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MOMENTUM AS A FACTOR IN NATIONAL SECURITY

Reginald E. Gillmor

THE MUNITIONS BOARD AND NATIONAL STRATEGY . . . 17

Rear Admiral Morton L. Ring, USN



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FOREWORD

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MOMENTUM AS A FACTOR IN NATIONAL SECURITY

A lecture delivered by
Reginald E. Gillmor
at the Naval War College
on May 8, 1950

My thesis is creative momentum, its components and characteristics and its relation to all development—good or bad, natural or man made, political, military, administrative, scientific, economic and industrial. My argument is that relative superiority in any field of development results from the product of the static values and the momentum; a high static value will quickly lose superiority if the momentum of its evolution to higher forms is relatively low.

The evidence that I submit will fade or become obsolete. What I hope will remain is a small intellectual tool or way of thinking which, when added to your many tools, may be of value in solving the problems you will encounter in the pursuit of your profession.

As the first piece of evidence in support of the argument I would like to develop for you a presumptive curve of growth of the millions of species of life that now inhabit our planet. Competent biologists say the first organic cells were evolved from inorganic material about one thousand million years ago. For approximately five hundred million years organic life was not sufficiently dense or complex to leave fossil records. Science tells us,

Mr. Gillmor is Vice President of the Sperry Corporation, and served, in 1948 and 1949, as Vice Chairman of the National Security Resources Board. A Naval Academy graduate, class of 1907, Mr. Gillmor served as Flag Secretary to Admiral Sims, Commander of the U. S. Naval Forces in European waters, during World War I.

RESTRICTED

1

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however, that many points along the curve of evolution are marked by organisms that attained stability in ages past and still exist today.

Some of the unicellular organisms of ancient origin have differential sensitivities which gave them the equivalent of sense organs in various parts of their bodies. There is also evidence that in their efforts to survive many of them developed cooperative relationships. An indication of the first step toward multicellular cooperation is found in certain forms of amoeba. When their feeding grounds give out these amoeba, in response to some mysterious signal, quickly gather together into worm-like forms, thus, by cooperation acquiring a mobility which enables them to move with comparative rapidity to new feeding grounds where they disperse. A further step in evolution is found in certain slime molds which form and disperse and in which the amoeba are specialized, some forming the head, some the stem, and some the foot.

All single cells have a sort of immortality; that is, they reproduce by fission. This was an obstacle to the evolution of new species. For the first 500 million years, therefore, the curve of increase of new species had a low exponentiality; that is, the upward slope of the curve of growth was very gradual.

With the evolution of bi-sexualism and death, a very rapid growth in the number of species became possible and the growth curve rose steeply with an increasing exponentiality. The curve reached a plateau comparatively recently—probably between one and ten million years ago. Some few species are still disappearing and some evolving but, generally speaking, there is now a plateau in the number of species.

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The eminent French biologist, Lecomte du Nouy, says that the only evolution of any consequence still continuing is the spiritual and intellectual evolution of man; all other forms of life have either failed to adapt and therefore ceased to exist or have become perfectly adapted and ceased to evolve.

Here, then, in number of species plotted against a billion years of time is a curve the slopes of which show the growth and decay of momentum in the evolution of life. A gradual slope for the first half of the curve, turning upward into a steep slope for the last half of the curve, and turning over toward an asymptote, or plateau, at the upper part of the curve.

The basic factor which produced momentum in the development of the countless species of organic life was conflict with the adverse forces of environment. Many failed to survive. The dinosaurs, for example. With little brains and big posteriors, they managed by sheer strength and size, to survive for 140 million years, but their momentum toward sizes and their lack of momentum toward brains eventually proved their undoing. They failed to adapt to changing conditions and disappeared. The same phenomenon is observable in the history of man-made organizations. Big posteriors and little brains are not a very alert or adaptable combination.

Every surviving species is characterized by the means evolved to insure its survival. From the microbe to the elephant, life is replete with the most intricate and amazing individual and social mechanisms to serve this purpose.

For example, there is a beetle of the Meloid family which lays its eggs near the burrows of certain mining bees. The eggs hatch tiny lice. The lice seek flowers frequented by the bees

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and, at precisely the right moment, hop on the bee's back and hide in its fur. There they stay until the bee has provisioned herself with pollen and honey. Then, at the moment when the bee lays her egg, the tiny louse jumps from the back of the bee and lands on the egg, which it uses as life raft and larder for several years while it goes through seven metamorphoses, finally emerging as an adult beetle to start the life cycle all over again.

Only once does the tiny Meloid louse seek the flowers; only once does it jump on the bee's back; only once does it jump on the egg. Survival required that some sort of memory cell must continue through all of the transformations and tell the tiny organism precisely what to do and precisely when to do it.

The survival mechanisms of all the two-winged insects—of which there are some fifty thousand species—include a gyroscopic automatic pilot that is amazingly compact and effective, and far superior to anything man has invented. The migratory birds and homing pigeons are equipped with position finding mechanisms—Lorans—the nature of which we can dimly understand although the mechanisms are still a mystery. Many animals are physically superior to man. And yet in a very short period of evolutionary time man has become the lord of creation on this planet. Let us construct the curve of his evolutionary momentum.

Biologists tell us that man is of the order of primates, the family homonidae, the genus homo, and the species sapiens. The order of primates probably evolved some 20 million years ago, the family homonidae several million years later, and the genus homo about one million years ago. The specie sapiens is comparatively young, probably less then 100,000 years. It is a very remarkable fact that all men on this planet are of the same order, family, genus and species—this is not true of any other higher animal. That

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it is true in the case of man is shown by the fact that all of the species of whatever size or race can breed with each other and produce fertile offspring.

Here again in the evolution of the species sapiens we can, in our imagination, construct the characteristic curve: A long, gradual slope of evolution of the order of primates, the family homonidae, and the genus homo, followed by the evolution of a species of such superior mentality that he was able to eliminate all competing species of the genus and begin an evolution on a steep slope to become the most superior form of life on the planet. Although the physical evolution of the species has practically ceased, the intellectual and spiritual evolution continues on a curve of high exponentiality. This rapid evolution is due to man's creative mind or, more accurately, to the creative minds of that relatively small minority with innate ability to think in the abstract, to make new contributions to knowledge, invention, and to act together in bringing about specialization combined with cooperation.

