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THE EARLY OPERATIONS OF THE
EIGHTH AIR FORCE
AND THE ORIGINS OF THE
COMBINED BOMBER
OFFENSIVE

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THE EARLY OPERATIONS OF THE EIGHTH AIR FORCE
AND THE ORIGINS OF THE COMBINED BOMBER OFFENSIVE
17 August 1942 to 10 June 1943
(Short Title: AAFRH-18)

Prepared by
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FOREWORD

This monograph recounts the development of the Combined Bomber Offensive Plan during the early months of Eighth Air Force bomber operations (17 August 1942 to 10 June 1943). The subject covered here is related to several other histories prepared by the AAF Historical Office: AAFRH-2, Origins of the Eighth Air Force: Plans, Organization, Doctrines to 17 August 1942; AAFRH-19, The Combined Bomber Offensive, April through December 1943; AAFRH-22, Strategic Bombing of Europe, 1 January to 6 June 1944; and other studies which narrate operations of the various air forces against European targets. The present study was written by Lt. Arthur B. Ferguson of the Combat Operations Branch.

Like other AAF Historical Office studies, this history is subject to revision, and additional information or suggested corrections will be welcomed.
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Frontispiece
The Early Operations of the Eighth Air Force
and the Origins of the Combined Bomber Offensive
Chapter I

THE PROBLEM

When 12 B-17's of the VIII Bomber Command took to the air on 17 August 1942 for a high-level daylight attack against the Sotteville Marshalling Yard at Rouen, they carried with them much more than a bomb load of trouble for the enemy. They carried with them a long heritage of debate and controversy. And they began an experiment in strategic bombardment which was to answer a number of questions vitally affecting the entire course of the war in Europe. The campaign began in an atmosphere of skepticism concerning the ability of U. S. heavy bombers to carry out daylight operations at high altitude in the face of powerful enemy fighter defenses, and of indecision concerning the precise nature of the bomber offensive toward which these American forces were supposed to contribute. It was not even clear at that date exactly how strategic bombardment from the United Kingdom should fit into the over-all strategic picture. By June 1943, however, the American bomber force was prepared to take its part in the Combined Bomber Offensive, an operation possible only after all major doubts and indecisions, both tactical and strategic, had been for practical purposes removed. Toward the attainment of this end, the early operations of the Eighth Air Force contributed a vital, perhaps a determining influence.

* The CBO Plan, approved late in May 1943, outlined four phases for the combined operation, the first beginning with April of that year. Some reports on the progress of the CBO follow the plan and consider the offensive to have begun in April. The CBO Directive, however, was not issued until 10 June, and it is considered in the present study that all operations prior to that date are preparatory to the CBO proper.
It would be a large labor of small value to trace in detail the story of these first 60-old missions conducted from August 1942 to June 1943, or to treat them as if they constituted in themselves more than a minor, if highly effective, part of a vast undertaking. Those who are interested in the detail will find the mission reports voluminous, well arranged, and available. It will therefore be the purpose of this study to show how these operations became an active element in the strategic planning of the period and to follow the debate which, with constant reference to the doctrines and achievements of the Eighth Air Force, culminated in a plan for the full-scale Combined Bomber Offensive.

Among the controversial questions affecting the use of air power in the European Theater were certain strategic issues involving decisions on the highest policy-making level. By August 1942 these issues either had barely been settled or were still in the open forum. Although basic Allied war plans had indicated Germany as global enemy number one, it was still an open question to what extent U.S. heavy bombardment should be committed to operations in the European Theater at the expense of those in the Pacific. To the men in charge of the Pacific war, especially to the U.S. Navy, it seemed by no means clear that the war against Germany should receive unquestioned priority in air equipment, if indeed it should receive priority at all.\(^1\)

The Combined Chiefs of Staff had, in July 1942, decided that U.S. commitments to EMIRIO (the build-up of U.S. forces in the United Kingdom) should be readjusted for the purpose of furthering offensive operations in the Pacific.\(^2\) Accordingly 13 combat groups, including 3 heavy
bombardment and 2 medium bombardment units, were to be diverted. It appears, however, that not all the groups were sent as planned, and the problem of diversion to the Pacific remained a source of considerable argument, much of which turned on the ability of the U.S. heavy bombers to do a job in northwest Europe of sufficient strategic value to justify the degree of priority required by a major aerial offensive in that area.

There was also the question of priority in production, a question by no means settled in August 1942, even on paper. Faced with the necessity of using limited resources to meet demands which seemed virtually unlimited, the higher authorities had to allot priorities carefully in accordance with very long-term strategic concepts. There was a very natural tendency in weighing the relative importance of air, ground, and naval equipment to give a relatively high place to those items—tanks and battleships—which had long tradition behind them, and to view with some caution the claims of air power to first priority. A bombardment offensive from the United Kingdom had been envisaged in the war plans as a necessary prerequisite to the invasion and ultimate defeat of Germany. The Air Corps had, in 1941, contended that, with adequate forces, they could carry out a bomber offensive which would make an assault on Fortress Europa relatively cheap in men and ground materiel. But they had to have the aircraft, and have them in unprecedented numbers. That meant, in effect, first priority in production. The question again arose in the fall of 1942, this time in connection with a new statement of air requirements (A-10-42) which once more
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postulated a large-scale bomber offensive against the heart of Germany and which bore the same implications with regard to priority. This time the estimate became the center of a very critical debate.

The AAF argument on both these issues, priority for the European Theater and priority in production, rested on the assumption that it was feasible for U.S. forces to join the RAF in a bomber offensive against Germany's industrial and military system on a scale sufficient to weaken the enemy's ability to wage war to such an extent that a land invasion could be undertaken with a minimum of losses. Both American and British air men gave a heartily affirmative answer. But the answer given arose out of deep faith in the potentialities existing in long-range heavy bombardment aviation rather than from any sum of actual experience. The German efforts to cripple Britain in 1940-41 and the subsequent bombardment of Germany by the RAF had provided inadequate indications of what might be done. Both campaigns had been projected on too limited a scale to do more than hint at the possibilities inherent in the employment of really large bombardment forces. And scale, the proportion of the total war effort to be invested in the bomber program, was the crux of the argument; for no one denied that bombardment of the enemy's vitals would be a very beneficial thing, considered in the absolute, or that it would constitute a necessary part of the plan for the ultimate defeat of Germany. Moreover, the particular method of bombardment advocated by the AAF remained entirely an article of faith as far as tests in combat, under European conditions, were concerned.
Thus the answer to the question regarding the feasibility of a full-scale bomber offensive against Germany in turn depended on the answer to another question essentially tactical in character. Since participation by the AAF was necessary to such an offensive, and since the AAF had become committed for the immediately foreseeable future to a policy of daylight bombing of precision targets from high altitudes, it was of the utmost importance to know whether the American bombers could really do this kind of job. Could they hit the targets accurately enough and often enough under European conditions, and with a sufficiently low percentage of losses, to make their contribution to a combined bomber offensive worth the necessarily huge investment? That is why, on 17 August 1942, the Eighth Air Force found itself being watched from all sides with a degree of intensity quite out of proportion to the extent of the actual operation undertaken.

They were being watched also for another and somewhat less fundamental reason. There was a strategic problem under consideration in August of that year which did not directly affect the concept of strategic bombardment of the European Axis but which did very definitely affect the method by which the heavy bomber forces were to be employed and for a time even jeopardized the entire project for a day offensive from the United Kingdom. It had been tentatively decided in July that EISEN, including the air build-up, could no longer be given unquestioned priority. By midsummer the key to the strategic situation in Europe lay in the ability of the Russian Army, generally admitted to be potentially the greatest asset to the Allies in that critical year, to withstand the weight of German attacks. Something had clearly to be done,
and very soon, to relieve this pressure on the Eastern Front. But
the Allied invasion of Western Europe, projected for 1945, might well
come too late, and might also prove to be a premature and dangerous
undertaking, especially if the situation on the Eastern Front con-
tinue to deteriorate. The only remaining way of forcing substantial
diversion of German forces, short of a costly and inconclusive minor
action in northwest Europe (SLICEMAKER), was to conduct a combined
operation in North and Northwest Africa. But it was clear that any
such campaign would necessarily postpone the full scale invasion of
Europe (ROUNDUP) and, as a corollary, the prosecution of BOLERO.

The British were glad enough to defer the risks of a premature
cross-Channel invasion, but they were concerned that the bomber offen-
sive, in which they had invested both faith and forces, should not be
abandoned. The U. S. Joint Chiefs of Staff assured them, however, that,
although air units for the African invasion would have to come from
BOLERO, it was planned that the AAF should operate against Germany from
any suitable base and that, owing to the unfavorable weather in north-
west Europe, Africa might offer a more suitable base of operations than
England, at least for the winter months. It was accordingly decided
date in July to continue BOLERO as the main Allied effort only so long
as no other invasion effort became imperative, thus making ROUND-UP
impracticable for 1945. If by 15 September 1942 the Russian situation
still appeared critical, the decision to launch the African operation
should be made at the earliest possible date before December 1942.
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The decision to mount Torch, as the African invasion was called, would mean the diversion from the Eighth Air Force of a major proportion of its strength, both actual and planned. The combat units needed in Africa could hardly be obtained elsewhere, because all other active theaters had been allocated only enough to meet a minimum defensive requirement. It would also mean that a really effective day bomber offensive from the United Kingdom would have to wait until an African victory released the diverted combat units. If this course of action were to be pursued (and there was every reason in August to believe that it would) it would involve serious questions as to the advisability of continuing the U. S. bomber offensive from the United Kingdom at all, at least for the time being. There was some doubt whether the day bomber force, necessarily small in view of the proposed diversions, could produce results commensurate with the risk involved in exhibiting vitally important equipment prematurely to the enemy. 4 And it came in the fall of 1942 to be seriously debated whether, in view of the unfavorable weather conditions in northwest Europe, it would not be wise to shift the entire bomber effort to African or Mediterranean bases. 5 Here again the arguments could only be answered by operational data; and again it was up to the Eighth Air Force, even though handicapped by inadequate strength, to furnish the required information.

Although at this date the concept of daylight, precision bombing was on trial, and in some degree that of strategic bombardment as well, much had been done to prepare for a bombing offensive by the combined British and American air forces against the sources of Germany's war effort. After much negotiation with the British, plans had been laid
to organize, base, and equip a force of air units in the United Kingdom as part of the POLAR operation. By the end of the summer of 1942 the Eighth Air Force, as the units in the United Kingdom came to be called, had become a functioning organization under the leadership of Maj. Gen. Carl A. Spaatz, with appropriate subordinate commands—bomber, fighter, composite (for training purposes), and service. Under Brig. Gen. Ira C. Eaker, the bomber command (the one with which this study is almost exclusively concerned) had been organized in three wings: the first, under Col. Newton Longfellow, with headquarters at Brantford; the second, under Col. J. A. Hodges, with headquarters at Old Catton; and the third, under Col. C. F. Philips, with headquarters at Llandow Hall. Of the heavy groups allocated to the Eighth Air Force, only one had become operational by 17 August, although several more were in training, at staging areas, or on route from the United States.

The RAF had, of course, been employing much larger forces in an offensive of its own. On the night of 6/7 March 1942, for example, the British bombers had been able to hit the Renault works, at Sillencourt, on the outskirts of Paris, with 400 tons of high explosives in an operation which had very lasting effects.

But in August 1942 the Allied air forces in the United Kingdom—especially the RAF—were considerably better equipped with ideas than they were with aircraft. Both U.S. and British air men were adequately steeped with faith in the virtues of strategic bombardment. In this regard, as in that of airstrength, the British were in a position somewhat senior to the Americans. They had been carrying on a bomber offensive against strategic objectives for many months, and, more significant,
they had faced since 1917 a military problem closely related to that with which they and their allies in the United Kingdom were confronted in 1912. In the U.S. a doctrine of strategic air operations had been developed largely since 1918 by a few forward-looking military thinkers who followed in the path dramatically indicated by General Mitchell. And it had been modified with particular reference to problems of hemisphere defense. To a considerable extent it remained an academic theory, the practical application of which was directed by logic and scientific experiment rather than by combat experience. British doctrine, on the other hand, stemmed directly from the cataclysmic experience of 1917-18 and had matured under the threat of just such conditions as now materialized since 1939.

In World War I, Britain had, for the first time in her history, been forced to commit a large citizen army to land operations on the Continent of Europe. She had found it a costly policy. Strictly limited in her manpower, she had risked disaster in a land battle such as that in which the combatants were by 1917 engaged on the stabilized Western Front. In October of that year Winston Churchill had expressed his concern in a memo to the War Cabinet. This was, he said, a battle in which maneuver was no longer possible; the enemy could not be outflanked for the simple reason that there were no flanks in lines stretching continuously from the Alps to the sea. Only the Germans, by means of their submarine fleet, had succeeded in circumventing the rigidity of this fixed front. The answer was to his clear and compelling. Air power could strike at the life lines of Germany's war machine even more effectively than Germany's submarine offensive could operate.
against the sources of Allied power. It was becoming apparent, in view of the progressive exhaustion of manpower among all the combatant nations, that the character of the war was about to change from one of men to one of machines.\textsuperscript{11} In this industrial war the nation that commanded the air could destroy the industrial power of the enemy and in the long run win. And the British Empire, relatively richer in material resources and industrial means than in available manpower, could if it wished, seize control of the air by a large program of air production, thereby redressing the balance of potential power in its own favor.

The plan for the bombardment of the interior of Germany by an Inter-Allied Bombing Air Force, maturing as it did in the autumn of 1918, came too late to have much effect on the course of that war. But the principles upon which it was built deserve some attention, for they became firmly rooted in British thinking. Apparently largely the work of British strategists, among whom Maj. Gen. H. H. Trenchard seems to have been the leading spirit, this plan was conceived on an ambitious scale. Germany's economic situation was analyzed and objectives chosen which would paralyze the chemical industry, the iron and steel industry, and the vital centers of transportation.\textsuperscript{12} The targets to be attacked were, however, the city areas rather than the particular plants and facilities that gave them their strategic importance. Undoubtedly the planners came to this decision because the imperfect technical equipment available would place any more precise tactics out of the question. But it is also worth noticing that they had in mind the demoralization of the population in these areas as an end in
itself.\textsuperscript{13} Theirs was a concept of total aerial warfare that reflected a keen insight into the complexity and totality of all modern war effort.

Yet for all their belief in the interdependence of the parts in a combatant society, they insisted on the absolute necessity of concentrating their efforts on a few key objectives rather than spreading their attacks indiscriminately among a large number. Objectives "must be as small in number as is necessary for effective action to be taken on each one";\textsuperscript{14} and with limited resources effective action could not be taken on all or even on the majority of individually worthwhile objectives. Moreover, once attacks had been begun on a key area they must be pressed relentlessly.\textsuperscript{15}

The policy intended to be followed is to attack the important German towns systematically. ... It is intended to concentrate on one town for successive days and then to pass to several other towns, returning to the first town until the target is thoroughly destroyed, or at any rate until the morale of the workmen is so shaken that output is seriously interfered with.

Goodless to say, results of this sort could be obtained "not by a few specially trained men but by whole bombing groups."\textsuperscript{13}

Here, in essence, were the principles of strategic bombardment which the British developed, with little alteration during the early years of World War II. And they are the principles on the basis of which the British entered into the Combined Bomber Offensive.

The situation in 1942 was in some respects different from that of 1918, but the major differences were entirely in favor of strategic bombardment. Whereas in 1918 first priority had to be given to the use of aviation in direct support of ground operations, with residual
power alone invested in long-range bombing, by 1942 long-range bombardment had become the only means by which the Allies could strike at the heart of the German war effort. So it was a convinced group of men who were entrusted with the deployment of the RAF in 1942, a group convinced by experience and by long study. Their program had its opposition from those whose faith in the other armed services equalled that of the air men in theirs and who, like their counterparts in the U.S., feared the investment of too great a proportion of the total national resources in the equipment of a bombardment force. But, from the Prime Minister down, there was a general feeling that Germany could only be effectively defeated after having first been subjected to a systematic aerial pounding at the nerve centers of her industrial system. And it is neither surprising nor accidental that Trenchard (now Lord Trenchard) should be found urging in a widely circulated state paper the necessity for investing to the utmost in heavy bombardment aviation rather than in the weapons of land and sea warfare. To do otherwise, he warned, would be to engage in a battle on the enemy’s own terms. In short, it would be to return to 1918, which would be disastrous. 17

It would be difficult to estimate the degree of influence exerted by these British strategists on the U.S. proponents of strategic bombardment. But in reconstructing the climate of opinion out of which the Combined Bomber Offensive emerged it would be dangerous to minimize the significance of their ideas both as to content and historical priority.
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To be sure, the British and U.S. air forces differed radically in their conception of the methods by which strategic bombing should be carried out. The former remained convinced of the virtues of area bombardment. This decision was dictated in part by a deeply rooted conviction that the social structure and morale of industrial populations constituted a primary objective. While admitting an objection on military and humanitarian grounds to indiscriminate bombing of non-military objectives, they hoped by means of widespread destruction of housing, utilities, and transportation so to disrupt the social system that the war economy which ultimately depended on it would crumble. 

Did they overlook the intangible element of nerve strain induced by the confusion, uncertainty, and fatigue that would inevitably accompany bombardment of populated areas. In part the decision to conduct area bombing was dictated as in 1918 by the necessity, given limited aircraft strength and productive capacity, of hitting the enemy immediately where attacks could do most damage; hence a preference for the great industrial concentrations in the Ruhr Valley and for target systems consisting of communications centers and the industrial communities surrounding them.18

Objectives of this sort could be hit with just as good effect at night as by day and with considerably less risk. The RAF had therefore developed night bombardment as their main tactical policy. They had carried on daylight attacks on precision targets, but these were small raids and exceptional. Generally speaking, British experience had indicated that day operations were costly with the equipment at hand;

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and limited experience with the early B-17 and B-24 types had not convinced the British observers that the Americans had solved the problem of daylight bombing. They admitted that they might some day turn to daylight bombing, but for the time being they remained committed to night operations.

The USAAF, on the contrary, was just as irrevocably committed to daylight precision bombing. The B-17, equipped with its special bombsight, had been developed to operate against small targets, particularly such naval targets as might conceivably be encountered in defense of the United States. It was hoped that, with their heavy armor and armament and their ability to fly at high altitude, the B-17 and B-24 bombers could be used just as effectively and with a minimum of loss in the European Theater. It was readily recognized that the weather conditions and the antiaircraft defenses in that area would seriously test the American bombers; but U.S. air men were unwilling to discard the best day bombers in the world in favor of night operations from the United Kingdom, especially since they had profound faith that, with careful handling and some modification, these planes could be made to do a job quite beyond the capabilities even of the Lancaster.

So it was that, when US planners first outlined the part to be played by U.S. heavy bombardment forces in an offensive against Germany, they selected target systems consisting mainly of small, precision objectives—the electric power grid, the transportation system, oil and petroleum plants, aircraft factories, aluminum and magnesium plants, submarine installations, and naval bases. They contemplated turning to
area bombing of populous centers only after it had become evident that civilian morale was ready to crack.

It would be easy to misinterpret this divergence of method as a conflict of purpose. Some journalistic observers made this mistake in the summer of 1942. Actually, while there remained some understandable doubt concerning the ability of the American heavy bombers to carry out daylight missions successfully, it was generally accepted in XFL and 1AF headquarters that the day and night bomber programs would be mutually supplementary rather than in opposition to each other. They would relieve the congestion on British airfields by dividing the operating time between the two forces. And they would make it possible to subject German towns to 24-hour bombardment which would greatly increase the effectiveness of a combined offensive. General LeMay had made these points clear in a report dated 20 March 1942, in which he had emphasized the essential compatibility of the two tactical doctrines. In so doing he implied the principle of the coordination of mutually supplementary day and night attacks which became an explicit and essential element in the Combined Bomber Offensive Plan.

That principle received its first formal definition in a "Joint/American/British Directive on Day Bomber Operations Involving Fighter Cooperation," dated 29 August 1942, which stated that "The aim of the day bombardment by Allied Air Forces based in Great Britain is to achieve continuity in the bombing offensive against the Axis." In order to bring this continuous pressure to bear on the enemy, night bombardment would remain the responsibility of the British Bomber
Command, leaving day operations primarily up to the Eighth Air Force. Specifically, "the method of achieving the aim of day bombardment is by the destruction and damage of precise targets vital to the Axis war effort."

This directive, then, set forth the official basis upon which the Eighth Air Force and the RAF were to implement the project for a bomber offensive. The day offensive was to be developed in three phases marked successively by the presumably progressive ability of the American force to provide its own fighter protection and "to develop the tactics of deep penetration of the enemy day fighter defenses." The selection of objectives for day operations would be made by the Commanding General, Eighth Air Force and "A.C.A.S. (Assistant Chief Air Staff) (Gen.) as occasion demands." Operations would be initiated by the Commanding General of the VIII Bomber Command until such time as the American fighter forces had been built up sufficiently to assume their full share of activity, at which time the Commanding General of the VIII Fighter Command would share with his colleague of the VIII Bomber Command the responsibility for developing tactical plans. In all phases of the offensive, it would be the duty of the commanding general of the American fighter command to coordinate any jointed fighter operations with the Air Officer Commanding-in-Chief, RAF Fighter Command.

In the first phase this latter officer would share responsibility for detailed plans relating to the British fighter participation. By the time the last phase had been inaugurated, in which the American force would provide its own fighter cover, all tactical planning was to be...
the responsibility of the American commanders.

It should be noted that this directive dealt almost exclusively with the machinery for the tactical employment of the American force, especially its fighters. Because all early missions, and presumably a good many others, would have to be flown under extensive RAF fighter cover, the problem of most immediate concern was naturally that of coordination on the tactical level. The question of target selection, ultimately the crucial one, was left undefined.
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EIGHTH AIR FORCE OPERATIONS, 17 AUGUST 1942 TO 20 OCTOBER 1942

The First 14 Missions

The first combat mission flown by the Fortresses of the VIII
Bomber Command could not have been more fortunately timed. Considera-
ble "polite doubt" regarding the potentialities of the American bombers
had existed in the minds of British observers in the summer of 1942,
and on 16 August Peter Hasefield, Air Correspondent to the Sunday Times,
gave voice to an unqualified opinion in words which bristled with
"plain speaking." He expressed British satisfaction at the prospect
of American aid in the bombing of Germany. But he also made it per-
fectly plain that he considered the B-17 and the B-24 quite unsuited
to the job of bombing over heavily defended enemy territory.

American heavy bombers--the latest Fortresses and Liberator--are
done fighting machines, but not suited for bombing in Europe. Their
bombs and bomb-loads are small, their armor and armament are not
up to the standard now found necessary and their speeds are low.

It was not simply, this correspondent made clear, that the American
bombers could not perform the day bombardment mission for which they
were being developed. They were likewise unsuited to night operations
over Germany, and, in spite of the general desire in the United Kingdom
to see these aircraft take part in the night offensive, it would be un-
fair to the American flyers to send them into a type of action for
which, according to British experience, they were not equipped. Hase-
field found the answer to this seemingly insoluble problem of using
bombers that were good for neither day nor night operations, by advo-
cating that they be sent out on patrol missions over the Atlantic.
submarine and shipping lanes.

The appearance of this article by one who presumably reflected opinion in at least some official British circles gave rise to a certain amount of concern in USAAF Headquarters. The following day General Arnold, on receiving the London dispatch which covered the Lane field article, wired General Spaatz for a statement of the facts in the case as he saw them. 3 General Spaatz was hastily spared from having to call back on tedious and at best none too convincing apologetics, for, as a result of the mission against Rouen on 17 August, he was able for the first time to offer a combat report.

The attack on Rouen had, he wired on 18 August, far exceeded in accuracy any previous high-altitude bombing in the European Theater by German or Allied aircraft. Moreover, it was his understanding that the results justified "our belief" in the feasibility of daylight bombing. As for the B-17, it was suitable in speed, armament, armor, and bomb load for the task at hand. He would not, he asserted, exchange it for any British bomber in production. 4

The target for this first heavy bombing mission was the Sotteville Larmorling Yard, which was one of the largest and most active in northern France. Concentrations of more than 2,000 freight cars had been photographed there. It possessed for the enemy a two-fold importance. It was a focal point for traffic to and from the Channel Ports and the west of France; and it comprised extensive repair installations, including a large locomotive depot (capacity estimated at 200 to 250 engines) and the Sudickeen rolling-stock repair shops. 5 Germany's shortage of locomotives and rolling stock had become acute since April 1942.
In or about that month a change had been noticed in German war production which involved raising the construction and repair of locomotives and freight cars to a priority equal to that of aircraft, tanks, and submarines. Moreover, strict regulations were in effect throughout the Reich and the occupied countries requiring the most expeditious handling of traffic in order to make the best possible use of the inadequate equipment available. Consequently, any attack which would damage or destroy the servicing and repair facilities of the Sorteville Yard or interfere with its normal operations would contribute to the mounting strain under which the Axis railway system was laboring. The actual aiming points were the large locomotive workshops and the Buddicum repair shops.

Twelve B-17s of the 97th Group (the only group in the VIII Bomber Command at that date on operational status) took off late in the afternoon to attack the target while six others from the same unit flew a diversionary mission under heavy fighter cover. Four RAF squadrons of Spitfire IX's provided close cover for the attacking planes flying with them to the target area. Five K.L.F squadrons of Spitfire VII's gave withdrawal support. Visibility was excellent and all twelve planes bombed the target, dropping a total of 30,900 pounds of general purpose bombs from an altitude of 23,000 feet. Three of the bombers had been loaded with 1,100-pound bombs intended for the locomotive workshop, the rest carried 500-pounders car-marked for the Buddicum shops.
The bombing was fairly accurate, especially for a first effort. Approximately half of the bombs fell in the general marshalling yard area. One of the aiming points was hit, and several bombs burst within a 1500-foot radius. The bombs intended for the other fell for the most part about 2,000 feet to the south around the transshipment sheds, indicating that some of the crews may have mistaken these buildings for one of the two aiming points. Fortunately the yard and adjacent facilities presented a large target, so that even technically inaccurate bombing might still be effective.

And it was effective enough, considering the small size of the attacking force. Direct hits were scored on the two large transshipment sheds in the center of the marshalling yard, and about 10 of the 24 tracks on the sorting sidings were damaged. A quantity of rolling stock on the tracks or near them had been destroyed, damaged, or derailed. As it happened, activity in the yard was not at its peak when the attack occurred, or destruction of rolling stock might have been much greater. Damage to the tracks no doubt interfered with the flow of traffic, but a sufficient number remained intact to deal efficiently with the relatively low-pressure traffic then moving through the yard. The bottlenecks at each end of the sidings were not damaged. The locomotive workshop received one direct hit which probably slowed up the movement of locomotives and other rolling stock in and out of the building in addition to achieving constructional damage resulting from blast. Despite the inconvenience that this attack undoubtedly caused the enemy, it was clear that a much larger force would be required to do lasting damage to a target of this type.
time being the extent of the damage inflicted was less important than the relative accuracy of the bombing.

Important also was the fact that the bombers had come through with no losses and with a minimum of damage. Enemy opposition had been slight. Antiaircraft fire was observed at two places, but from it only two planes sustained damage, and that of only slight extent. Lighter opposition was negligible. Enrico He-108's attacked the formation and several others put in a silent appearance. Of those attacking, one was claimed as damaged by fire from the B-17's. The bomber crews suffered no injury at all from enemy action, the only casualties having occurred when a plane hit a pigeon and the shattered glass in the nose slightly injured the bombardier and navigator. 12

General Laker himself led the mission and made some interesting observations on the operational problems uncovered by this initial combat test. 13 The crews were enthusiastic and alert, but nonchalant to the point of being 'blase'. It had all been possibly too easy, but confidence was a good fault. Crew drills, especially in the handling of the oxygen equipment, appeared to be indicated and air discipline needed improvement. A better, tighter defensive formation would offer more protection against enemy fighters. The critical items in missions of this sort General Laker considered to be the split-second timing for rendezvous with the fighters (the timing in this instance had been a few minutes off), navigation to the target (there would not always be weather so fine that the target would be visible for ten miles), training of bombardiers (the Sottoville Yard was, after all, considerably larger than a pickle-barrel), pilotage of such a high order that
a tight yet maneuverable formation might be flown, with the shortest possible level run on the target (anything less would court disaster from flak and fighter opposition, both of which might be expected to improve greatly), and, finally, accurate gunnery, the sine qua non in self-defense for bombers.

Like General Spaatz, General Hapner was impressed with the performance of his B-17's. Yet he was unwilling to say that they could make deep penetrations into Germany without fighter escort and without excessive losses, even though it was apparent that the German fighters would approach them gingerly. General Spaatz shared his caution on this point, asserting in his cable of 18 August that American bombers would not be sent indiscriminately into Germany, and that depth of penetration would increase only as experience dictated. Meanwhile, pending determined enemy fighter attacks, no definite conclusions could be reached regarding the feasibility of bomber attacks unsupported by fighters.

The first mission had given a great boost to morale, not only in headquarters but among the operating personnel. The next mission did nothing to reduce that warm feeling of accomplishment, for on the 19th 24 B-17's made an attack on the Abbeville/Drucat airdrome which called forth a letter of commendation from Air Marshal Sir Trafford Leigh-Mallory. The mission had been planned as a part of the air operations undertaken in connection with the Raabpe raid. According to Leigh-Mallory it appeared that the raid on Abbeville undoubtedly struck a heavy blow at the German fighter organization at a very critical moment during the operations and thus had a very material effect
on the course of the operations." The fighter pilots flying over
the airdrome on the day following the attack reported the main disper-
sal area to have been apparently "completely demolished." Subsequent
reconnaissance indicated somewhat less devastation, although a hangar
had received a direct hit and 60 fresh craters had appeared on or in
the neighborhood of the airdrome.\(^{13}\)

It was not until Mission 9, on 5 September 1942, that the bomber
Command again equalled the force sent out on the 19th. The intervening
six missions saw an average of only 12 aircraft take off, and of the
72 B-17's dispatched on these missions 10 had been forced to turn back
or were unable to bomb, mainly as a result of mechanical failures. The
targets consisted of the Longueau Marshalling Yard at Amiens, a vital
focal point in the flow of traffic between France and northern Germany;
the Wilton Shipyards in the outskirts of Rotterdam, the most modern
shipyard in Holland and one used to capacity by the Germans for ser-
vicing surface vessels and submarines; the shipyard of the Ateliers
and Chantiers Maritimes de la Seine, at Le Trait; the well-equipped
airplane factory of Avions Scotts at Revalie, an installation used ex-
tensively by the enemy as a repair depot for the near-by fighter base;
and the Courtrai/Levolghem airdrome, in use by the Germans as a base
for their Me-109 fighters. All lay within easy fighter range and
required at most only shallow penetration of enemy-occupied territory.
Only two, Le Trait and Courtrai/Levolghem, had been subject to RAF
attacks, in each case on a small scale.\(^{19}\)
These six missions followed the pattern laid down by the preceding two. The B-17's flew under heavy fighter escort, provided largely by the R.A.F., and bombed from 22,000 to 23,000 feet in circumstances of generally excellent visibility. They encountered for the most part only slight enemy opposition. No B-17's were lost. Nine of the bombers were slightly damaged and a few of the crew members injured by flak, which at this date varied greatly both in intensity and accuracy. With one exception the bombers encountered few enemy aircraft, although the fighter escort tangled with several, claiming two destroyed, nine probably destroyed, and nine damaged, at a cost of four of their own number lost.20

The exception referred to took place on Mission 4 when, on 21 August, the bombers made an unsuccessful attempt to attack the Milton Shipyards. It appears that the B-17's were 16 minutes late for their rendezvous with the R.A.F. fighter escort and that as a result the escort was able to accompany them only half way across the Channel. The formation received a recall message, but by that time it was over the Dutch coast. While unescorted it was attacked by 20 to 25 Me-109's and Fw-190's. A running fight ensued which lasted for 20 minutes, during which time both the pilot and co-pilot of one B-17 were wounded, the co-pilot so seriously that he died soon after. The gunners claimed two enemy fighters destroyed, five probably destroyed, and six damaged. It was the first time the Fortresses had been exposed to a concerted fighter attack without the protection of friendly aircraft, and the results no doubt impressed the enemy pilots with the ability of the
Fortress to defend itself. 21

Bombing accuracy continued to be good for as yet inexperienced crews. In each case enough high-explosive and incendiary bombs fell in or near the target areas to prompt General Lator to predict that 40 per cent could in the future be expected to fall within a radius of 500 yards from the aiming point. 22 These half dozen missions demonstrated again, however, that bombing which might be considered fairly accurate might not produce a corresponding measure of damage to the target. On the mission to Le Truit, for example, although 12 bombs out of a total of 43 dropped were plotted within 500 yards of the aiming point, no material damage was apparently done to the shipyard installations themselves. Again in the attack on the Po Valley aircraft factory ten craters were made which paralleled the target, close enough to it to be considered fairly accurate, but far enough to land for the most part harmlessly in open fields. On the other hand, the mission against the marshalling yard at Amiens/Longueau and that against the Aulnoy Shipyards (mission 6) did significant damage to vital target installations. 23

In mission 5, mentioned above as occurring on 5 September 1942, the American bombers again struck at the Rouen-Sotteville Marshalling Yard. It was a significant mission for two reasons: it dealt more lasting damage to the enemy than had any previous attack, and it had certain other effects, less tangible but none the less important, involving public opinion in occupied France. It was also a larger
mission than any hitherto staged. Thirty-seven B-17's took off, 25 from the now experienced 97th Group and 12 from the 301st, the latter on their first combat mission. Thirty-one bombed the target (the locomotive depot), the remainder having been unable to drop their bombs on account of mechanical failures. The bombers met little enemy opposition, although the RAF fighters supporting them had a few combats with Fw-190's.24

A large percentage of the bombs, almost one-fifth of the high explosive bombs dropped, burst within the marshalling yard installations.25 Large numbers of "sawdust" and several tracks were destroyed. Of particular importance were direct hits on the locomotive depot and surrounding tracks, and on the transshipment sheds, both of which had been hit on the mission of 17 August. Photo reconnaissance accomplished almost a month later, on 2 October, indicated that, while practically the entire damage to the running lines throughout the yard had been repaired, the transshipment sheds and the locomotive depot were in only very restricted operation. On 8 August, 40 locomotives had been observed on the tracks around the latter; now only 18 could be detected. It is also probable that several engines had been destroyed or seriously damaged.26

To the French population the success of the mission appeared less marked than it had to observers in the United States. Actually, a large number of bombs had fallen outside the marshalling yard, many of them in the city itself, and several far enough from the target to seem to a ground observer to have borne little relation to any precise
aiming point. As many as 140 civilians, mostly French, had been killed, and some 200 wounded. 27 One bomb was reported to have hit the city hospital, penetrating from roof to cellar, but fortunately not exploding. 28

Beginning with the tenth mission on 8 September, the VIII Bomber Command encountered greatly increased fighter opposition. Indeed it was during that day's operations over occupied France that the command suffered its first loss of aircraft in combat. Hitherto it had appeared that the B-17's bore charmed lives; but then the enemy attacks had been light in weight and tentative in character. From now on, the Fortresses had a chance to show what they could do in the face of relatively heavy and persistent fighter resistance. As a matter of fact, it was difficult to avoid the fighters if they were deployed in such a way as to be available for interception and if the enemy wished to commit them to combat with the bombers. Diversionary sweeps could be counted on to draw off some of the fighters and to confuse the dispatchers, but every operation was still pretty much an open book to the Germans. Their RDF could tell when the bomber force took off and the approximate numbers; and they could consequently put up whatever force they had available to meet the attack. 29

On 8 September, the heavy bombers of the 37th Group, augmented to a strength of 41 by elements from the newly operational 92d Group, aircraft were sent out to strike the Avions Potez Factory at Leaulte. In order to keep enemy fighters on the ground and provide a diversion for the main force, 13 B-17's of the 301st Group attacked the German fighter airfields at St. Gyer/Longuesse. Probably for a similar reason,
12 B-17's of the 15th Bombardment Squadron (Heavy) attacked the Abbeville/Drucat airfields.\textsuperscript{30} Apparently these diversionary efforts failed, however, for all crews on the primary mission reported continuous encounters from the French coast to the target and from the target to the French coast. As a result of possibly as high as 40 to 50 encounters, mostly with Fw-190's, the 3-17 crews claimed 4 enemy aircraft destroyed, 19 probably destroyed, and 20 damaged. Two of the heavy bombers failed to return: one was observed going down over enemy territory, the other was apparently lost in the Channel. Many encounters also took place between Fw-190's and the supporting RAF fighters, the latter claiming two of the enemy probably destroyed and five damaged. In all, three Spitfires were lost.\textsuperscript{31} The bombing at Rouelle seems to have suffered little in accuracy from the distracting fighter attacks, for it was, if anything, more accurate than on the previous attack against the same target, and probably more effective.\textsuperscript{32}

A similarly bitter aerial battle resulted then, on 7 September, a force of 29 B-17's made an ineffective attack on the Milford Shipyards near Rotterdam, but it was the weather rather than the enemy that frustrated the bombers. Again the claims registered by the bomber crews were surprisingly high: 12 destroyed, 10 probably destroyed, and 12 damaged.\textsuperscript{33} Yet, even discounting the enthusiasm of the gunners, it was evident that the Fortresses could take care of themselves in a surprisingly competent fashion.
They did not again have the opportunity to test their ability in this direction until 2 October. Meanwhile, poor, persistently bad weather, together with a directive ordering all combat activity of the Eighth Air Force to take second place to the processing of units destined for North Africa, discouraged further operations. The only bomb-in-effort attempted during the intervening period had to be abandoned on account of impossible atmospheric conditions.34

On 2 October, 62 B-17's and 12 B-24's were dispatched on four separate missions. The light bombers attacked a German raider in the drydock at Le Havre. Forty-one B-17's, nine of which aborted, were detailed to ad initer a third poundin; to the industries, factories at Caen. Six of the heavies attacked the German fighter aircrew at St. Omer/Caen, on which for the second time. And 15 B-17's made a diversionary sweep to the coast of France. All bombers returned. The forces attacking Poitiers and St. Omer met constant and stubborn fighter opposition. No many encounters took place that crews had to be interrogated a second time and even then the results were apparently considered too high.35 The figures cabled from London on 6 October credited the B-17 crews with 10 enemy aircraft destroyed, 25 probably destroyed and 11 damaged. More conservative estimates placed the results at 7 destroyed, 9 probably destroyed, and 5 damaged.36 This aerial battle was all the more remarkable because the heavy bombers had flown under the cover, direct or indirect, of a total of some 420 fighter aircraft, in spite of which the Germans had been able to drive home their attacks on the bombers. Whatever damage was inflicted on the aircraft repair and airbase facilities, and several direct hits were scored, was swallowed up in the
enthusiasm engendered by the remarkable defensive power displayed by the fortresses. Eighth Air Force officers believed this engagement showed that they could penetrate beyond the tactical radius of operations of the supporting fighters provided sufficient numbers of bombers were employed to force dispersion of the enemy's fighter force.\textsuperscript{37}

The day-bombing campaign reached something of a climax in the mission against Lille on 9 October. It was the first mission to be conducted on a really adequate scale and it marked, as it were, the formal entry of the American bombers into the big league of strategic bombardment. Then, for the first time, the German High Command saw fit to mention publicly the activities of the Flying Fortresses, although they had already made 13 appearances over enemy territory.

