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The Acid Test

Wernher von Braun

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SPACE CHALLENGE

the acid test

By Wernher von Braun



Wernher von Braun was born on March 23, 1912, in Wirsitz, Germany. He acquired his doctorate in physics at the University of Berlin in 1934. In the spring of 1930 he joined Professor Hermann Oberth and assisted him in spare hours in Professor Oberth's early experiments with liquid fuel motors. He was Technical Director of the Liquid Fuel Rocket and Guided Missile Center at Peenemuende from 1937 until the end of World War II. The V-2 rocket was developed at Peenemuende and the first successful V-2 was launched in 1942. Dr. von Braun has been Technical Director of the Army Ballistic Missile Agency since 1956. He is married and has two daughters. His publications include *The Mars Project*, *Across the Space Frontier*, *Conquest of the Moon*, and *The Exploration of Mars*.

The acid test of men and nations is the measure of their courage and resourcefulness in the face of adversity and peril. Those which have survived crises have exerted the most profound influences upon mankind's destiny. Those which failed did so because they could not manage abundance and power.

Our country has faced agonizing tests more than once during its relatively short history. It emerged each time from the crucible not without scars but with greater confidence and richer maturity. America survived crises because it knew what must be done and did it without regard to consequences, with faith in its own judgment and in the resources which had to be marshalled for the common good.

Even now we are experiencing another test. Historians may record it as one of the most fateful intervals of the twentieth century which has certainly had more than its share of historic events. The early days of October 1957 marked a turning point in our destiny and that of other nations, large and small. An unprecedented technological achievement suddenly transformed a troubled but familiar world into one of strange and foreboding aspect. As it has, since the dawn of the Industrial Revolution, science had influenced

history, and directly shaped the lives of men.

The reaction to these events has been profound. They triggered a period of self-appraisal rarely equalled in modern times. Overnight it became popular to question the bulwarks of our society: our public educational system, our industrial strength, international policy, defense strategy and forces, the capabilities of our science and technology. Even the moral fiber of our people came under searching examination. Since the evident threat was to our security, the initial preoccupation concerned modern weapons systems and means of defending against them. The Damoclean sword menacing free people consisted of a monstrous destructive force inherent in automatic delivery systems, capable of transporting thermo-nuclear warheads over thousands of miles, in any weather, across all geographic and political barriers, at velocities of such magnitude as to imply total destruction without advance warning.

The logical process of evaluating our position has been underway ever since: first, to determine if we possessed these weapons, and what means of defense could be erected. Actions have been taken by the Defense Department, fully supported by the Congress, aimed at achieving operational capabilities with the intermediate and intercontinental ballistic missiles at the earliest practicable date.

Perhaps it is time now, without muddying the waters further, to determine whether we have correctly assessed the total threat represented by a totalitarian regime, whose end objective is world domination.

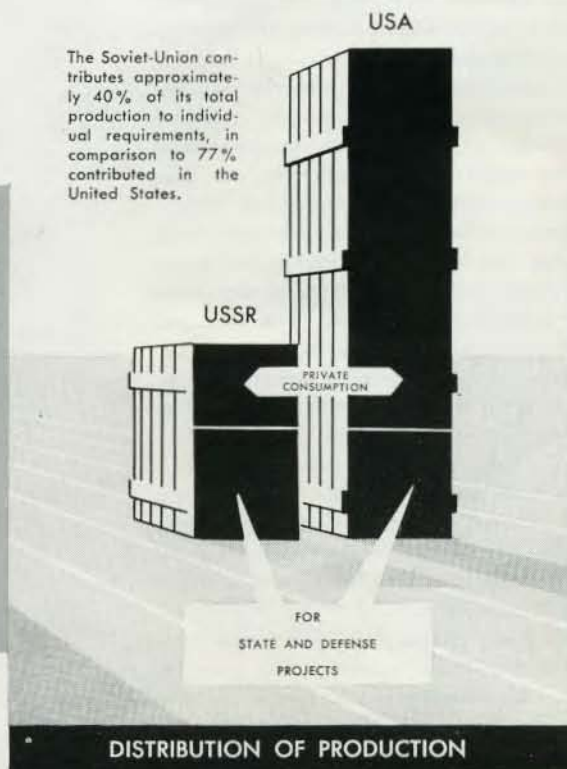
The Soviet challenge is by no means restricted to military technology. It goes far beyond the realms of politics and armies. No longer is the task of coping with the Red menace the exclusive responsibility of generals