The curve of acquisition of man's knowledge is well illustrated by the discovery of the 92 elements. My friend, Buckminster Fuller, has developed this curve by plotting these elements vertically against time horizontally. Nine of the elements (carbon, lead, tin, mercury, silver, copper, sulphur, gold and iron) were known and used prehistorically. Therefore, Mr. Fuller's curve begins with the discovery of arsenic in the year 1250. This discovery was probably an accident of an alchemist's trick but was nevertheless the first recorded isolation of a chemical element. Two hundred years elapsed before the discovery of the next element, antimony, about 1450. Then approximately 200 years more to the next, phosphorus. Then approximately 60 years to cobalt and platinum, about the year 1730. The slope to cobalt is very

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gradual; then it turns up sharply and continues on a steep slope to the completion of the basic curve in 1932 with the isolation of the element alabamine. This completion of the inventory of all the 92 basic elements of the universe was, as Mr. Fuller says, an attainment of epoch-making proportions. Advancement continues in the discovery and production of the super-atoms numbered above 92 and the radio-active isotopes of all the atoms.

It is interesting to see how our progress in science and engineering has been linked with the discovery and control of the 92 universal atomic building blocks. Steel, which is the basis of our industrial civilization, was developed less than 100 years ago after the elements entering into it were isolated and made available. Alloy after alloy and development after development has followed the availability of more building blocks. Now that we have them all and are continually adding to the super-atoms and isotopes, the possibilities are beyond the imagination. In every branch of the basic physical sciences, the curve of acquisition of knowledge is similar to that of the atomic curve. All are rising on a steep incline with no plateau in sight.

In all group activities, and especially those of men, the factors contributing to creative momentum are analogous to those in mechanical momentum. Mass is represented by the total amount of balanced, specialized knowledge, experience and facilities contributing to the effort. Velocity is proportional to the cooperation between those engaged in the effort. Motive power is provided by the urge to accomplish and the urge derives from various degrees and forms of conflict including desire for reward, fear of failure, competition, rivalry, criticism, hate, and even love. When all of the three factors (urge, knowledge and cooperation) are large, momentum is quickly attained and maintained or increased.

RESTRICTED

When any one is lost or seriously depleted it may take a long time to regain momentum and in the meantime competitive groups may have attained such a high momentum that it is impossible to overtake them.

The history of scientific and engineering progress in the United States provides some interesting examples of the importance of momentum to technical achievement. Until comparatively recent times the rewards for achievement in pure science were low. There were very few people in the field and therefore little competition. As a consequence, most of the achievements in pure science were made in other countries. Only the last three elements in the atomic scale, illinium, virginium and alabamine, were discovered by Americans. For the last twenty years we have been rapidly gaining momentum in the pure sciences. In engineering, however, our competitive system and our large domestic market has resulted in giving us a very high momentum over many decades.

In technical developments having military value we have sometimes failed to recognize the importance of momentum and the factors contributing to it. New developments are surrounded with unnecessary barriers of secrecy, thus removing them from the stimulus of criticism and from the cooperation of those who might contribute to the development. To be sure, we should do everything we can to keep knowledge of our developments away from potential enemies, but we should never let this interfere with obtaining the cooperation and criticism of those on our side who might add to the development.

The development and production of the atomic bomb was frequently referred to as the best kept secret in the world. Actually, it proved to be no secret at all. One man, perfectly equipped to understand it, had access to everything, learned everything, and

RESTRICTED

transmitted everything to our potential enemies, notwithstanding all the barriers of secrecy surrounding the whole operation and every cell within it. It is doubtful that our opponents profited much from the information. Either their momentum was too low to enable them to understand and make use of it or too high in some previously chosen direction to permit them to change. The barriers undoubtedly kept the momentum of the development at a lower point than it would have been if there had been free and complete cooperation and criticism between the many carefully screened people who were working on the multitudinous phases of the problem.

The same kind of thing happened with the torpedo. Until after World War I it was competitive. In Germany the competition and criticism evidently continued under the fascist state with consequent high momentum in development. With us the stimuli of competition was reduced and, notwithstanding the conscientious efforts of the many fine men who were working on the problem, the momentum was not sufficient to give us a superior torpedo when we entered World War II and had to compete with the Germans and Japanese.

In my own field of military instrumentation I have seen many examples which emphasize the importance of momentum in technical developments. When the momentum of development is high enough every example of military instrumentation becomes obsolete very rapidly. If, notwithstanding every effort to keep it secret, the enemy should learn about it at any particular point, it would do him very little good. In fact, it might mislead him into believing that a particular development is the last word, whereas it might only be the beginning.

My company had an example of that in 1939 when the FBI

RESTRICTED

discovered that one of our employees was conveying technical information to the Germans. The spy had been well chosen; he was an experienced designer and very skilled in taking verbal descriptions from engineers and reducing them to drawings. His record was excellent. American born and educated, 15 years of experience with other companies engaged in classified developments for the Armed Forces of the United States, and 10 years of experience with us.

Our spy never took a paper or drawing from our building. All of his information was in his head and was reduced to paper in the basement of his home. He transmitted it by mail to an accomplice who micro-photographed it and conveyed it through devious channels to a steward on a Pan American plane flying to Lisbon where it was transferred to a German emissary.

The FBI discovered him early in his activities and asked us to keep him until they could nail down the others in the chain. They intercepted everything he sent, showed it to us and asked us to approve its transmission if it was of no importance. The interesting thing was that, after consulting the Government Services involved, we agreed to the transmission of many of his drawings. We were quite confident that none of the information transmitted would do the Germans any good. Even complete information would probably have been of little value. The Germans had acquired momentum in other directions and could not change. Eventually, after a year and a half from the time our spy was first discovered, the thirty-two German agents in the ring were taken simultaneously by the FBI, were convicted, and are now serving time in Leavenworth.

Even when you want to bring a friendly ally up to date in a new development it is sometimes very difficult because he does

RESTRICTED

9

RESTRICTED

not have the background momentum or has acquired momentum in some other direction. This phenomena was observable on many occasions in the cooperation between Great Britain and the United States during the last war. Sometimes they would be ahead of us and sometimes we ahead of them, and it was always difficult to change over from one line of development to another.