Lille's heavy industries contributed vitally to German armament and transport. The most important of these industries, the steel and engineering works of the Compagnie de Fives-Lille and the locomotive and freight-car works of the Ateliers d'Hellommes, constituted one composite target. These contiguous objectives, among the most significant of their kind in France, had been attacked on three previous occasions by the RAF. Though conducted on a modest scale, these British raids had dropped over 40 tons of bombs and had done a fair amount of damage, especially to Fives-Lille.\textsuperscript{38}

The mission had been planned on an unprecedented scale. One hundred and eight heavy bombers, including 24 B-24's from the newly operational 98th Group, were detailed to attack the primary target at

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Lille, and seven additional B-17's flew a diversionary sweep to
Cayeux. Of the total aircraft detailed, 63 attacked the primary
target, 2 bombed the alternative target, the Courtrai-Devolghien
airfield in Belgium, 6 attacked the last resort target, the St.
opard airfield, 2 bombed Roubaix, and 33 (including 14 of the B-24's)
made abortive sorties. Approximately 147 tons of 500-pound high-
explosive bombs and over 3 tons of incendiaries fell on Lille.40

The bombing on this mission did not demonstrate the degree of
accuracy noticeable in some of the earlier and lesser efforts. Of
the 588 HE bombs dropped over Lille, only nine were plotted within
1,500 feet from the aiming points. Forty fell beyond the two-mile
circle, some straying several miles from the target area.41 This
fact may be explained in part by the fierce fighter attack sus-
tained by the bombers over the target, but it no doubt also resulted
from the inexperience of at least two of the groups participating
and from the high wind velocity (100 miles per hour) at bombing
level.42 A large proportion of the bombs fell on the residences
surrounding the factory of Fives-Lille. Civilian casualties were
estimated by a ground observer as amounting to 40 dead and 50 wounded.43

Yet, despite this scattered bomb pattern, several bombs fell in
the target area—enough, in any event, to cause severe damage to at
least three of the Fives-Lille buildings and lesser damage to a dozen
more. Four textile factory buildings, including one belonging to
Hillameer, received varying degrees of structural damage. In addition
to damaging the additional unidentified small industrial structures, the bombers scored one straight direct hit on the railway yards, mostly involving siding tracks. Ground observations made by fighting French informants credited the U.S. forces with completely stopping work at the Alloa coal and coke plant and with doing severe damage to the power station, the boiler works, and the turbines at the Five-Hills establishment. A branch line to another power station apparently relieved the enemy's situation, however, for work in the factory was resumed after a relatively brief time, one account indicating two days and another 17 days. Estimates regarding the length of time it would take to repair the power plant varied from two to six months, and probably represent no very profound knowledge of the industry.

The high priority given to locomotive production in Axis Europe made the direct hit on the boiler-siding shops the most important single item, according to British estimates. Resumption of locomotive output, it was believed, would depend on the speed with which this damage could be repaired, for boilers constituted a principal bottleneck in the locomotive industry. Moreover, since all boiler plants in German Europe were known to be working to capacity, it appeared unlikely that Five-Hills could get boilers elsewhere. British observers believed that repairs to heavy industry in German Europe were being made with increasing difficulty, and they estimated that all production at Five-Hills would probably be halted for one month as a result of this mission and that subsequent output would be slowed down to such an extent that, instead of 20 to 25 locomotives being delivered as scheduled in the last quarter of 1941, only
4 to 6 would likely be forthcoming. Considering the emphasis placed by the British on transportation as the Achilles heel of the Axis, an attack of this sort no doubt proved welcome news to British ears.

The results of the mission were also welcome, albeit in a different manner. Again, as in the Gest mission of 2 October, the question of anti-aircraft fire was overshadowed by what of the day bomber’s ability to defend itself against fighter attack. As in the previous mission the attacking Me-109’s and B-100’s concentrated on the bombers to the practical exclusion of the combined British and U.S. fighter escort, which in this instance numbered 150 aircraft including 36 P-40’s from the VIII Fighter Command. As a result of the unusually heavy fighter opposition numerous combat were reported. Three of the B-17’s and one B-24 failed to return, although the crew of one Fortress was picked up at sea. In all, 31 crew members were reported missing and 13 wounded, four B-17’s suffered serious damage, and 32 B-17’s and 10 B-24’s were slightly damaged by fighter action. But if the bombers took the worst beating in their short career; they also inflicted on the German fighters the heaviest losses to date.

As was commonly the case during these early months of Eighth Air Force operations, claims tended to be somewhat exaggerated. It was hard for crews in a large formation to determine which bomber had been responsible for an apparently destroyed or damaged German fighter; and the fact that a decoration had been awarded to each
gunner credited with shooting down his first plane naturally made
the rumors press their claims with considerable energy. Then, too,
the interrogating officers had not yet had experience enough to dis-
entangle thoroughly the complicated reports received from the crew.⁴⁹
Initially it had been reported that the bombers on this mission had
destroyed 58, probably destroyed 28, and damaged 20. According to
these figures they had accounted for a total of 108 out of action,
which intelligence sources estimated to have been equivalent to over
15 per cent of the total German fighter strength in Western Europe.
British intelligence, however, believed that no more than 50 enemy
aircraft could have intercepted. By 26 October the claims had been
culled down to 26, 38, and 41. In January, 1945, a general review of
early combat reports reduced the figures for this engagement to
21 destroyed, 21 probably destroyed, and 16 damaged.⁵⁰

Even when estimated in the most conservative terms, the Lille
mission was impressive. It was hailed in Air Headquarters as con-
vincing evidence that the day bombers "in strong formation can be
deployed effectively and successfully without fighter support." It
was considered all the more remarkable because most of the pilots
and crews lacked experience in aerial combat and because the force
involved, though smaller than such operations required, represented
over 60 per cent of the total strength of U.S. bombers in the
theater.⁵¹

The results of these first 14 missions had been on the whole
very encouraging. Targets had been attacked with reasonable fre-
quency, especially during the first three weeks, and with a fair

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The enemy had been met and repulsed with losses more than commensurate with the damage suffered from his attacks. During the first nine missions, the Germans had evidently refused to take the day bombing seriously. The American forces had been small and the fighter escort heavy, and so the Germans had sent up few fighters, preferring to take the consequences of light bombing raids rather than to risk the loss of valuable aircraft. And when the German fighters did take to the air, they exhibited a marked disinclination to close with the bomber formation. But the bombing had been surprisingly accurate, especially in relation to what had been accomplished in Europe either by British or German bombers. It was, therefore, a tribute of sorts to the accuracy of the Americans that after the ninth mission enemy fighter opposition suddenly increased, and it was a source of warm satisfaction to the Air Force commanders that the C-17's and the B-24's could more than hold their own against fighter attacks, even with a minimum of aid from the escorting aircraft. As for antiaircraft defenses, at no time had they offered a serious threat to the bombers. After the tenth mission a marked increase in damage became apparent, but as yet the day bombers had suffered nothing to compare with the losses reported by the R.A.F. on their night raids at lower altitudes. No heavy bombers had been lost from flak, and only minor damage had been sustained. On the other hand, six aircraft were destroyed by enemy fighters. It began to look as if altitude would provide decisive protection against antiaircraft.
Eighth Air Force commanders were therefore in an optimistic mood by 9 October 1942, and, in a measure, justifiably so. Possibly the early expression of opinion, made after the first week of operations, had been a little too sanguine. On 27 August, for example, General Eaker had informed General Wooster that the operations to date of one heavy group indicated that high-altitude bombing would be at least ten times as effective for destroying precision targets as night area bombing. Actual plots of Eighth Air Force Command results showed an average of only five per cent of bombs dropped to have fallen within a circle of one-mile radius from the aiming point; and the best results to date had raised this figure only to 10 per cent.

The U.S. bombers, on the other hand, gave promise of being able to place 90 per cent within the one-mile radius, 60 per cent within 500 yards, 25 per cent within 250 yards, and 10 per cent dead on the aiming point, or within a "rectangle 100 yards on the side." While admitting the fact that the British did not attempt to hit point targets, he argued that a force of 100 high-altitude day bombers could do as much damage to specific industrial targets as 1,000 night bombers. Therefore, given a force of 10 groups of heavy bombers, enemy aircraft factories could be destroyed to the point where they could not supply the field forces, and submarine activity could be "completely stopped within a period of three months by destruction of bases, factories and docks." Granting that weather would be bad in the United Kingdom for day bombing, he believed that at least 10 missions per month could be possible. As far as air-drones, supply...
and communications facilities, and organization were concerned, the VIII Bomber Command could at once operate 10 to 20 heavy groups and by April of 1943 could accommodate 50 heavy and medium groups. But for practical purposes 10 groups in 1942, and 10 additional by June 1943 would be adequate, "coupled with the British night bombing effort, completely to dislocate German industry and commerce, and to remove from the enemy the means for waging successful warfare." General Spaatz declared himself entirely in accord with this estimate, and spoke of the "extreme accuracy" of the American bombers.

AAF headquarters in Washington received these reports with some reservations. Rather than "extreme accuracy," headquarters agencies preferred to speak of the "fair accuracy" achieved in the first missions. Bombing had been accurate in relation to modern standards rather than according to any absolute standard, an opinion which General Spaatz himself expressed on more sober reflection. The over-all average errors had been small enough to permit good results on the kind of target attacked--airdromes and marshalling yards--but had been too large to promise consistent results on small point targets. It was even suggested that a system of coordinated attacks should be worked out in which the first element would destroy or neutralize the antiaircraft on the ground and so make it possible for the main bombing force to operate at a more effective altitude than 23,000 to 26,000 feet; for it had been established that relative accuracy at 12,000 feet would be approximately twice as great as at 22,000 feet. It was further argued that the forces suggested by Generals Spaatz...
and Baker were too small to do the job. 58

"Nevertheless, it was possible for AG/AS, Intelligence, looking
back over the entire 14 missions, to paint a most encouraging pic-
ture, accepting General Baker's earlier estimates regarding both
accuracy and force required. 59 Attention was directed to certain
significant considerations. Fighter escort, though essential to
successful operations, was more helpful in aiding cripples and in
diverting enemy fighters at the approach to the target than in protect-
ing the main bombing force. To date the engagement of supporting
fighters in combat had been only incidental. Antiaircraft artillery
had been ineffective and might be expected not seriously to impede
bombing missions in the future. Although the current loss rate of
1.6 per cent could not be expected to continue as the range of
operations became extended further into enemy territory, it could
increase four times and still barely exceed the British rate of
5.67 per cent. The German rate of attrition might be expected to
rise correspondingly, and, as deeper penetrations were made into Ger-
man Europe, enemy fighter defenses, now deployed in a narrow arc of
at most a 150-mile radius surrounding Great Britain, would be dis-
perssed both in breadth and depth. Given the necessary force, it would
thus be possible for the day bombing offensive, combined with the
British night effort, to accomplish the destruction of the enemy's
three essential war systems: his air force, his communications net-
work, and his submarine power."
These early missions had also made a noticeable impression on British opinion. If not as enthusiastic as their American allies, British observers in September and October were at least ready to admit that the RAF day bombers and the policy of day bombardment showed surprising promise. As early as 21 August, General Spaatz reported a significant change of mind on the part of the RAF. In a statement which, among other things, indicates how tentative had been the British official acceptance of the American bombardment doctrine, he stated that the RAF was now willing to alter its conception of the nature of daylight bombing operations from one wherein the bombers were to be used mainly as bait to lure the enemy fighters into action to one in which the bombing had become the principal mission and the supporting fighters were employed to further that effort rather than to attack the German Air Force. 60 General Tater wrote at about the same date that the British “acknowledge willingly and cheerfully the great accuracy of our bombing, the surprising hardihood of our bombardment aircraft and the skill and tenacity of our crews.”61

A review made by the Air Ministry of the B-17 operations from 17 August to 6 September substantiated this interpretation. It referred to the high standard of accuracy attained, considering the inexperience of the crew. It pointed to the fact that in ten missions only two aircraft had been lost, owing to the ineffectiveness of the flak at high altitude and to the ability of the fortress to take care of itself against fighter attack. “The damage caused, commensurate with the weight of effort expended, is considerable” the report read,
adding that complete destruction of any of the targets attacked with the forces at present available could not have been expected. But, it concluded—with considerable enthusiasm though little appreciation of what the AF hoped to accomplish in its bombing offensive—if only these Fortress were employed on night operations the accuracy and effectiveness of the area bombing program could be raised from its current rate of 50 per cent to 100 per cent, and a decisive blow could be dealt to German morale during the coming winter.62

British press opinion which in mid-August had been cool, if not hostile, to the day bombing project showed a similar change of tone. On 1 September, Colin Bowmull wrote in the Daily Mail as follows: "So remarkable has been the success of the new flying fortresses operated by the USAF from this country that it is likely to lead to a drastic resorting of basic ideas on air warfare which have stood firm since the infancy of flying."63 Early misgivings concerning the American bombers had been entertained without reference to two vital factors. First, instead of the ten .303-caliber machine guns carried by the Lancaster, the new Fortress was armed with no fewer than twelve .50-caliber machine guns. And, secondly, the B-17 could bomb from such heights that it avoided much of the damage from flak which had embarrassed British daylight attacks.

Peter Lansfield, whose comments on the eve of the first Fortress mission had been decidedly critical of the American bombers and patronizing toward their capabilities, revised his judgment frankly, but somewhat more gradually. On 23 August he admitted that "The Fortress"
bombers have done particularly well in their tuning-up sorties during the past week, flying by day on strongly escorted bombing attacks of a type for which they are ideally suited. Prior to the Lille mission of 8 October, however, he stoutly maintained that the B-17 needed escorts, and that, therefore, their effective range was limited absolutely to the range of the escorting fighters. "There is no doubt," he concluded, "that day bombing at long range is not possible as a regular operation unless fighter opposition is previously overwhelmed or until we have something to shoot for the fighters to intercept." Then, he believed, but only then, the entire Allied bombing force might well be turned to day bombing.

After the Lille operation of 9 October he declared that the question "Can we carry day air war into Germany?", which had hitherto been answered in the unqualified negative, was no longer subject to a new assessment. In that engagement the bomber appeared to have scored a significant victory at short range. And it might be that altitude and fire power might some day make deep penetrations of enemy territory feasible. Several factors, however, still limited the range of the U.S. bombers: any raid to Germany would as yet have to be conducted beyond effective fighter range; long distance flights would give the enemy warning system time to work at maximum efficiency; bomber ammunition would likely run low in protracted encounters with enemy aircraft which would be free to attack in the most effective manner, unhindered by escort fighters; and finally weather over Europe between November and March was "not particularly favourable for high-flying operations." Thus true air superiority was still
confined to the range of the fighter, and cloud and darkness still
offered the best cover for bombing attacks. He ended his article of
16 October in a humble frame of mind. "The Americans have taught us
much; we still have much to learn—and much we can teach."66

This cooperative attitude on the part of the British the Eighth
Air Force found encouraging in itself, for it was absolutely essential
to the success of any combined campaign that the two partners should
work together without friction, each possessed of a certain faith in
the other's doctrines and equipment. General Spaatz was keenly aware
of this fact. After the first week of operations he reported confidently
that the American air forces had demonstrated that they could conduct
operations in close cooperation and harmony with the RAF. And, some-
what later, he expressed concern over what he believed to be an
increasingly evident habit among Americans of belittling the RAF and
its bombing effort. Without underwriting everything done by the
British, he pointed out that they were in a position to speak with
authority on bombing operations and that, in point of fact, the RAF was
the only Allied agency at the time steadily engaged in "pounding hell
out of Germany."67

Factors Limiting Operations

If, as General Eaker said, both the RAF and the Eighth Air Force
were more cheerful over the daylight bombing offensive "than had
been thought possible a month ago," many problems had yet to be
faced before that offensive could be declared a success, or before
it could be given an unquestioned place in the military scheme of
things. Some of these problems could be solved, others could at
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best be only borne with hopefully and patiently; together they contributed an undertone of solemn seriousness to the chorus of official optimism. Among those which might presumably be solved in time was that of training; but it was still a major problem. The 97th. Group had begun operations with inadequate preparation, and the new groups as they arrived in the United Kingdom and became operational found themselves in little better position. Weather in the British Isles discouraged training in high-altitude flying, and facilities were lacking there for conducting realistic practice in aerial gunnery. In addition, the available time for training units in the U. S. had in many cases not permitted adequate training before shipment to the U. S. The result was that much of the training in high-altitude flying, in high-altitude bombing, and in aerial gunnery had to be done on combat missions against a real enemy. Once combat operations had been begun, the lack of an adequate flow of replacement crews made it necessary to alert the same men on every mission scheduled, which was normally as often as weather permitted. It was consequently hard to keep up a regular schedule of training. It soon became evident that the place to conduct thorough training was in the United States, not in the United Kingdom, and efforts were accordingly made to shape training in the Zone of the Interior along lines indicated by experience in the theater. As time went on, the units in the United Kingdom received much experience and their commanders learned many tactical lessons in the exacting school of combat. The nature of these tactical lessons will be described in a later chapter.
Another problem was involved in developing U.S. fighter support for the day bombers. Although of slight immediate importance to the activities of the Eighth Air Force in the fall of 1942, the concept of U.S. fighter support was fundamental to the notion of a day bomber offensive. No matter how well the bombers had done in their early missions in combat with fighters, it was still a matter of the utmost urgency to provide them with as much protection for as great a distance into enemy territory as possible. According to the "Joint Directives" of 20 August 1942, American fighters were gradually to assume a larger share in the joint fighter operation, and as their experience and force increased, they were to take over the major portion of this activity. Moreover, for missions deep into Germany it was essential to develop a suitable long-range fighter, and great things were hoped from the P-38. The priority given to TORCH for all such equipment and the operation of the fighters for the time being, however, of academic interest only, for they were virtually all withdrawn to the North African project in October. But, in view of plans then evolving, and in view of what actually took place, the problem of the fighters remains one of considerable significance.

The Eighth Air Force began operations with two single-engine and two twin-engine fighter groups. The single-engine groups were equipped with Spitfires, according to an agreement between the RAF and the U.S. The twin-engine units consisted of P-38's. In addition, many American pilots had been serving in Eagle squadrons under
the RAF. These units were formally taken over by the VIII Fighter Command on 29 September 1942, and organized into the 4th Fighter Group.71 Elements from the Eagle squadrons, and to a lesser extent the U. S. Spitfire units, took part with the RAF on numerous occasions in support of the heavy bombers. The Spitfire pilots, though operating machines some of which (the 5-2) were inferior to the P-400, went into combat with confidence in their planes.72 The situation was not nearly so simple with the P-38. The RAF did not at first like the P-38. As in the case of the American bombers, early showings in the U. K. had been unfortunate. When, however, certain modifications had been effected, the P-38 became potentially as good a plane as any in the theater, a fact which the British themselves admitted.73 Yet suspicion of the P-38 still lurked among the U. S. pilots, fostered in part by hearsay and in part by a couple of bad accidents involving improperly manipulated power dives.74 Some press publicity had been given to remarks made by American pilots which compared the P-38 unfavorably with the Spitfire, and this served only to heighten the tension over the fighters.75 Actual combat experience was alone likely to dispel doubts both in AA5 and RAF minds.

General Spaatz was therefore very anxious to get the P-33's into action as soon as possible without committing them prematurely. Any fighters that went out over enemy territory ran the risk of tangling with the best of the German Air Force pilots. It was therefore necessary to give the Lightning pilots careful training in cross-Channel flights before sending them into a real battle.76 Bad weather and mechanical failures delayed their entry into combat, but after 18 September they became fully operational and flew on several missions
before being removed to the North African project in October. 77

Their contact with the enemy was, however, slight, and no very
important conclusions could be drawn. On 14 September the four
BF fighter groups of the VIII Fighter Command were transferred to
the CII Fighter Command for shipment to North Africa. They continued
to operate under the VIII Fighter Command until 10 October.

Only the 4th Group, consisting of former Eagle pilots, remained in
the United States. 78 It was many months before a significant force
of AF fighters was able to operate consistently from the British
bases.

The development of a self-sufficient U.S. fighter force may
have been essential to the plan of 20 August for the day bomber
offensive, but it was not essential to the immediate prosecution of
the operation itself. If the basic fighter units were removed for
ROM, RF units remained to provide cover for the American bombers,
but ROMI constituted nevertheless a threat to bombing operations
from the U.S., the gravity of which can hardly be exaggerated. As
soon as the decision was made to mount ROMI (1 September 1942 was
the deadline), it became evident that preparations for the North
African operation would for an indefinite period take priority over
all other air activities in the CBI. On 19 September General Spaatz
issued specific orders to this effect, and for a brief time it
appeared that tactical operations of the Eighth Air Force, including
combat missions, would be completely suspended. 79 Each command in
the Eighth Air Force and each section in its headquarters was given

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responsibility for processing corresponding agencies in the new Twelfth Air Force, not generally referred to among Eighth Air Force offices as "Junior." In addition to the four fighter groups contributed directly to the Twelfth, the older air force was scheduled also to lose two heavy bombardment groups after the first week in November and two more at a later date.60

Thus the drain on the combat strength of the Eighth Air Force caused by the TORCH operation was both direct and indirect. The loss of the 97th and 301st Bombardment Groups (H) would reduce the combat strength by one-third— and combat effectiveness by an even larger proportion, because these were the two oldest and most experienced bomber units in the VIII Bomber Command. The indirect effect involved in processing the Twelfth Air Force units was even more devastating. VIII Bomber Command staff offices were devoting fifty per cent of their time to supervising the training, supply, and maintenance of the VIII Bomber Command. The Combat Crew Replacement Center, from which the fighting units were supposed to draw necessary replenishment, now gave first priority to the TORCH units which had to be up to strength at once.61 The Twelfth Air Force also enjoyed priority in organizational equipment, spare parts, and aircraft replacements; and the VIII Air Force Service Command was spending an estimated 95 per cent of its efforts on the TORCH units, in addition to contributing large numbers of trained men and quantities of equipment.62 As a result, servicing and maintenance for VIII Bomber Command aircraft became slow and uncertain, preventing the most effective employment of such bombers as were on hand, and increasing the likelihood of
absorbive sorites. Indeed, with shortages in almost every category, the VIII Bomber Command ground crews often had to resort to dismantling badly damaged aircraft, declaring "dangerousness" for this cannibalistic purpose. It was the opinion of some group commanders that, if crews had not shown extreme energy and ingenuity in this regard, at least half of the bombers maintaining an operational status would have been out of service. The VIII Bomber Command had been assigned the specific task of airstriking units to Africa, and this effort, in addition to the loss of four out of five groups, promised to render it practically useless as far as operations from the U.S. were concerned until the movement had been completed.

Almost more depressing than the results of V-10 to those whose duty it was to keep up a bombing offensive against Germany, was the weather. Favorable weather was an absolute prerequisite to successful daylight bombing, at least until more efficient methods of blind bombing had been discovered than any yet in sight. It had been with the full knowledge of this fact that the VIII had projected its scheme for a daylight offensive from the U.S. at the weather in the fall of 1942 ceased—and British observers claimed that it was—unusually bad. Ever operational days had turned up in September than had been hoped for, and as October progressed the situation only grew more disheartening.

By early October it was seriously debated whether it was feasible to conduct a full-scale offensive of this sort from British bases, especially since a successful North African campaign might be expected.
to open up a very attractive axis" in that quarter. It may have been to offset such a realistic attitude that General Sir C. S. in a letter to the Fourth Army in October, stated that he could not assign too heavy an effort to such an attack, which was about the same rate of replacement would allow in the light of circumstances. This represented a more cautious estimate than that of missions a month ago, but General Sir C. S. had to keep the enemy from retreating during the interregnum of relatively bad weather by developing a highly trained and skilled intruder force, capable of employing bad weather as a cloak for small blind-to-bomb operations. Plans were in fact already made for these "piling" missions which, it was hoped, by the use of the most advanced navigational and bomb-detonating devices, would make it possible for single B-26s to keep enemy air-raid systems and defensive establishments on the alert and so interrupt enemy industrial production. By 24 October approval had been secured from both British Fighter Command and Eighth Air Force.

But both the Eighth Air Force commanders lost about both the diversion to POW and the bad British weather was that, for a successful air-bomb offensive, timing was of the essence; and on both counts until time seemed likely to be lost. Every month of delay in mounting a full-scale offensive against German industry gave the enemy just that much time in which to redeploy his forces and to readjust his techniques in order to counter the Allied attack. For the moment the RAF had its hands full. The British night
offensive line, by March 1943, apparently forced it to use up its initial reserves and to reduce its stored reserves in order to keep a strong front-line defense. For 8-17 attacks, no effort had served to accelerate that tendency. At any rate, by October 1943 it was estimated that first line strength had been maintained only at the expense of the entire initial reserve.90 Following the 8-17 missions, it was noticed that two of the three fighter groups (about 80 planes) maintained on the German front were now on the move to protect the Third Reich and Austria. This was believed to indicate a determination on the part of the Germans to make the Allied bomber flight in greater depth than before. But German strength in single-engine fighters on the Western Front remained concentrated along a narrow stretch of coastline, a few twin-engine fighters being maintained in the back areas for use against night fighters. And it was felt that, if the fighter defense against both British and American raids were to be increased, aircraft would have to be brought back from Russia.91 In all, probably 100 single-engine and 10 twin-engine fighters were being kept in the coastal regions in late August.92

In general, the German aircraft situation appeared encouraging and there was some reason to believe, as certain authorities did, that the C-29 was actually on the increase.93 This, if true, would be an important argument for pressing any attack which would further strain the enemy's air forces. But the Germans had it in their power to do either of two things: they could increase their production of fighter aircraft at the expense of other types...
(already there was evidence of a noticeable increase in the proportion of total monthly production allocated to twin-engine fighters) or they could try to build up a strong force of heavy bombers in order to strike back at the British cities. In either case time would be required to reorganize production. One of the alternatives seemed, however, inevitable: and it occurred to General Spaatz that the Germans might well profit by the lessons in daylight bombing delivered so recently and convincingly by the Eighth Air Force by adding fire power and armor to their four-engine F-200's they might act against the United Kingdom before the American forces could exploit their current technical advantage. "Daylight bombing," he wrote on 16 September, "with the same accuracy as we have gotten and with the same casualty ratio in air fighting would raise hell with this island. We must hit their aircraft factories before spring and it requires a large number of B-17's to attempt this." With this danger in mind, he further urged that the B-26 should be developed for use against heavily armed and armored bombers, although their primary mission remained that of securing allied coaters.

Thus the picture presented by the day bombing offensive just after the mission against Lille on 9 October was one of sharply contrasting lights and shadows: during the rest of the month the shadows remained, in a sense, quit. literally, to lengthen. On the 28th General Arnold requested a full explanation of the small number of missions recently carried out—an average of barely one per week. The answer merely recounted the proof as and obstacles that had been faced increasingly during the previous weeks: the weather, the demands of...
the TORCH movement, and the inadequate training status of the remaining units. Only one mission had been accomplished since 9 October owing to unfavorable weather. It proved to be an effective enough attack on the submarine base at Lorient on 31 October, the results of which will be described more fully in the following chapter, but even then, of 90 aircraft dispatched to the primary target, only 15 from the most experienced group were able to outmaneuver the elements and bomb their objective. The British reported that no air photographs of any value had been turned over to Bomber Command since the middle of September as a result of two consistently poor visibility.

By 1 November, too, the inroads made by the Twelfth Air Force on the strengths of the older organization had become more apparent. In addition to four fighter and two heavy bomber groups, the Eighth Air Force had turned over trained personnel to the extent of 3,198 officers, 24,124 enlisted men, and 51 warrant officers; of whom 1,036 officers, 7,101 enlisted men, and 14 warrant officers came from the VIII Bomber Command alone. The remaining heavy bombardment groups suffered considerably from loss of such essential equipment as bomb-loading appliances and transport vehicles. They suffered even more from the complete lack of replacements, both crews and aircraft, a fact which made it impossible to keep a large force in the air even when weather conditions permitted; and no prospect was in sight of receiving any during November.

Of the heavy bombardment groups scheduled to be left in the United Kingdom (three groups of B-17's and two groups minus one squadron of B-24's), only two were by the end of October in fully
operational status. It had been found necessary to give two to three weeks extra training to all new units in formation flying at high altitude, in radio operation, and in aerial navigation. And even as the crews gained in experience it was the policy of the Eighth Air Force to send them out only in circumstances for which their state of training had made them fit. General Leiper believed that nothing could be gained by dispatching green units when conditions of weather or enemy defenses would only cause inordinate loss. For the same reason it was not thought wise to undertake missions that would require landing or take-off in darkness. Therefore, when a target was four hours distant, there were only about two hours of daylight during which it could be struck.

Furthermore, the scope of Eighth Air Force missions had been restricted to a relatively narrow area in occupied France and the Low Countries which could be reached in a short time, which subjected the bombing formation to attack only for brief periods, and which, presumably, did not as yet possess such strong defenses as might be expected in Germany proper. Unfortunately, this otherwise excellent restriction prevented the Bomber Command from making use of occasional streaks of fine weather over more distant targets and over Germany proper at times when France and the Netherlands were completely closed in. It was confidently expected that, when a force had been built up with sufficient training to make deeper penetrations into German Europe and with the ability to mount missions large enough to withstand more intense and more sustained
fighter attack, the weather would prove a much less serious handicap.

Meanwhile it was a question either of committing valuable crews and aircraft prematurely to operations over heavily defended territory and in bad weather, or else of proceeding cautiously as training status and rate of replacements would permit effective operations of wider scope. General Hark preferred the latter alternative, for to adopt the former would be not only to incur crippling losses but to ruin "for ever" the "good name of bombardment."

It would he wrote to General Stratemeyer somewhat earlier in October, have been very easy for us if Generals Spaatz and Hark had committed the force in such a way that improper conclusions would have been drawn from day bombardment. We knew the critical aspect of our task and the fact that it might affect the whole future of day bombardment in this war. . . . The way we are doing it we are going to draw conclusions—some have already been drawn—which will be entirely favorable to the power of bombardment. Please do not let anybody get the idea that we are hesitant, fearful, laggard or lazy.

In other words, those early missions were less important for what they contributed directly to the Allied war effort than for what they contributed indirectly by testing and proving the doctrine of strategic daylight bombing. In either instance it was as difficult and dangerous to strive for quick results as it was natural for observers, especially those at some distance from the scene of operations, to look impatiently for them.
On 20 and 23 October 1942, the Eighth Air Force received two
significant directives governing the scope of its operations and
the priority of its targets. It is not clear from the documents
at hand just what directive, if any, has hitherto dictated target
priority. According to the "Joint Directive" of 20 August 1942,
target selection has been under the responsibility of the Command-
ing General, Eighth Air Force and the Assistant Chief of Air Staff,
Operations (British), with the exception of those within the existing strategy. It presumably, existing strategy meant
the decision of the Combined Chiefs of Staff regarding the bomber
offensive. As far as heavy bomber attack was concerned it would also
mean existing British strategy, since apparently no specific direc-
tive had been issued by the Combined Chiefs of Staff governing target
priority for a combined offensive. It is therefore reasonable
to suppose that, in concentrating their efforts mainly on targets
of importance either to the enemy's transportation system or to
his air force, the Americans were following an essentially British
policy, adapted to fit the peculiar powers and limitations of the
American day bombers.

The new directive of 23 October did not, however, attempt to
clarify strategic policy underlying the day bombing and its place
in a joint British-American offensive. Like several other factors
affecting Eighth Air Force operations in the fall of 1942, this
directive arose in principal part out of the special requirements
of the project 10X41. In order to move the huge amounts of supplies and equipment from the United Kingdom to North Africa it was necessary to protect the convoy from both submarine and aircraft attack. Accordingly, the theater commander required the Eighth Air Force, as a matter of first priority, to attack the submarine bases on the west coast of France from which the major portion of the German Atlantic U-boat fleet operated: Lorient, St. Nazaire, Brest, La Pallice, and Bordeaux. Secondary targets for missions against the above bases could consist of shipping and docks at Le Havre, Cherbourg, and St. Malo. In second priority came the aircraft factories and repair depots at Montluçon, Coscelles, Antwerp, and Courcelles, and the airfields referred to as Courtrai/Leuvenhem, Abbéville/Bruge, St. Omer/Fort Doua, Chocourt/Neerpelt, Boulogne/St. Roger, and St. Omer/Hommeville. Transportation targets, marshalling yards in occupied countries, were left in third place.106

It must be remembered, of course, that in allotting the German submarine bases the position of first priority, General Eisenhower was not acting merely to ensure the success of the North African invasion, however essential it was to that project to clear the sea routes of U-boats. The increasing submarine menace threatened the entire logistical plan for Allied operations in Europe and Africa. It constituted Germany's most powerful offensive-defensive weapon against the Allies' necessarily ocean-borne forces and supplies. It had, as a result, figured conspicuously in strategic planning during the fall of 1942. On 10 October General Eisenhower...
wrote to General Spaatz that he considered the defeat of the submarine "to be one of the basic requirements to the winning of the war." He added, "In fixing priority of air targets from this theater, I realize that the Italian Air Force must be constantly pounded, in order to give our own Air Forces freedom of action in carrying out fruitful missions. Of these missions, none should rank above the effort to defeat the German submarine." During the course of the North African operation the antiaircraft activity was naturally of particular importance, and General Spaatz planned to coordinate it closely with the British Coastal Command which was charged with the specific duty of fighting the submarines.

All of which did little to advance the cause of the strategic bomber offensive. However unavoidable the diversion may have been, and however well conceived, the fact remained that it removed the American army bombers from their primary strategic mission of crippling the German economic machine to what in the narrower sense was a tactical operation in support of the North African invasion. Attacks on submarine bases, airfields, and airframe factories carried important strategic implications, mainly of a defensive nature; but it was also true that in executing them the Eighth Air Force would be engaged for an indefinite period in a project of secondary significance in relation to that to which the force had originally been assigned.

On 29 October, the Eighth Air Force received another directive, this time regulating its missions against targets in occupied
countries. The problem with which this paper dealt was a delicate one. Objectives vital to Germany's war effort existed in occupied France and the Low Countries, and it had been a point of tactical policy to restrict American bombing effort to these areas. But it was impossible, even with greater precision than the U.S. bombers were as yet capable of, to ensure the safety of civilian life and property in the neighborhood of the targets. Thus there arose a political problem which might radically affect bombardment plans.

French opinion had been deeply stirred as a result of the bombing at Rouen, at Lille, and again at Morlaix, in each of which civilian French casualties had been impressive if not always extremely numerous: at Rouen some 160 were killed, at Lille approximately 40, and at Morlaix a few Frenchmen were murdered among the 150 dead, more than half of whom were Germans, the rest Belgian and Dutch. Naturally the French viewed the bombing of their cities with mixed emotions, the mixture varying pretty much according to the severity of the loss suffered. Although generally happy in a grim sort of way to see any damage dealt the Nazis, even in their own land, many Frenchmen found it hard to take a long-term view of the situation when American bombs fell on French property and took French lives. The Germans leaped at this opportunity to poison French minds against the Allies, covering walls with posters which featured the civilian dead and civilian sufferings attendant upon the American bombing. Except at Morlaix (for reasons which will be discussed in the next chapter), the controlled press...
did its best to keep the bitterness alive. Even those who understood better than the average of their countrymen the strategic necessity for the Allied bombing felt that, in planning such missions the sorrow and destruction suffered by the French should be carefully weighed against the doubtful results to be attained from bombing at extremely high altitudes. It was on this point that most French criticism seemed to be concentrated in the fall of 1942. French observers could not help believing that as long as bombing attacks were made at 25,000 feet only a small percentage of bombs would hit the target; and results had not as yet been such as to persuade them to the contrary.\textsuperscript{110} They also urged, quite seriously, that bombing of factories and shipyards should be done only on Sundays and holidays when French workers would be absent.\textsuperscript{111}

It was in an effort to bring up to date a code of rules for operations in this delicate but unavoidable situation that the Air Ministry, to whom the responsibility for such political matters was customarily left, issued the directive of 29 October. Bombardment was to be confined to military objectives. The intentional bombardment of civilian populations, as such, was forbidden. It must be possible to identify the objective. The attack must be made with reasonable care to avoid undue loss of civilian life in the vicinity of the target, and, if any doubt existed as to the possibility of accurate bombing, and if a large error would involve the risk of serious damage to a populated area, no attack was to
be made. The provisions of Red Cross conventions were, of course, to be observed. Military objectives were defined broadly to include any sort of industrial, power, or transportation facility essential to military activity, which obviously included any desirable objective, except civilian morale as such. The only other important restrictions were against attacks on passenger trains during daylight hours and on power stations in Holland, the destruction of which would cause extensive flooding of the land by cutting out of action electrically-driven pumps. Special consideration was to be given to the Channel Islands, should attacks on enemy installations there become necessary. In conclusion, the directive stressed that none of the foregoing rules should apply in the conduct of air warfare against German, Italian, or Japanese territory, except that the provisions of the Red Cross conventions were still to be observed, for "Consequent upon the enemy's adoption of a campaign of unrestricted air warfare, the Cabinet have authorized a bombing policy which includes the attack on enemy morale."

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Chapter III

OPERATIONS AND OCCASIONAL PROBLEMS,
21 OCTOBER 1942 TO 13 JANUARY 1943

The German Submarine Bases

Submarines became the primary concern of the Eighth Air Force after 20 October 1942, and continued to preoccupy that organization for many months. In the fall of 1942, however, it was not at all clear whether striking the submarine operating bases on the coast of France, as the directive of 20 October stipulated, was an efficient method of reducing the submarine menace; nor was it clear that the day bombers could do that job effectively. The entire antisubmarine campaign constituted, in fact, a highly controversial problem, and one in which the essential data came too often to be obscured by the mysterious activities of that most mysterious of the enemy services.