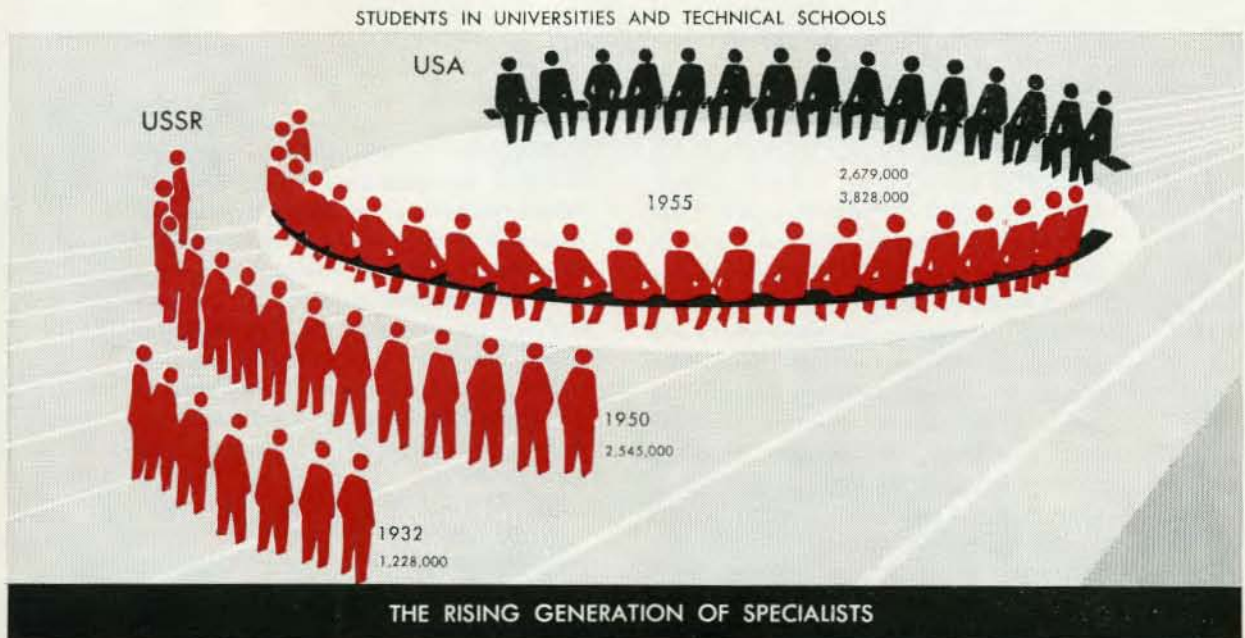
and statesmen. The acid test involves every facet of our civilization, every part of our society: religion, economics, politics, science, technology, industry and education. Free men everywhere have been caught up in this grim competition. We who enjoy our homes, drive the family car, spend more time in leisure and less in work, and pay less attention to national affairs than to television shows, are faced with a decision—will we do whatever is necessary to win this struggle, or will we continue in our comfortable illusion and thus court the risk of a defeat which would forever eliminate freedom, and place our children and their children under the control of an all-powerful state? What we are about to discover is whether a nation, which has rated its home run sluggers and its fullbacks above its scientists and philosophers, can meet the total competition of aggressive communism, and still preserve its way of life.

It will not be enough to perfect weapons systems which have at least equal capability with those of a potential aggressor.