The greatest danger in the cancellation of the 65,000-ton aircraft carrier might be the loss of momentum in the development of that type of ship. Many of the men who were working together in the evolution of new designs for aircraft carriers must have been dispersed, and the stimulus removed from those who remained, with consequent loss of momentum in the development of this very important type of ship. During the Pax Britannica the British were not content with their superior naval power; they continued to develop new types of ships, such as the dreadnought and the battle cruiser, and thereby gained momentum in ship design which kept them superior to all other navies for many years.

In the social sciences, if they can be called "sciences," the curve is still on a gradual slope with low exponentiality. There have been some examples of a steep rise, especially in the field of government. For example, the Athenian Republic, in a period of 80 years, rose with great rapidity, but complacency led to a turning of the curve and its termination by the conquest of Alexander, the Great. In modern times our own Republic is the most progressive example of balance between increasing specialization and increasing cooperation by means of individual freedom. Young as we are, it is an extraordinary fact that, among all the nations of the Twentieth Century, we have the longest history of unchanged political philosophy.

RESTRICTED

In general, however, world society is still in a very unstable condition. The early conflicts which led to the extinction of other species of the genus homo continued for many centuries, with the result that the less fit of the species were forced to the less desirable portions of the planet. Many of these groups were so weak that they have remained where they are without protest. Others have gradually gathered momentum in an effort to break out of their boundaries and spread to richer portions of the earth and this tendency has been accelerated by improved communications.

This was the case with the Japanese. For more than 2000 years they were content with their islands and chose to have very little communication with the outside world. Following the visit of Commodore Perry they began to learn how to build a better life for themselves by acquisition of scientific knowledge and by the development of industrialization. Their rise as an industrial nation followed a very steep curve and resulted in a momentum which eventually carried them into a war which they could not win, with consequent loss of their position as a world power. They can again become an important industrial nation, but it is hard to conceive that they could in the foreseeable future acquire any serious military potential. In this day of rapid development of practically every offensive and defensive weapon, the possibilities that the Japanese or the Germans could acquire any serious military potential is about the same as the possibility that a Model T Ford standing at the curb could catch a Cadillac passing by at 100 miles an hour.

An eminent Japanese educator, when asked why his country made the blunder of going to war with us, replied: "We made three disastrous errors: First, we over-estimated the power of the Germans; second, we underestimated your great industrial

RESTRICTED

momentum and its power to produce and transport vast quantities of weapons, equipment and supplies; and, third and most serious, we mistook your disagreements and diversities of opinion for weakness instead of the great strength they really are." American competition and diversity of opinion provides the motive power for productive momentum.

As you know better than I, our only serious competitor is Russia. For centuries they have been confined to a relatively unfavorable portion of the earth. They have vast areas of waste land. Their sources of food and raw materials are inadequate in many portions of their country. Transportation facilities connecting the richer lands with the poorer lands are difficult to establish. They have inadequate outlets to the sea. With an instinctive mass urge they gathered momentum for centuries under the Czars. This leadership degenerated and was replaced by a police state which has intelligently employed every modern technique of ideology, infiltration, communication, discipline and technical development to build a strong military power.

During the last war the Russians acquired from the Allies and the Germans an enormous amount of technical information and have further added to their technical abilities by pressing into service many capable German scientists and engineers. From considerable contact with them from 1929 to 1936, I have the impression that both the mass and velocity of their technical progress is still considerably lower than ours, but the urge is very great.

The greatest weakness of the Russian State derives from the suppression of criticism. Stalin recognized this in a letter he wrote to Maxim Gorky in 1930. In this letter, as reported by TIME Magazine, Stalin said: "We cannot do without self-criticism. Without it will come immediate stagnation, rotting

RESTRICTED

away of the apparatus, growth of bureaucratism, undermining of creative initiative in the working class." What Stalin feared has happened. Whether or not their tendency toward stagnation can be compensated for by other factors remains to be seen.

The Russians have several obvious advantages. Their population is widely dispersed with no large concentrations of people or industrial power. Because of the vast size of their country and the poor transport communications, they have probably had to make each industrial area self-sufficient. Their totalitarian government makes it possible to deliver a heavy blow against us without warning. From all accounts their military forces are superior in number of planes, submarines, ground forces and equipment.

It is doubtful if the free world will attempt in peacetime to match the size of the Russian military forces. Our strength lies in our large engineering and industrial momentum. All of the factors contributing to that momentum are large. The urge from hope of reward, competition and other factors is much greater than that of the Russians. The mass, represented by specialized knowledge, experience and facilities, is very great, and, notwithstanding the competition, the cooperation within individual industries and between them, by means of engineering and management societies, is very high. We have several serious vulnerabilities, among them being large industrial concentrations, especially in our port cities, a very high degree of interdependence of each industry on many others, the fact that most of our industries have a high momentum in peacetime production which would have to be redirected for war. All of our vulnerabilities would be aggravated if we were attacked by surprise, for then it would be extremely difficult to accomplish the redirection of our industrial power and to compensate for its interdependence.

RESTRICTED

Because of the importance and complexity of the problem of conversion of our industrial power, the Congress created the National Security Resources Board and charged it with the responsibility of providing the President with plans for mobilizing and utilizing all of the resources of the country, human, material, financial and industrial. Fortunately, this vitally important agency now has as chairman one of the most able men in our Government. Under his leadership it will gain momentum rapidly.

It is my great hope that within this year the Resources Board, the Munitions Board, the Industrial College of the Armed Forces, the technical and procurement branches of the Armed Forces, and all of industry will be working in close cooperation in the development of mobilization plans which will provide for the quick conversion and expansion of our resources under any contingency that can be foreseen. When such plans have been evolved our vulnerability will be greatly lessened, though it may never completely disappear.

In conclusion, let me shape in a few words the small intellectual tool which I wish to leave with you. The attainment and maintenance of superiority in any field of endeavor is dependent upon the momentum in that endeavor. The motive power for creating that momentum is derived from the urge for its accomplishment and the urge is derived from a great variety of factors, among them being hope of reward, fear of failure, criticism, competition, rivalry and desire to excel. The equivalent of mass is the total of balanced knowledge, experience and facilities assembled for the endeavor. The equivalent of velocity is derived from the cooperation between all those concerned with the effort. The factors contributing to urge sometimes conflict with those contributing to cooperation; in that case it is the resultant of urge and cooperation that counts. Free cooperation is obviously better than forced cooperation. Free

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cooperation in any group can be greatly increased if every individual knows what is expected of him and is made to feel that his position in the group is secure. Superiority in any endeavor can be quickly lost if its momentum with relation to competing endeavors is lessened.