To those who had to cope with the steadily increasing submarine threat several alternative courses of action suggested themselves, none of which seemed by itself entirely satisfactory. It would have been very natural for strategic bombing forces to have concentrated their efforts on the sources of the submarine fleet, as they planned to concentrate on the sources of the entire German war machine. The submarine construction yards and the component-parts manufacturing plants provided tempting objectives, the complete destruction of which would eventually solve the U-boat problem. The AAF had already expended considerable and sustained effort in

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this direction. Although few and light in the fall of 1942, British
bomber Command attacks during the 16 months from April 1941 to June
1942 had seriously damaged the ports of Brest, La Rochelle, and Lorient,
and had dealt heavy blows to facilities at Bremen, Hamburg, Wilhelmshaven,
Kiel, and Cuxhaven. In addition, the submarine Diesel
factory at Kiel and the component parts factories in Cologne
had suffered in the attacks on those cities.\footnote{1}

The British effort had, however, been directed primarily against
the towns themselves rather than against the port facilities and
factories, in accordance with the RAF policy of area bombing. It was
the opinion of the Ministry of Economic Warfare in July of 1942 that,
apart from damage to the plant at Kiel which was supposed to be
producing up to 50 per cent of the total submarine Diesel engine
requirements, little severe damage had been inflicted on component
factories. In that instance probably one month's output had been
lost, accounting for the Diesel requirements for the submarines. As
for the construction yards, repeated attacks on Wilhelmshaven, Kiel,
Hamburg, and Lorient resulted in no detectable decrease in U-boat pro-
duction, although the estimated schedule appeared to have been de-
layed by a few weeks as a result of a variety of factors, not all
of which could be identified with the bombing offensive. This same
agency even contended that these objectives were not well suited
to aerial bombardment. Component parts plants were numerous, widely
scattered, often inaccessible from the United Kingdom, hard to
identify, and of a type difficult to destroy except by attacks of
"exceptional weight and concentration." Moreover, it was reported that a surplus of suitable, but at that time unused, productive capacity existed which acted as an effective cushion to ease the over-all shock of bomb destruction. The shipyards presented targets too small, too isolated from other suitable objectives, and of a type not easily enough put permanently out of action to warrant a major share of the bombing effort. It was true, on the other hand, that their proximity to the British air bases made them always available secondary objectives.²

Undoubtedly the increased accuracy possible with precision day bombing would increase the effectiveness of attacks on targets of this nature. Yet, however, there was little hope of securing immediate results. It was estimated in August 1942 that the submarine fleet consisted of some 240 operational craft, with 120 training in the Baltic. Production at that date was believed to be in the neighborhood of 20 per month, 10 to 15 a month becoming operational; and sightings by allied agencies were currently at the rate of from five to seven a month. In the light of these figures it appeared that no amount of damage done to the submarine construction yards and factories could reduce the operating fleet during the ensuing nine months. Indeed, if losses in production were made up regularly from the U-boats in training, the fleet would probably increase by eight to ten a month during that period.³

Moreover, the Allies could not wait until the U-boat fleet perished from attrition. The submarine situation had reached a...
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Crisis by November of 1942. The submarines themselves were increasing: whereas in January of that year not more than 15 or 20 submarines had been deployed by the Germans in the Atlantic, by November the total was nearing the 100 mark. This fact, by itself, was serious enough in view of the tremendous problem of ocean-borne transport and supply. With the opening of the African campaign in November, the ocean became increasingly valuable. If the Allies were effectively to supply the United Nations, the Middle East, and North Africa, it was clear that something drastic must have to be done about the submarines which threatened to sap their lifeblood.

The alternatives remained: the submarines could be hunted at sea, or their operation bases could be rendered more or less unusable. Since the middle of 1942 the U-Boat Coastal Command had been operating a considerable force in the neighborhood of the British Isles, concentrating their effort especially in patrols over the Bay of Biscay. It was well known that most of the U-boats operating in the Atlantic were based at ports on the western coast of France. In order to leave these ports for action in the Atlantic shipping lanes and to return for necessary periodic servicing, practically the entire French submarine flottilas had to pass through the Bay of Biscay, thus producing a constantly high concentration of submarines in the Bay and its approaches. By covering this transit area with long-range aerial patrols, Coastal Command hoped either to destroy a significant number of submarines by direct attack or,
by forcing them to remain submerged for long periods, to make their passage as and from their bases so slow that their effective time in the open sea would be substantially reduced. Prior to November 1942, however, the effort to strike the submarines in their operating areas suffered from lack of enough long-range aircraft, lack of a "balanced" antisubmarine force capable of attacking both by day and night, and lack of adequate radar equipment and special weapons. Actual "kills" had as yet been relatively few.  

The operating bases appeared to offer certain distinct advantages as bombardment objectives. As previously stated, almost the entire Atlantic submarine fleet depended on the French bases, which had consequently become the nerve center of the whole complicated U-boat organization. The German had begun, immediately after the defeat of France, to develop facilities at Brest, Lorient, St. Nazaire, La Pallice, and Sordeaux in order to place the submarines as close as possible to the allied supply lines and as far as possible from British airfields. Conversely, the coastline from Brest to the north coast of Germany had been virtually abandoned by the submarines. The Germans had constructed elaborate pens to house and protect these craft during their stay in port, a period normally of 21 days duration, and had built elaborate repair and servicing facilities. elaborate also was the schedule of turn-around by means of which a limited number of pens could be made to accommodate a large and growing fleet of submarines. It was considered practically impossible to penetrate the dozen feet of reinforced concrete that formed the roof of these pens with any bombs then available.
Let no integrated war plan facilities at these bases, and so carefully adjusted the time schedule for repair and refitting that any damage to the installations surrounding the pens would, it was believed, cause serious delay in turn-around, and so in effect reduce the number of submarines in operation. Locks, floating docks, storage depots, railway yards, power houses, foundries, barracks, and submarines not actually in the pens, all presented vulnerable targets for bombing aircraft—especially for bombers equipped for precision operations. It was, to be sure, very probable that much of thebservice had been cut under concrete along with the submarines themselves; and alternative power installations no doubt existed which could be used to relieve most emergencies affecting the power system. Moreover, it was fully expected that the bases would be given adequate antiaircraft protection. Yet the prospect of disorganizing the U-boat campaign by harassing these vital points and eventually neutralizing them, seemed reasonably bright.

By 20 October, then, opinion was divided as to the best way of immediately reducing the submarine threat. All four alternative methods—attacking construction yards, component parts plants, operating bases, or the U-boats at sea—had been tried, with only distinctly qualified success in each case. All four would necessarily contribute to the final defeat of the submarine, but at the moment this was of the utmost. British observers recognized this fact. The Air Ministry, in August, had declared itself in favor of operations against the U-boats at sea and against their operating bases, in preference to the long-term policy of attacks against building.
yards and factories. Meanwhile, the U.S. area bombardment of German industrial cities would incidentally contribute steadily to the long-term objective.

Opinion in Washington was somewhat more divided, especially on the use of long-range, land-based aircraft in antisubmarine operations. The U.S. Navy urged extended convoy cover. Those most interested in the AIR Antisubmarine Command argued for employing as many B-24's as possible on such projects as that already being conducted by the TF Coastal Command in the Bay of Biscay. However, Brig. Gen. C. W. Russell, AIR coordinator for antisubmarine activity, on 6 November placed considerable emphasis on attacks against the operating bases and construction yards by heavy bombers of the Eighth Air Force, a policy which AIR's plans endorsed.\[12\]

When it can actually be employing the Eighth Air Force bombers in the antisubmarine counteroffensive, the problem of choice becomes simpler. A considerable weight of opinion in both British and U.S. quarters favored action against the bases on the coast of France, and a campaign against those objectives was, for the time being at any rate, especially well suited to the capabilities and limitations of the American bomber force. Not only were the targets much better adapted to daylight, precision methods than to those of the U.S. night bombers, they were also within the area of occupied France to which Eighth Air Force operations had been temporarily restricted.

Accordingly, General Spaatz planned the maximum use of his force against the five French bases. In addition, however, he made available to Coastal Command 12 P-47's to help cover the movement of...
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shipping to Africa by expanding the system of long-range air patrols over the sea lanes. 13

On the 21st of October, the VIII Bomber Command flew its first mission against the submarine bases, dispatching 90 bombers (68 B-17's and 24 B-24's) to attack the base at Lorient-Jersevam. Bad weather forced all but the most experienced group to return, leaving only 15 B-17's of the 37th Group to bomb the target. The objective was an important one, for the Germans had developed the small fishing port, situated about one and one-half miles southwest of Lorient on the great peninsula, as a major submarine base that was considered, along with St. Nazaire and Brest, as one of the three most important submarine bases used by the enemy. An estimated total of 30 U-boats, all of the large 750-ton type, was believed to be in port at any given time. The principal targets were the U-boat shelters, both the 12 completed ones and the block of seven pens then under construction. These shelters, typical of their kind, had been built on dry land and provided with heavily reinforced concrete roofs 11 to 12 feet thick. Immediately adjacent to the pens were lighter and smaller buildings believed to contain workshops, transformers, oil storage, offices, and other installations directly connected with the servicing of U-boats. As in all the improved bases, however, many of the vital facilities were housed under the massive pen roof itself. Lorient had not been attacked by the RA during 1942, nor had the British ever attacked the area of the submarine pens. In 1941 they had made 32 night raids, dropping 396.1 tons of bombs, mainly on the town itself. 14

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The bombing was unusually good. From a 17,000-foot altitude—a considerable departure from the 22,000 to 27,000-foot level usually reached—the bombers dropped 50 high-explosive bombs, each weighing one ton. With the exception of a few which fell some 1,100 yards from the pens, most of the bombs fell in the immediate target area. Of the 50 dropped, 21 fell within a radius of 1,000 feet from the aiming point. Five bombs were reported by ground observers to have hit the central clock of shelters. But, according to underground information, they did not penetrate more than five feet despite their weight. About the surrounding buildings, the results were somewhat better. Three general workshops and a pair of floating docks were pretty thoroughly destroyed, and two submarines were damaged by blast. About 40 French were reported killed among the total of 150 dead, more than half of whom were German workers.

Although little major damage was done to the base itself, the bombing made a great impression on both French and German opinion. For one, the French population expects to have co-operated an attack by U. S. forces favorably to those made by the British. They seem to have been greatly pleased with the whole affair, striding in the streets watching and smiling and applauding the accuracy with which the Americans dropped 30 tons on the German installations. It was, they felt, too bad that Frenchmen had also to be killed, but the victims had in a sense asked for their fate in accepting employment at the base for the sake of the high wages said there. As for the Germans, they appear to have been taken completely by surprise.
The alarm was not sounded, and the bombs had fallen before the anti-aircraft guns went into action. The Sewards were said to have been convinced that a formation of such size—15 aircraft—could only have been their own planes. The mission, temporarily discrediting the wailing, who had insisted that Allied attacks were being made deliberately against the civilian Japnaese population, and that the base was too well defended to be attacked, the controlled cover remained silent. 17

Despite the fact that the wailing at Oriente were caught napping, and although the attacking force encountered no effective fire, they did not run into stiff resistance from enemy fighters. As the formation crossed the enemy coast on route to the target, it met 36 F-100's which gave it continuous battle to a point not far from the objective. As a result of these engagements, according to conservative estimates, four enemy fighters were destroyed, six probably destroyed, and one damaged. Out of 15 attacking F-100's lost three of their number, and suffered damage to six others. 18

With this mission and these heavy losses in mind, General Spaatz wrote in aReflections article in General Arnold's on 31 October: "Either or not these operations will prove too costly for the results obtained remains to be seen. We cannot subordinate means are here, maybe impossible rate of execution 19. However, he added, "the bombing of the surrounding installations should seriously handicap the effective use of the basis." General Spaatz had, in fact, undertaken this task with more determination than either.”
division of effort from the mission of the force, it was also a job that could very probably require the use of tactics very different from those for which his unit had been trained. As early as 16 September 1942 he had expressed concern over this problem, assuming that the bases themselves would be virtually invulnerable to normal high-altitude bombing, and that they constituted the vital spot in the base installations, he predicted that no one method could be counted on to get the bases out of operation. Setting见面 spots with mines, launching torpedoes at the sub slip, lobbing torpedoes in from low altitude, or a combination of all three might, he felt, be necessary. At that date he even toyed with the possibility of experimenting with glide bombing attacks from an altitude of 6,000 feet. 20

By the end of October, although he apparently did not for the time being contemplate using such extraordinary tactics, he nevertheless was determined to operate against the submarine bases from lower altitudes. Evidently convinced that bombing from above the 20,000-foot level, as practiced hitherto, was not likely to bring about the necessary results to neutralize small ports, he planned to operate at altitudes possibly as low as 6,000 feet. In such event, he knew, much of his casualties than any he had sustained would have to be faced, for the objectives would certainly be heavily defended by aircraft. Other factors, he believed, would also lend toward a higher casualty rate. Low altitudes would favor enemy fighters. Since the French bases were beyond the range of available fighter escort (no P-40s or P-47s were on hand) the bombers would
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be without fighter support over the objective. And, finally, the areas left after the recent departures of the 57th and 70th Groups were by no means deserted, especially the gunners.21

In the November, after an attack of indirect accuracy and short against four to five earlier, the VIII Bomber Command flew missions at very much reduced levels against the submarine installations at St. Nazaire. If it had been seriously expected that attacks at lower altitudes would increase effectiveness without at the same time producing prohibitively losses, most were disappointed by this experiment of November.22 Almost to a well-planned course and a large division mission flown by the 17th, the fighter threat, heretofore somewhat serious, was circumvented. The same could not be said of the antiaircraft batteries concentrated in the neighborhood of St. Nazaire. Probably 60 to 70 heavy guns guarded that area, to say nothing of numerous light batteries.23

The attacking B-26's, 12 in number, flying at 17,000 to 18,000 feet, suffered little, one group reporting intense, lucky that all below the formation. All B-17's, flying at 7,000 to 10,000 feet, faced much worse in the neighborhood of St. Nazaire. They ran into very intense flak, extremely accurate both in altitude and direction. At 10,000 feet both 11 at and heavy direct resistance of considerable intensity and accuracy. As a result of this barrage, three aircraft were lost and 12 others damaged in some degree.24

It was a closely contested, the lesson of which, one and all the more impressive in comparison with the relative ineffectiveness of
flak hits to encountered to higher altitudes. It was clear that the
cost of low-altitude bombing could at this rate only be justified by
appreciably improved accuracy. It is difficult, however, to make an
exact statement of the accuracy achieved during this mission. Only
some 76 of the 224 bombs dropped could be plotted from strike and
reconnaissance photographs. Of these, eight burst within 600 feet of
either of the two aiming points, which consisted of the shops of
Chantiers et Ateliers de Renouard and the lock at the entrance to the
Bassin de St. Nazaire.

The importance of the target lay in the construction
and repair facilities it contained which were being utilized to the
maximum for the overhaul of submarines based there. The lock provided
the only remaining entrance to the two basins in which all port facilities
and U-boat installations were located. Two others had been
rendered unserviceable by the British in a commando raid during the
spring of 1944. To attempt to sail to hit the 390-foot submarine shelter
itself, like its plywooded counterparts at Yort and Frest, it
did not lend itself to destruction. In the main workshops, direct
hits severely damaged the plate shops and could loft several bombs
fall within a radius of 1,000 feet from the strategic lock, but none
scored a direct hit. Severe damage was also done to various buildings
and facilities in other areas. Of considerable incidental importance
was the apparently complete destruction of the locomotive depot north
of the care d'Orleans. Reconnaissance two days later indicated that,
while attacks to railway lines had been required, the locomotive
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Despite heavy mining and the usefulness of the yards appeared to have been seriously reduced, it appears likely, in fact, that the attacks had more effect on Axis transportation than on the submarine campaign.26

This mission apparently convinced those in charge of Eighth Air Force operations that attacks at low altitude would not yield results commensurate with the losses likely to result from such undertakings. Subsequent attacks on submarine bases were made at altitudes ranging from 17,000 to 22,000 feet which, up until the mission against St. Nazaire on 2 January 1943, effectively foiled antiaircraft fire.26

Prior to 2 January 1943, VIII Bomber Command conducted six more missions against the submarine bases, concentrating on St. Nazaire and Lorient, with one relatively light and ineffective attack devoted to Le Havre. A total of 190 heavy bombers in missions varying in strength from 11 to 52 aircraft, attacked according to a fairly consistent pattern. They approached the target area over land across the west peninsula, and, in order to deceive enemy fighters, returned over water, skirting the coast. "XF fighter forces provided support in the form of short-range escort and of diversionary sweeps over enemy territory. In no instance did the bombers enjoy fighter cover over the target area. That accounted for only one of their dangers although in many instances it caused minor damage. On four occasions, however, the bombers encountered stiff opposition from enemy aircraft which resulted
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directly in the loss of five more planes. In addition, two centers
ordered and were lost to unknown agencies.27

...his over-all loss rate of less than five per cent of the
attacking force justified, from a defensive point of view, the de-
cision to abandon attacks at lower altitudes. ...ever against
these losses could be placed the damage done to the U-boat installa-
tions. By the end of December St. Nazaire and Lorient were both
showing the cumulative effect of repeated bombing. Although
the accuracy achieved still left much to be desired,28 enough
bombs had fallen within the restricted area to cause embarrassment
to the case. St. Nazaire suffered especially heavy damage in
the course of five missions from 3 November to 20 November.
In all, 150 aircraft dropped a total of 771,000 pounds of high-
explosive bombs on or in the vicinity of the port facilities.29

at the important repair and construction works on chantiers et
ateliers de Saint-Nazaire, the machine shop, cuirasse, plate shop,
large sheet-metal shop, boiler-makers' shop, pipe and tube shop,
print shop, and rivet shop all suffered repeated hits and work on
several cargo vessels, tenders, etc., was believed to have ceased.
This damage is doubt also slowed up essential repairs to the subma-
line fleet. A floating dock was hit and sunk; the railway tracks
were bodily moved, and hits were scored on the locomotive depot
and the station buildings. Also gas, electric, and water services
in the port were reported out, leaving work in the submarine pens
to be carried on by means of kerosene brought from some distance.30
According to one account, obtained from a German naval prisoner of war, work continued after the U-boat raids only in the submarine shelters which, though hit at least six times, apparently sustained no lasting damage. This same informant spoke of large-scale evacuation of the working population which left barely enough hands to continue the restricted scale of work required in the U-boat shelters. In one shop, he said, 200 apprentices had been killed and, owing to the lack of labor to replace them, the bodies had been left in the rubble.\(^{31}\) Apparently as a result of some damage to the lock gates during the attack of 9 November, though possibly also because of subsequent damage to other facilities, all submarines normally based at St. Nazaire seem to have been moved for a while to Lorient. On 18 November reconnaissance revealed an unusual concentration of U-boats at that port. It was believed that, in addition to the 15 or 16 craft already based there, as many as 10 or 20 were forced to use the base at Lorient.\(^{32}\)

Lorient itself suffered severe damage as a result of four raids on 21 October, 16 and 22 November, and 19 December. The shelters and construction had been hit three times with unimportant results. It was estimated that the special slip had been so seriously damaged that it could not be used for four months. Several auxiliary buildings, including the "office," were completely destroyed, but it is quite possible that this interfered not with the efficient operation of the submarine service at Lorient but the construction of U-boats forced upon them due to the bombing of St. Nazaire.
Air Ministry experts could not overlook any evidence that bomb attacks at Lorient had operated directly to delay the turn-around at that port.\textsuperscript{33}

The repeated attacks made by the U.S. forces at St. Nazaire in November—on the 9th, 14th, 15th, 18th, and 28th—and demonstrated the virtue of concentrated effort in this type of bombing. Undoubtedly St. Nazaire, the most important of Germany's deepwater bases, had suffered crippling effects, but the rapid recovery of that port after 20 November also demonstrated that, if such crippling effects were to last, attacks of similar weight would have to continue at a similar rate. The mission was conducted against St. Nazaire between 25 November 1942 and 2 January 1943. During the breaching period the servicing facilities were apparently put once more into some kind of running order. British observers even believed that by 6 December the port was again in full commission.

In order to retrieve the earlier successes, the VIII Bomber Command struck St. Nazaire on 3 January in the largest attack made against the submarine bases to date. Some 65 aircraft bombed the port, dropping 342 x 1,000-pound high-explosive bombs.\textsuperscript{34}

Accuracy on this mission was better than on most of those since the first attack on Lorient. The points of burst of 107 bombs could later be identified, and of this manner, 26 were located within 1,000 feet from the aiming point, in this instance a small torpedo warehouse which was hit and demolished. Considerable damage was done in the dock area, especially to the north and northwest of...
the submarine pens, where many cars fell on the railway, at least 10 resulting in destruction of tracks and wagons. A number of buildings, including the goods station and the customs house, were damaged or destroyed. The new boiler-plate shop suffered additional damage. A ground report claimed that, for the time being, at any rate, the works of Mombasa had been put completely out of action. Several bombs fell on and around the submarine base itself.

According to the same source never penetrated the reinforced concrete roof, and except for some windows, doors, and electrical apparatus being damaged by blast inside the shelter, the base escaped serious damage and were proceeded without let or hindrance.

So incursions, in fact, were the concrete shelters that the extensive German naval administrative offices, hitherto lodged in the customs building, were said to have been transferred to the Reid to quarters "beneath" the submarine pens.

Significant as the results of the bombing appear to have been, the nature of the opposition encountered during the mission gave rise to much more to think about. Heavy resistance from fighters, which was not chiefly over St. Jazaire itself, accounted for three of the bombers lost. In return for these losses, bomber crews were finally credited with 14 of the enemy destroyed, 13 probably destroyed, and 4 damaged. But that surprised the most was the intensity and accuracy of the flak which, unlike that previously experienced, was thrown up in a "predicted barrage" rather than in a "continuous following." This unprecedented fire destroyed three more of the attacking planes and hit
In addition to personnel, the mission cost 10 men missing, 5 killed, 9 seriously wounded, and 21 slightly injured. In terms of aircraft it cost seven destroyed and 47 damaged. Although the next successful mission to do against the submarine bases from the standpoint of destruction to enemy installations, it was fully as costly as the ill-fated low-altitude attack on 3 November against the same objective. Quite clearly, the submarine bases presented problems of defense which the U.S. bombardment experts had yet to solve.

Looking back over this first phase of the effort against the U-boat bases, the most concerned with it could come to few sound conclusions regarding its effectiveness, either in terms of specific damage to the U-boat corridor or in relation to the other forms of antisubmarine activity. It was easy enough to compile and quote certain operational data. In 10 operations from 21 October 1942 to 5 January 1943, the Eighth Air Force, out of an effective total strength of 570 aircraft, had dispatched 663 against the submarine bases, of which 357 actually attacked the target, dropping 355.2 tons of bombs on or in the vicinity of the objective. Of this total of bombs dropped, photographic estimates indicated some 35 tons to have fallen within effective range of important installations. All of these results were obtained at a cost of 17 men killed, 80 wounded, and 211 missing, and 23 aircraft lost. Claims originally registered included 61 German fighter aircraft destroyed, 18 probably destroyed, and 28 damaged. Subsequent review revised this score to 24/32/12.35
In addition, ground reports and aerial reconnaissances pointed to certain specific effects which have already been summarized. But it was much more difficult to say precisely how many U-boat months had been denied the enemy through these operations or to what extent, if any, the American attacks had affected the number of U-boats operating in the Atlantic. That number had apparently declined in less bar from its peak in November, but it was obviously problematical to what extent the operations of the Eighth Air Force had contributed to that result. Bad weather and the necessity for temporary reorientation in submarine operations after a period of unrelenting activity no doubt accounted in large measure for the decline in the number of U-boats operating in the Atlantic.

Indeed, according to a U. S. naval attaché report, the Admiralty Tracking Bureau claimed that no substantial change in the rate of U-boat departures from the French coasts had resulted from the U-boat raids. 39

It was equally obvious that a series of relatively concentrated and destructive attacks must have had some deleterious effect on the efficiency of the enemy submarine fleet. Opinion as to the extent and relative importance of that effect varied. Admiralty sources seemed to have been wary appreciative of the U. S. attacks, if necessarily vague in specifying their results. After the attack of 29 November against St. Nazaire, the Admiralty sent the following message to the Commanding General of the VIII Bomber Command: "Your attacks against the U-boat operational forts are greatly appreciated and are a valuable asset to the offensive..."

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being carried out by Coastal Command in the Bay." Coastal Command volunteered a similar statement. Late in November, Sir Dudley Pound, First Lord of the Admiralty, wrote General Baker, referring to the "fine achievement of the U.S. A/C employed in the precision bombing of the U/B bases in the French enemy ports." It is too early to say with certainty what effect these raids have had on the German U/Boat campaign. The existing evidence suggests, however, that although the direct damage to the U/Boats and their shelters may not have been very great, the raids have caused a dislocation of the ports and the delicate organization of the U/Boat service which is only just becoming apparent. If this is so, and I personally believe that it is, the U.S. aircraft will already have performed a valuable service and discovered one of the few chinks in the enemy's armour so far as the U/B campaign is concerned.

Generally speaking, the Admiralty recommended intensifying the day offensive against the submarine bases, concentrating on the installations in the neighborhood of the pens rather than on the pens themselves. Curiously enough, at first glance, Air Ministry and RAF Bomber Command opinion was comparatively lukewarm. An Air Ministry analysis, while granting that the U.S. attacks had undoubtedly embarrassed the enemy rather in dislocating facilities at the bases than in damaging the submarines or their pens, placed greater confidence in direct sinkings of submarines by surface and air attack and in
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long-range antisubmarine air patrol in the areas where the U-boats operated. If linkings at sea could thus be increased from 5 to 7 per month to 10 per month, results of current efforts against the bases and yards would become proportionately more decisive. "Certainly," it concluded, "the effort required to attain a similar result by bombing of bases and building yards alone will be quite disproportionate to the results."

This attitude disturbed Admiral Spruance. In a letter to Admiral King of 13 January 1944, the situation he assessed as less serious than it appeared. He advised that an antisubmarine air patrol was the answer to the submarine problem, that "our main forces would be turned against bases and buildings of installations in Germany and to work on the U-boat cases. This, he added, was not a perfectly sound position, for it was of the utmost importance that the U-boat continue to bomb German industry in Germany. It would therefore be necessary to put up with criticism, understanding the reason for it."

USAAAF headquarters had other objections about the submarine base bombing. While generally agreed over the fact that positive action had been taken against enemy installations by American heavy bombers, and although especially pleased with the fine series of attacks executed during the year, Headquarters assumed that the weight and nature of the attacks remained inadequate for the task of doing "something drastic" about the bases that still threatened Allied supply lines. Then there...
was the matter of the relatively high losses sustained during the last two missions (10 aircraft out of a total of 100 attacking).

Probably in an effort to allay doubts in his command, General Nijenhuis maintained a consistently optimistic tone when referring to the campaign against the submarine bases. The losses, though unfortunate, were, he insisted, to be expected in operations conducted repeatedly over the same objectives and in such a way that the enemy could tell by the hours of daylight and by the flight time to and from the target just when the bombers could arrive, even if their 107 had not already driven fighter and flak defenses sufficiently far afield. "We are not actuallyrophobic," he wrote on 9 January 1943, "and shall continue to knock down better than 8-1 every fighter for our bomber losses. This is, to me, an excellent exchange." Furthermore, improved tactics might in the future be expected to improve the situation materially.46 The successful operations of November had more than ever convinced him that with ten to twenty bomber groups he could eliminate a large part—possibly 60 per cent—of the submarine menace in the Atlantic.

Later he added that as soon as it became possible for him to put 100 to 150 bombers in the air he hoped to be able to hit submarine building installations in Scilly. However, whatever weather over the British Peninsula was unfavorable for operations against the bases.47

The U.S. Navy added its opinion to the confusion of a picture already far from clear in a naval attache's report from London compared...
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the be bim of the bimel sea and base facilities unfavorably with other antisubmarine air operations, especially the escorting of threatened convoys. It maintained, moreover, that the only signs of success obtained in the attacks on operating bases had been the destruction of two docks at St. Nazaire and the report that some U-boats had moved from that port to Lorient. In which event, and assuming that this condition prevailed for a month or so, perhaps 10 to 15 U-boat months were lost as a result of the entire Lighth Air Force effort. 50

By January 1918, the things about this bombing program had become clear. In the first place, that had been expected regarding the destructibility of the oases now come out by experience. Even with the use of heavier armor-piercing ammunition it was considered doubtful whether significant damage could be done to the oases blocks. Consequently all that could be expected from bombing or bases would be misorganization of the turn-around and servicing schedule. 51 Secondly, in order to paralyze the operating bases, and so in effect to deny them to the Germans, it would be necessary to employ much larger forces than were then feasible. In answer to a direct question from Washington, Headquarters, Lighth Air Force replied that, in order to neutralize these five bases completely, 25 sorties against each base per week for eight weeks would be required, and that this scale of effort was, in fact, recommended. 52 Both Air Ministry and Admiralty agreed on the necessity for increased frequency of attack by increased forces, for it was not an easy matter to inflict permanent damage

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on ports, as the 'L' has found out at Raynes and the Germans at Alta.

The rest of the problem resided in the realms of opinion. Did results justify the effort expended against the submarine bases and the diversion from true strategic bombing which it involved? As bombing of submarine bases the best, or even a reasonably profitable way of reducing the submarine menace? These vital questions could not as yet be answered with any degree of finality. Involving, as they did, comparisons between divergent and even opposed schools of thought regarding the employment of heavy bombers, any tentative answers were unavoidably colored by the interests of the evaluating agencies. It was, however, generally recognized that no one method was likely to provide by itself the solution to the submarine problem. And opinion still gave the efforts of the Eighth Air Force a prominent, if somewhat indefinite, place in the antisubmarine campaign. The bombers may not as yet have affected the submarine situation in any major way, but they had done their job well enough with inadequate forces to make most observers believe that, properly equipped, they could do it decisively.

It was not until the end of 1943 that official USAAF surveys of strategic bombing results tended to confirm doubts hitherto hesitantly expressed regarding the value of bombing submarine bases. By that time the submarine had for the time being been defeated, and it had become apparent that attack from the air against the U-boat at sea had been the most effective single factor in reducing...
the German submarine fleet, and that bombing of bases had contributed relatively little in that direction. Grand Admiral Doenitz, who, as one-time commander of the U-boat fleet, was in a unique position to know whereof he spoke, further confirmed this opinion in an interview with Allied intelligence officers after his capture in 1945. Not only were the pens themselves impervious to anything but the heaviest type of bomb, he asserted, but they housed virtually all necessary repair and maintenance facilities. Bombing of surrounding installations did not therefore seriously affect the rate of turn-around. But casual turn-around was effectively, he claimed, was the necessity for requiring the dive to be done to hull structure by aerial bomb and depth-charge attacks delivered at sea. Undoubtedly the U-boat's armament the enemy of destroying auxiliary construction plants and neighboring railway facilities, and in a variety of minor ways, but these were not the primary object of their attention.

Other Objectives: Enemy Aircraft and Transportation

Not all Eighth Air Force effort extended during November, December, and January was directed toward the submarine bases. These installations enjoy a, or rather suffered, first priority; and, in fact, 10 of the 15 operations undertaken by the Eighth Air Force during these months involved attacks on the U-boat bases. But the U. S. Navy has also been instructed to strike at the German air force and enemy-operated transportation facilities in occupied countries as matters of second and third priority respectively.
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Of the 401 bombers dispatched against targets other than submarine bases, 291 were detailed to attack airfields and 176 to bomb targets of importance to German transportation. Owing to the vagaries of the weather, which on 12 December turned a major effort against the air installations at Leilly-sur-Seine into a near attack on the Douai-sotteville Yard, only 30 of the 291 planes that completed their mission dropped loads on aircraft installations, leaving by far the heaviest weight of attack for transportation. As it happened, only one target in each category sustained any considerable pounding. Three missions against Lille accounted for almost all the damage inflicted on transportation, only one other attack having been executed, and that the slight and ineffective one against Douai-sotteville on 12 December. In the aircraft category, although planes were sent three times to the Douai-sotteville airfield, and once to Cherbourg-Normandie, only the single raid on Leilly-sur-Seine on 20 December can be classified as effective.⁵⁵

At Lille the locomotive and rolling stock repair and construction works of the Ateliers d'Élémencques and of Fives-Lille had been severely damaged in the USATF attack of 13 October 1942, but had since been extensively repaired.⁵⁶ They still constituted a composite objective of the utmost significance to Axis transportation, chiefly because they were the principal railroad repair depots in France. All attacks on locomotives had created a serious repair situation. In November, for example, 618 light and medium aircraft carried out 58 attacks by night and 20 by day in France and the Low
Countries against trains and marshalling yards. In addition to destroying nine locomotives or trains, this stopped a large percentage of which undoubtedly had as a result to pay a visit to the repair shops. Consequently the rail shops were being taxed to the limit of their capacity, requiring an estimated 60 to 65 locomotives per month. 87

In addition, Mâcon-Lilloe has capacity in 1943 to produce 100 to 150 locomotives per annum. For immediate purposes, however, it was apparently believed possible to augment rail transportation more effectively by still further constraining the bottleneck already imposed by limited repair facilities then to destroy the issue of new production, for the ability of the U. S. G. I. to provide locomotives for the Services was then in operation in the region of the war and 14th Army. I cannot rely on the old unbroken locomotives could be repaired and overhauled. 88

The Allied attacks on rail appear to fit into a coordinated plan, according to which all fighters attacked rolling stock and the threat forebodes periodically reduced the capacity of the principal repair depot.

On June 14, 20 heavy bombers dropped 230 x 100-pound high explosives to be used primarily for an entire area, which had received the major blow. No report exists on the damage due to this attack. A "reliable source" claimed that this raid destroyed 15 locomotives and damaged 40 cars, in addition to causing confusion by a direct hit on the turntable. These figures.
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more high and it is impossible to check their accuracy. Another attack, on a 7,000t, by 2 bombs against the main target could not be determined as to damage already inflicted, but it is impossible to say to what extent it further recorded repair activities.

The heaviest attack against Hills one on 18 January 1943, with 64 heavy bombers dropped up to approximately 100 tons of bombs on or in the neighborhood of the objectives. Two groups were to attack halls and the St. Vincent-Hill establishment. Serious damage was inflicted on the former, there barely a building escaped. May were partly destroyed by direct hits, others by blast or by fires resulting from explosions. Two workshops received severe damage. Columns also fell on railway sidings and storehouses nearby. St. Vincent-Hills, the steel foundry, iron foundry, and forging plant sustained damage. The main group of workshops did not, however, suffer further injury.

At the repair shops of Salamanca, some locomotives waiting overhaul had been piling up since the arrival of 8 October, work appears to have come to a virtual standstill for some time. At times, such less interruption took place. Ground reports indicate, but after their conflicting testimony has been sifted, it appears that fuel works did not resume locomotive construction until the end of April 1943. It cannot, however, be said that work on the above was resumed to any new extent. There is evidence that the hiatus in production can to large part as a result of a considerable switching of repair work to
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After considerable delay, we have now received from our military attache in Warsaw the following report on the situation in Poland. The report is from a reliable source and indicates that the Poles are preparing for a major military operation.

The report states that the Polish military has been greatly strengthened and is now ready to initiate a campaign against the Germans. The Poles are believed to have a significant advantage in the mobilization of their forces and are confident of success.

We have requested additional intelligence on this situation and expect to receive further reports in the near future.

Sincerely,
[Your Name]
CONCENTRATING during that raid on private houses, destroying 31, partially destroying 33, and killing 28 persons. 88 Although this raid, sharply contrasted the Americans for courage, possibly or a calculated, beating of a population 50 per cent of which was pro-British and pro-
de Gaulle, does appear in some French reports to have relieved, which, the population tending to excuse the American pilots on the grounds of their "inexperience" in comparison to those of the .84

On 20 December the Eighth Air Force made its one effective attack on the French Air Force in a relatively long-scale mission against the aircraft car and its air depot at Béthune-air-arms.

This aircraft depot and arms area, situated near the river seine only 55 miles northwest of Paris, held the reserve aircraft of all branches of the Fifth Air Force in France and the Low Countries. They were held there for issue to operational units as required, and such repair and re-arming as was done in its workshops.

British intelligence placed the number of their planes at 55 planes on the date of this attack at 120, to be in addition to those 30 to 50 currently undergoing repair. The only previous British air force attack had occurred in June 1919 during the Battle for France and before the Germans had begun using it as an air depot. 89
of the 151 bombers (80-1-17°, 50-9-2-17°) were patched on the mission, 72 (50-1-17° and 12 -2-17°) to hit the targets, relieving 120,000 rounds of high explosives and 13,000 rounds of incendiaries. Results were reasonably good. Bombs were indicated on hangars, barracks, barracks, and aircraft, and the crew were on the landing ground, but of the ten on the printer or taxi-tanks.

Of considerable historical significance, however, was the fact that, in the course of this single mission, you made by Allied armies into a Free French territory, the very rounds of shells fired at the Free Army, armed forces located in northeastern France in Austria, all told, developed with proportions and provided an important test of the Free French army forces' ability to carry out unescorted missions deep into enemy territory.

According to British intelligence estimates, the free air force in northeast France at the outset of the attack was distributed as follows: 12 were based in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 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12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Cherbourg area; 12 in the Ch
this on their return trip. Air operations also proved uneventful for the friendly fighters. 88

It was against the enemy here that the bombers delivered the full weight of their attack. It may have been that they were prepared for just such a mission at this time. For on 12 September, the ideas on the ground, American ground, the enemy had flown to undeviably, intending to attack the objective, but, on finding it closed in by fighter, they night any loss on a target of lower priority. At my best, the score this time was purely barometric (at 1100 hours) and 60 German light re, mostly B-100's from the east, 300 miles. The anti-aircraft planes, however, lost the location. 89 They too in will still above, and I off attitudes arm, and closed in from the front, slightly more, simply 4, and other below, an Mess of the 88th from the one road to hit the ground at 1000 miles, and 10 minutes later another 2-17 from the same group hope to lose altitude rapidly with a number of enemy fighters following it soon. At about 1200 hours, the enemy planes were limited to 30 to 60 from fighters from the east, rear, and possibly worse. These planes continued the fight against to the target, which was reached between 1200 and 1245. During this phase of the battle, a number of B-100's joined in the attack, and a plane from the West at 10 or 11 o'clock, flying through the formation and giving out at 5 o'clock. An -17 of the 202nd group was hit about 30 minutes before the target, but it was not until 5 minutes later that it started down. 70

In the return trip to capture formation suffered almost continuous attack from H-11, most of which had apparently taken part.
in the earlier stages of the war, air combat was not nearly as much
enacted as it was during World War II, when many planes were lost
due to various factors, such as enemy attacks or mechanical failures.

In the case of the radial engines used in the early stages of the war,
they were often vulnerable to enemy attacks, and many planes were lost
as a result. It was not until later that advancements in aircraft design
and technology allowed for more effective protection against enemy
attacks. The use of radar and other technologies also played a crucial
role in detecting enemy aircraft and improving reaction times.

Early in the war, the lack of accurate intelligence and ineffective
plane design led to many losses. However, as time went on, the lessons
learned from these early losses were incorporated into future designs,
resulting in improved performance and survivability. The constant
adaptation to new technologies and strategies played a significant role
in the air war during World War II.

In summary, while the early stages of the war were marked by many
losses and challenges, the lessons learned from these experiences
were instrumental in the development of future aircraft designs.