Others have pointed out that the deterrent effect of these machines of war may cancel the possibility of total conflict. It has been argued that this will turn aggression into another direction: that is, to the perimeter or brush-type war, in which the huge rockets of great range and mass destructive capability would not be employed. Against this estimate, the Army has reshaped its striking forces and equipped them with battlefield rockets and guided missiles. The urgent need of an adequate defense posture capable of dealing with any type emergency has met a rare degree of unanimity here and abroad.

In sharp contrast, however, wide disagreement has developed over the real significance of the best-publicized exploit of Communist engineering—the Earth circling satellites whose monotonous signals were intentionally audible to listeners everywhere on Earth. Skeptics, who refuse to accept the possible until it has been demonstrated, have clouded the issue. This is a dangerous state of mind in a day when breakthroughs occur so rapidly that obsolescence of complex weapons systems has become a primary concern.





Perhaps the launching of the Explorers helped to redeem our promises, but no amount of explanation or justification can show why we did not do it ahead of the Soviets—and no amount of mutual backslapping that we succeeded with Explorer on the first try can hide the fact that we have lost a round. We cannot afford to lose much more. It was a grave error in judgment to fail to recognize the tremendous psychological impact of an omnipresent, artificial moon visible to anyone with a good pair of eyes and audible to anyone with a simple radio receiver.

Another grave error was the failure to evaluate realistically the research, development, engineering and production capabilities of a totalitarian state. This lulled us into complacency and led to an underestimate of our adversary—risky business in any competition.

Since I had the dubious privilege of living and working under a totalitarian government for many years, I should be able to discuss this topic with some degree of competence. Anyone who says that science and technology cannot flourish in a police state does himself and his country a great disservice. It is generally recognized, of course, that personal freedom of movement and thought, and a free exchange of ideas, are essential to scientific advance. From this, however, many erroneously conclude that genuine scientific work is impossible in the climate of dictatorship. Let

me clear up this notion once and for all, in the interest of arriving at an honest appraisal of our situation, by citing my personal experience at the Peenemuende Rocket Center in Hitler's Germany.

Neither I nor any of my associates were ever required to submit a travel itinerary in advance, whether for a short business trip or a vacation lasting several weeks. Throughout the war we had intimate, continuous contact with 36 universities and technical institutions. They performed research in support of our missile programs under contracts so broadly worded that they permitted the institutions an extremely wide latitude in implementation.

Discussions and symposia, quite similar to those conducted in this country, were held frequently. Many ideas were generated in this truly liberal academic environment. True, these ideas related exclusively to our technical concerns and not to politics, but they are successfully applied even today in rocket and missile activities. As far as personal freedom of movement is concerned, as well as free exchange of ideas in the strictly scientific and technological sphere, it would thus simply be misleading to assume that things were much different than in a free country.

The heavy hand of dictatorship is rather felt in another area. In Peenemuende, the security police kept dossiers on all of us, listing all the things we might have said about the regime or individuals of the upper hier-

archy. Personal vices and weaknesses were catalogued in their files. But they left us alone as long as our usefulness, in their opinion, was greater than our debit account. Once they felt they could do without you and you were in their way, they'd call for the dossier and destroy you. It was that simple.

I realize that this sounds quite awful to men who have never experienced it. But the sober fact is that people, whether scientists or candlemakers, learn to live with such a situation. We don't deny ourselves week-end auto trips in spite of the National Safety Council's warnings about multiple deaths. Just so the man living under dictatorship adjusts himself to business-as-usual, whether he likes it or not, because he must in order to survive. Something like seven hundred million people are living today under Communist rule and, in all probability, they have learned to live in the face of such possible "road accidents."

Consequently, we should disabuse ourselves of the dangerous myth that the impotent Russian scientist bends over his slide rule with a gun pointed at his head. It appears that he enjoys at least as much reward as the American scientist and that, until quite recently, he had even greater latitude in his selection of resources and assistance.

We must consider, in this measure of the forces arrayed against us, the overall post-war era in such areas as atomic and thermonuclear bombs, nuclear power plants, jet aircraft, guided antiaircraft missiles and long-range rockets.

