not demolished by the author's carefully chosen example of Soviet ICBM production.

Indeed, the focus on "numbers of vehicles" ignores the fact that it was concern about Soviet MIRV's and accuracy which served to justify the Sentinel ABM system. Equally curious is Wohlstetter's failure to discuss overestimates of Soviet ABM deployments and Chinese ICBM deployments which justified the American MIRV and ABM deployments.

Wohlstetter seems to believe that these recently declassified estimates bear impor-

tantly on the title of his article, "Is There A Strategic Arms Race?" He believes that the myth of "invariable overestimation" is "one major feature" of the presumed dynamic of the arms race theories which he is testing.

But in testing this theory, he makes the error of assuming that classified estimates of Soviet capabilities constitute the national political assessment of the threat. In fact, through selective disclosure of classified information, it is entirely possible to make a small Soviet threat appear large, and to produce a large U.S. response, notwithstanding the classified estimates. Wohlstetter chastises strategic analysts for not providing a model that would reflect "institutional forces" within each country, but he then tests their alleged theory without providing any such model either.

In fact, the very existence of his article reflects in a small way some of the institutional forces of selective disclosure to which we refer. Somehow the numbers of vehicles upon which Wohlstetter makes his case have been declassified, but not the sections of the same classified Posture Statements that deal with the other aspects of adversary strategic postures. We have, therefore, asked the Department of Defense, under the Freedom of Information Act, to make available to us the entire estimate of Soviet and Chinese strategic forces in which the "51 newly declassified U.S. predictions" (p. 6) appear. When we have that data and when we can comment on the second half of Wohlstetter's article, we will make further reply.

But, in general, Wohlstetter's article has many flaws and is filled with unrelated and underivable obiter dicta. They stem from an underlying unwillingness to treat the widely held concerns about the strategic arms competition with sufficient respect to do them justice. As a result, the article is reduced to first caricaturing the opposition and then nit-picking. Even the straw men are left standing.