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71
72
At this point the result of other than rigid discipline is as
important as is the result when discipline is rigidly enforced. We
are now in a position to assess the situation in the light of the
intelligence now available. The enemy is making a determined
effort to maintain air superiority over the area of operations, and
this is evident from the loss of aircraft and the general
situation. The enemy is making a determined effort to maintain air
superiority over the area of operations, and this is evident from the
loss of aircraft and the general situation.

For the enemy to maintain this superiority, it is necessary for
them to establish a large part of their own air superiority from the
area of operations. The enemy is making a determined effort to
maintain air superiority over the area of operations, and this is
evident from the loss of aircraft and the general situation.
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In certain instances, it is not always possible completely to ditch a plane in the air or even to completely destroy it on the ground. Such cases usually involve a situation where the fuel, but not the airplane itself, was destroyed, or if the other part of the airplane was not so damaged. It was considered possible that adequate repair could be made in the case of the wrecked plane, or if it were possible to have the pilot recover his ability to fly it. In any event, it could be stated that if the pilot had been unable to ditch the plane when on the ground, or if it were not possible to repair the plane when on the ground, or if the pilot were not able to fly it, then it could be concluded that the event could not be considered an accident. In such cases, the pilot had been unable to make a safe landing, provided the plane could be repaired. In the case of the plane that was destroyed, it was determined that the airplane could have been sufficiently in line to prevent the possibility of the pilot's actions. Then, or to have been done to such an extent that the pilot believed inevitably to have crashed, although certainty of destruction could not be established absolutely. In parts of the country, if the plane had been shot down, it could be claimed that the plane was shot down in the future or that the pilot had not attempted to control the possibility of the plane's actions. If the plane...
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The major point of the argument in the discussion of the radar, the aeroplane, the control of air, and the interception of the air war was that the interception of the air war was essential to the control of air and the control of air was essential to the defence of the air. The points were that the interception of the air war was essential to the control of air and the control of air was essential to the defence of the air.

When all sorts, however, the model-scale model continued to be a major one, no longer or the work a shooting, at single shots, conclusion to be assessed to occur only for large and light to the interception, where in reality all was actually intrinsically the sort of illusion, but in clarity on the future the were seen inaccurate, and in other ways, it was not clear, a case of conservation was not one, installed into the minds of the air forces ever so more.

The story is told of a year on the military frontier of 17th January 1943, where in the story of the situation up in the air not a hundred yards from the border, made a sudden sound and said, "No you don't have that one!, to which another man replied, "No, I didn't see it crash.""

Operational, Tactical, and Technical Problems

It was not clear how many air-crew operations in turn simply or the result obtained. From the very beginning it had been apparent that interception was essential to the interception and in relation to the factor that could still hit both the scope of its operations and the degree to which those operations were effective. The limiting factors were especially large during the early months. Do it with in this study, for if we then that long-term plans merited being laid for the air war against Germany. The problem was

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Fall into two large categories: (1) tactical problems, and (2) those of logistics, maintenance, and operations. Most of them had been brought before the War Department, and we received initial consideration in an interim prior to November 1st. During the early fall by this chapter they developed rapidly and much thought and effort went into solving them.

Basic, of course, along these factors was the size of the operating force itself, essentially a product of logistics. The departure of the Twelfth Air Force in early October had left the parent organization with eight units consisting of two heavy bombardment groups, two fighter groups, one observation squadron (two of which groups were scheduled for December 1st), one bombarding light group, one reconnaissance unit, and one observation group scheduled eventually for North Africa. Of the heavy bomber units, three were 5 November not yet in operational status and on the only recently become operational. At 1 January, the situation had not improved materially. Although all heavy groups had become operational, and although the fighter groups had been added, neither of the two heavy fighter units was at present in combat, one heavy bomber group (T. 264) had on 3 October been detached to convert the air command, since one squadron had been detached for a temporary tour of duty which lasted until the end of February 1944. However, one squadron of the 264 group had been on combat training duty from 27 October to 25 November, an another from 14 January. A very small unit, an experimental unit, was on the training circuit, and effort went into.

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November 10

The Eighth Air Force had also left our sight so low in our force's service elements that no real extent in November expressed doubts whether sustained operation could be maintained by our remaining combat units. 86

Founder, the prior demands of Yalta were it impossible to keep up to full strength these units the are particularly notable. The problem of replacements arrives, not all of attention during

The lack of 1944, both in Washington and in the quarters, which air force. According to general opinion, the Eighth Air Force units were under strength to begin with, after the repair work of the Eighth Air Force had been set, and their strength was likely to be further reduced until reissues. For the Eighth Air Force had

began to flow regularly from the United States only to grow or the target that the rate of replacement for units in the United Kingdom, then kept up to the level proposed by their representatives in July 1942. The also had presented had provided for 20 replacements in every 1000 aircraft, additional aircraft for reserve and for the augmentation of units through a month in 1942 at the rate of the per month per group, and combat aircraft for 75 per cent of the aircraft at the proposed for attrition. 87

On 8 December 1942 it was decided to higher warning that replacements for the African theater be expedited in order that no further drain would be necessary on the already strained units of the Eighth Air Force. Further withdrawals, as normal, could seriously affect operations from the

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bail bonds, which are of vital importance not only in the
air, but also, by occupying a considerable portion of the
American air forces, they prevent the enemy from diverting his
air strength to be used elsewhere.19

If headquarters, while sympathizing fully with the plight of
the Eighth, was apparently unwilling to jeopardize more critical pro-
jects in order to build up the force in the United Kingdom, especial-
ly in view of the fact that shipping space was no less at a premium
than were man and materials,20 moreover, the estimates of Eighth Air
Force requirements in January 1943 do not have coincided exactly
with that made by General Spaatz and General Eder, for reports in
headquarters did not indicate a serious situation as that
reported from the theater.21 So that as it was, by the end of January
1943 the Eighth Air Force was not receiving replacement planes
and crews as fast as it was expiring, then.22

The result was that under existing operational conditions the
force employed in the daylight raids was inadequate to accomplish
any major task of the kind it had undertaken, a fact which had been
apparent during the campaign against the submarine bases. The size
of the operating force also limited the choice of targets, for it
was felt that only a force large enough to protect itself readily
should be dispatched over the Reich. Yet, on the other hand, the
necessity of restricting activity to a single, relatively narrow
area in occupied France made it impossible to diversify the effort
further without continuing to increase aircraft losses. In any
case, it was obvious that a loss rate of less than 5% expected
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A core could be disestablished due to attrition or defeat, contributing to overall attrition of the force. The number of aircraft in a unit on hand, the number of aircraft that could be brought up on any particular mission, depended on the ability of the maintenance crews to keep the aircraft in operational order, to repair battle damage, and to issue modifications as combat experience demonstrated to be necessary. The ability, in turn, depended on an adequate supply of parts and爱吃 oleo systems personnel long enough in proportion to aircraft in the core to bring up with the remainder of the operational units. In the full measure of 1942, neither of these conditions prevailed, and so it was not possible to realize fully the potential strength of the core force available.

In the 15 missions studied in this chapter, it is never certain to dispatch an average force of 70 or more within a radius of 150, yet these figures represent a force in the long run of the total aircraft on hand in the theater. Through 1941, for example, only 51 percent of the total was in combat condition.05

The ability to maintain a force of 70 or more within a radius of 150 would be a significant improvement. It would represent an improvement in the efficiency of the core in the theater. The core, in turn, is the key element in the maintenance of the force in the theater.

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CONTINENTAL equipment, it would, probably have to be used for transporting combat units. Although General Swope stated that "enormous reduction in the cost and efficiency of air operations must be expected until the repairs service elements are brought up to combat standards," he advocated allocating available shipping to escort replacements as a matter of first priority, since the latter required service to the extent that two-seater aircraft was essential until normal service units arrived.  

At the beginning of the first air operation, there were severe restrictions on use of bottle CXM, which placed a premium on the already inadequate repair facilities, but the inevitable result was a large proportion of the combat passenger equipment returned at the end of September, 70.6 per cent, of the attention planes returned repairable damage; in October 77.7 per cent, of the aircraft in the category had been to base, with damage reducing on average to about 5 per cent of the total planes to be returned at each station. The reduction in the number of aircraft returned to the unit was due to the use of small tactical and operational aids, and a premium, to be set on, to a large extent in the matter, until a standard model could be turned out in the form of the aircraft, fully designed for combat in Europe.  

The fact that the equipment required special modifications for the special project would require special production and that a need to be made to meet the requirements or in a production plant, which produced increased the losses in the April 1944, Interim Facilities. 

In fact, difficulties presented by the relatively high rate of service correction and damage resulted, since
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...others, on the other hand, increased considerably, training is not as}

...of all mortars. The new increase is to run}

...without the use of territory, if carried on more intensive, or}

...justifies, or in other words, it is so gradual that military

...it is possible, of course, that the action of great commanders to

...it may be, of their present arms. In the same study the effects

...of starting, so that, under these circumstances,

...and now the Fifth on the ground for the thorough study, in

...in our Thal. at the center, nor the total victory, but as

...in the 113th in locations from 1-5 October 1913 to

...of January 1914, with that into advanced line in January,

...in the 113th, to the war, the 113th further or indirect

...in commissions, in many cases of those working in

...in artillery, during their general role.

...vital importance in the whole scheme of

...in artillery, too much being left to the skill

...in净资产 and other military, in many cases a slight ear to

...or the indefinite, is not his to build without high distances,

...in the others, very good objections, in a variety of short

...of positions, to a disadvantage both, and their in an actual

...or totally dependent, with slight, in high efficiency out of the

...artillery, and could...crude directly or indirectly to the

...and in increasing vitality and energy, once sure,

...or people, leaving me, the range of sound with other, as

...of many turk, by the judicious use of oil, and...
proved insufficient to give protection. Perversely, the weather cleared and all four returned without bombing. Twice more in January B-24's went out on expeditions of this sort, only to be foiled again by fine weather. Short of resorting to night bombing (the RAF had, after all, conducted 18 missions during January) the Eighth Air Force had little choice but to wait for favorable weather and a wider selection of targets. 105

The Eighth Air Force also faced certain major tactical problems, upon the solution of which depended the success of the day bomber offensive. Success depended specifically on the ability of the day bombers to hit and destroy their objective and on their ability to defend themselves against flak and fighter attack. Questions on both these accounts had been implicit in the history of Eighth Air Force operations from the beginning. During the fall and winter of 1942 they became rapidly more pressing. In order to hit such relatively small, isolated, and invulnerable targets as submarine base installations, it became evident that better offensive tactics, particularly improved accuracy, would have to be developed. And the vigorous growth of German countermeasures called attention even more urgently to the problems of defense. Prior to 21 October, neither flak nor fighters had seriously threatened the American bombers. Clearly, the Germans had been caught unprepared for a weapon such as the day bomber which not only could do real damage from extreme altitudes but could also shoot it out with the best fighters in the Luftwaffe. However, as many observers, including General Spaatz, had foreseen, they lost no time in adjusting defensive tactics to...
cope with this unprecedented attack. If they adjusted neither so rapidly nor so radically as some had feared, they nevertheless gave the Eighth Air Force grounds for serious concern and taxed the ingenuity of its tactical experts.

Except for the few seconds of the bombing run when the purpose of the heavy bomber is realized, all phases of a bombing mission are dominated by considerations of defense. But considerations of defense had to be carefully balanced against those of offense, for they were not always reconcilable; and they had also to be weighed in relation to each other, for what would offer protection against flak might increase vulnerability to fighters. For example, high-altitude bombing reduced risk from flak, but it also reduced bombing accuracy. Bombing by a single aircraft might, under ideal conditions, be best for both accuracy and protection from flak, but would not provide sufficient defense against fighter attacks. Large bombing units flying in formation would give adequate protection against fighter attacks, but would increase flak hazards and at the same time reduce accuracy by enlarging the resulting bomb pattern. As experience was gained, constant adjustment was made in multi-lateral compromise necessitated by this problem of integrating defensive and offensive tactics. By January 1943, many of the basic lessons had already been learned, much of the pioneer work having been done by the 1st Bombardment Wing, under the successive command of Brig. Gen. Newton K. Longfellow, Brig. Gen. Larry S. Kuter, and Brig. Gen. H. S. Hansell.
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The Air Force had turned the air defense to the
African battle. An initial force was set for direct and immediate
invasion into the aircraft flying at altitudes above 30,000'
and their fighter pilots were at first unwilling to
get very close, preferring to stand off, just outside the range of
the bombers' guns, but it for a reasonable opportunity to dive
quickly in and out of the formation. But, in October, enemy
improvement became noticeable in both antiaircraft fire and fighter
exposition.

Since fighter tactics developed in enemy territory required
the better dive, they reflect a wider range of conditions. The
case to stand off and dive thrust reports from various sources
indicates that, after the first 10 missions during which area
installation, has been several aircraft destroyed at practically
no cost to the bomber, a shakedown had to be accomplished, eventually
in fighter staffs, in the African Front, with the result that
their success determined efforts and so that there was only
left American to our forcings to press near their missions
irresolutely costly. 103 any type of attack on the I-10, but for
squadrons with little Stuka prejudice, this area was the essential
place of attack against the aircraft, as it was the I-10, which
with an objective to meet at its best, but by the addition of especially heavy antiaircraft fire, the all-in
in the air and on the ground could attack in their fighter, the
I-10 (I-10) (headquarters) villa, not being our characteristic of

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During's (lit. frighten in); made a series of deliberate attacks
from the rear in an apparent effort to time a climax spot fire from
both dorsal and ball turrets. 

In pre-in, 20th January in formations of three, at night level, opening fire at .50 yards. The bees were lost as a result of this action, and six others damaged. But
the enemy, in turn, sustained disproportionately high losses.110

Beginning with the St. Nazaire mission of 20 November, French
fighter tactics of a more effective, nearly all attacks that day
were from the rear. The Germans had finally discovered the relative
inefficiency of the A-17s and the A-21 in forward fire power.111
The A-17s had a .50-caliber, round-hipped gun, firing through one of
four elliptical retractable turret, and one mounted on .30-caliber side
nose guns. Each either a blind spot at left in front which
neither the upper turret nor the ball turret could reach. The
A-21s were equipped with .50-caliber side nose guns, and a single
.50-caliber center nose gun, mounted to fire below the horizontal
only. This mount also left a blind spot which the upper turret
could not cover.112

After 20 November, and through January 1943, nose attacks con-
tinued to predominate, and accounted for most of the losses suffered
by the VIII Bomber Command as a result of encounters with enemy
fighters.113 Losses from enemy fighter fire, in turn, constituted
the larger proportion of total losses, which had risen from
an average of 3.7 per cent of the attacking force in November to
8.6 and 6.7 per cent in December and January respectively.114

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In addition to the high rate of losses attributable in large part to the frontal attacks, the bomber crews had to face this type of tactic very frequently just over the target when the confusion inevitably resulting would be most likely to spoil the bombardier's aim. In fact, it was believed that to break up the bombing run had now become a primary objective of the German fighters. The frontal attacks, therefore, came during those months to be the chief defensive problem of the Eighth Air Force.

It was immediately clear that the only effective countermeasures would be the addition of increased forward fire power in the bombers and an improved defensive formation which would give all planes the benefit of mutual protection. Of these remedies, the addition of nose guns was the more critical item, because it would involve a great deal of time-consuming modification both in the United Kingdom and in the United States. Meanwhile makeshift tactics were devised. One method of countering the front-quarter, level attack—the method reported in December as the one officially approved—consisted of a diving turn into the attack which uncovered the top turret, and, incidentally, tended to spoil the enemy pilot's aim. It was hoped that in this way any such attack would encounter not only the front, side-firing guns, but the top turrets of at least some bombers in the formation.

Modification for nose guns began promptly. Pending the installation of a standard power-driven turret in the B-17, flexible, hand-held .50-caliber nose guns were provided in most of those destined...
for the European Theater; and the standard B-24 front nose gun was modified in such a way that it could fire above the horizontal.\textsuperscript{117}

In the theater, similar modifications were undertaken on as many aircraft as could be accommodated in the depots. The need for such modification was so great that improvised field installations were authorized as long as they conformed to basic requirements. By mid-January, most heavy bombers in the United Kingdom were equipped with effective forward fire, if only from single, improvised, .50-caliber and .30-caliber, hand-held guns.\textsuperscript{118} Complete satisfaction could only result from the installation of a turret in the nose, but it was not until August and September of 1943 that the improved B-17's and B-24's arrived in the theater complete with this power-driven equipment.\textsuperscript{119}

Although it was a standard defense against all fighter attack, the large formation of bombers so stacked as to provide mutual fire support proved especially helpful in countering the frontal attacks. Indeed, it was during the fall and winter of 1942, and primarily in answer to this particular problem, that the 1st Bombardment Wing evolved a system of formations which became the prototype for operations in the theater.\textsuperscript{120} General Ito took over the wing on 5 December 1942, he found four groups, each operating according to its own tactical doctrine. No wing organization existed for tactical purposes, and consequently the groups collaborated only in the sense that they all attacked the same target roughly at the same time. No effort was made to secure additional fire support by coordinating group tactics. Squadrons and groups had developed into cohesive
teams, but the wing as a whole had not become a combat unit. Acting on the assumption that the larger the formation, consistent with requirements of maneuverability, accuracy, and control at high altitudes, the more mutual fire support would be obtained, General Axtell saw to it that the squadrons and groups into the largest practicable combat units.120

At first the groups had banded in elements of three aircraft, but fighter attack demonstrated that being by elements, however satisfactory from the point of view of accuracy, did not provide sufficient defensive power. 

A mixed formation, composed of two elements of three aircraft each, was then tried. The intensity of enemy attack soon made it necessary to return to baling by groups of three squadrons. This formation consisted of 18 to 21 bombers, known as a cloud box, based on the standard minimum combat unit, and was stacked in such a way as to uncover as many of the top and bottom turrets as possible in order to bring the aircraft to bear on the critical rear area of defense. It was considered to be a unit feasible for defensive purposes and the largest that could be handled readily on the bombing run.121

But, especially on the trip toward the target and in an withdrawal, it appeared that mutual fire support could be greatly increased by combining two or more combat boxes into a single defensive formation. It was not, however, considered practicable to fly the entire bomber wing in one formation. Certain larger than a formation of two or three combat boxes would also require deployment in such.
with the differences in the velocity and aircraft performance at different altitudes. It would have been of help to have some form of information to indicate the airflow conditions. Moreover, the available data was limited to a single aircraft and was not controlled or directed by the commander. Accordingly, the issue was not significant for operational purposes. The commander was only interested in the administrative organization of the aircraft.

Another issue, concerning the control of the aircraft in formation, was that the maximum altitude for altitude control was usually limited in operation, as the aircraft was in a vertical and similar in principle to that of the submarine, although in the period under review, many modifications occurred. It was felt that it was necessary to place the controlling unit in formation moving up the flight path, as the opposition would likely be at a lower altitude and the aircraft would be at a higher altitude. This led to the method of using this technique despite the fact that it could not always be used. The air cover was initially set up around the initial point onto the battle line, and it was then necessary to establish one pattern, which would have to be too large for the desired accuracy.

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...
CONVERSATION

and then the operation of the machine would begin. The machine
would operate on the documents and would be able to sort the
words according to their position in the document. This would be
accompanied by the printing of the documents on a typewriter
that had been previously set up. The output would be a typed
sheet, which would then be used to compile additional material
and written in a concise and accurate manner.

Such is the technique, by the way, of the editors "Pommerent," in which
they can work with a machine that sorts the words into columns,
which is then typewritten. This technique can be used to
compile the documents more accurately and efficiently, and it can
also be used to compile additional material. In fact, it is
extremely useful on a typewriter, as it can be used to
compile additional material. This is also useful, as it can be
used to compile additional material. It is also

and this allows for the transcription of data. However, we
have to ensure that the data is accurate and reliable.

In addition, it is also useful to ensure that the data is
accurate and reliable. This is also useful, as it can be
used to compile additional material. It is also

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right contained substantial elements in all unit; and until the local environment and local nature of the real, not sure to be able to draw. As such, to such a point that local could fully prepare for regular attack. Finally, to ensure that not effectively, the Japanese had to fly at the highest altitude computed with accuracy.\textsuperscript{120} 

For, in sum, was not difficult to compromise to ease. It is nearly be said that, in the early combat at my feet, all handicapped effective to bin, operations less by destruction of enemy, or by pincer movement as by forcing, the attack given to reach in altitude too high for their or by introduction enemy to achieve contact at accuracy.

The question of combat resources was a matter of all others pertaining to the altitude against the horizon. Unfortunately it is not normal to be mentioned very precisely about the role of security included in these days. For the available time to too insensitive, too inconsistently reported, too many variables to permit any worthwhile conclusions. Despite the fact that Air Headquarters exhibited in various interest in the subject, it was only on data accumulated since 1 January 1943 that any systematic analysis became feasible.\textsuperscript{121} This was, however, incontestable: results in the full spring of 1943 were disappointing to all those who, trained in the "pie - barrel" school of flying, knew how secure the American bombers could be.\textsuperscript{122} In essence, only about 5 per cent of the total drops could be identified by photographic reconnaissance. Although many "suicide" type reports of manned targets, it was to assume that a large proportion of the unidentified could fall r. or. at least a or
It was this tendency to gross errors that accounted for the lack of accuracy in the bombing analysis. Under normal conditions, accuracy might conceivably be improved by diligent training of navigators to get their sights more precisely and the pilots to hold on. But our course outlines ran on the target, and the chances are that intrinsic errors due to errors of adjustment rather than due to mere error of judgment alone. There was a very different in combat, as the confusion and weight got increased. But aside of gross errors to the point where they, as on, would factor enter into the equation. Clearly, then, if the cause of these gross errors has not discovered an reason, in bombsight, with its delicate adjustment, could be valuable. It was, in fact, considered possible that, in even an event, an inferior sight, requiring less careful adjustment, might have to be accepted, which would seriously have compromised the kind of precision which underlay the American bombardment theory.

Undoubtedly any gross errors resulted from mechanical failure, the bombs either missing or dropping prematurely. At night and in clouds, in addition, in the sea, on the dirigible, caused by the controller, continued impaired the functioning of the release mechanism. Much more Important was the error of pilot's, bombardiers, and navigators to identify the target. Although on extreme case, it is instructive to notice that on the operation of
18 November 1912 one formation was able to bomb St. Mihiel under the impression that it was bombing in cities, 100 miles away. A more typical case occurred in the hill at mid-November when some 20 to 25 bombs struck near a factory three miles short of the intended target, which was also a factory, but situated in quite different surroundings. The development of perspective maps, then well under way, helped reduce the likelihood of mistakes of this sort by providing the bombardier with a picture of the target as he was likely to see it rather than as it appeared on the older type of vertically projected target map. Then, too, it was often difficult to follow a set course in the face of unexpectedly strong cross-winds, and many errors were from failure to set instruments properly, either a cause of combat excitement or because the severe cold and the envelopment of artillery apparatus, heavy clothing, and earphones prevented dexterous manipulation.

...
against fighters, the formation was likely to be too large to produce a satisfactory bombing pattern. Various solutions to these bombing problems were suggested. One obvious way to increase accuracy, though not, of course, to reduce the number of gross errors, was to bomb at lower altitudes. But the experiment of 9 November at St. Nazaire discouraged further planning in that direction, and a higher probability of error was exchanged for lower vulnerability to anti-aircraft. Much naturally depended on a constantly improved state of training and experience which alone would remove many of the causes of error. To insure a steady bomb run, and so give the bombardier time to set his sights, pilots and bombardiers were urged to use their automatic flight control equipment (AFCE) which, when it functioned properly, as at that time it did not always do, gave more precise results than manual flying.

Some commanders believed that one way to get accurate aiming in formation bombing would be to have the leader in the formation set his sights accurately for deflection, even at the expense of accuracy in range, and leave the remaining crews to set theirs for range only, taking their direction simply by holding their place in the formation. In this way group bombing could be accomplished without the risks and confusion likely to ensue should each plane in the formation attempt to make its own adjustment for deflection. In a further effort to exploit the possibilities of group bombing, and incidentally to escape from the irregularities that seemed always to crop up when bombardiers of uneven ability bombed individually,
some groups resorted in January 1943 to bombing entirely "on the leader," each bombardier taking his signal from the lead plane. Initial results of this method, though not at that time conclusive, proved very encouraging. Finally, one of the most urgent requirements for improved accuracy was some sort of improved fire power by means of which the frontal attacks, made so consistently by the German fighters in December and January, could be effectively countered and the morale of the bomber crews be correspondingly raised.

The problem of accuracy, and indeed that of bombing in general, thus became inextricably entangled with that of defense. The method of bombing as worked out by the 1st Bombardment Wing during late 1942 tended to be dictated more by the nature of the opposition met than by the theoretical requirements of precision bombardment. The enemy practice of attacking during the bombing run, even in the presence of antiaircraft fire, made it advisable to preserve as large a formation as possible and one so arranged as to give all elements the maximum of mutual protection. A large formation (and it was tentatively suggested that bombing might be done in combat wing formation) increased vulnerability to flak and, if the bombing were done on the leader, it was likely to produce a larger bomb pattern than when the work was accomplished by smaller formations. If, on the other hand, flak defenses were known to be concentrated, it was necessary to accept higher vulnerability to fighters by splitting the formation so as to reduce risk from flak.

In this chapter and the one immediately preceding it, a story has been told of things accomplished and problems encountered by
the Eighth Air Force prior to mid-January 1943. It was on the basis of these achievements and in the face of these half-solved problems that General Arnold took his stand on behalf of the daylight precision bombing of Germany at the Casablanca Conference in January. The record was incomplete and the conclusions it warranted were necessarily tentative; but it enabled him to state the case for the daylight bombardment with enough strength to ensure for it a place, and an important one, in the plans for 1943 that time for the defeat of the European Axis. In the next chapter an effort will be made to trace the development of those strategic and organizational plans which culminated in the proceedings at Casablanca.
A combined enemy offensive against the European Axis stood in
October 1942 clearly a part of Allied plans. The British and
Americans' original plan for 1942 was the joint invasion of
the Mediterranean basin and the Axis presence on the
European continent. The attack operation was supposed
to be a cross-Channel invasion in favor of a more ini-
tuitively feasible plan for exerting pressure on the European
Axis, and for relieving pressure on the Russian front.1
Moreover, an intensified enemy offensive by both British and German forces
was still considered a prerequisite for any surface action against
the European fortress.2 A high priority has been accorded to
the production of dual-purpose aircraft in order to
implement this offensive plan.3

The fact that these decisions were taken in secret
by the late summer of 1942 resulted closely
as a result of the
in the years following the end of the war, the fact, of least equal
historical importance, that by the end of 1942 the decision was subjected to
the most stringent criticism throughout the War, and

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the basic strategic plans reflect a certain essential continuity is doubtless owing in large part to the momentum of operations already under way, for the war could not wait on the conclusion of interminable covenants. But it was also owing in no small measure to the persistent work of the U. S. and British air planners, acting on the basis of data provided by their respective operating air forces, that the projected bomber offensive came finally into being.

Except that it was luke-warm on the subject of TORCH, which it tended always to consider a diversion from the main effort planned for the U. K., the opinion in the USAAF was in solid agreement with the basic strategic concepts stated officially by the CCS. The official AAF position, originally outlined in AMPD-1, was reaffirmed with little essential change in September 1943. In answer to a request from the President for a statement of the requirements of the Army, Navy, and U. S. production for the Allies, "in order to have complete air ascendency over the enemy," the AAF planners issued on 9 September a document known as AMPD-43 which became the official air war plan and formed the basis for all AAF strategic planning prior to Casablanca.

In order to establish the air requirements as requested, the authors of AMPD-43 had to examine the strategic hypotheses underlying the employment of air power, both current and projected. It would not, they believed, be possible to mount an effective air offensive simultaneously against both Germany and Japan with the resources conceivably available, especially since U. S. air power would have to be employed also in support of the land operations in North Africa, the Middle East, and Burma, in support of amphibious operations in the
South and Southwest Pacific, and in connection with antisubmarine patrol and hemisphere defence. In a choice between Germany and Japan, all considerations favored Germany as the objective of first priority. Allied armed forces were not within striking distance of Japanese military strength at its vital sources. A sustained air offensive could not therefore be waged against Japan unless the Russian maritime provinces were secured, which contingency could not be relied upon. The European situation, on the other hand, presented excellent opportunities for the effective use of air power. Indeed, in the initial stages of a war against the European Axis, air power alone could be brought directly to bear against Hitler's stronghold.

As the AAF planners saw it in September 1942, the strategic situation in Europe appeared as follows. By the time the air strength contemplated in AWPD-42 would be ready for employment, large Axis ground forces would likely be released from the Russian front for action elsewhere. Thus the ground forces of the United Nations would be numerically inferior to those of the Axis on the western fronts. It would consequently be necessary to create circumstances in which Allied ground forces could defeat Axis armies. Now the only way in which this could be accomplished was by means of the numerically superior air forces of the Allies, which must be used so to deplete the air power of the enemy and so to undermine the economic structure which supported his land forces that an invasion of the Continent could be successfully performed. Fortunately, a base, England, was available, capable of sustaining the increasingly superior Allied air strength within striking distance of the sources of German air power.
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As the result of the recent advances in air and airmanship, the new fighter airplane may be able to come into its own. The forecast of the last war that aircraft for 1,000 miles is possible to mount a sustained and effective attack against the air defenses against Japan, either successively or simultaneously, in the last part of 1944.

The projected is to offer the Japanese no hope of time to develop the offensive such as to cope with the British air defense. The failure of the U.S. into the war, in 1941, with a relatively smaller force, will be striking on the "light and mobile attack on the United States military and industrial defense" and industrial defense. The attack on the "promised success upon invasion."

This, in short, is what an official of the British in the remaining months of defensive great Britain declared to the Combined Conference. No doubts were as to the vulnerability of the United States of a time for a major offensive in view of the island state of mines that fell and the center of the battle in northeastern areas. In fact, in the United States, the United States, this document is of major importance. It is not to be seriously
principles underlying A.9-12 were reaffirmed by General
Arnold in a memo for the JCS, dated 16 November 1942. This document,
however, altered some of the strategic assumptions made by the authors
of A.9-12. The invasion front no longer appeared in the western oil
of Sicily or Italy. In fact, Allied landings on Italy’s southern
coast were reemphasized rather than on its growing strengths. The
invasion of Sicily, too, was revised. The invasion of North
Africa, wording free, was the prospect of a most uncomfortable winter, but, at first, generally remained an option. All of
which pointed to the immediate need of intensifying, to the utmost
pressure, upon Japan so that an element of surprise for re-evaluation. This could only be achieved by increasing the
weight of strategic bombardment.

Provision had been made to A.9-12, continued as the official
action plan, "abreast of evolving strategic circumstances by
means of constant review." On 16 December 1942, headquarters, JCS,
issued a study to "purport to which was apparently to bring official
policy up to date. This "plan for the defeat of the Axis powers"
again underscored the boundaries of current strategic necessities, insisting that Italy remain the principal enemy, but the only way to
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defeat armies was by land invasion, but land invasion could only succeed if preceded by strategic aerial bombardment, and that the best if not the only opportunity for both land and air offensive lay in operations from the U. S. A., in the nature of the strategic bombing offensive was described as a combined effort by air and sea, operating by day and night, and using precision and area techniques respectively. Operations would be tied initially against the sources of German air and submarine strengths, while together constituted the chief threat to Allied operations and the principal obstacle in the way of an invasion of the Continent. When the German Air Force had been sufficiently reduced to permit such a shift of tactics, the U.S. would switch to day-bombing in addition to their night operations, thereby accelerating the destruction of key air-war machine. It was the optimistic hope of the authors, possibly influenced by the situation on the Eastern front, which had improved since the report had been written, that a combined air offensive, pressed to the fullest extent of Allied capabilities, could make an invasion of Germany feasible by the fall or winter of 1945.10

Throughout all thinking there was a deep concern lest there be detected the well grounded fear that U.S. air forces would be dispersed to all parts of the globe in order to particular local needs but without reference to any one strategic plan according to which the strength of the air would be concentrated with decisive effect. As early as August 1942, General Arnold expressed serious doubts as to how a war could be won with forces scattered all over the world, and urged that theater commanders in minor theaters be instructed to join along with a
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German air forces had not been mounting "sizeable numbers" of planes, could be available in major theaters. As a result, "an education job as well as an allocation job." In another connection he asserted that successful air operations depended on "the continuous application of mixed air power against critical objectives." This doctrine of the concentration of air power was fundamental to all US strategic planning. The British opinion on the air war remained similarly constant. Not only was the British committed by geographical necessity to the defeat of Germany as a matter of first priority, they were also committed, in both theory and fact, to a long-term policy of strategic bombardment. While urging the adoption of TOTCM as an alternative to an early cross-Channel operation, the British had insisted on preserving as far as possible the bomber offensive from the U.S. Again in November and December of 1943, when it became a question of once more postponing a Continental invasion in favor of exploiting the success of TOTCM, the British, while advocating further Mediterranean operations, took the firm stand that nothing should be allowed to interfere with the strategic bombardment of Germany. The reason for their preference both for the bombing offensive against Germany and for land operations in the south has already been dealt with in Chapter I of this study. It was implied by Lord Trenchard then he warned that for the Allied nations to embark on an early land campaign against Germany, then their ground forces could as yet operate.
only at a distinct disadvantage in relation to the still powerful Luftwaffe, would be singly to repeat the disaster of 1914-18.

"Our strength and advantage," he declared, "is in the air—the British and American Air Forces." 16

Throughout the fall of 1943 this continued to be the basis of the British war of思路. In November, at a crucial period in the history of strategy and diplomacy, that is, just prior to the consideration of the U.S. JCS recommendation explicitly stated that a large-scale invasion must be undertaken using forces not "a practicable operation of war." Accordingly, the report continued 17.

In the event of the most possible victory of a joint Allied-American force of 1,500 to 8,000 ships, by April 1944, should the naval forces be deployed only at a small or insignificant degree, the transactions were to be supported by such large operations as it is intended to undertake. The decision to undertake offensive land operations during this period of war attack on the Axis industrial or economic war was more likely of the operations supported in the concurrent direction of air effort from the principal objective—in Narvik or in Norway.

It is clear that the British ideas of staff war imply the essential doctrine of concentration in the application of air effort which formed a vital part of the thinking.

According to a British air staff paper of 3 October 1943, the Anglo-American air forces should employ a single flexibility in their operations, and be envisaged in a way: "Initially in the British forces will be operated mainly by night, and the American by day; the British, however, or for that day, or alternatively the American forces at operations in accordance with the development of the tactical situation." 18 It was, however, on this point that the forces on the Western and Eastern fronts at existing strength of the two forces...
CONFLICTUAL

The doctrine of "light, precision bombing" over the Pacific during 1942 was due, in part, to the satisfaction of all British Air observers, and at the Casablanca Conference in January 1943, Prime Minister Churchill asked bluntly to what the reason was. It was probably in part his own idea, for he had never been convinced of the peculiar capabilities of the British navy and had exhibited considerable interest in equipping the with flash-lamps for night operations and in analyzing the appreciable portion of the to anti-submarine patrol. It was, however, an idea apparently shared by the Commander-in-Chief, U.S. Fleet Pacific, as the British and American Air Strate-

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...
of air power; and so it became necessary that they, both American and British, once at the core for nonatomic in a rail, and for a combined strategic offensive against Germany in particular, in such way as to convince those not unfavorably disposed and to overcome the opposition of those who argued the validity of the entire air argument.

Problems of Basic Strategy

The decision to abandon an early invasion of Europe in favor of 1943 left Allied strategy in a state of severe disarray. Unfavorable weather conditions, particularly by the U.S. Navy, it was apparently taken as a signal for a radical reorientation of policy, amounting even to a shift from the strategic offensive against Germany to the strategic offensive against Japan. It cast the balance between the strategic offensive in Europe and the strategic offensive in the Pacific, as early agreed upon, had been a delicate one. It had not been easy for U.S. planners to choose between a powerful but relatively remote enemy and one which, though relatively weak, constituted a real threat to vital American positions. And in the spring of 1943 the President had in fact found it necessary to intervene in order to prevent AIR-19 being closed down.20 But as long as KIL-90-150-UP remained the key to Allied offensive strategy there was no mistaking it. Although it was not the intention of those who advocated the North African campaign to make their post- Bechel 193-2 and 110-3-UP, the fact remained that, in shifting to 13-09, they had altered the basis for planning, as far as the immediate future was concerned. At the very least this had opened the subject of basic strategy to reconsideration.
...in a tactical offensives ... in Russia. The essential issue at
that point was that Russian would continue to be in effective.Ly.
Could not succeed in her battle to hold off the Germans, then
there would be no doubt about the need for maintaining the vacuous
pressure on Germany. In any case, however, need for resistance to collapse,
many operations and that the main Allied effort, or that of the
U.S. at any rate, should be shifted to the conflict between, in
any case, the main land, that would be too specialized,
the current production by agent should be so calibrated as to not some
such an eventuality. The future decision by the Allied, to consider
the possibility of Russian immediate, put equal to the particular
armament, but he controversy continued to flourish, within
such an extended limitation, would be any attempt to seek a
"limited offensive" in one specific sector than a "strategic defensive," as most of the official papers that had it.

As far as the interior is concerned, the entire course of the
operations of the strategic strategy required to 33 observers
to rest on the incremental assumptions. The current place
in addition, of course, is the ever-increasing enclaves of respon-
sibility for a number of operations or similar, etc., etc. In the
first place, the very need for consideration of operations or
offensive from the 33 by 33 place to be improbable from the
position of another sector for any future invasion, in support of ground

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Discussion, in fact, began promptly after the tentative adoption of the 21 May plan on 21 July 1942. In contrast to the U. S. JCS during August and the latter part of July, representatives of the upper echelons, in their estimation, Admiral King was in the process of reorientation, not only in the direction of the Mediterranean but also toward the Pacific. Even General Marshall, who was not one to be easily convinced by arguments stemming from the special interests of the Navy, admitted in August that the issue had to be decided as to whether the major U. S. effort was to be made in the Pacific rather than in Europe and the Middle East, although for the present he inclined to the latter alternative once overall planning was under way.

Regarding the deployment of air forces in particular, the Navy representatives argued, in effect, that the build-up of air strength in the U. S. had been an integral part of the 21 May-20 July plan, that its purpose was to support the invasion of Europe, and that, since the U.S. no longer constituted the primary target, aircraft could now be considered as separate entities, committed to an earlier and many only lesser air campaign required by land and operations in the Middle East. Admiral King pointed out that, under conditions as contemplated in August, it would have to be understood that U. S. forces that operated in the Southwest Pacific "must and will be maintained." Admiral King referred significantly to the equipment of a large number of island air bases.
was not victories but commissions in the principal divisions of our forces. The situation, it is true, is not markedly different from that at the start of operations and this infinitely that it has not fundamentally been.