If you want to know what the score is going to be, try to figure out what the momentum is.

RESTRICTED

15

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THE MUNITIONS BOARD AND NATIONAL STRATEGY

A lecture delivered by
Rear Admiral Morton L. Ring, USN
at the Naval War College
on May 11, 1950

I would like to discuss this morning the work of the Munitions Board and tell you something about the industrial plans being developed and the measures which are being carried out to support current and future military operations.

You will note that I use the word support. This word keynotes the role of the Munitions Board in its relation to national strategy.

If military men have any distinguishing specialty which sets them apart from their civilian brothers, it is their proclivity for teamwork and organization. It is a natural tendency because it is based on the knowledge that teamwork is essential. For a team to function effectively it must be well organized.

And so, for centuries, when military men have been given a job to accomplish, they immediately have turned their thoughts to how to organize to do it.

Now whether the elements of a military organization are identified as Bureaus, or G-1s, G-2s, G-3s, or G-4s or directorates of training, intelligence, operations, etc., we nevertheless recognize

Rear Admiral Ring is Director for Military Supply, Munitions Board. A Supply Corps Officer, he has held the position of Vice Chief of the Material Division, Office of the Secretary of the Navy.

RESTRICTED

17

RESTRICTED

the need for some men to concentrate on personnel matters, others to concentrate on intelligence, others on operations (strategy and tactics), and still others on logistics. Of these, three play a supporting role to the fourth. Intelligence, personnel and logistics all owe their existence to the necessity for supporting the people engaged in operations.

Of these supporting elements that I have mentioned, there is one which most accurately describes the area in which the Munitions Board specializes. This is the area of logistics.

In its broad sense, logistics embraces all activities necessary to build, support and maintain fighting forces. It is the broad effort based upon the productive capacity and manpower of a nation. It extends through successive phases of planning and through the procurement and distribution of manpower and material to theatres of military operations. It is a process by which the raw war-making potential of a nation is translated into military forces that are employed against the enemy in pursuit of strategic and tactical objectives.

At the top-most level the logistician must bridge the gap between two activities, one of which is almost fully military and the other civilian and economic. He has a twofold responsibility. The logistician is required to make military requirements intelligible to industry so that it can produce equipment and supplies. He also has to see that the logistic capabilities, including the nation's economic capabilities, are reflected in strategic and tactical calculations.

He must act as the link between the war front and the home front, for the logistic process is at one and the same time the

RESTRICTED

military element in the nation's economy and the economic element in its military operations.

In World War II, more than ever before in military history, operations were conditioned by "weight of materiel." By "weight of materiel" is meant all supplies and equipment used by, or useful to, the armed forces in adequate quantities to permit them to accomplish effectively their mission of national security. The ability to mass materiel rather than men in a given area became, in general, the governing factor in preparing for an offensive.

Circumstances which I need not detail here gave us the time needed to prepare this materiel. It seems quite evident from the record that the organizing of our logistic support for World War II was for a long time inadequate to support major offensive operations and was enormously wasteful.

Our victory in World War II was the result of a number of factors. We had fighting men of great courage and ability. We had friends on the battlefronts who held the line until we could prepare and join them. We had enemies who made some grave mistakes. We had superb military and civilian leadership. We were convinced that right was on our side, and we entertained no thought of losing.

But our greatest advantage, and it proved to be sufficient to swing victory to our side, was American industry and its ability to mass-produce the goods of war in a volume that almost defies comprehension.

Just by way of reminder, I might say that in addition to millions of other items, large and small, we turned out during the war nearly 300,000 airplanes, 87,000 tanks, 80,000 landing craft,

RESTRICTED

19

RESTRICTED

17 million rifles, 2½ million trucks, and 4½ million tons of artillery shells.

This was the unforeseeable factor that lost the war for the Axis. They had not dreamed—nobody had ever dreamed—that such a mighty arsenal could be developed so fast. When our President, shortly after we were attacked, announced America's intention to produce immediately these vast quantities of munitions and other machinery of war, the laughs and jeers of German leaders rang throughout the world. They had good reason to laugh. They were industrial experts and they had spent many years building up their war machine.

And they were very nearly proved right. Some of the darkest days in the history of this country followed Pearl Harbor. What armed forces we had were meagerly armed and equipped. Our troops went bravely into the first bitter campaigns with far less in the way of modern arms and equipment than we knew they should have. Better things were on the way; they just weren't ready yet; and the war couldn't wait for them.

We came closer than many people realize to losing the war because we were late—perilously late—in converting our industry to war production. Donald Nelson, the Chairman of the War Production Board, expressed the considered opinion that we would have been beaten before we got started had our country bordered on Germany. It would have been the greatest irony in history had this catastrophe befallen a nation whose potential strength and industrial output, when finally geared to the production of war goods, exceeded by far any similar effort in the history of man.

But we succeeded with tremendous effort and at staggering cost. In the desperate and convulsive adjustments to an all-out

RESTRICTED

wartime economy, we learned bitter lessons, which we filed for future reference. Nobody involved in that effort can ever forget the costly and frightening difficulties, and nobody could recommend that we attempt such a job again under similar circumstances.

The unhappy fact is that we can never again expect to have the breaks we had in World War II. Our salvation then was time—two years of general preparation before we were attacked, and another year of protection by our Allies after we were attacked, before we began to throw our full weight into the fight. But we will never have all of those advantages again. And this means that we must ourselves maintain such a military posture—and help our friends to maintain such a military posture—that any aggressor would be discouraged from attacking us or any of our friends.

In July of 1947 the President signed the National Security Act which created a national security team. It provided for a systematic organization of civilian and military mobilization planning. This "Unification Act", as it is sometimes called, brought our entire military force under a single cabinet member, the Secretary of Defense. It unified military planning in the field of industrial mobilization. In August of last year Congress made certain changes in the Act, particularly giving the Secretary of Defense authority, direction and control over the military departments and other agencies of the Department of Defense.