When we consider their low general technological status, as evidenced during the last war, plus the tremendous physical damage inflicted upon the Soviet industry by the war itself, it becomes frighteningly clear that their rate of progress greatly exceeds ours.

The real peril lies in the enormous momentum they have built up, which certainly will yield other dramatic by-products along the way. They have long since embarked upon a dynamic program to achieve supremacy in science and technology. Their state-controlled educational system is turning out competent engineers and scientists in greater numbers than ours. It is upon this broad foundation that the Russian is waging his effort and not

upon the gleanings of the brain-picking of some captive, foreign scientists as many people in this country still seem to believe. Clearly we must accelerate our effort at a rate calculated to overtake and surpass the Russian advantage. And this calls for a sacrifice of an unprecedented scale.

It must be understood also that the Soviets have grasped the significance of man's imminent conquest of space and have proceeded well along the road in that direction. A current estimate of the situation would include these possibilities.

First to launch their satellites, the Russians probably used a multi-stage rocket which was originally designed to carry a thermonuclear warhead over intercontinental range.

Second, the same rocket configuration, with minor modifications, can place a payload of between 50 and 100 pounds on the moon.

Third, the rocket can also put up a satellite capable of military reconnaissance, equipped with a television playback feature. A few such orbital devices can keep track of the progress of all surface construction projects, ship movements, and air base operations anywhere in the world. Once they achieve this, and I am convinced that it is only very few years off, "open skies" inspection for purposes of disarmament becomes academic.

Fourth, the Russians have a sound program designed to solve the question of safe return from orbital flight and related space medical problems, with the purpose of preparing for manned space travel.

I would recommend that we brace ourselves for other Soviet "firsts" in the new field of astronautics. We are behind and we cannot catch up in a day or two, since major technological projects necessarily involve lead time. It will require several years of concentrated effort for us to come abreast, and even longer to pull ahead.

We can waste no time commiserating over the sorry lot of the Russian worker or peasant, comparing his lack of freedom and creature comforts with our prosperity. We should also "shuck off" another illusion, that the Russian people will rise up to overthrow the Kremlin and thus relieve us of all our worries. Perhaps a dream of freedom exists in the Soviet Union.

Perhaps, by exposing more young people to scientific training, a search for truth will be generated which will eventually reach against the dictatorship. But we cannot stand around, hands in pockets, waiting for others to do what can only be accomplished by us. I am convinced that it is man's destiny to enter space and that he who controls the open space around us is in a position to control the Earth. The only choice left us is to accept the Soviet challenge or "pay the piper."

I certainly do not suggest that we move into space with any belligerent intentions. It would only be consistent with the fundamentals for which the United States stand, if we would propose to the United Nations the universal acceptance of the principle of the freedom of outer space—in analogy with the principle of the freedom of the seas.

But any such doctrine would be void and meaningless if we cannot back it up with a position of relative strength.

It has been said that with the Sputnik Khrushchev and Company launched their eventual downfall because this country reacted by firing up its missile and space programs.

And indeed, in more than one aspect this may be our last chance. In the first World War, as well as after Pearl Harbor, the United States had time to marshal her resources. Even in Korea and now, after Sputnik, we had time to initiate the necessary counteraction. Next time, in this world of long-range ballistic missiles and thermonuclear warheads we may not have time. Either we will be ready at a moment's notice, or historians may conclude over the ruins of our cities that we were "weighed and found wanting."

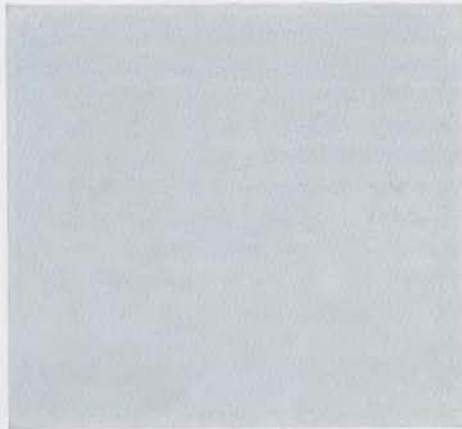
I hope that we will not conclude that money alone will turn all the tricks—there are other factors involved which cannot be settled so easily. It would be presumptuous for me to offer "school solutions," or even to list all the things which must be considered. But there are some minimum requirements which can be identified and which demand prompt action.