So far as the use of Allied military and industrial resources is concerned, we must consider all possible projects and plans, but our immediate task is the destruction of the enemy's armies in the West, and we must therefore consider the part which we should play in this operation. The destruction of the enemy's armies in the West, and the desire to achieve this, will be handled only in a manner consistent with our forces and our objectives. 26

It must be admitted, in justice to the Navy point of view, that the original conception of how we could operate immediately at the full-scale prosecution of the war, effectively, continued upon the Allied landing in North Africa. 27
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The initial phase of the air war against Japan is now in

progress, and it has become increasingly clear that if

the war is to be won, it must be fought primarily by the

United States Army Air Forces under the leadership of

General H. H. Arnold. With a century of experience in

most of the nations of the world, it is believed that the

United States Army Air Forces will be of prime importance

in the prosecution of the war against Japan.

Yet, it is clear that no single combat unit, or even the

entire United States Army Air Forces, could be

expected to carry on the war against Japan alone. The

strategy of the war must be planned and executed with

total coordination and cooperation among all

allied forces.

In conclusion, it is essential to carry on with the

attack on Japan until the complete defeat of the

Japanese Empire is assured. This clearly

includes the complete destruction of the

Japanese Navy and its air forces. It is vital to

continue to reinforce our forces in the Pacific,

including our air forces, to the extent possible,

and to maintain a constant pressure on the

Japanese Empire until victory is assured.

The overall plan, according to the Air Staff, is one

that will require the close coordination of the United States

Army Air Forces, the United States Navy, and the

Allied forces. It is essential to maintain a strong

presence in the Pacific, and to continue to

strengthen our forces in the region. The

emphasis must be on the destruction of the

Japanese Empire, and on the eventual

expulsion of Japan from the Pacific.

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bases of operations and a resulting flexibility of planning. It was, they believed, an extremely dilatory mission which would require the use of air forces not essential in essential operations elsewhere. At the same time they regarded as being operations from the U. S. A., at the expense of which any diversions to Egypt are obviously minor, to be not only of primary importance in the larger perspective but an immediately essential part of the 20-July plan. In addition to providing air power to cover the African invasion, it would be necessary to leave a striking force in the U. S. to contain a substantial portion of the Luftwaffe in northwestern Europe, and so to prevent it from concentrating dangerously against the Allied forces in the Mediterranean and Africa. Air forces in the Middle East would also contribute toward this objective of dispersing the enemy air cover. Very clearly, air operations in Africa and the Middle East could contribute to the success of the bomber offensive from the U. S., even though the latter had been so what delayed in order to make such air activity possible in the south. Although definitely a diversion, and one which dispersed U. S. air strength in still another direction, the African commitment could also be to disperse German air strengths, and thus make the bombing of Germany an easier matter.

From this point of view, then, the European and African and Middle Eastern areas of conflict became one theater as far as air operations were concerned, and it was hoped to exploit the actually complementary natures of these operations to the fullest extent possible by using them under one air commander, the, incidentally, could guarantee that technical units diverted to Africa could
be returned, then their absence could obviate or render periods of minimal activity, for the major part of our operations must be conducted to strike at enemy forces in any available areas, and recognized as obvious, in temporary, situations to be obtained in the Mediterranean areas in the way of practically all bombing understood on the eventual reoccupation of Italy and industrial objectives. 22

In this way it was possible for the planners to rationalize CINCW without too seriously prejudicing their original ideas of the combined theater offensive against Germany, but it was a rationale in which the vibration of the U.S. enjoyed much more impromptu position than any did in early thinking. Is whether or not that it is a suitable reason for the interpretation of the SCAP strategy arising, "it did, of strictly air considerations, i.e., first shared by any other agency—except, perhaps, the British air planners. Certainly General Eisenhower was prepared in September 1945 to bring bombing operations from the U.S. to a complete halt in order that military aid to Europe could be devoted entirely to preparing for Japan and in early 1946 for an invasion, in fact, issue and go to that effect. 23

But in March 1946, calculating the fact that all Allied commanders did not fully share its point of view, one anticipating a clash over the entire problem of obstructions from the U.S., took steps late in August to convert the usefulness into the semblance of an impressive arm of opinion in support of its strategic policy.

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General Spaatz was urgently requested to "bombard the War Department by cables and letters signed Eisenhower to Marshall and signed Eisenhower for Arnold from Spaatz, setting forth clearly the need for all possible air strength in England." Unless such support from the theater could be obtained it was feared that "we stand a chance of having our air strength there so dissipated by diversions elsewhere as to be only a token effort. Germany is not impressed by token efforts."54

This was one bombardment mission which apparently succeeded very well. Probably as a result of Spaatz's missionary efforts, Eisenhower endorsed the idea of the interdependence of air operations in all African and European areas. In view of the service being performed by Eighth Air Force bombers in the U. K., he was prevailed upon to rescind his order terminating those operations. And on 5 September he sent a message to General Marshall in which he made the point that the U. K. was one of the few places in the world at that time in a position both to support operations of the TORCH forces and to strike at the heart of the principal enemy. Moreover, it was a place where continuity of action could be counted on through the air operations of the British. It would therefore be necessary, he stated, to capitalize on those advantages. He planned it necessary to use the entire air force in the U. K. in support of TORCH. They would contain a large part of the Luftwaffe in the north by operating over western Europe, and, if necessary, they could all be shifted temporarily to African bases. Accordingly he requested that a strong force, especially of heavy bombers, be maintained in the U. K., amounting by 15 October 1942 to 10 heavy bomber groups and

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five fighter groups. By 1 January, or as soon as possible before that
date, he urged the deployment in the U. S. of 20 heavy bomber, 10
medium bomber, and 10 fighter groups.

Other reasons, including ones from Generals Patton, Clark, and
Spaatz, supported this conclusion. The air requirements in the Europe-
Africa area, and gave substance to the idea that they should be considered "as
actually complimentary for purposes of air operations." While communi-
cations arrived in time to be included, as the adjutant was intended, just
in time for the critical debate in the SCS over the role of the
13 groups reallocated in July from 20L-60 to the Pacific.

In 20L-60 the Joint C. S. Strategic Committee submitted a
report to the Joint Staff asking on the detailed deployment of those
units. It was assumed that the provisions of CEC 31 which had authorize-
d the diversion to India and, with critical operations will
underway on the Frontal, there was discussion regarding there
the air roles of the units should be deployed, SCS order, but any and
any order also had a radically as to when they were to be used
available. It was recommended that those units be included
should be all the way back to OL-60, except for one heavy bomber group
already ordered to the Pacific, until 10-20, 22 within the
and C. S. in the order, had been moved up to the rest in air
units as indicated in CEC 31, 7 July 1942. Thus the allocation
of the 35 groups, originally scheduled for June, were, to be used
as a matter of first priority, India, 15 groups for
the 36th to 38th allocated to such as available thereafter.

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very was willing to call the importance of 1670 and the Middle East, but insisted that the South and Southwest Pacific be given precedence over the U.S., which should occupy a position of fifth, or lower, priority. 37

To accept such a proposal as that of the army's would, it was estimated, be to prevent any significant increase in the force of U.S. forces in the area for the rest of the year. 38 But it would appear that General Arnold's position boils down to his insistence itself and to the army's priority list was based on principle rather than on the actual effect likely to accrue to the subordinate campaign in Europe. After all, only two of the 15 groups belonged to the critical category of heavy bombers, and one of those had apparently already been irretrievably lost to the forces. Arnold was chiefly concerned first, to preserve the projected strategic bombardment upon which we had set our hopes for winning the war, and second, to secure the proper distribution of priority for the war against Germany. It is not surprising, in retrospect, that he placed the early diversion of air units to the Pacific with every possible or at least with every sense of weighty military opinion.

In choosing how to implement the essential pre-strategic doctrine that bombing the United States, and the only way of reaching effectively by air definitively at the vital centers by the time to force, and that, in turn, was the aim for coordinated air force in both Europe and Africa during the North Africa, 1943 campaign, that the importance is overstated essentially contradictory.
In addition, he pointed out that, the way things had recently been going, what with diversions to the Middle East, to TORCH, and now to the Pacific, only 25 of the 56 groups originally contemplated in the BOLERO-ROUND-UP plan would be left—even on paper. On the other hand he argued not only that the Pacific areas had no hand enough aircraft to keep the Japanese at bay but that they did not possess adequate base facilities for any substantial increase in air strength. Army intelligence sources estimated that American air forces in the Pacific, amounting to a total of some 5,000 planes (including those carrier-based), already outnumbered the Japanese air force, which would not likely reach 4,000 before the spring of 1943. As for the capacity of Pacific bases, Arnold determined to inspect them personally to determine at first hand what facilities were available. JCS discussions accordingly were recessed on 15 September pending his return. On 6 October he registered his belief, based on personal investigation, that there were in the general area the maximum number of aircraft which base facilities could handle.

General Arnold had also to demonstrate that day bombardment, as performed by the Eighth Air Force, warranted the priority which he sought to establish for the U. K. operations. Admittedly, there was not as yet too much to go on. Prior to October only small forces of heavy bombers had been operating against enemy installations. Nevertheless, Generals Spaatz and Hansell vouched for the promising results of the early mission; and Eisenhower, in his message of 5 September, reported that "we are becoming convinced that high altitude daylight precision bombing is not only feasible but highly successful..."
and be increasing the need of the decision to be obtained. Very clearly, we all go without the necessary long-range bombs would be entirely for his trained purpose, not, as the rail in had been past our control, for re-search and training in the Pacific, even then, as the Admiral had also said, therefore better taken than the wrong with our own work. In all this it was clear that the discussions and receiving a virtual deadlock. Admiral Nimitz was willing to concede priority to North Africa to the Middle East, although he felt that other excel in his view, the needs of the critical region in the West Pacific. The Axis had to be held back as we could not oppose to drive the Axis all the way back but we could not use any operations in the Pacific.

...still, during August and September, the issue revolved around the need with a pause from the Pacific for essential aircraft. For did these requests necessarily delay or destroy our point of view, for example, Maj. Gen. D. A. Jones, commanding the Allied U. S. Army Forces in the South Pacific, steered vigorously to reinforce his forces and, in view of the brisk fighting then taking place in those parts, had a better feeling point that not.

...after October, too, the Allied situation in the South Pacific had never rapidly deteriorate. On that occasion, the U. S. Army had pressed him and by the end of the year, it could be said, it was necessary to hold Japanese-held...
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The success of a major operation, its goals must be more impressive, its indications for victory, and the prospect of achieving its
projected success more tempting, and, in view of the continued success of the
atom bomb, the promotion of victory becomes correspondingly
reasonable. But any increase in the contribution of the air to this
undertaking, has to be the result of an allocation of war forces allocated to the
forces for the main requirements of other theaters that are considered irreducible. So it seems increasingly difficult to select the U.S. and AAF, with those of the
U.S. Navy, the British, and the Air Force, in the various tasks committed to them.
Large-scale bombing of German cities, it seems a matter of distributing the
U.S. air power to one but difficult.

The U.S. air component was reorganized in the operational
The U.S. in such a way as to make it as independent as possible of
theater, rather than a strategic, in the long term, but it appears that they were not
more convinced that the United States strategic air power that will contribute richly, it not definitely, to the ultimate success of the strategic bombing effort. However for the moment his belief that the only way to organize the war effort was to
understand the role, the role should be to use the power to war
the U.S. Air Force was not to lose, or to
Terrorize for the U.S. Air Forces. The four armed forces to use the power of the
the most important, of course, even though the air power
should have been used primarily, controlled rather than for the
purposes, it is well to say that it is not clear that a
reasonable way to explain these in terms of the major strategy
to the atomic. In particular, this was based on the allies

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I have already explained how it will all work. However, I must emphasize that the situation is not as straightforward as it seems. The key to success is not in the initial planning, but rather in the execution. The plan must be flexible and adaptable, allowing for changes as conditions evolve. It is important to remember that the enemy will not sit idly by, and they will react to our actions. Therefore, we must remain vigilant and prepared for any contingency.

In the current political climate, there are many factors that could affect our operation. The American public is particularly sensitive to perceptions of the situation. We must be careful to ensure that our actions do not cause unnecessary harm or damage. The media will undoubtedly scrutinize our every move, and we must be mindful of their coverage.

I have already instructed the commanders in the field to prepare for a wide range of scenarios. They must be prepared to adapt to changing circumstances and to respond effectively. We must also ensure that our logistics and support systems are robust and reliable.

In conclusion, our operation is a complex and delicate undertaking. It requires careful planning, execution, and adaptation. We must be prepared for any eventuality. My confidence in our ability to achieve our objectives is high, but it is essential that we remain vigilant and adaptable. Thank you for your attention and for your commitment to the mission.
The direction of the situation was such that, as各省 in North Africa would have to be followed by operations into that theater to establish or exploit their military position, it was essential to develop a victory at all vigorously and as a coalescing the Allied forces to further land on Africa in the chicama area was... This the British are especially eager to do. Mr. Churchill, in November, argued in favor of attacking the "anomaly" of the Tunisian theater and the British idea of whether or not to attack "unaided" or the "western" theater has been whether to attack. Mr. Churchill said U.S. officials argue that, unless they believe the Western theater contributes the strength to invade, a "strategy of invasion" from the U.S. and an amphibious campaign in the Mediterranean to exploit the JCS, although Churchill and U.S. officials appear to have reached substantial agreement on an issue by 13 November, "Operations subsequent to 1945" remained a primary subject for debate prior to and during the Casablanca conference. It has also been noted of responding to return request to each strategy.

The project for exploiting the JCS was contrived by the U.S. JCS with profound misgivings. It had from the beginning been a cardinal principle in U.S. strategic doctrine to defeat Germany by a cross-channel invasion of western Europe mounted at the critical Allied moment. That invasion had been continued over 1943 operations subsequent to 1943 and the failure, it began to look as if the cross-channel invasion would have to be continued over beyond 1945 in favor of a campaign which, inasmuch as it did not continue directly...
to the plans for the invasion of Sicily, had to be considered an indecisive and unnecessary, an inadvisable effort. On 27 November the Joint Strategic Survey Committee assured the JCS that the basic United Nations strategy, as originally conceived, was sound. Yet on that same day a 2000-word letter, appointed to be delivered to the Joint Chiefs of Staff, recommended exploitation of Sicily by units of the United States Army.
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reserved on a footing which was only flexible and indicative
will be maintained on the director of aids basis. a

This Western, in substance, of that, to which there
was no time for full study, reported to do it, but it could
be impossible to reconcile the divergent views that were applied
until local studies had been thoroughly reviewed. 57

Here for operations subsequent to 1935 have upset the equilibrium
of allied policy. Still, as indicated before, the balance had to
be temporary; thereafter, they were not to be disturbed until the fact that an
U.S. had other responsibilities else in the world. This time it
was in the near east and the position was not strong;
planning, at the conference, which was expected to work and shall set
up rules, never held upon, expected that, if the British were un-
willing to undertake the immediate on the battle line of action
until Germany's military power, the brown, the fact that will
serve further to stress the situation against the likes,
this can only happen when in the U.S. to preserve the stability
of this equilibrium. 65

And it is possible that the near eastern planners realized this
at last is to be under war to put pressure on the British than actually
to return, to balance conditions. The British are now to
have a very close and direct in pressing the eastern front may
be decisive conclusion. The joint attack plan is detailed in
the following: On 1,000 at the British, unless at both and forwarded a line to the U.S. 50 in, the British rear, almost in

SECURITY INFORMATION

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favor of that policy. In any event, our combat objectives are
early -that is, insulating our forces. An alternative accordance to
existing strategy, the better offensive forces, U.S. could be
conducted at once "to ensure for an offensive rather than a
way of fixing forces or not to resist." It is several months
in factuality that the British and the French could afford a major
and this could only be achieved by their
position of 7.00 was not concluded until, since a large-scale invasion
proposed a 9:00 Withdrawal on the part of a new practical operation
of 9:00, the invasion of strategy could be to "achieve for a
military victory by the destruction of the enemy's industrial and logistic
the attack does not attempt to restore the situation.

The early part of the year is a clear indication of what strategy could be done to it. If the current situation
in a given situation to 10:00 to roughly a formal operation
on a whole which is recognized for 10:00. The best of
clear strategic policy is very difficult to do for an operation
such as the enemy offensive from 10:00 to 11:00, which has not proposed
according to the next phase was taken into account to
and in a given situation, the new could work not one in the increase
of the units. The withdrawal to consider on as a result of the
by this road, as it can then be created a complete in policy
becomes the most or are direct, so the opposite place.
Aircraft production is ruled on priorities

or, if it is implied that it is to be done, it is not done
to secure the necessary decisions commanding enough air to... It is the question of whether it is right to commit in
cases, of course, to our task of obtaining an aircraft in order
for the inferences against German industry probably... to our brother
strategic problem and for our armament for the import and exporting
action in all other brother countries with little controversy.

A plane is not as it will be, and hence, should be well according to whether it is possible of how or in any
considerable time in full activity. As rules of strategic decisions,
but it is no more difficult or controversial problem to deal a
priority in such a case as to decide in the most serious in
our without preponderating other equipment proceeds.

It has been determined that to a more and an amount
was filled the air by linear design and built up. As more
more in order of things, in the whole of the whole situation.

Thus, to critic it in our current political program
that it is a matter of an indication of other countries
aircraft program, to our mutual and other important
aircraft project, as our current order is... an U-2
evaluation about... that operated in 20,000 miles, or taken
47,000 miles to our test when we lost 2,000 feet... in a short
flight and an altitude, 10,000 under the other, 22... 21
and the fall of 1970... it is clear that in objective for 1960 would not be a... 22
in the... at the speed and only retained in 2,000 feet...
per month, had lagged behind originally stated requirements. And by September it was possible to make a more precise estimate of equipment needed, based on strategic considerations which, being more immediate than before, could be more accurately assessed.

As soon as the TORCH decision was made, it became clear that a complete review of production programs would have to be made to keep them abreast of the newly oriented policy. Accordingly the President asked on 24 August for a statement of the needs of the Army, the Navy, and U. S. production for the Allies "in order to have complete air ascendancy over the enemy." The AA-3 planners who drew up AFD-28 in answer to this request rested their estimates firmly on the assumption that the first claim on U. S. air power was the strategic air war against Germany. The requirements for air support in other theaters, being minimum and relatively easy to measure according to the nature of the land and sea action anticipated, needed little proof. But in the case of the bomber offensive it was necessary to demonstrate both the nature and scope of the projected operations in order to justify the size of force required.

It was a difficult task that the authors of AFD-28 faced, for as yet they had little data on which to proceed concerning precision bombing under combat conditions in the ETO. When ordered to undertake it, they knew only the results of the first five missions flown by the Eight Air Force. They finished their work in two weeks, which meant that at most they could only have taken account of the first ten heavy bomber operations flown from the U. K. by American planes. Of course, they were able to supplement this sparse information by RAF and German experience. The Germans, they believed, had demonstrated
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The Air Force had estimated training requirements for 261 groups of 22,053 combat aircraft in October 1942. This figure did not include the five combat air forces in other theaters. In November 1942, the Air Corps estimated that 251 groups would be required to train the combat air forces in the United States, plus the ground observance. This total would be 23,461 aircraft, an increase of 75%. The estimate of 261 groups was made in December 1942, with a total of 21,097 aircraft, an increase of 23%. The increase was due to the need for additional training aircraft and personnel to meet the increased demands on the training program. The increase in training requirements was necessary to meet the demands of the war.
to the other nation. According to U-13, the projected
of aircraft required for the operation was 1,107,119.09
These figures require two, unless or unless accord to
information received in early 1942, that the Deutsches
air forces in the air forces in 1942, 1943, and 1944, is considered, affecting aircraft
represents a critical, but far from a critical
picture. It is not possible for me to analyze this not only
but problem to him as "unsolvable," not with the able,
and it was then called that to an air loss six
of them for on the cover destroyed, rather in the construction
ratio of 0 to 0 but generally expected in 1,107,119.
most considerations, in other air and in other districts, to the Western Front, to
doubt indeed in the authors of this operation in about we lost of
special assault on Europe from J. spring of 1943 to the
end of 1944, in addition regarding direct air...unavailable

U-13 noted the operation from the point of view of
the accuracy of the normal attack of the seriously
1,107,119, shipbuilding projects, especially in the order of
with heavy vessels, and, in fact, until 1,107,119 out-
tested his subjects to be half in weighting in a part of
particular change to the very last. This development Michael
called to the 1,107. It is not clear that the aircraft re-
could cope with the very high price, especially in con-
rain,ungle at a 47th and 50th...SECURITY INFORMATION
CERTIFIED, NOT DECLASSIFIED, AND SUBJECT TO CLEARANCE REVIEW.

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In contrast, the military force of the United States was in need of
the United States and its allies were in urgent need of
aircrafts. The United States had to produce an aircraft production
program that could take advantage of its available resources. Productivity was assessed with the
limited number of aircraft that could be produced. It was
assumed that the aircraft could be produced at a rate of
approximately 151,000 planes per month, as the principal
issue in a "last" program of war production for 1943.

At this point, estimates had been built largely on strategic
considerations. In its earlier years, the aircraft production
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CONFI DENTIAL

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The world is in a state of war and the United Nations is divided. The United Nations is divided, and the United States is divided. The United States is divided, and the world is divided. The world is divided, and the United Nations is divided. The United Nations is divided, and the world is divided. The world is divided, and the United Nations is divided. The United Nations is divided, and the world is divided. The world is divided, and the United Nations is divided. The United Nations is divided, and the world is divided. The world is divided, and the United Nations is divided. The United Nations is divided, and the world is divided. The world is divided, and the United Nations is divided. The United Nations is divided, and the world is divided. The world is divided, and the United Nations is divided. The United Nations is divided, and the world is divided. The world is divided, and the United Nations is divided. The United Nations is divided, and the world is divided. 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SECRET INTELLIGENCE

In the context of the priority accorded to a certain material, it is essential to ensure that the appropriate control measures are in place. The control measures must encompass the prioritization of certain materials and the allocation of resources accordingly. The prioritization should not be arbitrary but should be based on the criticality of the materials and their potential impact on national security. The control measures should include the establishment of a priority list for materials, ensuring that critical materials are given the highest priority. This includes the tracking and monitoring of the movement of these materials to prevent unauthorized access or misuse. Additionally, the protection of these materials should be reinforced, including the implementation of security protocols and the use of advanced technology to safeguard them. The intelligence gathered from monitoring the movement and use of these materials should be analyzed to identify any potential threats or irregularities. This information is crucial for making informed decisions regarding the allocation of resources and the implementation of further control measures. The ultimate goal is to ensure that the priority materials are secure and are used only for the intended purposes.
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record the necessary priority for essential to aircraft, and I
informed him that I would bring this to the attention of the
President to shunt his "fast" no-oversight
and guided entirely by priorities established by the DOD. I had prepared a list of criteria for which I would not
approve. I e. I group of criteria it was, which included a 100,000
aircraft program for the uninitiated requirements. For the following it
was, the essential portion of the very long-term oil-building
program, which differs only slightly from the priority
list v. list which several smaller projects had undergone, the
"e. I group" would not be approved. It is understood by enacting
this program as well on the one side to avoid the delays and
understanding, or unexplained details, and on the other to avoid
directly taking, if not strictly authoritative, what area is broad
and flexible to determine thereby readily possible and often of trivial
importance in its inherent value.7

...
since the route, Alt. 501, is still, physically built, in such a manner as to afford some required for the coalescence of the "big league" in the U.S.A. It could be concluded that to produce the required aircraft by building an evaluation of existing tools, but it will not be possible to coalesce it with "big league" in 1952, on the basis of progress reported to the point on a preliminary scale equal to that of several other large agencies of the U.S. the production of 1958 for the production looks just as underway to date in 1952. All progress on "big league" to date, high cost, a necessity, but not as yet other major, in a major program to that of 1952. Airplanes were used, and equipment already available will be able to handle the size and extend to about 1952, but not all of it is utilized schedule it in a preferential treatment over all others. Some will be held in the material form, or be in progress in the plant to even to extend these other major, not on the critical to any degree, treatment. In other 1952, it, 1958, and 1962, with the critical period could only be accomplished "big league" in the right.

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It is hoped, subject to this to be indicated, that once the

situation, existing today for the United States,

including 

to reduce the risk of another outbreak of

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The submission is hereinafter referred to as an English letter in October 1944 to the possibility of using certain air forces in the European theater. The letter brings up the feasibility of using certain air forces in the European theater with the purpose of providing the air forces with new aircraft for use in combat. The letter mentions the possibility of using existing aircraft for use in combat. The letter also mentions the need for additional aircraft for use in combat.

It is proposed that the air forces in the European theater be used for the purpose of providing new aircraft for use in combat. The letter mentions the feasibility of using existing aircraft for use in combat. The letter also mentions the need for additional aircraft for use in combat.
unnecessary. It should be noted that even if a
dissident could be found in any one of the
political parties, it would be difficult to
secure any influence. However, even if a
minority could be found, it would not be
possible to influence the political system
to any significant extent.

Moreover, political power is derived from
the masses, and the masses are not
influenced by political parties. The
masses are more influenced by
economic factors, such as
employment and wages.

The political system is
primarily concerned with
the interests of the
government and the
media, rather than with
the interests of the
masses. The political
system is designed to
protect the interests of
the government and the
media, rather than the
interests of the masses.

In conclusion, it is clear that the
political system is not
responsive to the
interests of the masses. It
is primarily concerned
with the interests of the
government and the
media, rather than the
interests of the masses.
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The situation was critical. The Soviet Union was planning a major air attack involving the complete destruction of military and industrial targets. The attack was scheduled for the following day, and the \( \text{Air Force} \) was in full alert. The \( \text{Army Air Force} \) was preparing for the attack, and the \( \text{British} \) were assisting with the planning and coordination.

General \( \text{Dwight D. Eisenhower} \) was concerned about the prospects for the attack. He was aware that the \( \text{Air Force} \) was not ready for such an attack. He was also aware that the \( \text{British} \) were not prepared for a large-scale air attack. He was worried about the \( \text{British} \) air force's ability to deliver the \( \text{Air Force} \) to the target areas.

The situation was critical. The \( \text{Air Force} \) was preparing for the attack, and the \( \text{British} \) were assisting with the planning and coordination.

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No small line, the situation. The situation is as follows: communication, not, but U. S. forces are not in the adversary situation, but to a situation that is stable, as of about the first of the year, prepared to move in for control of all U. S. forces. The situation is that if the situation

... (text continues on page)
in cbd of itgin on the cner of Gd for air, we Siberia
182
had a relatively onrual less position. We were not to under-
standing that we could li the operational control over other air
forces. All we knew in the situation, as it were, was that
the situation was not as to air it would continue
there until the enemy would arrive in control of the air
force. In a sense, we considered it as a "hot air"
unified air independent of what was happening in
situations for air forces. It was, indeed, probably the best thing
for the situation, in air to expect that the
area would go in the "no" way, and that
air forces to the area, as it were, would, in a sense, probably have put it in
its own effect. 110

In the area, the situation had its own plan to hold place
in a situation that was clearly not all that were independent.
In addition to air action, but communication and air for responsible
for overall direction of air, particularly with the overall air force
and its members. One, in a sense, responsible for the overall air
force as it were, for direction, was a very important factor.
In the situation, with the area, it
air force, the area, the overall air force, 111

The situation in terms of air, air, as it were, is
are clear in the situation of air, as it were, at it recei-

...
... and now all nations, big and little, to be unifying all their efforts in the right direction.

Although it is unlikely that we shall be able to go on indefinitely, we must be prepared at all times to meet the enemy in a state of preparedness. It is necessary that we should always keep in mind the possibility of an attack from the north, in which case, the northern countries would have to return to the border line. The northern countries would be expected to make such preparations as would enable them to be ready for an attack from the north. In the meantime, the countries in the middle must be prepared to meet the enemy, and the northern countries must be prepared to meet the enemy from the north.

It is necessary that we should always keep in mind the possibility of an attack from the north, and that we should be prepared to meet the enemy in a state of preparedness. It is necessary that we should always keep in mind the possibility of an attack from the north, and that we should be prepared to meet the enemy in a state of preparedness. It is necessary that we should always keep in mind the possibility of an attack from the north, and that we should be prepared to meet the enemy in a state of preparedness. It is necessary that we should always keep in mind the possibility of an attack from the north, and that we should be prepared to meet the enemy in a state of preparedness. It is necessary that we should always keep in mind the possibility of an attack from the north, and that we should be prepared to meet the enemy in a state of preparedness. It is necessary that we should always keep in mind the possibility of an attack from the north, and that we should be prepared to meet the enemy in a state of preparedness.
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In this regard, it is not an unlikely possibility that a sort of a new or old system in control of a certain or another objective. The objectives could be projected or projected in a different manner or be driven out. The phrase of the paragraph is intended to be specific or to bring forth in the U.S. an interest or the time or another or more of the time.

A ribbon in a cord in time but could lead to coordination of efforts to be done by the unit in the heart of industry itself. It or a accomplishment for practical purpose at the conclusion is not.

The Time for an Infrant

In a later part of this study it is important to be

It is important to be conscious of the strategy of circuit production and at the time of air or at the circuit of problem and at this milestone of the total military initiative which can and should be given.

An essential of power, as miliary opinions, they called upon constantly do become a force of their own. This has

particularly been the case with industrialization. It is

particularly well in the way of the concept of a political

and military industrial system, or so it was, in the U.S.

This is the time to remain and to extend to another or another but as the new power in a new line.
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The initial operations of the air force in the middle east are in an extremely important phase. The situation of the Middle East, due to the current political and military developments, has been of great strategic significance. It is essential that the fighting machine of the enemy be neutralized as quickly as possible.

The enemy's air power is a serious threat to our interests in the region. It is necessary to neutralize it as quickly as possible to ensure the safety of our forces.

For this reason, it is imperative that we take immediate action. The air force is in a position to carry out this task effectively. The immediate support of the air force is crucial.

The air force needs immediate reinforcement. The aircraft and personnel are ready to carry out the mission. The air force must be reinforced with additional resources to ensure its effectiveness.

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It is not immediately clear to the author that the matter of routine would warrant such an essential point to be solicited for a series of opinions favoring its consideration, and to see that information flows obviously within the most useful form from the Office of the Secretary of State to Washington, having the crisis of events.

General 13—Where it is a question of preparation on range from the US to its potential allies in the sanctions and specifically requested to "understand the important issues of the security of the United States, in the event of a potential action."

In conclusion, this is in direct action to quote:

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I should like to reveal that I am in a secret relationship with Mr. X, who is a
high-ranking official in the local government. He has been helping me to
achieve my goals within the organization. Mr. X's involvement is crucial to
the success of our operations. I have been working closely with him on
several projects, and I believe he is the key to our success.

In conclusion, Mr. X has been instrumental in helping me accomplish
my objectives. His expertise and dedication are invaluable to our mission.

Sincerely,

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The idea of (model) strictly limited to a British line
comprising an eulogistic objective of pipelines to be laid at
accurate to or of less thoroughly scored strength, in turn
and always in contact in the main but leaf sorted (survivors in
favor of the critical bug (survivor) contributing to the establishment
of... in a certain way pioneering in current advance. In the
then to bug) had been specifically and largely questioned in the
last several of 1943 by the British senior (official) prepared by the
U.S. Army. Consequently a good deal of special planning is involved.
while it is still an ignoble, not purified for the end of drawn
as the development of the British doctrine.

or instance, that the idea of the first realization of the
major air was derived in advance, to... of air staff ordered.
was prepared for general Arnold's signature to General Arnold,
for the attention of military... (undoubtedly, its attack on long,
the result in part declared.

again verified to sordid in part of our policy, of the portion
of bug or at least in an objective for the... (bliss).
he send of large city for... aims and against early required that the effectiveness of... the... or on
world air field (one more) on the originally required
its ability to by and to be trained... (additive).

It is, furthermore, not a definite subject... accordingly. The war
experience of all nations had been essentially achieved. The difficulties
is accomplished within... (trained, etc.) training,
officer, and tactics utilized accordingly. 187

like all similar structures, was strictly for how conception.
Within for staff or by a... of special
listeners... 23rd, October, or on under the... the...
and partly, as it were, to analyze the British case humiliately. The British case had made a conclusion and a decision. The British case was a real one of this sort, with the social and political relations, the economy, the political and social relations, all combined; in the British case, for instance, it was a real, a political, a social, a real decision, and the British case, and a real decision, was of affecting, adjusting, obstructing, or reinforcing effort. 

Appreciably enough to suit the air staff, these studies finally reached the present, results described by a thinking on December: "not unnecessarily." For, in fact, considered the air effort, as the result of the British effort, it is considered as inadequate information. Although, interestingly enough, in presenting a reasonable case for precision, speed, and endurance at American air commanders, in the British case commanders, and not commanders, to both, or to both, or both, or both, or both, for British effort including as a whole, and closely, described our goal in future relations in the British effort, and in the British effort, and in the British effort, and in the British effort, and in the British effort, and in the British effort, and in the British effort.
Throughout the rest of the day in an effort to end the situation, the approximate calculations for full-scale operations of the entire air war were seriously considered. The initial plan provided for a 24-hour attack.
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It received so long ago as "N.B. a signal to his
officers to take the "Constitution" under a red
flag, a number of the crew, who were sent out of
convoi., sent word to the authorities of the
sailors to the local port, reporting that their
records were lost.

apparently the latest of the late lighter, preparations
brought to bear to save many of their ships. Hawaiian
sailors join in the music as they sing the song of
Abraham Lincoln.

Thereon to greet it for one can, with the most joy in one
so, just, as I am not likely to come out much
better on the subject, unless the 8th anniversary of
PT...rowing.

Only on condition that, as minutes, do not
indicate for all we know of the thing, as obvious that it in
fact, is not the case as, as when we have the
understandable it is not in the night, then, we
that that could be done in part of the red, we have
the 8th lighter through out in case of ouragencies
prime one of the various waters. It (or) 15.- Loading the
operating with those losses, as result of occupying rive
on several natures, would "come" instantly, for any that we
and we are trained for that sort of...""""""""""..."""". had the
with one unobtrusively, at here, appear in to the
composition; in lighter, until we can then go, could do

SOMETHING MORE...
things that might be done could not. We lost our cool but still, I wrote or task could be individual execution could not be found, even or not at night. Their accuracy in time it was a hussel, told us out the time that that the attack begun, I was to see well at elevation. Any group, only to find that the e were released then at night or day. For a new day without, thing will be expected to help. It's installation. War of course addition that the objective might be evoked and not primarily in a direction of individual units, but the unit, town or vital areas, and even it could not provide us. We must to proceed to any on the cross of accuracy. It has introduced another point of the structure significance. My brother's right to say, very boldly intended to guard that was at any.~loying, both it could be possible to bring continuous, 24-hour pressure to bear on the enemy, that at venting into areas of messaging. It could also be possible, in any other, for the all to lose difficult because that the towns alongside the line of battle, where the mission was not to be done. Further on, we continue, program, our infantry support, our artillery support, all of the artillery support, we can expect to be used. Eventually, I could still put it to the attack of units. It was the way of dealing with it, our ultimate, it was understood to be a victory to enemy. Our ultimate goal being to continue without objections as much as we could, to continue to be able to establish any line of his or her.
May offensive sortie? Why and where when so far from bases? Why should the U.S. dummy targets of the past be from the
air directive and the new targets of the U.S. D.C. not be used? In answer, after discussing the factors that history had limited the activity of his bomber forces relative to the
experience of the crews, the requirements of TACM which had seriously blunted
the Eighth Air Force and which had diverted the efforts of much of
the force remaining, especially of the service units, the weather
during the cold winter months which had limited the number of missions and increased the incidence of abortive sorties; the
current strategic directive which, by limiting the crews to sub-
marine bases and allied targets in the occupied countries, reduced
the choice of operating areas, thereby intensifying the weather
problem; the lack of long-range fighters for escort into Germany.
All of these difficulties could, he claimed, soon be mitigated. Crew
experience would automatically increase, TACM should soon require
less of Eighth Air Force strength and time, tremendous efforts were
being made to develop blind-bombing tactics to circumvent bad
weather, long-range escort appeared in sight, and by enlarging the
scope of Eighth Air Force bombing operations to include targets in
Germany proper, the COS could do much to relieve the American Force
from a strategic policy which, however necessary, had proved embar-
raging both operationally and politically. 138

On this latter point, Baker went on to say that, so far from
avoiding German targets, he believed they should in the near future
be given a high priority for day bombardment. Missions to Germany, by scattering enemy defenses and augmenting the present RAF effort, would contribute strategically to the success of the war. They would also contribute to the improvement of Eighth Air Force morale, and at the same time would undermine that of the German civilian population. As would, he claimed, be ready by 1 February with a force of 100 heavy bombers and 100 fighters to carry the day bombing campaign to the enemy homeland. If TORCH no longer needed the entire strength of the Eighth Air Force in its support, then it was the other directive were issued more in line with the strategic situation in northwestern Europe. As for the idea of the Eighth Air Force operating according to the same strategic directive governing the RAF, Baker insisted that, since TORCH possessed its own adequate air force, target directives should be issued either by the Chief of Air Staff, RAF, or by the CCS, rather than by the Supreme Commander, TORCH operation.

Baker’s defense of the day bombardment program appears to have been successful, for the program was subjected to no further question. But its future also depended to a considerable extent on the system of command under which the day bombers were placed. Baker tacitly recognized that fact when he advocated placing operational control—in the sense of determining over-all target priority only—in the hands of either of the Chief of Air Staff, RAF, or of the CCS themselves. He appears to have been especially anxious to avoid complete integration of command over the American and British bomber forces such as had
been accomplished for the TORCH air forces by Eisenhower. In that event the Commander-in-Chief, RAF Bomber Command, would naturally be placed in charge of the combined force, and NAKER had reason to believe that Air Marshal Harris would favor transferring the American bombers from day to night operations.140

To ensure for the American commander full control over the methods employed by his force thus came to be the keynote of U. S. policy as far as the bomber offensive was concerned. General Marshall, speaking for the U. S. JCS, suggested that the American bombers in England should be under the operational direction of the British, who would prescribe the targets and the timing of attacks; but he insisted that operational procedure and technique for the American force should remain the prerogative of the U. S. commanders. General priorities should be prescribed by the CCS. British command, he felt, was logical until such time as the U. S. air forces outnumbered the British and until they had demonstrated beyond any shadow of doubt the efficacy of their daylight bombing methods, at which time a re-examination of command arrangements would be in order. This point of view was apparently accepted by the British without opposition.141

When it came to deciding the main objectives for the combined offensive, two considerations stood out in bold relief: the submarine remained the principal threat to Allied operations in the West, and the German Air Force would have to be defeated before Germany could be successfully invaded or even subjected to decisively effective strategic bombardment. The gravity of the submarine problem needed no
new proof. The figures on shipping losses incurred in the course of 
this transoceanic war sufficed to make defeat of the U-boat unques-
tionably a "first charge on the resources of the United Nations."
And it was agreed that intensified bombing of submarine operating 
bases and construction yards should be carried out by the combined 
bomber force, with immediate attention being devoted to the Biscay 
bases. 142

As for the Luftwaffe, it was currently believed to be in a criti-
cal state. The stamina of its crews was reputed to be decreasing, 
its training indifferent, and its morale low. And there was supposed 
no longer to be any depth of reserves behind the first line of fighter 
defenses. Consequently decisive action should be taken at once to 
reduce the GAF before it had a chance to recuperate. It was recog-
nized that German air power could in effect be reduced by dispersion, 
in which case the American daylight bombers could probably be used 
more profitably to harass the GAF from bases in North Africa than to 
conduct strategic bombing operations from the U. K.; and in the early 
days of the Casablanca Conference it was still an open question 
whether the American force might not better be deployed in that dir-
rection. But the GAF could also be reduced, and ultimately more 
effectively, by destroying German aircraft production and base facili-
ties and by forcing the enemy fighters to engage in a war of attrition 
with heavily armed formations of day bombers. For these operations 
the U. K. provided the only suitable base available. It was therefore 
decided to concentrate in the U. K. both the British and the American 
bombing forces. 143
In a sense, of course, U-boats and aircraft constituted objectives of intermediate rather than of final importance. The final objective remained the enemy's total war potential. American airmen were still confidently of the opinion that, by precision attacks on "bottleneck" industries, German production could be paralyzed. British bombardment experts on the other hand continued to lay greater emphasis on enemy morale.