This National Security Organization consists of three levels or echelons: the non-military agencies reporting to the President; the Office of the Secretary of Defense; and the Departments of the Army, Navy, and Air Force.

RESTRICTED

The non-military agencies are: (1) The National Security Council which advises the President with respect to the integration of domestic, foreign, and military policies relating to national security, and (2) the National Security Resources Board which advises the President with respect to the coordination and integration of civilian, industrial and military mobilization plans.

Within the Department of Defense, the Act and its amendments created four staff agencies to the Secretary of Defense—the Armed Forces Policy Council, to advise the Secretary of Defense on top policy; the Joint Chiefs of Staff to develop strategic plans; the Research and Development Board to coordinate scientific research for military purposes; and the Munitions Board, which is the industrial mobilization and logistics planning arm of the Department of Defense.

The operating echelon of the national security team consists of the Departments of Army, Navy, and Air Force.

At this point I would like to cover briefly the relationship which exists between the Munitions Board and the various other 'arms' of the national security team.

Of the organizations which I have just described, the Joint Chiefs of Staff, the Munitions Board, the Logistics Groups of the three Departments, and the National Security Resources Board are agencies most intimately involved in logistic planning and coordination.

It must be emphasized that the National Security Resources Board engages in planning for *all* requirements and coordinates over-all planning for military, industrial and civilian mobilization.

RESTRICTED

The Munitions Board on the other hand supervises the development of *military* requirements which include end items, together with the manpower facilities and transportation required in the production of finished munitions.

Another way of stating this division of responsibility is to point out that the National Security Resources Board does for the nation as a whole what the Munitions Board does for the Department of Defense in the economic and industrial mobilization fields. The National Security Resources Board is concerned with two major jobs: (1) national mobilization planning and (2) measures to be taken during peacetime to keep our resources in readiness for mobilization.

Mobilization planning, from the National Security Resources Board point of view, involves identification of problems which will arise if the nation must move from a peacetime to a wartime situation, and the development of measures necessary to resolve these problems. It requires consideration and development of all measures to mobilize effectively the Nation's human, natural, productive, and financial resources to meet wartime needs.

A specific example of how this relationship between the National Security Resources Board, or a similar wartime control agency, and the Munitions Board would operate in wartime may be in order. The National Security Resources Board makes broad allocations of materials and manpower to the Department of Defense and to *other* claimant agencies as well. The Munitions Board makes allocations of facilities and materials among the Army, Navy and Air Force and establishes priorities and schedules governing their procurement programs. Matters pertaining to price control, rationing, wage stabilization, monetary policy, and over-all utilization of small business fall within the purview

RESTRICTED

23

RESTRICTED

of the National Security Resources Board or some other agency such as an Office of War Mobilization.

Another example may be useful to you. The Munitions Board is interested in the petroleum products, the iron ore, and the tin available for military programs and makes allocations of these materials among the Army, Navy and Air Force. The National Security Resources Board necessarily makes plans involving the same materials but it concerns itself with the allocation of the Nation's *total supplies* among several claimant agencies of which *one* claimant is the Department of Defense.

The second major job of the National Security Resources Board concerns current policies and programs, or peacetime policies and programs, through which the nation may achieve an adequate state of readiness against the eventuality of a future war. The policies and programs deal with such matters as stockpiling of strategic and critical materials, training of skilled manpower, and the wide range of other measures being undertaken currently to keep industry and the armed forces continually prepared to meet the needs of a possible wartime situation. The Munitions Board looks to the National Security Resources Board for broad policy guidance on preparedness programs in order to coordinate fully the military preparedness measures. To this end, the Munitions Board interests itself not only in the military requirements for strategic and critical materials, and skilled manpower, but all conceivable devices which will facilitate and speed-up the transition from peacetime to wartime conditions. Some of these devices which will be discussed in detail later are: assembling of mobilization requirements of the Armed Forces; production planning with industry; developing a standard cataloging and specification system; and establishment of uniform procurement regulations.

RESTRICTED

The Joint Chiefs of Staff are charged with the preparation of strategic and logistical plans for the direction of the military forces. All actions of the Munitions Board are in support of these plans. The requirements which we use to make production plans are those computed by the departments based on Joint Chiefs of Staff plans and given the seal of approval by the Joint Chiefs. In its simplest terms, the Joint Chiefs of Staff tell us what will be needed for mobilization and the Munitions Board prepares the industrial plans to fulfill these needs. We advise the Joint Chiefs of Staff on the logistic and industrial feasibility of their strategic plans and they determine what adjustments will be made in these plans in order that industry can adequately support military needs. The Joint Chiefs of Staff advise us of the priority in which equipment and supplies will be needed and we make production plans in accordance with those priorities.

When the National Security Act was passed, it contained no clearly defined line in the logistic field. However, on the basis of experience in the last two years, we have worked out an understanding with the Joint Chiefs of Staff. The Munitions Board has responsibility for what we call "producer logistics" and the economy or business aspects of "consumer logistics." The remainder of the logistic field, which we call the command aspects of consumer logistics, is the responsibility of the Joint Chiefs of Staff.

In order to clarify the use of these terms, "producer logistics" is defined as all logistic activities up to the time that a military end item enters our military distribution system. From that point on, the field is called "consumer logistics."

The Research and Development Board has the responsibility of advising the Munitions Board, as early as possible, of any new developments, both in the way of new materials and end items which

RESTRICTED

25

RESTRICTED

may require new production processes and schedules. The Munitions Board, in turn, must convert these new developments into adjusted requirements and production plans.

Within the Department of Defense, the Army, Navy, and Air Force are the operating agencies in industrial matters. Their representatives not only participate in planning for industrial mobilization but they then convert planning into actions. The viewpoints and considerations of the staff and operating agencies of the departments bear on the formulation of Munitions Board programs. It is through the military departments that the Munitions Board programs are carried to successful conclusions.

So far, I have just made general statements regarding the Organization for National Security and the relationship which the Munitions Board has to other branches of this organization. Before we proceed to more detailed remarks concerning the Munitions Board's program and fields of operation, I would like to give you a brief sketch of its organization.