Our educational offerings must come under scrutiny since it is tomorrow's generation which will have to cope with the problems developing today. If their preparation is to be compatible with the kind of world they will inhabit, our young people must be taught basic and essential knowledge at the earliest practicable age—in the elementary schools. We have teachers we need, who can provide the ingot to disabuse ourselves of the idea that school is a place solely to teach boys and girls how to live together. They must understand mathematics and the physical sciences, which means more and better teachers and expanded offerings both in scope and number. Better salaries, improved professional status, and more adequate classroom and laboratory facilities are essential to obtain the kind of inspirational leadership to interest young minds in facts.

I do not believe the Federal government will or should attempt to dictate such a program, but it should establish generally recognized educational standards and it should assist in a pump-priming role in the public schools and in our colleges and universities. Education in a democracy is the concern of every citizen. The people must insist upon a redirection of emphasis and willingly accept their just measure of responsibility for execution of our educational programs. To all who ask, "What can I do to help?", my answer is to take active interest in what is being taught, how it is being taught, and by whom.

There has been unnecessary concern about possible Federal interference in local schools. The Federal government as well as the states have been supporting public education in greater or lesser degree for years—all we are talking about is funneling support into more productive channels. If the Federal government can support highway projects, why not schools?

Finally, we must generate the will to supremacy. Because this is intangible—because it must come from the hearts and minds of our people, it cannot be legislated, budgeted or evoked by decree. We want no Federal



propaganda machine exercising dominion over the free press. We want no dictator telling us what to believe and what to do. But we must set about learning the facts and, when we have understood them, buckle down to the challenging tasks which confront us.

We should stop telling the world what we are against. We should tell the world what we are for. We must not fight the communist ideology with negative statements, but with the lofty ideals of the founders of this great republic. The antidote to communism is not anticommunism, but the belief in God and the dignity of the individual. Let us not deceive ourselves; the communist ideology has a powerful appeal to the have-nots, the uninformed, and the desperate. But ideas are fought not with material means, but with superior ideas. And where should these ideas be found in this world today, if they cannot be found in this glorious land of the free? The flag of leadership of the free world has been thrust into the hands of Americans. Let us live up to the historical challenge.

We must think in terms of long-range objectives, not on the time scale of next year's automobile models. We must put our trust in men assigned to carry out these programs, and not interrupt or divert them by frequent reexaminations or demands for justifications. We must supply them with the resources they require, hold them responsible for results, and leave them alone to carry out their missions. We must look for, and demand, competent

and honest reporting, the hallmark of American journalism, which is sometimes lost sight of by a small segment of the press bound to carry out propaganda attacks or sales campaigns by self-serving interests.

If we can inspire a national determination to achieve the ultimate victory, all other factors will fall into their proper perspective and places. We will then move forward, a united people, into an age in which the far reaches of the universe will become as familiar as the next town.

It is disquieting to be asked "But what will all this profit us?" Such questions betray a lack of confidence and, even more serious, the kind of unenlightened approach which has hamstrung our progress in the past. No man can say with assurance, what benefits will accrue from our discoveries. With Explorer I, we made a modest beginning. We have stepped into a new, high road from which there can be no turning back. As we probe farther into the area beyond our sensible atmosphere, man will learn more about his environment; he will understand better the order and beauty of creation. He may then come to realize that war, as we know it, will avail him nothing but catastrophe. He may grasp the truth that there is something much bigger than his one little world. Before the majesty of what he will find out there, he must stand in reverential awe. This, then, is the acid test as man moves into the unknown.