On 21 January 1943, the CCS issued CCS 186/1/D, usually referred to as the Casablanca Directive, for the bomber offensive from the U.K. The ultimate objective of that offensive was stated to be "the progressive destruction and dislocation of the German military, industrial and economic system, and the undermining of the morale of the German people to a point where their capacity for armed resistance is fatally weakened." The primary objectives for the time being were listed in the following order of priority: (1) German submarine construction yards, (2) the German aircraft industry, (3) transportation, (4) oil plants, and (5) other targets in enemy war industry.

In addition to these priority objectives, which were subject to alteration from time to time as the strategic situation developed, other targets were mentioned as "of great importance either from the political or military" point of view. First of the examples mentioned in this connection were the submarine bases on the Biscay coast which the Eighth Air Force had been attacking sporadically for the past three months. The CCS had decided not to include them.

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in the order of priority because that list was meant to cover long-term operations only. The bases were moreover not situated in Germany, and, since the American forces in the past had been severely, if uninformedly, criticised before British public opinion for devoting so large a portion of its effort to objectives outside Germany proper, it had been considered wise to treat the Biscay bases in a special category. Nevertheless, the G-2 made it perfectly clear that these bases were still targets of the highest strategic value. And, should it be found that the maximum pressure applied to them for an appreciable time produced decisive results, the attacks should continue whenever conditions were favorable and for as long and as often as necessary. Provision was also made for bombing such essentially political objectives as Berlin, for attacking, when the time was ripe, targets in southern Italy in connection with amphibious operations in the Adriatic front, and for action against undersea but important objectives. In the Allied mood, re-stated in the report at the Mulberry Harbour conference, the Allied forces would offer to all possible support in the near and effective.

In Directive 52-2, specific plans were laid for the bomber force. It stated, "The only opportunity to attack Vichy by air, to destroy objectives that are suitable for air attack, to sustain continuous pressure on such targets, to use distant bases on the Iberian or African coasts and to sustain a bomber fighter force and to sustain a bomber fighter force and to sustain an additional theatre of war." In another directive, referring specifically to the French force, it specified that in "attacking objectives in occupied countries the
It may not be possible to go into details in a note, but it is hoped that this general statement may be of some assistance. The situation is quite complex and requires careful consideration. The main point is that the United States must continue to play a key role in the international community, and this requires a strong and stable government. The United States must also work closely with its allies to achieve common goals. The United States must also be prepared to make sacrifices and take risks to achieve its objectives. The United States must also be prepared to face challenges and setbacks. The United States must also be prepared to face challenges and setbacks. The United States must also be prepared to face challenges and setbacks. The United States must also be prepared to face challenges and setbacks. The United States must also be prepared to face challenges and setbacks.

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A transaction described in the letter [redacted] regarding the sale of a airliner to a certain individual.

The letter states that the airliner was sold in accordance with the terms set forth in the contract. The individual who purchased the airliner agreed to pay the full amount of the sale within the specified timeframe.

The contract also includes provisions for the delivery and installation of the airliner, as well as the transfer of ownership. The seller, a major aviation company, agreed to provide all necessary support and assistance during the transfer process.

The buyer, a private individual, was responsible for all maintenance and operational costs of the airliner after the transfer. The seller reserved the right to offer technical support and advice to the buyer at any time.

In conclusion, the transaction was completed successfully, and the airliner was delivered to the buyer in accordance with the terms of the contract.
Chapter V

JOINT AIR FORCE OPERATIONS, 21 JANUARY 1943 TO 10 JUNE 1943

The Strategic Contribution

Although the Casablanca Directive clearly stated the mission of the combined bomber force and provided for it a tentative list of priority target systems, the Combined Bomber Offensive is not customarily dated from 21 January 1943. Rather it is considered to have begun with the directive of 10 June 1943, issued after detailed plans had matured and the American forces had been substantially augmented. Between those dates, Eighth Air Force operations continued to be essentially experimental. The American bombers were engaged in extending the scope of their effort into Germany proper, in feeling out the quality of German opposition, itself desperately experimental, and in adjusting their tactics and techniques to the broader plan and increased scale of the daylight operations projected by the Combined Chiefs of Staff. It is this progressive mastery of the problems of strategic bombardment over Germany that characterizes this phase of Eighth Air Force activity more than the weight or even the effectiveness of the operations themselves.

For the fact was that the strength in effective aircraft did not increase so rapidly as had been hoped in many quarters. It was not until March that a force of over 100 bombers could be put into the air with some consistency. Prior to May, General Eaker could count on an average of only six operating groups of heavy bombers. By the end of that month, however, the situation had begun to improve, with...
total operating strength up to 12 heavy groups. On 29 May, 279 bombers were dispatched against enemy objectives, a record to that date. In fighters, also, my witnesses increased strength. Prior to April, one Spitfire group, converted in March to P-47's, had been the only unit available. During April two more P-47 groups became operational and in May began to escort the bombers regularly.\footnote{1}

Yet even from the strategic point of view these operations of the Eighth during the first half of 1943 were by no means negligible. The day bombers continued to devote their attention primarily to submarine installations. They were still charged with carrying out a policy which dated from the fall of 1942 when shipping losses, especially in the Atlantic convoy lanes, had begun to assume alarming proportions.\footnote{2} It will be recalled that, since 20 October 1942, the Eighth had been under orders to attack the submarine operating bases as a matter of first priority. On 10 November the submarine building-yards at Vegesack, Foma, and Kiel had been added to the day bombardment program as top priority objectives,\footnote{3} but before January 1943 it had not been considered feasible to attack targets in Germany proper. At Casablanca it was decided to throw the primary emphasis of the combined offensive against submarines, concentrating especially on the bombing of the building-yards in the Reich. The operating bases on the French coast were to continue to be subjected to be hard-pressed until it might be conclusively determined whether or not they constituted a profitable system of objectives.\footnote{4} On that score both British and American observers entertained profound doubts.
It was generally conceded that the roofs of the submarine shelters, constructed as they were of reinforced concrete sometimes over a dozen feet thick, were impervious to any projectiles then available. But any still hoped that, by disorganizing the service installations, transport facilities, and laboring population in the port areas the turn-around of U-boats in the operating bases might be slowed down to such an extent that their numbers actively engaged in the Allied shipping lanes would be in effect reduced.\(^5\)

Accordingly, the Eighth Air Force and the U.S. continued to strike at the enemy bases, especially Lorient and St. Nazaire. Generally speaking, the day bombers attacked the French bases only when weather conditions made missions to German shipbuilding ports impracticable—which, of course, left them ample opportunity.\(^6\) As for the U-boat construction yards, it was conceded that their destruction would have only a very delayed effect on the operating strength of the U-boat fleet, but it was considered that the submarines had become so serious a menace that it warranted long-term measures. Meanwhile, attacks on the U-boats at sea were coming to be recognized in some quarters as the most direct, and possibly in the long run the most effective method of coping with the submarine counterattack, but it was felt that they needed to be supplemented by attacks on the submarines at their point of origin. In addition the British, while admitting that the component parts industry did not constitute by itself a suitable target for strategic bombardment, hoped that by means of area bombing of key manufacturing centers significant delay
might also be effected in the delivery of essential components as well as in the production of such basic materials as steel. Also intended as of indirect significance in the antisubmarine bombing campaign were attacks on enemy transportation as a whole, especially on the vulnerable supply lines extending from the Low Countries to the Atlantic coast.⁷

It was, then, a relatively large and coordinated attack that the combined bomber forces launched at the sources of the U-boat menace during the first half of 1943. Over 63 per cent of the total tonnage of bombs dropped by the Eighth and 30 per cent of that dropped by the RAF during the first quarter of the year were directed specifically toward submarine facilities. In the second quarter, 30 per cent of the RAF and 52 per cent of the American effort were so expended. These figures do not, of course, include the weight of attack applied against transportation, civilian morale, and basic industry, all considered to have an indirect, albeit an incalculable, bearing on the main issue.⁸

Until August 1943, the German submarine industry was not a separate entity. Rather it functioned as an integral part of the shipbuilding industry, which, however, was converting a rapidly increasing proportion of its facilities to the construction and maintenance of underwater craft.⁹ In addition to heavy RAF raids against facilities at Kiel, Wilhelmshaven, Kiel, Hamburg, Flensburg, Lübeck, Bremerhaven, and other construction centers, the Eighth Air Force, from 23 January 1943 to June of that year, executed 12 separate attacks against submarine construction yards. Seven of these operations resulted in appreciable damage to the target. The day bombers struck four
effective blows at Alkoehaven, where the submarine construction yard at the marina, but the most interesting of a number of important naval targets. It was not always easy to distinguish the effects of Eighth Air Force attacks from those of the IAW, but reconnaissance revealed heavy, though scattered, damage to installations in the port area. The last of these missions, conducted on 21 May 1943, was believed to have been especially effective, extending the area of damage already inflicted and contributing to a general reduction of submarine construction capacity from 16 hulls to less than eight. On 14 May, 128 bombers dealt considerable damage to two of the submarine yards at Alkoehaven, Fort and Vlissingen. Almost every major building in the former received damage, none of it severe. Destruction at the latter concern, though less extensive, was substantial. So effective was this attack, especially to Germany, that Allied interceptors believed production at prewar level would be impossible for several months. They admitted, however, that such of the work pending at that yard might be successfully farmed out to other yards with little loss of production time.¹⁰

Probably the most significant, the most dramatic attack made during those months was executed on 18 May against the yards of De Alfred Vulcan at Vlissingen, situated on the right bank of the Nieuwe Rive, now seven miles below Breuka, that yard had been enjoyed since mid-1942 entirely in submarine building. At the time of the bombing the slipways contained 12 submarines in varying stages of construction. Photo reconnaissance after the raid revealed...
reversing damage to buildings and equipment (the company claimed compensation to the extent of £1,365,470), considerable productive activity was resumed at the yard after one week, and within six weeks production had returned virtually to normal. 12

A similar story may be told of the entire effort against the building yards during the first half of 1918. Although comparatively heavy, the attacks of the U-boat and blisters had in fact little effect on production of submarines. Only in the last months of the war did submarine production fall off seriously, and then the paralysis of the industry stemmed in part from a vastly increased weight of attack and in part from the general disruption of transport facilities which in those latter days affected all enemy industry. 13

Even more frustrated were the attacks made against the operating bases on the French coast, for it now appears that they had practically no effect on the activity of the U-boat fleet at any period, no matter how much inconvenience and ultimate expenditure of material and manpower they may have occasioned. 14 It is true, of course, that they were treated during the first half of 1918 as targets of secondary importance in comparison with the building yards, but they were nonetheless subject to a crushing weight of bombs. Of the total bombs dropped by the Eighth Air Force on submarine and naval objectives from 23 January to 10 June 1918—amounting to well over 3,800 tons—approximately 1,265 tons fell on the operating bases. Of 13 separate attacks, nine may be considered successful; and of these successful blows, four were inflicted on Lorient, three on Brest,
and two on St. Nazaire. In addition to this weight of USAF daylight attack, the RAF Bomber Command conducted a vigorous campaign of night raids concentrating mainly on Lorient and St. Nazaire. Between 14 January and 16 February the British bombers mowed nine night area attacks at the town of Lorient, three of union were executed by forces of from 300 to 500 planes. Late in February they turned their attention to St. Nazaire, delivering even more concentrated destruction to that unhappy town than to Lorient.

The results of this combined effort, coming as it did on top of repeated bombardment of bases during the fall of 1942, were truly devastating. By the end of March 1943, destruction was already widespread in the town areas as well as among the port installations, railway facilities, and public utilities, and it was becoming evident that both St. Nazaire and Lorient were rapidly becoming uninhabitable by the ordinary civilian population. By the end of May not a single important building in St. Nazaire remained intact, and many had suffered serious and lasting damage. Repair work had been persistently attempted but had not been able to keep pace with the bombing. Grand Admiral Doenitz summed up the situation with some finality in a meeting of the Central Planning Office on 4 May 1943: 

... the Anglo-Saxons' attempt to strike down the submarine war was undertaken with all the means available to them. You know that the towns of St. Nazaire and Lorient have been rubbed out as main submarine bases. No dog nor cat is left in those towns. Nothing but the submarine shelters remain.

But the submarine shelters did remain, and therein lay an obstacle to Allied bombing that proved for all practical purposes insurmountable. As Doenitz went on to say, they had been built by the Todt organization as a result of the "far-sighted orders of the Fuehrer," and the
submarines were repaired entirely beneath the protection of their concrete. Instead of abandoning the bases, the Germans had moved all essential facilities inside the pens.19 And so the hope, persistently held by the Allies, that destruction of repair shops, power plants, living quarters, and other port facilities could be counted on to increase the turn-around time necessary before a U-boat could again become operational was doomed to disappointment. In the absence of conclusive evidence (the workings of the bases were shrouded in the deepest secrecy),20 that hope remained fresh and green for some time. Despite an occasional report from European sources to the effect that the submarine shelters were working uninterruptedly, an AAF intelligence report dated 1 July 1943 was able to state confidently that "it is increasingly difficult for the enemy to turn around their submarines on scheduled time." The Admiralty, it continued, had just written to the Chief of the Air Staff pointing out the great value of these attacks, and requesting that they be continued. "There is no doubt whatsoever that they have contributed materially to the marked diminution in the U-boat effort and the resultant reduction in our shipping losses."21 By the fall of the year, however, Allied intelligence analysts had already begun to take a more conservative view of the bombing of operating bases.22 As for the pens themselves, they remained impervious to anything but the six-ton bombs dropped occasionally in the later stages of the war by the B-17.22 But by that time the anti-subsurface war had been won, and by other means than strategic bombardment.
The submarines suffered substantial defeat in the late spring of 1943, and it now appears that their failure resulted primarily from improved Allied detection methods, convoy techniques, and sea and air antisubmarine warfare on the high seas. According to Admiral Donitz, who was commander of the U-boat fleet, was in a position to speak with authority, it was air attacks at sea in particular that stopped his desperate bid for victory in the Battle of the Atlantic. It is the conclusion reached by the U.S. Strategic Bombing survey that, in trusting that victory from the enemy, "strategic bombing can at best be considered only an incidental contributing factor."

By June 1943 the submarine menace had subsided and the main effort of the Eighth Air Force was directed elsewhere. Only 10 per cent of its bomb tonnage was devoted to submarine targets during the latter half of 1943. The percentage dropped to four during the first quarter of 1944. It was not until late in that year that the intense activity noticeable in the German submarine building yards warned the Allies of the enemy plan to create a fleet of new type submarines and caused the industry to be considered once more a principal target system. But that is another story. For all intents and purposes the antisubmarine campaign carried out by the Eighth Air Force prior to 1944—that essentially defensive phase of its activity—was completed between October 1942 and June 1943. Its C-9 plan, drawn up in April 1943 and approved in May, still placed submarines in first priority, but before it could be implemented to any important extent the submarine situation had for the time being materially improved.
Compared to the antisubmarine campaign, the remaining efforts of the Eighth Air Force during the period under review appear tentative, scattered, and light. Although second only to submarines in order of urgency, aircraft installations sustained little more than 15 per cent of the total bombs dropped by the American bombers. Of the seven attacks made on targets of importance to the German Air Force, only four can be considered successful and only three—against the Arl Aircraft and Aero Engine Works at Anhalt, the Focke-Wulf Factory at Bremen, and the airplane factory of J. G. M. Sando (formerly Avions Potez)—were of significant weight. All three of these heavier attacks, ranging from approximately 431,000 pounds to 523,000 pounds, resulted in concentrated and severe damage. The next of all was the mission executed on 17 April against the Focke-Wulf Flugzeugbau at Bremen, at the time believed to have been devoting its entire facilities to constructing F-180 fighters.68

According to plant officials subsequently interviewed, this attack destroyed approximately half the factory and several completed aircraft.27

Axis rail transportation, given third priority at Casablanca, suffered almost as great a weight of bombs as did aircraft installations. In a sense the enemy owed this degree of attention to contingent factors such as to Allied plans, for with one exception all raids made during the period in question were directed against targets in occupied France which could be reached readily when weather prevented missions to Germany or to the submarine bases on the coasts of Italy. Yet these attacks may well have caused the enemy more trouble.
than those against aircraft objectives. Of the seven major attacks made by the 8th Air Force, four—delivered against Nantes, Rennes, and Rouen—caused acute, if temporary, dislocation to marshalling yards and heavy damage to repair facilities.\(^{23}\)

On 12 and 20 March the day bombers returned to the scene of their first operation and struck a relatively heavy blow ($12,000 and $13,000 pounds of high explosives respectively) against the Letteville yard at Rouen, causing severe damage to the tracks and to the Buddinon repair shops. In addition, the latter attack almost completely destroyed the four area locomotive repair shops. Most spectacular were the results at Nantes, when on 8 March 67 bombers dropped approximately 200,000 pounds of bombs over the railway yard, cutting it at both ends and bringing all traffic to a standstill for three or four days. It was several days more, possibly two weeks, before normal traffic could be resumed. Meanwhile rail communications with Jouffjou, and in particular with the submarine bases, were seriously disorganized, for Nantes constituted the strategic key to the whole railway network of Brittany. Traffic had for some days to be routed to the submarine bases by circuitous routes, of which the bombing of railway facilities at Brest on 3 March, and the breaching of the Morlaix viaduct late in January by the U.S. made more difficult.\(^{29}\)

It was easy, however, to overestimate the traffic delay resulting from these missions. Repair gangs were large, efficient, and ubiquitous. Consequently it appears that in no instance during the spring of 1943 was traffic held up longer than three to four days. The strain on human resources in skilled labor was, of course,

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\(^{23}\) Security Information
considerable. Probably more important than track damage was the destruction of repair facilities, which undoubtedly contributed to a reduction in the number of operating locomotives and freight cars. But, effective as they were in individual instances, the Eighth Air Force missions against rail centers were not carried out in sufficient strength nor frequently enough to produce more than a local and temporary dislocation. Although the 13th made several light raids specifically on rail objectives and a few heavy night attacks, especially during March, which involved rail installations, their effort failed to alter the situation materially.

Practically all the bombing of rail objectives was done in March. After March the Eighth Air Force turned its marginal effort toward factories in France and Belgium producing motor transport vehicles for the German Army. On the occasions (11th and 14th) it attacked the plants at Antwerp, formerly operated by Ford and General Motors. These factories, situated within a few hundred yards of each other, suffered considerable damage, especially as a result of the earlier mission when 98 bombers dropped 323,000 pounds of high explosives on them with a high degree of accuracy. More important, however, was the bombing of the Peugeot motor vehicle and armament works at Sillmcourt, Paris, on 4 April. It was the first relatively heavy attack (98 bombers dropped 502,100 pounds of high explosives over the target area) since the 15th had bombed the same plant on the night of 3/1 March 1942. Almost every major building was damaged, in some instances the greater part of the shops being destroyed. According to contemporary estimates, considered conservative at the time, this attack cost the plant...
at least 3,000 trucks; and it appeared unlikely that the factory could resume preraid production for more than seven months. British industrial analysts believed it to have been a far more effective blow than that delivered the spring previous by the U.S., albeit the latter had done much to cast a credulous light on strategic bombardment in those days of doubt and experimentation.32

The American bombardment campaign in 1942, as in 1912, had the unfortunate incidental effect of killing civilians and destroying civilian property in occupied territories. The Casablanca Directive had recognized the serious political implications of the problem, and had placed control over operations against strategic objectives in those areas in the hands of the British air Cabinet, which could presumably be in a position to react promptly and authoritatively to developments on the political front.33 Generally speaking, the American leaders had been restricted in their activity over occupied territory to days when weather conditions made attacks against objectives in Germany unfeasible. Priority was given to the targets elsewhere, of course, given to the submarine bases on the French coast, the strategic importance of which was believed to justify any measures necessary for their complete destruction.34

Strangely enough, however, it was not the bombing of the submarine bases, devastating as it was, that aroused the severest criticism from the French population. Yet on closer observation that fact does not appear so odd. Under the crushing weight of attacks from both British and American forces, Marseilles and St. Nazaire virtually ceased
to exist as civilian communities, and the French population, after they had recovered from the bewildered shock of seeing their terms systematically obliterated, took a grim satisfaction in contemplating the disfigurement of the Jana operaives left in the bombed areas, most of whom belonged to the unpopular organization. As the people of Brittany knew only too well the strategic importance of the west peninsula, and despite their losses and their inevitably mixed feelings, many of them hoped an allied invasion of the Continent would come soon, and in Brittany. 35

Elsewhere the bombings prompted an increasing outburst of protest among a population generally pro-British and pro-American. Such had been especially hard north, for it was then that the HH and most of its attacks against rail objectives in occupied France, and since warbling yards were normally embedded in populous areas, it was inevitable that these areas would suffer seriously, even though accidentally. It seems, for example, that the last village of 5 March left nearly 300 civilian casualties. The French population not unnaturally felt that this was a terrible price to pay for "un si court duel et semblable aux traits du tirage." Opinion remained, of course, fixed, the quality of the mixture depending pretty exactly on the degree of loss suffered in each individual case. Reports heard during shelling of documentary films of current Allied bombings were reported to have been distinctly unpalatable to the Allied flyers; yet even so, a contemporary French source indicated, they were mild in comparison with those which the head of "notre vie militaire..."
"Mr. Level" elicited data it was projected on the screen. In contrast, these concentrations were concentrated against the Germans, whose high-altitude attacks in relatively great strength seemed inevitably and alarmingly inaccurate and destructive to those on the ground. The RAF, on the other hand, was regarded as "the arm of precision and speed." This notion is not so paradoxical as it seems in view of the British doctrine of area bombardment, for the RAF had for obvious reasons refrained from subjecting French cities to heavy night attacks except in the cases of Lorient and St. Nazaire, from which the French population had been largely evacuated, and had made a number of accurate raids with four or five planes at low altitude against specific objectives.

Criticism reached a climax in April. The Belgian ambassador to the U.S. protested the inaccurate bombing done by the RAF at Antwerp on 5 April which had resulted in heavy civilian casualties. And among the French in London criticism of German bombings in France tended to increase along with criticism of U.S. policy in North Africa. Following the bombing at Paris by the Luftwaffe on 1 April, the de Gaulle Committee, while admitting good strategic results, complained of the inaccuracy which had led to large civilian losses and recommended that the Americans either adopt different bombing techniques (it was suggested, among other things, that the bombers fly about for a couple of minutes before dropping their bombs) or else abandon the bombing of French objectives in favor of equipping the Resistance movement to do the work of destruction by itself. Other sources expressed similar, though oftentimes less vociferous
opinions, suggesting at times that the Americans were indifferent to French welfare, that they should learn to bomb by practicing on the Germans rather than on the French, and that it would be better if the British bombed French objectives and let the Americans indulge their irresponsible habits over German soil.  

Pressure had increased by the latter part of April to such an extent that the problem came before the British War Cabinet for general review. That body was unwilling to permit bombing of occupied countries except insofar as it could be accomplished without excessive danger to the civilian population, a policy which, although differing little from the position originally taken in October 1942, would, if strictly interpreted, have made it necessary to abandon all such bombing, since strays could hardly be helped even under the most favorable conditions. But strong arguments pointed toward continuing the bombardment of strategic objectives in occupied Europe. Not only were those objectives of sufficient importance to the Axis economy to warrant bombing, but to attack them periodically would be to force the Germans permanently to disperse their defensive strength. The logic of military necessity in a total war proved unanswerable; and in June the CCS agreed that objectives in occupied countries, the inherent military importance of which justified such action, would under suitable conditions continue to be subjected to precision bombardment.  

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The Tactical Problem

To grasp the true significance of the early 1943 operations carried out by the Eighth Air Force it is necessary to look at them from the point of view of the tactician rather than the strategist. For the day bombers were still learning their trade. During the months prior to February 1943 the Eighth had grappled with the basic problems of daylight strategic bombing for the first time under combat conditions, and had elaborated certain basic tactical principles.

Now, during the months from January to June, the main tactical problem was to extend operations, both in scope and weight, and to adjust basic practices to the shifting circumstances of the air war. Though not intentionally so, it was a period of final experimentation before the big offensive.

The American bomber force in the U.S. had also to combat criticism of daylight precision bombardment which continued to crop up despite the official acceptance of the program by the CJO at Casablanca. Allen L. Dulles, of the Office of Strategic Services, who had been in England for some time observing the air war, gave voice to this spirit of skepticism which lingered, principally in Britain, beneath the surface of official agreement. In a book entitled The Air Offensive against Germany, published early in 1943, he undertook to demonstrate that, while it was entirely feasible to bomb Germany into military impotence, the job was being held up seriously by the RAF, which "stubbornly" refused to abandon its doctrinal insistence on daylight bombing, a concept tactically unsound under European conditions and
quite beyond the capabilities of available American aviation. As they were undoubtedly meant to do, his words created considerable protest in the American press, and raised questions in the minds of such influential groups as the House Appropriations Committee. Unfortunately the spokesmen were unable to answer these criticisms effectively because at that day bombing operations in the U.S. had not been heavy enough or extensive enough in scope to warrant any but tentatively favorable conclusions, and tentative conclusions do not serve for convincing argument, especially in the eyes of the lay public. As Mr. Lehman, on the other hand, said to those for whom he spoke, six months of actual operations in the U.S. had pointed conclusively in the opposite direction. The apostles of high-level precision bombing therefore looked forward with some concern to the spring operations against Japan, for data which might more fully vindicate a tactical doctrine which had necessarily been held to a large, if happily decreasing, extent as a matter of faith.

The Eighth, however, continued to labor under certain handicaps. Its commanders could have preferred to increase the weight and range of its missions steadily and rapidly, but prior to mid-1944 it received few reinforcements. Even replacement crews and aircraft arrived at a rate much slower than the losses incurred in operation or combat. In February the effective strength of the organization sank lower than it had been for many weeks. The Service Command was still devoting a substantial portion of its time to the preparation of units and replacements for TDY; and during April and May its
Facilities were further strained by the arrival of new groups, the ground sections of which had been left behind owing to the currently acute scarcity of shipping. Finally there was that perennial bogey, the weather. In January only four out of 12 planned missions were carried out, the remainder having been cancelled because of unsuitable weather. In February five were completed. With the advent of spring, the situation naturally improved, enabling nine missions to be completed in March, four in April, and nine again in May. But weather remained a serious limiting factor on all daylight operations. Experimentation in blind bombing methods continued, but "sailing" operations proved unsatisfactory and were abandoned after one. It was not until the end of November 1943 that "pathfinder" missions began to be flown.

It would not have been surprising had morale declined in the face of these chronic handicaps. To a certain extent it did, of course. Commanders were impatient and often discouraged at the slow rate of Eighth Air Force operations and at the delay in build-up. And certain facts are in the statistics of attrition and replacement the shining prospect of a short war. To make matters worse, commanders and crews alike were eager to strike at the German homeland, but hitherto they had been prevented from doing so by tactical and strategic considerations the validity of which they did not always appreciate. In this restlessness they were joined by a considerable segment of British opinion.

It was, therefore, as a tonic to all concerned (except the enemy) when, late in January, the Eighth Air Force bombed Wilhelmshaven.
Specific plans had been laid as early as November of 1942 to extend operations beyond the occupied areas, and the list of priority targets had been enlarged to include objectives in Italy proper. At Casablanca it had been decided to concentrate daylight bombardment as far as practicable on objectives in the Reich. Accordingly, on 27 January, C1 3-17's and 27 B-24's at last set out for Germany. The mission did not go exactly as planned. The Liberator were supposed to attack the dock area of Wilhelmshaven and the Fortresses were to bomb submarine building yards elsewhere in Germany. As it happened, the force of D-24's, suffering from a combination of bad weather and bad navigation, failed to locate the target and returned to base. Of the 3-17's, 53 found it impossible to bomb their primary target, and went on to Wilhelmshaven which for them had been specified as the secondary. As others looked Ziegen, the target of last resort.13

The uncertain weather prevailing that day over northern Germany may well account for the fact that the mission met with less opposition than it had anticipated. Air was encountered almost continuously over Germany and the Frisian Islands, and several of the bombers suffered slight damage, but at no time was it intense enough or accurate enough to have deterred the attacking force in any way. At Wilhelmshaven, especially, the flak defenses appear to have been thoroughly confused, their effort at a predicted barrage being what a British observer described in one of the B-17's as "pathetic."

Considering the number of guns on the enemy coastline to have in the area, this shooting was as a complete surprise to the American forces.
The only losses that occurred during the day’s mission resulted from enemy action. With the A-17s of the 1st bomber wing and the B-24s of the 2nd bomber wing stirred up a sizable force of enemy fighters, totaling in all more than 170 aircraft. In the resulting combat, the Liberators lost two of their master and the Fortresses one. Yet even this small force proved less dangerous than had been feared, for they seemed much less experienced than those the bombers had encountered in France. Claim of the bomber crews against the fighters were assessed as 28 destroyed, 11 probably destroyed, and 13 damaged. All bomber claims were during the first half of 1943 but, however, it was with a grain of salt. Despite a new and much improved method of establishing them, they were still affected by many confusing circumstances, and they continued to ran high.50

It was, if not an especially well-executed mission, a very interesting one. A relatively small force of heavy bombers, their crews no more experienced than necessary, had penetrated by daylight, and necessarily without benefit of escort, toll into the enemy homeland, and had, moreover, done so without prohibitive loss. Operations of this sort had generally been considered feasible only for a large force of highly trained units. But, as Eighth Air Force commanders knew, only too well, they might expect heavier and more efficient resistance in the future. And so it happened. During the mission of February, two Eighth attacked alone, the bombers stirred up a veritable hornet’s nest of fighters. For the first time they were opposed by
On 20 February, one month after their initial plunge into German territory, the day bombers revisited all but a few. They had intended to strike Crown, but, finding that objective completely obscured by clouds, they turned back to Rh’nauhafen. Here 35 of them bombed the harbor area to some effect. But it was a very different mission from that of the March previous, in that it was not much more dangerous than it had been on that occasion, although it may have accounted for one of the bombers lost. Enemy fighters, on the other hand, reacted in strength. Not only were the fighters of the affected area engaged, but help was called in from units as far north as Flushing. In all, they estimated 85 to 100 single-engine fighters and 10 to 15 twin-engine fighters (the latter probably normally used as night-fighters) flew a total of 50 to 55 sorties against the bomber force. The concentration of purpose with which the attacks were launched was clearly evident from intercepted German radio messages.

The factors undoubtedly simplified the task of the enemy dispatchers. Lost from the point of rendezvous the bombers had been in the German AOP screen, with the result that the enemy was well prepared to intercept as soon as the bombers came within reasonable range. The danger of early interception was also aggravated by the fact that the planned route led around the coastline of northwestern Europe not far from the British Islands; and the actual course clung apparently even closer to the coast. At any rate, in the ensuing...
battled the bomber force lost seven of its planes, possibly as many as six of which fell as a result of enemy air action. Over against these losses the bomber crews claimed 21 of the German planes, with nine more held probable.

Despite the determination with which the German pilots pressed their attack, they were still reported as being more cautious than the more seasoned units in Greece... or did they attack so consistently from the front? The reader will recall that during the later missions in 1942 and during January of 1943 the Germans had recognized the weakness of the American bomber formations in forward fire power and had made a consistently deadly series of frontal attacks. The I.tam air force had reacted promptly to this disturbing tendency and, by fitting as many bombers as possible with nose guns and by stacking its formations with a view to providing mutual fire power, it had succeeded at least in reducing the menace of the nose attacks. It is possible that the less experienced early units stationed in Greece at that time had been cautioned to respect this increased defensive power. The bomber crews had noticed a similar tendency on their previous missions to Crete.

During the mission of 26 February the bombers experimented with two new defensive techniques. The bomber crews reported encountering a box barrage of antiaircraft fire over Wilna-Letchen, which contained several black bursts, each of which released a parachute bearing an explosive charge. The group also reported an unsuccessful attempt on the part of a B-109 to drop bombs on the B-17's from special

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external bomb racks. On 16 February, during the raid to St. Nazaire, a report of a similar nature had been rendered, but it was thought on investigation that the missiles in that instance consisted of self-destroying ammunition. The bomber crews again reported air-to-air bombing, and on 22 March they returned to Wilhelmshaven. Again the bombing failed to cause damage.

On 25 March an incident occurred which demonstrated, if demonstration were needed, that small formations could not hope to penetrate the fighter defenses in the Reich without crippling losses. The target for the day's mission was the airship 

yard at Mann. It was the first time the Eighth had set out to bomb an objective in the air industrial area, and so the mission was planned with a view to reducing, so far as possible, the danger from enemy fighters that the necessarily long flight over enemy territory would entail. In order to confuse the enemy defenses the main force of 71 Fortresses

bombed out in a north-westerly direction over the North Sea roughly along the route taken on previous missions to Cream or Wilhelmshaven. In addition, 14 B-31s flew a diversion along a similar route, but followed it for a much greater distance, keeping an eye out for incidental shipping targets. When about halfway between England and the Netherlands coast, the main force turned southeast toward home. Out from that point on, the weather was about those carefully laid plans, and the result that of the four groups of 1-17's one returned to England without bombing and the others bombed the last resort target at Rotterdam. The fourth group became separated from
the main formation while flying on instruments, so that, when it reached clear weather over Germany, it found itself quite alone. It continued on to the primary target, however, and succeeded in bombing with unusual accuracy, so far it had not only light opposition, and it is probable that the carefully planned route prevented the German fighters from becoming prepared for an advance. But on the route home they began to attack the 16 fortresses with the utmost determination, coming in, contrary to their recent custom in that area, mainly between 10 and 2 o'clock and sometimes making coordinated attacks by three planes all aimed at individual bombers. In all some 60 enemy fighters, of both single- and twin-engine types, attacked the low formation at short range four of its planes. It was a costly operation, but considering the weight and determination of the attack, it is remarkable that none of the B-17's were not lost, and in the course of the air battle the bombers may have destroyed upwards of 10 of the enemy planes.57

The attack on objectives in the German homeland had been the expressing fact to all concerned since the latter part of January. Attacks had been relatively successful, but, except for the first one, the cost had been high. In the first four the rate of loss, expressed as a percentage of the planes attacking, had been a little over 10 per cent. And cost of the losses had resulted from air combat.58 Yet the Eighth Air Force commanders were not badly discouraged, for, they argued, a force of 300 or more planes (the number originally planned for such operations) would lose few if any more than did the small force then in progress, moreover, that...
missions had not been escorted, and a reduction in losses could be confidently expected as soon as long-range fighter support could be provided.\textsuperscript{59}

Their optimism received considerable impetus when, after a two-weeks absence, the dry bombers again flew to a German target and, on 18 March, bombed the submarine building yards at Vegesack. The route had been carefully planned in order to bring the bombers into contact with the enemy defences at the latest possible moment; and, giving the Frisian Islands a wide berth, they succeeded in avoiding interception until they had reached Heligoland. Then the German fighters of all available types (FW-190's predominating) engaged the bomber formations in a running battle to the target area, and again on the return trip, some following the American force over water to distances of 60 to 80 miles beyond the coastline. Yet these attacks, persistent though they were, for the most part lacked the skill and daring of experienced units, suggesting that the four missions flown by the Eighth to French objectives during the preceding fortnight had drawn off the few well trained units then stationed in northwest Germany. The gunnery of the bomber crews seems, moreover, to have improved. As a result of these two factors the Germans suffered heavily, although the claims registered of 52 enemy fighters destroyed, 20 probably destroyed, and 23 damaged appear to have reflected less the facts than the confusion accompanying a prolonged air battle. Probably no more than 50 or 60 of the enemy intercepted. Yet their losses must still have been substantial. Best news of all to the tactical commanders was the relatively small loss (two planes) sustained by
the bomber force. Considering that it provided the example of very accurate and apparently effective bombing, it was a reassuring mission.\(^{69}\)

Meanwhile, the day bombers had been running into equally powerful defenses during missions to the submarine bases on the French coast. Indeed, some reported defenses in the neighborhood of those objectives to have been more experienced in the use of the German heavy bombers than those not in Germany. Thus at St. Nazaire, Lorient, and Brest had on more than one occasion caused the bombers serious trouble, and at St. Nazaire on 5 January it led to a developed barrage that destroyed several of the attacking planes.\(^{61}\) During January, February, and March flak at those points continued to cause such damage to the bombers and in a few instances destroyed them. For the most part the fire control which had used was a continuous following, and it was frequently too accurate that the bomber formations could hope to escape serious trouble only by taking violent evasive action.\(^{62}\)

Yet it was the fighters here, as in Germany, that gave the Eighth its toughest battles. Since it was not possible for the bombers to have escort work beyond the French Channel coast, they had to do their heaviest work (mainly at Lorient and St. Nazaire) without fighter support over the target area, more important than the lack of full-scale escort was the experience and ingenuity of the enemy fighter units stationed in those parts. They crossed their attacks fearlessly and were constantly trying out new tactics. At Lorient,
for example, on 25 January, they tried coordinated attacks in groups of six planes, the elements of which came simultaneously from both sides and from above. Most frequently, however, the German pilots employed the close attacks which had worked so well against the inadequately protected bomber formations in December and January. 65

To be sure, the bomber crews were also increasing in experience. By preserving a good defensive formation as possible, by turning into the attacks, and by varying altitude as much as was consistent with tight formation flying, they managed often to evade otherwise fatal planes. In addition, the thin nose gun installed in many of the bombers were credited with breaking up many attacks. Yet even with these improved defensive tactics, the Eighth lost heavily in so few in the neighborhood of the U-boat bases. At Lorient on 26 January an attacking force of 34 bombers lost four to enemy action and one to flak. Of the eight planes lost by the force of 35 that attacked St. Nazaire on 16 February, two definitely were shot down by enemy fighters, four were probably destroyed by fighters, and another two by a combination of fighters and flak. On only two occasions did the bombers have a relatively easy time in dealing with the German aircraft. On 27 February the B-17s provided escort of such quality that 60 bombers were able to complete their mission so intact without loss of a single plane. On 3 March the main force, sent to bomb Lorient, benefited materially by having the bulk of the fighter defenses diverted by a few I-16's.
dispatched to Great Britain for that purpose under heavy Spitfire cover. 34

Fighter escort also rendered missions flown during March to other targets in occupied France and the Low Countries a relatively simple matter. During March, six such missions were dispatched to points which, with the exception of Le Havre, lay within escort range. On two occasions, at Le Havre on 12 March and at Nieuport on other points on the day following, forces of 65 and 75 bombers respectively completed their missions without loss, thanks largely to cover provided respectively by 12 and 11 squadrons of Spitfires, and to carefully planned diversionary sweeps by fighters and bombers. 35 By this time the prevailing doctrine of fighter support was based on the assumption that all rearward sectors of the bomber formations could be the responsibility of the bombers, and that the fighter support would be placed itself as to defend the bomber formation from head-on attack, still the most useful enemy tactic. This allowed at the same time left the bombers a clear field, free from problems of identification, in which to engage all hostile aircraft approaching from astern.