The Board itself consists of a civilian chairman, Mr. Hubert E. Howard, and one member each from the three departments. At present, the Munitions Board members are Mr. Eugene M. Zuckert, Assistant Secretary of the Air Force; Mr. John T. Koehler, Assistant Secretary of the Navy; and Mr. Archibald S. Alexander, Assistant Secretary of the Army.

The Chairman of the Board directs and supervises our staff through the Director of the Staff. The Director of the Staff is assisted by three staff directors; one for Industrial Programs, one for Military Programs, and one for Military Supply. Both the Chairman and the Director of the Staff are assisted by Advisors in such fields as economics, law and legislation, and public information.

RESTRICTED

The Director for Industrial Programs is concerned with production planning, the acquisition of strategic and critical materials, the maintenance of reserves of industrial plants and equipment, materials, construction, and manpower. This group looks toward industry.

The Director for Military Supply concerns himself with the assignment of purchase responsibility, development of procurement regulations, standardization, cataloging, and small-business aspects. In the field of supply management, he concerns himself with such matters as material control, material handling, maintenance and salvage, transportation, traffic management, and communications. This directorate looks down into the business functions of the departments.

The third director, the Director for Military Programs, concerns himself with the coordination of mobilization requirements and with international programs, which include foreign military aid, export controls, and planning for economic warfare. This directorate also handles all internal planning, coordinates various programs of the Munitions Board, works out our relationships with other military agencies and departments of the Government, and supervises budget matters in the field of industrial mobilization planning. This group deals with the Joint Chiefs of Staff and the planners in the departments.

You will note that our organization is on a functional basis. There is one exception to the organizational structure: Three commodity divisions have been created as focal points for coordinating end items that are considered critical enough to the armed forces to require treatment on a commodity basis. These are the Divisions for Aircraft, Petroleum, and Electronics.

RESTRICTED

The Munitions Board is a staff organization of the Department of Defense dealing in policy and it has certain statutory functions from which its plans and programs are derived. However, a simple way to remember the Munitions Board plans and programs that will be necessary in case of an emergency is to think of what activities would be required to produce an end item such as a submarine, or an airplane, or a tank. First of all, we must know the number of the item that will be required, and this will include such things as initial issue, stock levels, replacement quantities, and pipeline requirements. Production facilities are needed, so we have a production allocation program. Machine tools are needed, manpower is needed, electric power, water, housing for labor, transportation, and raw materials to make the item. Security plans are required to protect the activities. All of these should indicate the nature of the programs that must be prepared and adjusted by the Munitions Board in consonance with the strategic plans and the civilian economy.

One of the primary requisites for assuring industrial preparedness is informing industry of what it will be expected to manufacture in an emergency. Before this information can be furnished in sufficient completeness and accuracy, a fundamental step must be accomplished. This is to find out what and how much the Army, Navy, and Air Force will need in time of war. This is not the "what" and "how much" of material alone; it must include all the material and personnel in the right place at the right time. These needs are called "requirements." Specific data, collected in peacetime on wartime requirements, when added to similar data for civilian wartime needs, are the foundation upon which can be built the military, industrial, civilian, and national economic mobilization planning for the support of a war effort.

RESTRICTED

Our Requirements Program is the end product of our strategic planning cycle. This cycle begins with a JCS strategic plan which outlines forces and missions for the Army, Navy and Air Force. The military departments in turn translate the missions assigned in the strategic concept into operational plans, adding the necessary supporting and service troops. Then they have to figure what these troops will need and the times and places they will need them. If a particular plane is more important to our campaign plans for a certain area than a particular tank is in another area, then we can translate this fact into industrial programs together with the order of precedence they must assume. Not only for the manufacture of the plane itself, but for procuring the fuel to run it, the ammunition it will use, the clothes and equipment its crew will need, the ground equipment necessary to service the plane in its combat area, the transportation to take the maintenance personnel and equipment to the area.

I will list the thirteen categories of requirements that are considered in industrial mobilization planning: Manpower; materials; components; construction; equipment and supplies; communication facilities; transportation service; petroleum products; water supply; production equipment; electric power; gas; and coal and coke.

The calculation of requirements in sufficient detail to be useful is an intricate and time-consuming process. Where military decision and judgment are necessary, these calculations must be made carefully and deliberately. Where the work involved is more clerical in nature, requiring the translation of specific troop units into end-item requirements, the work may be expedited by the use of mechanical and electrical calculating systems. The procedures to be followed by the Army, Navy, and Air Force in compiling and

RESTRICTED

29

RESTRICTED

presenting their mobilization requirements are prescribed in the "Requirements Manual", a publication of the Munitions Board.

In order that we may be reasonably certain that the operational plans can be supported by American Industry, prior to the detailed calculation of many thousands of items, we conduct what we call a 'feasibility test'. Since we can't take all of the items, we select some 300 important end items, such as particular types of planes, naval vessels, tanks, trucks, and electronics; steel, copper, aluminum, petroleum, construction, and merchant shipping. If the strategic plan appears infeasible from an industrial point of view the JCS will either modify the plan to bring it within the capability of American industry, or the JCS will elect to take calculated risks as to short supplies of various needed items. Dependent upon the answer given by the JCS, the military departments proceed with the detailed computation of requirements, with a reasonable assurance as to the degree to which they can be produced by industry in the event of war.

The Munitions Board consolidates and reviews the total requirements as they are prepared by the three departments and arranges for necessary adjustments. When completed, the consolidated mobilization requirements are presented to the Secretary of Defense with recommendations for their adoption. The Munitions Board presents and defends these requirements before the National Security Resources Board, and then acts as a claimant agency for the Department of Defense in the allocation of all national resources.

The Requirements Program provides the information necessary for the operation of all other industrial mobilization programs. It becomes, therefore, the central or key problem requiring solution.

Once the requirements of the three departments have been established, it is obvious that the next step is to determine *where*

RESTRICTED

and *how* these needs can be fulfilled. No single program of the Munitions Board will provide the answer to the *where* and *how* but rather a series of inter-related programs and plans are necessary.

In World War II we found that a strong industrial economy that can make automobiles, refrigerators, and other consumer items cannot be converted over night into making weapons and supplies needed by the military services. We also found that it takes many months to produce a satisfactory finished product from a newly constructed plant. Such a period of grace cannot be expected if we become involved in another conflict. We need stand-by plants which can be converted quickly into war production. Our Plant Reserve Program, which follows Public Laws 364 and 883, authorizes the military departments to maintain plants owned or controlled by the Army, Navy, and Air Force. These plants are maintained in stand-by condition so as to be available for production of military supplies in an emergency. In addition, military and other Federally owned plants that are surplus to our current needs, can be sold or leased with a "national security clause." Under this clause, the Government retains an interest in the plant which requires the buyer or lessee to maintain the plant in such condition that it can be converted to war production within 120 days. Surplus plants for which we cannot find a prospective buyer or lessee are in the hands of the General Services Administration. It holds them in reserve as custodian.

Considered as a whole, these various reserve plants, together with the plants that have been sold but which still make their original product or a similar product, amount to over 900 of the 1,595 plants that the Government constructed during World War II.

RESTRICTED

31

RESTRICTED

Reserve plants are obviously inadequate to meet the military requirements in event of an emergency. To fill the gap, there is a program for pre-planning with industry for the manufacture of essential items of material. This is known as the Production Allocation Program.

The over-all objective of this program is to develop plans, in consultation with industrial management, that will enable a quicker change-over to war production should the need arise. Specifically, the objective is to:

- (1) Locate *now* the manufacturing capacity that will be required for wartime production of essential supplies and equipment, and
- (2) Develop specific and realistic production schedules that can be converted into production contracts in time of mobilization.

It should be noted here that Industry's participation in the Production Allocation Program, while vital to its success, is entirely voluntary. No production preparedness plans requiring the participation of management will be effected without management's consent and cooperation.

When you think of this task in terms of the thousands of items required to make war, and the thousands of plants needed to make these items, the job seems almost impossible.

The wartime requirements for articles of a military nature (the production of which in peacetime is generally confined to a few Government arsenals on little or more than a pilot line basis) presents the problem of industrial conversion. This change of existing industrial facilities to the production of military items is one of the first and most pressing necessities of industrial mobilization. The problem is not only one of conversion, but of *rapid* con-

RESTRICTED

version. The Industry Preparedness Measures Program is intended to shorten the time between awarding of contracts and reaching the highest possible wartime production rates for such items by means of production studies in peacetime.

As a general rule, the items considered for study have no commercial counterpart. Exploratory studies are made by industry in order to discover what bottlenecks might develop in wartime, and recommendations are made to the departments on the best way to remove them. Then, if appropriate, additional contracts are let based on the early studies. These might involve plant layouts, planning for important components, actual tools might be purchased, and in some cases, small quantities of the item are manufactured in order to test the tools and to train and maintain the know-how of the working force.

In the discussion of the Reserve Plant Program, it was pointed out that the intent of the program is to preserve the industrial potential of our reserve plants for possible future military production. In like manner we must provide for reserves of production equipment, such as machine tools, handling and processing equipment, etc. For this purpose we have established the Industrial Production Equipment Program. These reserves are in addition to the items of production equipment that are part of the plants held in the Plant Reserve Program. Most of the equipment was supplied from postwar surplus inventories under a program operated jointly by the three military departments. Maintenance of the reserves and the inspection, acquisition, and allocation of the relatively small number of surplus items still available are now coordinated by the Munitions Board. On 1 April 1950, there were approximately 100,000 items in the military reserve and 15,000 in the national reserve. Then some 59,000 other items are in actual use by the military departments or by their contractors.

RESTRICTED

33

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I have discussed two important factors in production—industrial plants and equipment. A third factor is production materials. One of the most important programs to the Nation is the stockpiling of strategic and critical materials that will not be available in sufficient quantities in time of war. Our Stockpiling Program is a national program, not just a military one. The Munitions Board acts as central staff agency for the entire program and coordinates the activities of other government agencies that can assist in the stockpiling effort. The actual purchasing is done by the Federal Supply Service of the General Service Administration.

On the basis of materials surveys made by the Munitions Board, 71 materials have been chosen for the stockpile. Of these, 52 are minerals. Only 8 are produced in this country to any great extent, and only 27 are produced in this country at all. This stockpile, when completely filled, will cost approximately 4 billion dollars at present prices. We hope to have about 50 percent of the materials actually in the stockpile by the end of this fiscal year.

I mentioned to you earlier that, although the Munitions Board is organized on a functional basis, it does give special attention, on a commodity basis, to three types of requirements. These are aircraft, petroleum and electronic equipment. The reasons for selecting these commodities for individual treatment are:

- (1) The special military importance attached to the end items involved in these three programs.
- (2) The integrated nature of the industries involved.
- (3) A recognition of the high priority which these commodities will have in drawing upon the Nation's resources.

RESTRICTED

(4) The fact that because all three military departments are so deeply concerned with the use of these commodities that it is not feasible to assign procurement responsibility to any one department.

I have discussed with you the most important of the Munitions Board Program which will reach full implementation only in time of war. There are other activities of the Board which are aimed primarily toward increasing the efficiency of the Department of Defense—those activities which will produce economy in men, money, and time. These programs might be called our war-preparedness program, or supply management.

The concept of a supply system was well expressed by the Hoover Commission report. It stated that the following primary phases must be included in the word supply:

1. *Specifications*, or the task of establishing standards for the property to be purchased.
2. *Purchasing*, or the acquisition of property.
3. *Traffic Management*, or the transporting of property from the point of purchase or storage to the point of need.
4. *Inspection*, or insuring adherence of property to purchase specifications.
5. *Property identification*, or the task of cataloging property under a standard system so as to facilitate identification.
6. *Storage and issue*, or the storing of necessary reserves of property and their distribution when needed.
7. *Property utilization*, or the task of seeing that property

RESTRICTED

35

RESTRICTED

is efficiently used, adequately maintained and suitably disposed of when no longer needed.

To any one of the seven primary phases of supply this speaker could well devote his whole effort. Suffice it to say that the Munitions Board is devoting extensive effort to each of these elements of our "readiness for war" program. We are convinced that sound supply management policies will assist in extracting the utmost return from the dollars now budgeted for this purpose. We feel very strongly that we can no longer plan for a war where we will have inexhaustible resources of men, money and materials. We may at any time pass from the status of a "have nation" to that of a "have-not nation" and we must plan accordingly.