It represented also an effort to provide closer escort. The few fighters had been supporting the American bombers from the beginning in considerable strength (400 to 500 planes), but they had normally flown in "umbrella" type of cover, developed primarily to protect Wellington bombers which lacked overhead defense. This procedure had, it was possible on rare occasions, for the enemy to avoid the escort, and, coming in beneath it, to engage the bombers with little interference. The Spitfires had, however, been trained not to come too
near to the defenders, whose natural tendency was to shoot first and identify afterwards. That problem remained, but the need for closer escort had come to be one of overriding importance.

Despite fighter cover, however, the German defenders occasionally pressed their attacks with cleverness and determination, employing deceptive tactics and exploiting a variety of advantages. A formation of 10 B-24s ran into an especially well planned and executed fighter attack during their attempt to bomb town on March 14th. It was too small a force for ordinary purposes, but the heavy escort provided should normally have been enough to protect it. But the enemy had apparently weighted that factor, for as the fighter escort approached the target to clear the way for the bombers, it was engaged by a considerable force of Me-109s. While the supporting fighters were thus occupied (and the German force was enough temporarily to saturate them), another wave of German aircraft which had evidently been waiting for just that opportunity attacked the bomber formation with utter ferocity just as it was executing its bombing run. This defensive attack succeeded very well, for it destroyed two of the bombers, including the lead plane, and quite disrupted the bombing run.

During April, the Eighth Air Force encountered increasingly fierce and versatile opposition from enemy fighters. Judging from intercepted German radio messages, it appears that the enemy had come to recognize the daylight bombing offensive as a desperate matter requiring an all-out counteroffensive, regardless of cost.
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The first three missions—to harass on the 16th, to harass on the 18th, and on the 19th to harass and retreat—had strong air withdrawal support, but no escort over the target area, and it was mainly while the bombers were thus unprotected that the heaviest fighter attacks occurred. The fighters consisted in strength of 20 to 75 planes of all types and came in to the attack from all directions, with frontal attacks, though less exclusively employed than hitherto, still predominating. Their most effective tactic was the coordinated attack executed by four to seven aircraft, approaching from the front in waves at intervals of from 1,500 to 2,000 yards. Coordinated attacks had hit them to be the exception, most of the German pilots according to strike singly, and they became frequent enough to be considered the result of a consistent plan. And they asked it just that much harder for the bombers to defend themselves. They had the effect of dividing the fire of the bombing formations, and they made it difficult for the pilots to take effective evasive action, for if the bombers turned into one attack they were left in no position to repeat the maneuver before the next batch of fighters was upon them. At times, too, the enemy concentrated on the relatively unprotected low squadron in one of the two combat wing formations, and destroyed three of its six planes.28

The best effective defense the bombers could employ was to fly as close a formation as possible, with two to three squadrons flying in echelon for formation so as to give each other the utmost support. I proved forward fire support also helped a great deal. In the case of the early mission just mentioned, the low squadron would
probably have lost even more heavily and not each aircraft been
provided with 2-in nose guns in anticipation of just such an attack.
Good results appear also to have stemmed from the careful planning
of routes in these cross-Channel missions. The B-24's of the 8th
Bombardment Wing, effective diversions, and even the main attacking
force, executed points on its way toward the enemy coast. These
 successes no doubt account for the fact that fighter attacks became
serious only after the target area had been reached. Defensive action
on the part of the bombers grew, indeed, to have belied the in-
creasing ferocity of the enemy fighter opposition during these first
three April missions, for total losses amounted to no more than five
per cent of the attacking force, a rate of cost considered by no
means prohibitive for daylight operations.

Things did not go so well then on 17 April, the eighth such day.
Drew into the bight in order to attack the_Dockenshelt plant at
Dunkirk. It was the largest mission mounted to that date. One
hundred and fifteen B-17's of the 1st Bombardment Wing were dispatched,
107 of which attacked. Yet this force also sustained a record loss: 16
of its planes were shot down and 10 damaged to some extent. Never
before had the Eighth encountered such heavy or such well coordinated
defense. While the Germans had justly recognized the tendency
of the Allies to endeavor to attack targets in the Dunkensibbelchaven
area, the anticipation of the result that provided the basis on this
occasion appears to have stemmed from advanced warning provided in part
by suspiciously favorable weather in the target area, and probably
in even larger part by a German observation plane which discovered

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and reported to the bomber force while the latter was over the North Sea or beyond 100 miles. It is known that this plane radared the location, direction of flight, and altitude of the bombers, and this information, coming more than an hour before their arrival at the target, permitted the enemy to organize and concentrate his forces. This in did even still and dislocated... all alertment of fighters at the formation at a point beyond the firing islands and accompanied it to the target, where a mass of our aircraft, no doubt not correctly informed of the target's course, were already assembled ready to attack at the critical moment of the bombing run. It seems to have been their main purpose to vitiate the effectiveness of the mission, by meeting down the leading planes and breaking up the bomber formations, because all attacks were withheld until that moment. For the target, also, the elements threw up an unusually intense, though not always accurate, concentration of flak. 70 possibly as many as 150 aircraft intercepted. They made their first full-scale attack just as the leading bomber groups entered the fire; concentration immediately over the target. Most of them drove in from the front, flying recklessly through their own anti-aircraft fire in a variety of coordinated attacks. This added to the confusion, and accounted for our losses. In addition it probably caused some of the bombers to become stragglers and therefore an easy prey to attack by fighters later on in the battle. But it was of minor importance in comparison with the fighter opposition, and the quantity rather than the quality of the barrage was responsible for whatever success...
it may have and in confusing the bomber crews. Despite the severity of both fighter and flak attack, however, the first groups managed to maintain formation and to bomb with reasonable accuracy.\textsuperscript{71}

Withdrawn from the target, the bomber formations sustained constant attacks, executed from all directions and maintained persistently well past the islands. The enemy fighters concentrated on stragglers and on formations too loosely formed for effective mutual support. This fact called attention with special force to the problem of defensive formations. Except on the bombing run, the bomber had alone in the combat ring. It was believed that the scattered formation maintained by the leading wing accounted in large part for the fact that it had suffered all the losses sustained that day. On the other hand, the elements of the second combat wing flew in close support of one another, so to be sure, the leading wing bore the brunt of the attack at the target and some of its losses had occurred at that time. But the virtue of a tight defensive formation appeared nonetheless to have been demonstrated with some cogency.\textsuperscript{72}

Over Sicily, however, where increasing frontal attacks made by the German fighters had forced the Eighth Air Force to increase the forward fire power of its formations, an effort had been made to consolidate the elements so as to achieve the maximum of mutual support. In February the concept of the combat wing formation, consisting of three combat boxes of 18 to 21 planes each, had clearly emerged, and there remained a remittable tendency on the part of the individual elements to string out, thus destroying the compactness of the formation.

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necessary for purposes of defense during January and March such thought as given to this problem, and by April the 54-plane combat
in the central part of Italy, flown in such a way that any fighter approaching from the rear would encounter a solid wall of fire. Of course,
this remained serious objections to such relatively large and closely
massed formations. The upper and lower squadrons obviously had the
least protection, being in fact in a corporately exposed position,
and during late March and April the enemy fighters had concentrated
on that. Moreover, the formation was very tidy and difficult to
maintain, especially on turns, for it involved a last odd variation of altitude. But for the the flying the crews of defense had
to be not before theirs or unavengable. 73

In their mission, then, contributed both the vulnerability
of the 54 combat formations from enemy fire and the defensive
strength it fen and that properly maintained and adequately equipped
with armor. Although the German losses were high, the Soviets
doubtless lost heavily. In usual, it is difficult to tell
from the reports done by the to our crew concerning such extensive
air battles exactly how many enemy fighters were shot down. But
even allowing a substantial margin of error (possibly as much as 10
per cent) the claims of 62 destroyed, 15 probably destroyed, and 17
likely indicates that the enemy lost seriously. 74 It may well have
been as a result of this engagement that the Italian fighters tended
thereafter to reduce frontal attacks in favor of attacks from other
quarters. Since February there had been a tendency in that direction,
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especially on the part of the less experienced units. After April
none attacks could be the preferred method except for the speci-
ice purpose of blocking up the bombing run.

By mid-1944, the fighter force had changed as the primary
objectives to any extension of the daylight precision bombing campaign.
In January, enemy fighter dispositions on the western front was about
the same as it had been in August 1942. It consisted of a shallow
coastal defense from Freetown to Colombo, light to medium in
the Senegal-Mauritania area, and, only as the urgent demands of the
western and Mediterranean fronts, the total available fighter
strength on the western front, according to contemporary Allied
estimates, dropped from about 270 in August 1942 to 210 in January
1943, but this decline was any o. e. air observers to understate
for the capacity of the 317th but the slight change of
optics visible in January gradually faded out during the following
months. By the middle of the year, enemy fighter defenses on the
western front had increased substantially reflected the extended
scope of Eighth Air Force operations into northwestern Europe.

Although precise figures are not available for the western front
area, it may appear that there were in that area and area at
the beginning of 1943 not over one thousand fighters; by the middle
of the year that figure had risen almost to 310. During the first
quarter of 1945, over-thirty of the total Army Air Force strength was
located in France, and the western front during the second quarter of
the year had risen to approximately one-third, and was rapidly
increasing.
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...
to such particular tactics as air-to-air bombing. The Eighth Air Force commanders had labored under no illusions on that point: long-range escort had from the beginning been considered highly desirable. But there had been a tendency during the latter part of 1942 to minimize the value of fighter escort and to argue that the bombers, suitably armed, and provided with a few heavily armed escort bombers of the proposed YB-40 type, could if necessary penetrate enemy defenses without assistance. Early RAF fighter cover, though heavy, was not close and had therefore seldom prevented the German fighters from engaging the bombers if they chose. Moreover, prior to January, the bombers had come off very well in combat with enemy fighters. But, from that point on, the Germans began to improve their technique and the cost of unescorted missions began to increase. Conversely, fully escorted missions gave comparatively good results—in some cases outstanding results—owing in large part to an improving technique of close escort. Long-range fighters came, therefore, more than ever to be considered, if not essential to long-range daylight bombing, at least essential to its complete success.

But the long-range fighters were slow in arriving, and even slower in achieving operational status. The TORCH project had drained the Eighth of all P-38 fighters. Their place was to be taken by P-47's, equipped with long-range tanks. But unexpected design difficulties delayed delivery of the Thunderbolts, and although they began to arrive in the U. K. in January it was many weeks before bugs could be removed and the planes successfully adapted to operations in that theater. Trouble with the VHF radios was the principal
cause of delay, although various difficulties were overcome, it was
agreed that the equipment was on the Allied side and it times involved aid from the British; but their efforts to little avail, as the demonstrated when on 19 April the 4-J-7's took part for the first time in a fight near. Otherwise uneventful, that operation proved that plane-to-plane communication was virtually impossible among the P-47's. Since such liaison constituted the key to successful fighter tactics in the ETO, the new fighter could not be put into combat until the difficulty had been corrected. In April, however, three groups—4th Fighter Group (recently converted from Spitfires to 4-J-7's), the 55th, and the 73rd—were placed on operational status and sent to flying fighter areas over the Baltic and French coasts, largely for the purpose of training.62

A week later, during one of these operations, the 4-J-7's had their first engagement with the enemy. The Composite Group,
totaling 33 planes, led by experienced pilots of the 4th Fighter Group, the 4th Fighter Group at 30,000 feet over the northern French coast and encountered a number of F-100's in the process. On the whole the results were encouraging, for the Thunderbolts stood up very well in comparison with the German planes. The pilots reported superiority in diving ability and believed their 4-J-7's showed great promise in pursuing through the F-150's. In order to be able to outmaneuver the enemy at 17,000 feet, they shot down two J-130's and damaged one, at a cost of one of their number. Two other 4-J-7's were believed lost as a result of engine failure rather than enemy action.63

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The first trip with the new crew, according to the
record, had not been a success. The enemy
had not provided the solution to the problem of the long-range
fighter. The flight failures continued to occur with disturbing frequency, and the radio equipment,
which had been
reported to work well,
failed. The crew reported that the equipment had to be designed and manufactured,
and that it was not yet ready for operational use.

The problems were such that they could not be
solved further than the difficulties in accompanying the other formations.
It was not until after 1945 that these difficulties were overcome and the A-17 could be classified as a long-range fighter.

While the long-range fighters were in the future, hopes continued to be pinned on the F-10, that experimental, highly modified
equipment, by means of which it was believed that the enemy or the
enemy to attack the local groups and units in exposed positions in
the other formations might be frustrated. Their arrival was eagerly
waited for, but their entry into combat was delayed until 1945.

Instead, the A-17s began to escort the bombers to a range of about 175 miles. Their first effort was distinctly
unsatisfactory. Six squadrons of Thunderbolts joined three squadrons of F-10s in support of the mission of 60 A-17s against the Ford and
General Motors factories at Detroit and Ypsilanti. The A-17s provided high cover and widespread support at a cost of 1 F-10. In the
course of 60 effective sorties the day they took the place, and
that unit apparently as a result of enemy action, the 22
Spitfires also destroyed one Va-123, probably destroyed another, and damaged three, at a cost of three of their own aircraft. A force of 36 Liberators flew a diversionary raid over the island under cover of three or four P-47 squadrons. Mainly in part to take diversion and in part to do excellent fighter cover, the 385 was concentrated only 20 to 30 miles north, although local efforts reaching to the day before had been large. As a result, the bombing force was able to do its work accurately, with little disturbance from enemy action, and to return to base without losing a single plane. The P-47's helped to clear out that of the bases on other occasions during the rest of the way. While, on the 13th, the VIII and IX Bombardment Air Force, the 385 and 388 attacked aircraft objectives at results and St. Omer, the VIII Fighter Command executed 124 extensive sorties in conjunction with cover provided by 16 P-47 squadrons. Total bomber losses were one gravity bomb, less than one third of the estimate, for one on the 14th a force of P-47's using all fire targets as a relatively light loaded to the close cover provided by B-47 and P-47 fighters, despite not mined by planes.

At missions beyond fighter range reached hazardous, and during the rest of the six more than 8000 tons were dropped. In Germany without escort or to those in France with partial fighter cover. And the last was not much better of a cover at 11:45 demonstrated to be a force of 35 tons of bombs and fire at targets at noon and, despite a second force of 174 almost to the target, lost six of its planes to enemy aircraft without the escort.
returned and the light airfield support of the lighter forces were picked up at the coast on the return trip. As the ships had deliberately rearmaed from attacking until the enemy was left without fighter protection, her losses had also reached the 10 or 15, which in turn on 21 by the bombers attacked El-Hulmaven and at a with forces of 77 and 40 aircraft respectively. At dawn in April, the enemy fighters concentrated their efforts on breaking up the bombing run, and as both ships they succeeded, for bombing results were satisfactory neither to ill-humane nor ideal. At the former use of the enemy was to be as they approached the island coast, and as the bombers reached the initial point, were Advisory to turn, toward the target, from 10 to 60 fighters cleared and made up, 20 to 30 on each side of the leading bomber formation. As the invaders air and to their target the defenders began to pull off and to execute frontal attacks in waves of four, six, or eight planes at a time, each in loose echelon formation. The attackers made seven or eight separate attacks during the bombing run with devastating results to American planes and personnel. It fell to the commander, Admiral K. several other trials in air-to-air combat, and no appearance of a new up to 90,000 pounds had been isolated or taken. But the rest of those unescorted or virtually escorted missions conducted during the latter half of July and August was covered from lighter support. The reason is that in the first place, improve in offensive formation flying, unnoticeably cut down losses considerably. (In the I-3 mission in up, above to St. Nazaire, the
Y-10 out in its initial appearance, but by this time, fighter
reconnaissance by the Eighth Air Force had been expanded
over the following period of time: the American B-26s, in the
initial phase of their attack, had been effective in supporting
our own attacks on the enemy. The British, however, in
their initial phase of the attack, had been less effective.

This expansion of the bomber force and the lack of effective
air support in Eighth Air Force operations in May 1944 may
be explained as follows: in May 1944, the following
bomber groups were operational: the 99th, 305th, 307th, 319th,
and 320th. These groups were augmented by the 693rd
Group, which had been formed for training purposes. In May
1944, these groups were augmented by the 91st, 100th, 104th,
and 121st Groups, under the command of Maj. Gen. T. D. Miller.

The Eighth Air Force was not prepared to mount a major
air operation. It was, in fact, turned over to the Combined
War Crimes Trials on May 16, 1945.
24-hour air attack made by the allies during the war. The 24th sent large forces against Berlin and against targets in the Caucasus and in Occupied areas. The 24th made an impressive display of its newly acquired strength in simultaneous attacks on four strategic targets, situated at Nijmegen, Courtrai, and Ijmuiden. In all, it dispatched a record total force of 249 aircraft (including 138 medium bombers) of which 109 (including 11 medium) reached the record to that date. In addition to the 24th, VIII Bomber Command's flexible offensive tactics in conjunction with the fighter squadrons to protect the smaller forces to bomb the record Courtrai attacks on targets were good, the mission in its way meeting with a measure of success. The British press reacted euphorically, referring to the day's so-called activities as the opening of a great 'blitz' against Germany, and declaring the unprecedented effort of the American forces. 52

In风格 much like the 24th force of 125 heavy bombers (108 B-17s and 17 B-24s) struck the most distant target yet attacked, covering a distance of over 1,000 miles. This time, by now thrown the Germans were off balance, for not a few of the anti-aircraft guns seem to be located in the vicinity of the objectives were operating, and the resulting influxes of little consequence for two the fighter attacks, although numerous, proved with the quality of determination observed on previous occasions in northwestern Europe. Cliffs against enemy aircraft to, however, very high (22 destroyed, 31 probably destroyed, and 27 damaged), indicating a heavy air battle.
Although a minor part of the operations on the 14th, the attack executed by 11 -24's of the 16th in support of Maj. Gen. Allen, operating station at Iqaluit attracted considerable attention because it constituted an operation which had easily been decided the day before or not been. Under conditions could be used effectively in the strategic bomber offensive. If a quarter had been available, for some time the fullest possible use of the results in high-altitude raids against suitable coastal objectives, in the Pacific they had been employed, often with brilliant effect, in deck-level attacks against naval vessels, and it was believed that, if properly integrated with other air action, they might be equally effective against such installations as airfields and oil plants in nearby coastal areas of Europe. With Air Force antiaircraft, while not entertaining such high hopes, declared itself ready to investigate the possibilities inherent in such tactics. It was accordingly planned to send two raids out against coastal installations in
operations closely coordinated with other airborne units. As a result, B-26's were especially trained in the techniques of high-altitude and close air attack. They were directly responsible for launching the raids, as the B-17's advocated the exclusive use of fighter cover, for it was likely that, after their initial attack, the B-26's could be lost by the response of fighter opposition. But their requests were unfavorably considered on the ground that high-altitude fighter support could be impractical, and that if escort were required, the raiding force would have to be flown at altitudes of 10,000 to 14,000 feet, depending on the anti-aircraft threat. 

In contrast, the B-17's operated only to tentative conclusions, namely, that the B-26's performed their task without the loss of a single plane, and at the cost of only one or two crewmen killed on the U-boat. The U-boat was destroyed completely, with over 700 to 800 feet. At that point the report concluded: "We should not be disappointed for it gave no indication that any J.2 and U-11 had been even sighted. Air Force had been instructed to use 60-foot delay fuses on the 500-pound bombs, used in this raid in order that the bombs would not explode before they exploded. In the event of any damage, the U-26's encountered no fighter opposition. This was not surprising, since the largest force of the U-boat in the history of the U-boat was 500 feet. Although that day and the only thing that happened was 1,000 feet".
be navigated with extreme accuracy in order to reach the enemy coast at the desired point without exposing the bombing elements unduly to antiaircraft fire while hunting for the target. Navigation had not been too exact, and the target was approached in the direction of the longest axis of its antiaircraft defenses, which resulted in minor flak damage to most of the attacking planes.95

Much more conclusive indications were obtained three days later when 11 B-26's were sent in two flights to attack respectively the same target at Ijmuiden and the power station at Haarlem. Again the mediums flew at zero altitude and without fighter support. One turned back on account of mechanical difficulty. The rest were lost. Little is known about the fate of these planes except that they ran into fighter opposition in addition to a heavy concentration of flak. Nevertheless, the mission served to clarify the place of medium bombardment in the strategic bombing campaign. It was apparent that worthwhile coastal targets were too heavily defended to be safely attacked at low altitudes. And it began to look as if the mediums could contribute only incidentally to the success of the strategic bombing campaign. General Eaker consequently decided to place them in VIII Air Support Command and train them primarily as part of a tactical air force for the purpose of supporting the ground forces in the forthcoming invasion of the Continent. Meanwhile, crews could continue to gain experience in medium-altitude attacks (10,000 to 15,000 feet) against strategic objectives under heavy fighter cover.96

Viewed as a whole, the success with which the Eighth Air Force solved the problem of penetrating rapidly stiffening enemy defenses...
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may be estimated in terms of the losses and battle damage incurred.

For the five months from January to May, inclusive, the total loss rate, expressed as a percentage of credit sorties (i.e., sorties in the course of which the aircraft has entered battle or been subject to attack) was 7.8 per cent. This figure includes both those bombers lost in action

and those listed as falling in Category "B," that is, damaged beyond economical repair and unable to participate in operational duties, expressed as a percentage of aircraft actually attacking the target, the figure rises to approximately 1.2 per cent.ighter losses in much later, amounting only to about 0.7 per cent of credit sorties, but this

may of the aircraft on which the figures given were based had been planned in such a way as to recycle the inexperienced units a relatively to early action. Of the other losses in action (not including Category "B") over half were known to have been lost to enemy

aircraft, and several of these listed as lost to unknown causes
doubtless met a similar fate. But, on the other hand, could be

credited mostly in part with the destruction of all slightly over 1%

per cent.

For little change, this story is somewhat different. A trifle

over 20 per cent of all credit sorties resulted in reportable damage,

not more than 6 in five of which could be considered damaged to a major extent. Of these damaged aircraft, approximately 50 per

cent were hit by flak and flak alone. Doubt and it possible

on any other occasions for enemy flak fire to destroy the bombers.
NOTE!

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entirely.33 Thus flak, while of small importance as an immediate cause of bomber losses, is a major source of danger, and since a dropped plane usually becomes a straggler, flak is an important indirect cause of losses, as many flak guns place beyond the principal obstacle in the path of the daylight bomber.

In the late air forces tactical experts had to grapple with the problem of penetrating enemy defenses as a matter of most immediate urgency. They had to consider that the primary purpose of interception is to strike the enemy, and of precision bombing to do so with the utmost accuracy. The basic techniques of point-bombing had been elaborated during the first five or six months of operations, and their close relationship with the requirements of defense had been initially explored.34 During the first half of 1943 it was therefore mainly a question of increasing the skill of the combat units, of developing established techniques, and of adapting them to the needs of a larger operating force.

For reasons of defense it had been a standard operating procedure for the bomber force to bomb in some sort of formation, and by now a considerable weight of opinion favored bombing by constant box or group, with aircraft dropping its bombs on a fixed line from the lead bombardier. But during the period in question a variety of sighting operations continued to prevail. Group formations frequently dropped on the leader, who sighted for both range and deflection, but often individual bombardiers set the formation forward through range of fire, sighting, and often the individual squadrons dropped
on the sighting of their own leader. In these test operations sectional commanders of the gun in the actual study of results, recommended strongly that, instead of using leading, to be dropped on the leader rather than hunting to individual aiming for range, it was suggested that the efficiency of using a leading target could be enhanced if the length of the resulting pattern could be reduced, either by flying closer formations, or by dropping, or properly on signal, or both. In practice, hunting on the leader itself, buttressed by careful technique, although not unimportant remained to factor or other variables, and, of course, particular problems arose for different solutions. An additional lesson was that, for example, the units, often booked in flights of six or more, become a group to be handled, could a merely be too long to be effective or economical.

In each, also, the pilots found successfully to employ the automatic flight control equipment (ACE) as an aid to accurate sighting. For purposes of this rate the pilot, which could be controlled by the standard or ease, to its own, or in synchronizing aircraft with aerial positions, and to provide a standard. The leading ram could be achieved even by a single pilot. The second immediately before the last order released his body and made the critical point in the taking aim, for it was best that the bomber performed his final sighting operation. So it was essential that the aircraft should be held as steady as possible to a steady course without slip, slide, or change in altitude, and

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That the pilots be as free as possible from the influence of the\nOne of attacking fighters. Direction of this sort is impossible\neven with the cost of pilots, with those produced by the hasty\ntraining programs into which the US had been forced. It could not\neven be appreciated.\n
Producing as it was in theory, the 105s had proved disappointing\nin its earlier trials. By March, however, certain modifications had\nmaterially increased its usefulness and on at least two occasions\nduring that month it was used by a group to work with very\ngood results. As reported on 18 March the most surprising results were\nachieved when the 105th Group, dropping on the tail\nof its lead bomber, the had used the effective pilot, overflown in\nplasma on 70 per cent of its bombs within a radius of 1,000\nfeet of the aiming point. Although not standing entirely free from\nuse of the new equipment, the results of the 105th Aviation did much\nto overcome a prejudice against it still prevailing in many quar-
ters. Although it continued to fail occasionally, and although unfore-
saw circumstances continued to prevent its employment on the bombing\nrun, the new pilot continued to give good results; and as it\nbegan available it was installed in the lead planes of most bombing\nformations.\n
Partly because of improved techniques and partly on account of\nthe increasing experience of the 105 groups operating from the U. S.\nunder October 1942, bombing accuracy in the Eighth Air Force im-
proved appreciably from January to November. The records are of\nuneven value, but it is possible to notice that it rises in January
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In January, a group could consider its training above average if 80 per cent of the shots were identifiable by photo record. In April, a group could consider its training above average if 75 per cent of the shots were identifiable by photo record. In each class, April training was not superior for groups to record 90 to 95 per cent in that category, and several instances were reported where the 80 per cent mark was not obtained at all. It is also noticeable in the consideration of shot hole patterns, the shots of the better results were obtained under conditions, which in the fact of high haze, resistance, etc., for instance, a Dr. on 17 April, then very satisfactory results were accomplished (one group placed 62 per cent of its shots within the 1,000-foot radius) in spite of very heavy flak over the target. In other fighter attacks, hazy weather, and heavy curtain fire. Over-all results of outstanding accuracy were obtained at Ramo and Fort. Such in Pork, at Cork in India, etc., could in

However, the results of mileage, of course, continued as results in complete failure. One group once in three failed a bombing run could place the center of its bomb pattern over 3,000 feet from the aiming point. Many of these so-called gross errors were not completely the fault of the bombardiers. In several instances poor visibility and inaccurate bombing; it possible. In other fighter opposition was so effective that it broke up the bombing run, etc. On 20 April, then the lead of the tanker was shot down just as it was approaching an enemy, and the rest of the unit recovered from the equation of the combat only to recover their own air as far as the to 15 miles from
the target, as usual, too, the transport in the lead plane could not function properly, but another in their group, it other columns were dropping on the target, to both inaccurately.

out on any other occasion the trouble with the replacement or inexperience of our entire line. Condition of the training run, failure to follow instructions or to test instruments, overconfidence, or simply lack of adequate training, occasionally led groups astray. Inexperience became especially noticeable once in the early bombardment of open operations. Later on, in the close-in hard-ship division, the groups were to do distinguished service, but in their work as erratics in the extreme. In the long-haul, for instance, very few of the our most accurate missions. In the mid to late days, some, the day before, everything was over, and in the conclusion the target escaped unharmed.

Indeed, the latter part of this week is an indication of a temporary decline in overall bombing efficiency. Not the inexperience of an entire unit, but only one of the planes involved. But importance was the fact that a larger portion of the force, minus a... problem... for a certain time, about formation by wing, notice in enemy's air force. Tactical analysts, was that the leading group or groups tended to achieve better results than those following them. In the trouble the latter tend to decrease appreciably in experience, which, in the handling of heavy bombing force, is an absolute must. It is difficult entirely to account for it except on the ground the preceding formation, insofar as they are
unbelievably influenced by these preceding ones. are subject not only to the adverse conditions ordinarily expected in attacking it, in line to conditions created by the distance of the leading group as well. At any rate, regardless of the state of training of the units involved in a mission, the incidence of gross errors was likely to increase in direct proportion to the size of the operating force. The problem of ensuring maximum accuracy in the overall attacking force became entirely separate from that in the individual bomb unit. In meeting the need, the ideal solution would have been never to allow more than two groups to take a single target in a single attack. The distance of a single large force is deceptive, and so the solution had to be sought during the succeeding months, principally in experience or relatively required in lar - 

 scale operations.108

Another problem was raised by the employment of incendiary bombs in a relatively large scale by large turbo-driven bombers. Incendiaries had been employed sporadically in the fall of 1942, but not then used since then. Now, in 1943, it was said to be recognized that incendiaries might, by destroying the heart of a city, place and economy, cause far industrial damage in certain circumstances than high explosive bombs. On three occasions, at

This PAGE Declassified IAW EO12958
a closer approach to the target before release, a longer bombing run
was required by units carrying them, which meant that the leader of
the air formation had to take into account the extra distance to be
traveled by the unit carrying incendiaries, and had to plan his withdrawal
accordingly. The unit had also to be placed in the last position in
the formation in order to prevent other groups from flying through
the cluster formed from the falling incendiaries. There were no
difficulties with these tactics: the incendiary group was likely to
be in the least well protected position in the formation, and the
longer bombing run necessary; then incendiaries formed part of the
air load left the formation early to empty out for an additional
unprotected period. On the air division of 17th, for instance,
a group of 17 L-44s carried the incendiary load and lost five of
its planes over the target area. The problem of the hard-
ness tended to disappear with the onset of darkness.107

Conclusion

Looking back over the operations of the preceding five months,
the evaluation of daylight bombing could be the end of my point
with a whole chapter of pride to the accomplishments of the daylight
bombing force. If the study had not produced an absolutely conclu-
sive result, it had at least done much to solve certain formidable	
particularly

Omissions, it is true, for example, as not yet been brilliantly
or had clinical history, conjectures not only for American
sources but from the Royal Air Force and the British Air Staff.108

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THIS PAGE Declassified IAW EO12958
by Jan. 1944 the Allied forces had taken its part in the Combined Summer Offensive from the start, making the plan for which had started during the preceding winter. With January it had become obvious that the sources of the forces of the drive, and the results produced, were accurately foreseen by the spring of early reaction, both in quality of troops at hand in Italy, provided by the day by day campaign. But the importance of these early operations of 1944 lay in the tactical lessons learned not on then in the strike in results. In particular, forces had been engaged in Italy; but the enemy, in testing the capacity of its own tactics, was patient, and in returning, both the scale and scope of its operations. In the latter endeavor it succeeded substantively, although the rate of increase of its forces had not been so rapid as its plans had hoped. During May it had reached the 100,000 mark; in June it had 200,000, and it had flown as far as 500 miles to attack objectives in the Dora line.

More significant, however, than the enlargement of its effort was the experience it had gained in holding, in generating enemy defense, and in handling territorially increased forces. In order to profit by that experience, its tactical doctrine and methods were flexible and adaptable to the situation. From this point, in a sudden tactical situation, still decided in large part by a general and increasingly mobile enemy. An experience of this order revealed the basic and complementary facets: first, the more the more, contributed the greatest threat to the Allied forces, the more the more, contributed the garment of early reaction, both the scale and scope of its operations. In the latter, the doctrine of the Allied forces is possible, not only for...
that the C3V had to be destroyed before the bomber offensive would
accomplish its strategic purpose, and that high hand strategic lead-
ing of Berlin was tactically feasible. Both conclusions are of en-
ough importance in tying the final plan for the Bomber to be a
success.
The establishment of an Allied air offensive against Germany, in the initial phase of the war plan, but it left much to be desired, for the concept could become a reality in a limited way. The Allied air forces would be built up to the point for it could carry its weight in the air operation and eventually, and a comprehensive plan of the need to be carried out. According to such the combined forces might operate effectively and eventually would be a reasonable hope. But within a given length of time, the planned invasion of Western Europe might be successfully launched.

On 17 July 1935, the O.S. approved the "Plan for the Combined Air Offensive from the United Kingdom," on the basis of which it issued, on 13 June 1936, a directive officially inaugurating the O.S. program. While planning was undertaken, the very elaborate and elaborate plan that had been attempted, once the O.S. committed was fully deployed in the strategic offensive against Germany, and since most of the outstanding problems were then centered upon the build-up of the U.S. bomber force and the extent of its part in the combined operation, the burden of planning fell mainly on the O.S.

**Logical Considerations**

The build-up of the Allied air force was crucial to the success of the plan, and the proposed...
as thought effective, it could be necessary to have more or less ready to strike new installations as seen as the first spring but in any daylight operation possible. But it was not until the build-up of the forces could begin in earnest. Meanwhile the Eighth Air Force continued to right with the few better for occasional or effective operation. During the period of January, February, and March, its average was not near what it was in October 1942, and in March it could take a lot in a given day combat sortie of 72 operating combinations (30 bombers and 42 escort). In April, improved somewhat in April, but up to the end of early September operating groups (104th and 295th) reached the total effective rate, 294,000. Moreover, prior to 3 April, the 48th Fighter Group, equipped in area with P-70’s, was the only U.S. fighter unit consistently available.

But the difficulty of not only that it was not until the invasion could closely plan daylight operation. In more limited and cutout position, one of the Horsa paratroopers during the winter months the Eighth Air Force had been far and in this respect because of the inevitable result of the 1939 occupation, all of temporary restriction, the placing of the other the operating groups to a marked extent. This was especially noticeable in combat and other total effective strength suffered not only from actual combat losses but from operational. Prior to the first of January, a plane on average over the total of only 29, 97 since 37 lost; and

It was estimated that by March 72 so that or 15 would have to be considered satisfactory. Several group over 500 of the ordnance to 50 per cent
strength, with the vital statistics of attrition underlying the
end of the remaining crass. During 1942, even availability had
not seriously limited the force that could be put into the air at
any given time. Beginning with February, however, the situation
shifted appreciably, and from then until major availability of trained
air crews generally covered the number of bombers that could be dis-
patched. 2

With this situation in mind, Maj. Gen. Ira C. Eaker, CO of the
Eighth Air Force, and Maj. Gen. Truscott, AOC, who had succeeded
General Spaatz on 3 February 1943 as CO, AOC, urged the War
Department to accelerate the air build-up in the U.S. in any way
possible. It was, they urged, essential that the Eighth Air force
be increased at once to permit the simultaneous dispatch of at least
200 heavy bombers, an objective which would require an estimated 100
bombers on hand in the theater. In a figure, not distorted by the
ultimate requirement of the combined effort seen by the nature of
the projected task. It had been apparent to both that future
fighter strength in the U.S. had been augmented by increased produc-
tion and by the transfer of units from Russia and the Mediterranean,
and, after 500 planes were considered the minimum that could
operate economically and effectively in the face of this growing
opposition. Moreover, a basic strength of 500 planes was held neces-
sary to secure confluence of action against vital area targets.
Until it could be attained, the day before could only "nibble at the
fringes of German strength" and inadequately exploit her defenses. 3
In official correspondence covering the
rate of the build-up of the U.S. army forces in the
area, General Omar Bradley, in an exchange of
letters with General Eisenhower, indicated that
the rate of increase of the army forces was not
corresponding to the needs of the situation. The
Allies were driven back in the early months of the
war, but the tide began to turn as the Allies
strengthened their forces. The Allies were able
to take advantage of the Allied forces in the
Far East and the Pacific, and by the time of the
Battle of Midway, the Allies were in a position to
begin to push back the Japanese forces.

As I understand it, the success of the
Allies in the early months of the war was due in
part to the ability of the Allies to supply the
armies with the necessary resources, including
food, fuel, and ammunition. The Allies were able
to take advantage of the weaknesses of the
Axis powers, such as their lack of industrial
capacity and their inability to supply their armies
with the necessary resources.

In the meantime, the United States and
Great Britain were working together to
strengthen their forces and to develop new
strategies for fighting the war. They were able
to take advantage of the resources available to
them, and by the time of the Battle of Midway,
the Allies were in a position to begin to push back
the Japanese forces.
"...or the basis of our vital interest in which you can be firmly established."

It was the vital interest of U.S. to build-up and maintain the actual flow or 99.99 percent of aircraft to the nation's 100 percent. It was also clear that the projected flow of aircraft, production, production, and training in a critical role, particularly, but the most pressing, was the therefore essential for the 1942 air transport to total planned build-up in the approximate rate. Early in 1942, the modified its direction in Washington that provision in the fiscal year for 63 bomber airfields in the U.S. on which to accelerate this build-up on the basis of our critical need group for airfield, and its specifically requested information concerning the critical air build-up as a basis for construction planning. General Arnold submitted a similar request for his own planning purposes. To this, however, it was not to such a question of the projected accommodations being adequate or if the American forces wing fully the early use of them. To date, General Arnold on March 10th stated, "...the main (3) to this critical need to increase, or to provide, in their facilities or their 100 percent, it will be reflected in providing insufficient airfields and facilities for the critical air force to be deployed from this country."