Thus far, I have discussed the major steps which the Department of Defense, operating through the Munitions Board, is taking to increase the industrial mobilization potential of the United States.

Now let me turn for a few moments to current international affairs. In this respect, I wish to discuss, in very broad terms, the industrial capabilities for war of the North Atlantic Treaty nations. Plans have not yet progressed sufficiently between the United States and the various allied foreign governments to determine their combined industrial capabilities for war. The Munitions Board, however, does have responsibilities in connection with the Military Production and Supply Board of the North Atlantic Treaty Organization. I will briefly outline the Organization and then discuss the functions and planning now being carried on by the Military Production and Supply Board.

The North Atlantic Treaty provides for a collective security arrangement among nations of the North Atlantic area. The

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Treaty is a 20 year agreement for the purpose of common defense.

The top organization is the Council, which is composed of the foreign ministers of the signatory countries. The U. S. member is the Secretary of State, Mr. Acheson. The Council has the broad responsibility for implementing the Treaty.

Under the Council is the Defense Committee, the U. S. member being the Secretary of Defense, Mr. Johnson. This committee has the responsibility for developing and maintaining the individual and collective capacity of the member countries to resist aggression.

The Military Committee represents the military side of the Organization, General Bradley being the U. S. member. This Committee is comparable to a combined Chiefs of Staff organization. It is charged with the formulation of strategic and logistic plans for the defense of the North Atlantic Treaty area.

The Standing Group is the day-to-day working organization, and is located in the Pentagon Building. Five regional planning groups have been established, which cover different areas of the North Atlantic.

The Military Production and Supply Board is the supply side of the organization. It might be said that the Military Production and Supply Board bears the same relationship, in a general way, to the North Atlantic Treaty Organization as the Munitions Board does to the Department of Defense. The U. S. member is Mr. Howard, who is also the chairman of the Munitions Board. The day-to-day operations are performed by the Permanent Working Staff, which is located in London.

RESTRICTED

The Munitions Board is charged by the Secretary of Defense with the development of guidance for the U. S. member of the Military Production and Supply Board and the U. S. representative to the Permanent Working Staff. The Munitions Board is also responsible for formulating, in coordination with the appropriate executive departments and agencies, the U. S. position on matters brought before the Military Production and Supply Board.

The initial responsibilities of the Board are:

- (1) To develop ways and means of meeting material deficiencies needed in support of strategic plans.
- (2) To promote more efficient methods of production of military equipment.
- (3) To promote standardization of military equipment.

In brief, then, the Military Production and Supply Board is an international agency having the responsibility for developing ways and means for meeting the material deficiencies needed to support North Atlantic Treaty strategic plans; for integrating the production of military items by European signatories; and for the promotion of standardization.

The Military Production and Supply Board is still in its infancy and progress has necessarily been slow. The second meeting of the Board was held at The Hague on March 29th of this year.

Working on a twelve-nation basis under Mr. Howard's chairmanship, the Board has accomplished all of the preliminary work necessary to embark on a coordinated military production program with the Treaty countries. A review has been made of the major deficiencies in military equipment for the support of the North Atlantic Defense Plan, together with a survey of production

RESTRICTED

capacity in Europe. The aid in machine tools and materials given by the United States for additional military production in Europe will fit into the over-all production scheme developed by the Board. The tempo of military production in Europe is stepping up now and will continue to do so.

A review of military equipment in Europe surplus to each country's needs has also been made. In some cases transfers of this equipment have been effected and transfers for the balance are being arranged. As you know a large part of Military Aid given by the United States consists of surplus stock.

Plans have been made and, in some cases, production already started in Europe to supply spare parts for U. S. equipment.

The Military Production and Supply Board has been directed by the Defense Committee to promote standardization of equipment wherever possible. This means that the Board will advise regarding production of equipment selected by the Military side of the organization. Standardization, wherever possible, is a most important adjunct of the North Atlantic Military Production plan.

I have covered our major programs. I believe you are now well aware of the fact that all our work in the Munitions Board has a distinctly industrial flavor. We recognize that the cooperation, advice, and direct participation of industry are essential to our work. Our plans must be workable. To insure that industry will want to adopt our plans, it must participate in their preparation. Industry has participated directly in our programs that have involved the surveying of productive capacity, the scheduling of wartime production in individual plants, and carrying on engi-

RESTRICTED

39

RESTRICTED

neering studies to improve our state of preparedness. Six hundred industrialists from all segments of industry serve on various committees and sub-committees and advise the Board and the Board's staff on important problems.

Our objective is to prepare industrial plans that will give America maximum security without militarizing our Nation or bankrupting our economy. Each procedure we adopt and every plan we develop are designed to buy time and to make it possible for us to mobilize our industrial potential rapidly and effectively in time of war. The participation of industry in the early stages of our planning will insure industry's understanding and cooperation in the event of an emergency.

Gentlemen, from my outline, I am sure you realize the scope and importance of our problems. I am sure, as well, that you must realize that the task is far from complete. May I ask you now, irrespective of your future assignments, to give your actual and moral support wherever you encounter our efforts.

RESTRICTED

RECOMMENDED READING

This section lists material published in current periodicals which will be of interest and value to Navy officers.

"Going Overseas"

(Information of Interest to Personnel Being Transferred Overseas) Marine Corps Gazette. May.

"Strategy of the Future—A Second Look"

By Cdr. George H. Miller, USN., U. S. Naval Institute Proceedings. May.

"The Hydrogen Bomb. III. Military Security Aspects"

By Robert F. Bacher. Scientific American. May.

"The Soviet Mentality As Seen at the U. N."

By Thomas J. Hamilton. N. Y. Times Magazine. April 30.

"Civil Defense Is Here To Stay"

By James H. Straubel. Air Force. May.

"Britain's Road Back"

By John Knox Jessup. Fortune. May.

"From Two Worlds To One"

By Raymond G. Swing. The Nation. April 29.

"Germany: Time Bomb of Europe"

By Henry C. Wolfe. The American Mercury. May.

"A Program For Atomic Peace"

By Senator Brian McMahon. Reader's Digest. May.

"How To Take The Offensive For Peace"

By John Foster Dulles. Life. April 24.

"What Can Ex-Communists Do?"

By Isaac Deutscher. The Reporter. April 25.

RESTRICTED

41