But it was not enough for Arnold and his staff to provide the critical flow information. While critical in operation of U.S. forces, and critical that the critical as the directive, is placed on a rapid increase in the U.S. forces or forces, and that flow information..."
essential to direct planning in the U., but we were not able to do much about it. Although we had been discussing the future since the end of 1922, but after the defeat of N.D.R and the reorientation of stra-
ttle policy to the Latin America, it had been impossible to make
first commitments to the U.F. In October 1927 the Secretary of War
had projected a total of 260 bomber groups and 11 fighter groups for
the air force in 1928. By a further 1929, 1930, and 1931, this
number had increased to 500. The planning of long-range plans upon
in order to the British request for the information, General
Scott wrote in February 1928 a plan to the chief executive in
Washington which called for the following build-up of U.S. air
forces in the U.K.: 10

<table>
<thead>
<tr>
<th>Date</th>
<th>Bomber Groups</th>
<th>Fighter Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>28 Jun 1928</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>31 Dec 1928</td>
<td>37</td>
<td>11</td>
</tr>
<tr>
<td>31 Dec 1929</td>
<td>57</td>
<td>25</td>
</tr>
</tbody>
</table>

Note that fighter units were to be reduced to a limiting total of
11, in accordance with the current policy. All other details, in
the Department of State received the principle determination of the
planning objective during the spring of 1928. But they were issued
with no strictest reservations; it was merely noted that the eastern
overseas are available, and are kept to a definitely unprofitable
11

Several of these factors operated during the period prior to
May 1929 to the distinct disadvantage of the U.S. air build-up in
the U.F. It was at the request that that project (as, for example,
referral to or the taking-over of a company subject to ex-
ternal factors. Indeed, the impact in the entire pro-
cess, it became clear to resolve. It was realized that the economic problems were not predominantly re-
related to the equipment itself but also to its ability to
meet the demand in the U.S., and consequently divertions to other areas continued to be a factor which only by early intervention could some
resolve. The 2-17 groups, the 39th and 50th, which had
been scheduled to the initial quota for the Eighth Air Forces were diverted to the U.S. Liba to form a group of 3-17s, the 80th,
originally destined for the 30th, was used in the area to the 39th
area in Europe. It was decided to reinforce the first split of the
by one or two 45 groups out of the initial quota to the U.S. In addition to these divertions, the existing utilization of the
Atlantic was increasing strain on the resources, that further
delayed the flow of the equipment to the Eighth Air Forces.11

Each group's diversion is still reflected in the part of
aircraft that was in the inventory or delivered the staff in windshield. It was for that reason that the utilization of forces in the U.S. in
the effort to maintain the base of work and speed up equipment
but overriding strategic considerations, coupled with considerable
pressure, led in favor of the equipment being at little cost,
but instead toward the U.S.12

Divertions inevitably raise over the importance of the
the utilization of unit's units over cost at the U.S. As it

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As of 20 April 1943, it was reported by JL 18 for the Service that 500 B-17's and 45 B-24's were either in the air or on routes. 17 And this means that the initial force during April will still operate with the Sixth Army Group, which provided a fully operational average daily strength for the month of only 158 planes. 18

So the delay in receiving, even a partially effective striking force in the U. S. before January and 1, 1943 was explained with reference to certain contingent factors, chiefly determined by the lack of available shipping for the transport of ground personnel.

Despite the resolution on 15 October of the date to develop the bomber offensive from the U. S. as rapidly as possible, priority is given necessarily to the invasion and critical operations in the Mediterranean. To finish TOB, and prepare for the Y plan that about all available transports would be required during January, early, and April to carry troops to North Africa. 19 Thus, even though the D-day is 11, February 1943, priority to the air forces in troop ships off so that 20 arrival of the troops in the theater fell off sharply during those months. In November 1942 and January 1943, the troops had been moved to the U. S. at a rate of approximately 500 per day, placing in the theater as of 20 January a total of 12,400. During February, only 300 per day moved, and during March only 630. The situation improved somewhat during April, and during May 22, 1943 troops were carried to the U. S., totaling...
Check "Joint/Allied/British directive on Day Bomber..." cited on p.15 (bottom para) of AAFR 4-18.

Exterior page on p.57 and p.62

Buildup 12 AF + depletion of PMF per 103 of AAFR 4-18

p.106a - discussions about ability of AF to hit targets & defend itself.

Development of policy p.123

Development of policy on p.135 and following pp

Independent bomb ops p.135 - p.137 and important

Aircraft production p.154-

Check "Joint Directly" of 20 Apr 42 -- cited on p.163 and other command problems pp.165-166

Problems in selecting a deputy for Air 171 ff

"The case for bombardment" p.174

Arguments for day bombing p.186

Priority objectives listed on p.191
Although the shipping space for personnel was almost depleted, cargo shipping proved no bottleneck. In fact, more space remained accessible to the Overlord project than could actually be required, and in order to make up for it, the policy was changed by the use of shipping equipment and supplies to the utmost extent in lieu of the initial arrival of the troops. By June 22 the bulk of the depleted cargo space would be in use. This has led to the end of the battle and the bolstering of troop shipping accordingly has been progressively less severe among the later part of the, although shipping in general remains a seriously limiting factor on all allied operations. 

One is also apprised in chapter 11 virtually no shipping could be available for moving troops to be on or prior to 17 July. Various factors were involved, but essentially that, if ground equipment and service troops could not be shipped, it will be impossible to move battalions as fast as they can arrive, and the ground troops to be sent at the first opportunity. Initially they could not be able to exert at a high level of efficiency, and if in enemy action at that late but relatively but initial effort will be to achieve a line of the ground troops among the enemy. In this ve, it is hoped, initial training and consolidation could be completed and the units prepared for operation by the time the ground vehicles...
arrived. They plan to, in fact, rebuild, and on 12 March 1918, they were able to report that a total of 452 tanks, including the fight seldom on six groups, were scheduled for work during March and April. All units, incidentally, are to receive one regimental aircraft to arrive with an R.T. at the center.

This nervous flight condition was reflected in aircraft without all quite ground all service troops, of course, only a temporary expedient, and an expedient of last resort at that. For it is obviously tending the services of ground crew already in the theater. Still, it caused added heart to the VIII Air Service Corps, which is still sending a good proportion of its air servicing units for a little (the 2nd Base of aircraft from the U.S. to service the normal until June 1915) and which

in itself is subject to reinforcement as a result of the quality of present shipping. The top echelon could operate only so well in the initial echelon, but it was not enough for the mind over the enemy in the fighting districts. The existing situation would be further complicated if they were able to move a timely enough to the front line, at the worst even to the worst, it would try to do the ground service on the front line.

In reality this point is clear that, although air transportation would indeed be provided for the shipping situation, it would not be practicable to rely on this crew even though personnel to provide substantial relief. Much of the work ground crew personnel and
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The situation in China has continued to improve, economic and military aid has been received in large part from the U.S. and its allies. The U.S. government has continued to supply China with military equipment and resources.

The formation of a unified government in China is still under discussion. The Chinese Nationalists under Chiang Kai-shek and the Chinese communists under Mao Zedong have been in negotiations for several months. The U.S. has been mediating these talks, hoping to strengthen the Chinese government and provide it with more support.

The military situation in China remains volatile. The communists have been gaining ground, but the Nationalists still control significant parts of the country. The U.S. is providing military aid to both sides, but it is clear that the communists have been receiving the bulk of it.

The U.S. is also continuing its efforts to bring about a peaceful settlement in China. The U.S. has been working with the United Nations to secure a cease-fire and negotiations.

[Security Information]

THIS PAGE Declassified IAW EO12958
A study which reflected a deep concern over the problem of shipping, and it was thought that such an effort would be of great value in improving the condition. The study was conducted by the Air Material Command.

As early as April, logistics studies had revealed the need to examine in detail the entire problem of equipment deployment and its effect on the overall capability of the Army Air Forces. In implementing the 100 percent combat mission for the United States, it was essential that this mission be achieved with the available equipment. The Air Material Command was limited in its ability to supply the equipment to the combat units of the United States Army Air Forces. The study concluded that the Air Material Command was not in a position to meet the requirements of the 100 percent combat mission.

A detailed study, according to the current program, should eventually be in the U.S. Army so that plans for all types of equipment, including 1,170 reserves, could be established. The study concluded that the Air Material Command was not in a position to meet the requirements of the 100 percent combat mission.

Only by the direct action of the Joint Chiefs of Staff, it was decided, could the Air Material Command meet the requirements of the 100 percent combat mission. The study recommended the establishment of a 100 percent combat mission committee to be headed by an officer of the Air Material Command, to proceed to the United States in order to study the various aspects of the 100 percent combat mission. It was recommended that the committee be

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and B-29s in the process, calling for 1,000 off on local
strength to 2,750 planes, involving 40,000 air crew. To be noted
overseas they could be sustained or could essentially be
used the re-crew of other 1 partent. Consequently, it would
have to either to reduce the size of its proposed overseas aircraft
strength or to re-organize it, that forces and units in such way
as to support with adequate strength, in aircraft with major
the D.O. . . ., should be suggested, either more opportunities for using cur-
rent than any other that: "First, because it is highly important-
ial . . ., second, because the ground situation is stable; and third, be-
cause the weather will ultimately have half of our overseas strength.

Until recently, the President has been instructed to study, among other things,
the possibilities of operating, maintaining, and supplying, on a large scale,
fronts of its forces from the U.S. 18 million of 100,000 aircraft
strength. If this proved impractical, it would be found that air-
crew strength could be operated with that strength in proportion

In reaching the steady state, subject to the circumstances
may be left, detailed to, or transferred to areas that will apply strategic
latter to logistical limitations. Originally formulated it
recommended the following: the of tactical groups to the

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<tr>
<td>Labor</td>
<td>2</td>
<td>8</td>
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<td>21</td>
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<tr>
<td>Fighter (night)</td>
<td>1/2</td>
<td>1/2</td>
<td>1/2</td>
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</tr>
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<td>A.T.</td>
<td>1/2</td>
<td>1/2</td>
<td>1</td>
<td>1</td>
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</tr>
<tr>
<td>Aircrew</td>
<td>1/2</td>
<td>1/2</td>
<td>1</td>
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</tbody>
</table>
it also established the interdiction of pipelines, and the
broads to the 3rd Air Force, which priority to combat units
forthcoming in the subsequent period. In this manner, it served as
the main point of action for the early days, and still constituted the
principal basis for the 3rd Air Force, especially in the
initial stages of the battle.

Since the detailed analysis in an Army intelligence report, however,
the Joint Chiefs of Staff, in agreement with the
Commanding General of the Strategic Air Forces, concluded that
the situation was fluid. In the light of the analysis for
the 3rd Air Force offensive, which was under consideration
and approved by the high command, the proposed plan for
the 3rd Air Force offensive was modified and
abandoned.

However, the plan to interdict in the 10th Air Corps
would not be abandoned. An order for
the 10th Air Corps to interdict one group of
12 January 1944. This represented a considerable
increase from the initial target of 12
or 13 air groups, which, however, had not been planned for
the initial deployment prior to March 1944. As a result, nevertheless,
the goal of 12 groups advanced in date to 10 February,
which in June 1944 was the current planning objective.

The creation of a new selection
was the development of an over-all, long-term plan
for the 3rd Air Force. Based on the pre-war, and future
the future Air Forces could not have
planned.

... an attempt at early victory, the enemy could
continue to counteract the offensive, and the
intervention of the 3rd Air Force was
not as difficult as it was in the past
offensive, suggesting that was not a satisfactory
choice.

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... it will be necessary to determine the impact of this aspect of the situation on the overall industrial policy and its relation to the solution of the strategic situation in the Far East. In order to begin this analysis, it is essential to clarify the basic issues of the current crisis, including the relationship of industrial planning to the overall strategy of the situation. It is essential to understand the problem of industrial policy with particularity.

Indeed, during the period following the conclusion, the U.S. took an initiative in planning for the future, seeking to ensure that the existing situation was not repeated. This initiative involved the establishment of a new system for the selection of targets, which was drawn up substantially on the basis of a report submitted to the Department of War by a committee of experts. This report was based on a thorough study of the existing situation.

The U.S. sought to ensure that the industrial objectives in Japan were taken into account decisively in the short term. This resulted from the application of industrial policy, which was a key factor in the overall strategy. It is expected that the results of this initiative will not be left unaddressed. In the report, the attempt to apply a scientific method to the problem of target selection is noted as one of considerable historical interest.
The split of Operations Analysis (OA) into separate parts is to be carried out. The aim is to establish a clearly calculated theory. An operations analysis is intended to be the key tool for more effective systems in the analysis of objectives, and for determining which would be of the greatest benefit to the plan or, from a strategic viewpoint. It is founded solidly upon faith in the scientific method, and on the specific belief that the united effort could be applied successfully to each target. The concept, throughout the Bathroom Hamlet in the American sense of precision, is being industrial analysis. It is possible to destroy the system in the area of for a production without expending effort a silliness or laboriously on objectives of less than vital importance.

For the first, it is not obvious why in the analysis of any industry one is to bring the many parts into its proper focus for attack to begin operations, to estimate it, and to decide in relationship of each part to the overall effort. The knowledge that the product of each industry is valuable to other industries is valuable to each industry itself. Thus, careful thought will be required in the plan for eliminating an industry, as for redefining one. In the individual industries, it will be possible to plan to the reliability of destruction in each industry. After this has been accomplished, each industry could be listed in order of priority for attack, all non-target within each industry.

With regard to the information: The document contains sensitive information.
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in the course of the military mobilization and to be obtained to the following questions: Is there the initial requirements of the enemy? In other words, at the point could a certain liquid to the front-line military effort or the enemy's initial production capabilities of the enemy? Is enemy capability in any country, including overseas, capable of the task, such as total or nearly self-sufficient in the end? Is it true that, in relationship between enemy capacity and initial requirements, leading into consideration stocks and available substitution? Are the elements that lead to that key step or total capacity in a limited by new plants? Are the physical characteristics of the installations under construction in the building and chain of structurally essential to high-explosive and incendiary attack is not preclude any circumstance to effect to destruction on one plant and the effect on front-line strength is not to effect its necessary destruction? In short, will it be cost?

one of the most important, no one today, the initial requirement of an initial liquid to be productive capacity and the result, the destruction is plant destruction and effect on front-line strength, or of particular importance, is not enough, for example, to establish the fact that bringing to producing a certain quantity of liquid and that it would be possible to destroy a certain percent of its total capacity to its critical

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problem was rather to determine whether and to what extent it would be possible for the Germans to make use of alternate capacity in the form of stand-by plants, to restrict non-essential consumption, and to draw upon stores of already processed material. Knowledge of the time factor was equally vital.

If the full effect of a bombing program would not be felt for 12 months, it would be folly to attempt in six months a ground invasion which depended on prior success of the air attack. Moreover, if the effects of a bombing program were too long delayed, there was every chance that the enemy could adjust his economy in such a way as to reduce or even erase the effect of the bombing on his front-line strength. So it was useless to attack an industry laying too deep in the economic process; and it was equally futile to strike indecisively, with a force and at a rate unequal to the task.

These, in brief, were the principles of target selection with which the GDA undertook the task of analysing German economy. The principles were not the product of the moment, however. In fact they were fairly well developed when, in December 1942, that committee began to function. Back of its work lies a long history of target selection. Owing in part to their close proximity to the German-dominated Continent of Europe and to their extreme vulnerability in event of war, the British had, since 1929, been at work analyzing the industries of potential enemies with a view to possible strategic bombardment. Their approach was substantially the same as that of the GDA with one exception, namely their emphasis on the bombing of areas rather than of individual installations. Just as the American analysts had their method shaped by their operational doctrine, so the British were influenced by theirs. British analysts were not, however, unaware of the virtues of attack on key or on so-called
"bottle-neck" industries. A paper prepared by the Air Ministry in July 1939 called attention to the value of these restricted objectives. There were, it said, "vital spots in industry as well as in the human body," but it warned that those would probably be well guarded by natural circumstances or by artifice. In addition, there are . . . many alternative manufacturing processes, and the manufacture of an essential commodity is frequently already undertaken or can readily be started in many different factories, particularly in countries which have made a deep study of their industrial economy and have organized their industry to meet modern war conditions." Area attack, on the other hand, is not intended to imply an indiscriminate scattering of projectiles over the whole or any part of a specific industrial area . . . On the contrary, there will be definite objectives in the area itself normally consisting of industrial targets which constitute the chief vital spots of the industrial body.

Despite a continued willingness to consider the destruction of specific industries vital to German front-line strength, the British, in emphasizing area attack, laid a basis for target selection which could not easily accommodate a force devoted to the attack of precision objectives. Just as the RAF plan of attack differed from that of the American, the industrial intelligence compiled by British analysts was likely to differ qualitatively from that demanded by the USAAF. During the period when the AAF was planning its day bombing campaign against Germany, and during the earlier months of that campaign, the American force depended for its target planning largely on British intelligence sources. But it was inevitable that sooner or later it would have to make its own analysis of German industry conducted specifically for its own purposes.
The plan for any in the situation at the outset Information
Statement, 30/10 44. By the action of 1942 it was indicated to
an increasing extent for many years later to proceed with
the plan. It would be difficult to assess by actual figures
an industrial system, but without any rational view of ejection.
It therefore set out to compile a series of tables of specific
industrial systems which call for the heart of the problem of
wartime selection. Actually speaking, that was applied as they
very slowly, upon by establishing the importance of the industry
in question so that our action will be as follows:
(a) Field tests of the main industrial units in the field,
and of the railroad supply industry in the analysis with
regard to its vulnerability to air attack, and
(b) Field tests of the necessary for interjection of mail, bulk
solutions in reducing flying strength.

One of the most difficult points to establish is the relationship
between railroad and supply systems. At the beginning of the
art of rail and industrialists, in that of the railroad
above, assuming that supply was readily divided by rail. But
that could not be done, for instance, with some degree of
accuracy. For rail, for example, that we are much
reduction in rail. Rail needs the country could unload and still
keep it or be effectively deployed, replied that the rail
capacity on any strained and that any reduction would have a
serious effect. Of course requirements and line requirements
were often to different levels, and on further study it was

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estimated that a reduction of almost one-third of U. S. railway could be absorbed without impairing the war effort at all. Analysis of German rail transportation convinced the air analysts that no effect on German fighting ability could be expected until 31% of rail facilities had been destroyed. Similarly it was estimated that other German industries, no matter how vital to the war effort, were less tight than had generally been thought. 46

The Air Estimates, by December 1942, had become the subject of considerable discussion. To some observers they seemed to smack of defeatism; to others they indicated a need for still more concentrated effort along the same lines. In either case they contributed to a mounting concern in the Air Staff regarding the problem of target selection in Europe. Also contributing was the controversy over AIFD-42. That document, essentially a statement of U. S. air requirements, had, it will be recalled, been built around the concept of a systematic bombardment of German war industry. It had come nearer than any document hitherto produced in AAF Headquarters to being a comprehensive bombardment plan: and insofar as it attempted to name each feasible target in the major industrial systems and to estimate according to a rational, if somewhat theoretical, method the size of force required to destroy the objectives, it represented a step forward in the direction of systematic target selection. But it had been completed in September, before the other efforts of A-2 had gone far enough to provide the systematic body of industrial intelligence considered necessary for that sort of study, and it suffered from the inchoate state of target information prevailing at that time. AIFD-42 was under discussion at the highest level during most of the fall of 1942, and as the discussions progressed its limitations in the direction of target analysis became the more apparent. 47

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On 1 Oct. 1943, General would sign a directive requiring
Col. L. A. S. M. to carry the ball at section.

At the time each group existed alone in a different organization,
but Colonel had the authority to create one to organize air
action and civil control for the purpose.

While in this part of the inst., the
Air Staff Study & wrote to, in this
instance, the staff of the service in
part, for the purpose of getting an idea of
the need for air planning, and in
the time for which a regular person is provided to
perform the operation, to
result conditions accordingly.

To be carried out in part for civilians and
in addition to him list, Jr.,
Mater., Mat., Mat., Mat., Mat., etc., leading an individual
list, to be well known and not
in the Department of Economic and the
Chief of the Office of
strategic Reserve,
the Director of the
Office of
strategic Reserve,
Commd. of the
Office of
strategic Reserve,
Commd. of the
Office of
strategic Reserve,
Originally called the executive officer's detail, this group was to be known as the Committee of Operations Analysis.82

Administratively speaking, the creation of the 50-C was an important step, because for the first time in the U.S. it led to the collection of industrial intelligence from all sources. This is not to say that the analysis of this information for the purpose of air target selection was a new responsibility. It also did a useful service by removing the task of target selection from the more restricted channels and making it more open and available to those who could handle the problems in relatively obscure staff work.

Subcommittees were delegated to study the pertinent questions on industrial aspects such as industrial capacity. Each subcommittee was to be supplied with the records of all the various government agencies and to make recommendations to the 50-C. The sources of information tapped by the 50-C subcommittees were very varied and included records of the Air Department, OSS, O.S.P.O., C.I.O., the Bureau of Foreign and Domestic Commerce, the Department of Justice, and the State and Treasury Departments. The British Ministry of Economic Warfare and the M.I.5, the Ministry of the Air, was also continued to provide valuable data.56 In January 1943 four officers of the 50-C flew to England where they reported on the British experience in the field of industrial security and the economic warfare division of the Ministry of War Production, both of which had been working on the problem of industrial security.85 The British, who had been working on target information in the theater,85 according to this committee, had an industrial aspect that was highly industrialized country could be handled more effectively by the Industrial Intelligence Division.
concern, the OSS placed direct attention to the organization was physical characteristics of important ... industries... was much of their information and the qualitative aspects in private industry. 

Many industrial surveys had been completed, or were nearing completion, or by different industries. 

On the basis of those taken in 1943 reported its findings to General Arnold, as Director of Production. He called upon him to place upon which the remaining causes of over-estimation military strength might be released through a variety of forces and to make an invasion of the Continent and the conduct of a War. He was unable to do for the reasons first, he could not forecast with any degree of certainty the air forces which would be available, no, much, but the operational experience of the Japanese air forces to date furnished an inadequate basis for conclusions as to accuracy, attrition, and other operational factors affecting such propositions. In all, however, present certain important conclusions. 

It is better to cue in late. The instruction is a new essential industry at a point but, to carry. 

All war needed to occur in any industry, whether collectively or individually, and in each. Should be tailored to each situation in action.

Some results the projects were immediately, it will be necessary to

(1) an instruction stating a contribution of its efforts to field military in a variety of industries not in this effort. Also, the actual conclusions of its work, a conclusion on the industry's individual effort and conclude other factors.
(2) In view of the ability of adequate and properly utilized air power to damage the industrial sources of the enemy’s military strength, only the most vital considerations should be accorded to delay or divert the application of enemy air striking force to this task.

It stressed the need for continuing effort in the analysis of target information, and for continuing close cooperation between British and American agencies in this regard. It further recommended that, since operational factors such as weather and the disposition of the enemy were only to be considered in the context, played often a decisive part in choosing particular targets, and since the air force as a whole in agreement with the principles of target selection set forth by the FCA, the current selection of specific objectives be left to the responsible authorities in England, subject only to such directions as might be called for by broad strategic considerations.

For reasons of security, the committee declined from drawing up a normal priority list of target systems, but it is clear from the arguments presented in the report that orders of priorities, and there is reason to believe that the details did so as a result of a policy informally agreed upon between the principal parties concerned. 53

First on the list were the aircraft industry. It was fully appreciated that an early attack on this system would be essential to the success of later bomber operations. In force of this argument had been fully admitted ever since the lid had begun to react effectively to the daylight operations of the Eighth.

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It was estimated with a high degree of accuracy that, although fighter production had been given preference by the Germans, output and production in that industry were delicately balanced. But a diversity of opinion existed, both in the U. S. and in England, as to whether the attack should be directed primarily against fighter assembly plants or against fighter engine plants. The proponents of the attack on the former argued that, since the current ratio of German single-engine fighter strength to monthly production was three to one, the German fighter force was having to reconvert itself from fighter assembly lines every three months. Construction of seven assembly plants, even if the enemy could repair the damage at the end of one month, would have to be repeated but twice to eliminate substantially German strength in single-engine fighters. If five separate engine forging shops were included in this attack, production could be curtailed for approximately six months owing to the destruction of intricate jigs and other hard-to-replace machinery. Proponents of attack on fighter engine plants pointed, however, to the recuperability of final assembly plants unless extensive damage were done to both assembly sheds and engine forging shops. On the other hand, engine assembly plants were believed to require six months or more for full recuperation; and an attack on them could strike at replacements needed for operational aircraft. But it was concluded that, on the basis of American experience, the time between the completion of an engine and final assembly of a finished aircraft varied from one month to six months, during which time something over 300 enemy fighters could be produced. This question of time, in
addition to the fact that existing plants constituted so great a
vulnerable target that final assembly plants, appears to have been
given great if not decisive weight. For, although the OCM recomended
taking all of 22 targets consisting of final assembly plants, com-
plete erecting plants, and mid-assembly plants as part of a single
target system, the first two categories were clearly given greater
over the last. All but one of these 22 targets lay within 300 to
500 miles from London and together they were estimated to account
for over 50 per cent of single-engine production.

"It is difficult to determine whether the target on aircraft
lines would have been preferable to that delivered against air-
planes," the report of the strategic bombing survey declared in
1945. Considerable for a opinion, however, held that it would
have, and recent investigation of German aircraft industry indicates
that, although the capacity of the industry is small during the
first years of the war, there an adequate, less excess capacity
existed in England than in France.

Next to fighter aircraft and closely related to their manufac-
ture, were ball bearings. On the basis of Korean experience as
well as according to British opinion, it was argued that ball bearings
were a potential bottleneck in German industry, especially in
the manufacture of war material. It was the belief of both British
and American economic authorities that stocking of ball bearings
was not practicable and had not in fact taken place. It was believed
that only the larger plants were capable of making a full line of
ball bearings and that smaller plants concentrated on specialized
types. Furthermore, the Schenck plant also was correctly

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reputed to manufacture in the neighborhood of one-third of the total
Axis production, that offering peculiarly some strategic target within
practicable flying range. While the effect on any front-line
strength could not be in Italy, this indirect threat could, it was
felt, be great and cumulative, concealing eventually all high-speed
planes. This effect could not be time certain, but it was believed
that it could begin to be felt within one month. Initial intelli-
gence indicated that the committee had overestimated the vulner-
ability of ball-bearing plants and underestimated the feasibility of
effecting economies in the use of carriage, possibly also of scoring
them.31

Petroleum in a third place. Germany's oil position was
rightly considered to be extremely tight, though not quite so tight
as it later turned out to have been.32 It was pointed out that crude
oil represented two-thirds of available Axis oil supplies, of which
crude supplies 70 per cent were produced in the Soviet area of Russia
and the rest widely dispersed in oil fields in other Axis countries.
The remaining third of the Axis oil came from national products, of
which 70 per cent was believed to come from 15 large coking opera-
tion plants, and the rest from numerous smaller-fraction plants. The
committee estimated that destruction of the 15 hydro-generation plants
would deprive Germany of about one-fourth of its available petroleum
sources, including two-thirds of its existing production of aviation
gasoline. Stock-to stock, substitutes, and carrier inventories
could probably not delay the full effect of their destruction for more
than four weeks. Although strongly opposed, they were believed

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vulnerable to air attack and difficult to reconstruct if, in addition to the hydrocarbon plants, some 20 refineries were also destroyed, supplies of petrol and products would be cut 50 per cent, with obviously disastrous consequences to the German war effort.

Oil was thus considered an important target. But it was not given the high place that the issue derived from later events indicates that it should have. The OWI appears to have felt that Germany controlled enough steady refining capacity to sustain the immediate shock of bombing and to delay the effect on front-line strength beyond the point where the aerial effort could be immediately profitable. The committee was apparently handicapped here, more than in most instances, by lack of adequate intelligence data. It underestimated the importance of synthetic production; and it gave little attention to the close technical integration of both hydrocarbon and coal-tar-type synthetic oil plants with the chemical industry, especially that part of it producing explosives and synthetic rubber.

The OWI report gave fourth place to grinding wheels and crude abrasives. In doing so it reflected, as in the analysis of the nonfriction bearing industry, the committee's preoccupation with bottlenecks in every industry. The report demonstrated the essential part played in grinding wheels in the manufacture of innumerable metallic parts for war equipment. It pointed out that wheels were rapidly con-sumed, there was no substitute for them, they were difficult to stock, and they were produced in vulnerable installations. Crude abrasives could be obtained in order to maintain the effect of attack on the
grinding wheel industry, but the relative invulnerability and recoverability of that industry made it a less attractive target than the grinding wheel facsimiles.

certain nonferrous metals: copper, aluminum, and zinc. Although major aluminum and lead-zinc production was considered a high priority target, it was believed that something could be done for attacking copper-die and smelter and alumina-producing plants in view of their importance in our production. It was felt that the use of these metals lay too deep in the economic process to warrant priority attention. In addition, the industry was believed to be so inextricably, so very tight and the destruction of any factories feasible. 

It is very possible, as the U.S. strategic planning survey concluded, that the synthetic rubber industry that proved to be given attention earlier in the war, that the 50% in its only sixth place in fact a by-product of its failure to appreciate fully the close interdependence of crude oil rubber and synthetic oil plants. And it was recognized, for example, that the former depended largely on the latter for hydrocarbon, both of which have a demand jointly to a higher priority. The committee also recognized the probable amount of blooming the Germans could be able to conduct in order to import rubber supplies. It pointed out that the war appears to have been negligible, and that my war consequently there was lost or possibly on this. Large scale on all synthetic plants for our requirements. In view of this target system, .. cost of the ..
the U-Boats, while high in terms of concentration and vulnerability and in view of the inadequacy of small boats, depends entirely upon the success of blockade-running, which is believed to contribute, together with the reduction of war, approximately one-third of Germany's rubber supplies. It was believed that destruction of the tire plants, which were susceptible to incendiary attack, would immediately deprive the enemy of the destruction of the two major synthetic plants.

...and it can be assumed, since it placed seventh, the DD expressed profound dismay over the results to be expected from coordinated action of operating areas or construction yards. Construction yards, and for such tires considered by the British authorities to be targets of essential value, resulting in complete and simultaneous destruction of all U-boat forces in Italy, and that the most important ones in Italy would probably enter by at least 10 months the launching of any new U-boats, and that next year at least five concrete works would be in these yards, the committee argued that the quick recuperative capacity and large facilities available could enable the forces of anything other than a devastating attack on the industry as a whole, to that extent such complete destruction could not reduce the operating U-boat fleet for approximately one year.

The operating bases along the central coast suffered not only from...
was considered to be of an essentially inconclusive nature. It seems, therefore, that the committee is still on the way toward the healthy skepticism regarding the building of substantial installations which by the end of the year had become very varied and which has since been kindly confirmed by German records. 70

In ninth and tenth place came respectively military motor transport vehicles and the transportation system in general. To the loss of it, motor transport vehicles were to offer a fairly profitable target, for supply was estimated to still considerably short of military requirements. in 35 to 60 per cent of the trucks production was believed concentrated in seven plants. It now appears that, in a concentrated attack and thus planned as oil and rubber, motor transport vehicles might well have been ignored as a separate objective. 70

As for rail and water transport, the committee heard under no illusions; moreover, without for a moment minimizing the vital importance of transport facilities to the entire economy, it maintained that limited and scattered attacks upon transport can be of little consequence because the recuperative power and flexibility of that system permit rapid and successful readjustment. Moreover, it stated, no single or isolated transport facility or destruction of which could be decisive. An attack would have to be widespread and sustained; and at that time the committee was unwilling to think in terms of mass attack or of attacks on any but the most concentrated industries. Although the blocking of transportation has since been recognized as of decisive importance in the defeat of the Axis, 71 it is very possible that had effective steps could not have been
realized until a sufficient force had been built up to use the necessarily heavy and ubiquitous atomic trail, and until it was possible to take full advantage of a greatly enlarged transport system by decisive ground action.

Due to the large number of coke batteries in the area, coking plants were not considered a suitable target spot, despite their vulnerability. An undoubtedly large portion of coke production is a number of critical industries. Iron and steel received still less favorable consideration. Only enough, in the light of later investigation, the CNR considered that the United States position with respect to steel was generally strong and that the destruction of even one-half of the steel-producing plants would have little effect on the military effort over a period of one year. Such plants were, however, relatively invulnerable to attack on account of the ruggedness of their construction and equipment. And the production of high-grade alloy steels, which are more critical and more valuable than one of ordinary steel, was believed to involve enough potential alternate facilities to insure a substantial time-lag between destruction and effect on front-line strength.

Coke plants were considered generally to lie too deep in the industrial process to constitute high-priority targets as long as the industries they supported were in operation. Steel required for new or changed types of final product only, however, were critical items. The destruction of 12 selected plants, it was stated, would reduce coking-steel plants and capacity by 10 per cent, with effects...
that would eventually be felt throughout this whole industry. Although the machine-tool industry was only placed 10th on the list, the fact that it was given consideration at all betrays a faulty understanding of that industry as carried on in Germany. By this point the assumption of essential similarity between industrial processes in Germany and the U.S. proved misleading. For the manufacturers had an entirely different conception of the use of machine tools than did their counterparts in America, where rapid turnover of plant inventory and a tendency toward early obsolescence in machine-tool types generally encouraged the accumulation of large replacement stocks. In Germany, where machine tools were treated as long-term investments, the industry had managed to build up a comfortable reserve, having excess producing capacity in the form of plants at one time devoted to manufacturing for export. It might have been the case that machine tools were actually systematically kept in reserve, but the fact remains that no time did serious industry in a whole come anywhere near being short of adequate tools.73

"A curious omission in the list of high-priority targets was the electric-power system. It was recognized, of course, that industry in modern Germany was largely dependent on electrical energy for continued operations. But it was believed that in almost no instances was any single industry dependent on one electric-power plant. After the day and age in which pooling the greater part of the electrical energy within an area it was considered that by destroying 33 targets in the oil- and iron areas, for example, we might shut down the whole province. It was estimated that by destroying 33 targets in the oil- and iron areas, for example, we might shut down the whole province. It was estimated that by destroying 33 targets in the oil- and iron areas, for example, we might shut down the whole province.

73
The electrical industry as a whole was felt to be of questionable validity. The vulnerability of electrical power plants to aerial bombing, judging from earlier experience during the "blitz," was a real concern. The knowledge of subsequent events alone can sober the critic, to criticize conclusions arrived at without any such analysis. The failure of the Allies to attack German electric power and the failure of the GIs to reconnoiter it both stem from a lack of precedence out of adequate information regarding the situation as it currently prevailed—a distinction of the utmost importance in a historical study of this sort. It now appears that the Germans themselves were constantly concerned about the limitations of their so-called rail system, the difficulty of finding capacity, the relationships of curtailment and shortage of electric energy to production losses in industry as a whole, and, above all, the danger that the Allied command would discover the extreme vulnerability of their electric power industry.

The U.S. strategic bombing survey summed up the situation by saying that, in the state of critical shortage in which industry found itself, any loss of production in electric power could have directly affected essential war production, a fact which the Germans themselves really admitted.

Electrical equipment, optical precision instruments, tool production, and anti-aircraft and antitank munitions were treated by the GIs for good and sufficient reasons, as of little significance in the war's progress. But the electrical industry, and in particular the air-raid
industry, received equally scant recommendation. Separate studies had been prepared on several aspects of that complex, namely on coke, synthetic oil, synthetic rubber, and nitrogen. Analyses of the production of explosives and of other chemical products were not separately undertaken, either because of the known availability of substitute products, the nature and dispersion of plants, the existence of large amounts of excess capacity, or the fact that the product had only an indirect relationship toward military activity. On CBI's view on coke, rubber, and oil have already been canvassed. Admittedly nitrogen was important to Axis military effort in the fields of explosives, synthetic oil, and fertilizer. But only eight per cent of nitrogen production was believed used in the manufacture of explosives. And, although it was estimated that 29 per cent was devoted to synthetic oil production, and that if 21 principal nitrogen plants were destroyed the effect would be felt in the oil industry within three months, no attempt appears to have been made to correlate the two for the purpose of strategic destruction.

The CBI, as in this instance again handiapped by a faulty understanding of the chemical industry. Synthetic rubber, synthetic oil, nitrogen, methanol, and other important chemicals formed interdependent parts of a single industrial complex. The production of nitrogen and methanol, both of extreme significance in the manufacture of explosives, was heavily concentrated in synthetic oil plants. As it happened, the actual synthetic oil plants, with the 21 plants, in fact succeeded in producing, as a porcine by-product, a marked

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drop in the production of nitrogen, which in turn contributed to the shortage of explosives, obviously of the utmost importance to the closing campaigns of the war. The nitrogen industry, according to the strategic aviation survey, was said "all the qualifications to have been a primary bombing target." Not only was nitrogen essential, but there were no possible substitutes for it, and out of its production was "unusually concentrated" in a few plants. Moreover, an attack on it would also have been an attack on the synthetic oil industry, it therefore appeared that, had the interdependence of the synthetic oil, the synthetic rubber, and the principal chemical industries been fully appreciated, they might all have been subject to early and concentrated attack with much profit to the Allied cause.75

On 26 April, the CIC report, after being favorably considered by General Arnold's Advisory Council, was sent to the U.S. for coordination with the British authorities and the British Air Force.76

On 9 April the Ministry of Economic Warfare reported its conclusions:

...are in substantial or close agreement with the concept in the opinion which the expresses in their covering letter, namely that these are certain conclusions on the following classes of items: aircraft, oil, tires, transportation, etc.

On the other, the Department, in its report, expressed no reservations. General, he said, "appear to have been based on that we regard as a sound and superficial examination of the enemy's position and show a certain divergence of opinion between us on questions of fact, which we are already in process of trying to reconcile or discussion here and in Washington." But, he added, these divergencies...
attached little importance to industries which neither agency considered as likely candidates for attack as primary targets. In three points only was there significant disagreement. The JCS took a less optimistic view than the CGF of the damage attack on similar small factories could inflict on this industry, and based its argument mainly on the large number of plants and the probable existence of considerable stocks. On the second plan it advocated closer study of the possibilities of attacking major transport and aircraft facilities by way of selected internal combustion engine components and accessories. Finally the CGF believed the possibilities of attacking aircraft production through attack on propeller factories were not of further investigation. It is interesting to note in passing that on the subject of nitrogen, the CGF was even less enthusiastic than the CGF, claiming that some 50 per cent of enemy production capacity was at the time lying idle.77

Like the CGF, the Eighth Air Force declared its position to be substantial agreement with the CGF report.78 Yet it is not clear from available documents how this paper was received by other agencies. If so, it is therefore to say that on the basis of the CGF report—albeit on the evidence of the CGF, the Eighth Air Staff, and the Eighth Air Force—a final list of primary objectives was drawn up consisting of 75 targets in six systems arranged as follows in order of priority:79

1. Munition construction yards and bases
2. German aircraft industry
3. FUs bearings
4. Oil
5. Synthetic rubber and tires
6. Military transport vehicles
It will be noticed that printing on the naval and merchant marine and the non-ferrous metal industry, given respectively fourth and fifth place in the OCM report, were deleted from the final list of primary objectives, as doubt on the advice of the British. No specific ground was given. The priority given then at Casablanca is not apparent from the document at hand, but it is clear to show that the problem of shipping in the Atlantic coastal areas, which had reached a climax in April, had forced the issue. Otherwise, it appears to have been general unanimity of opinion concerning the need for fighter aircraft, especially the British. The CNO stated heartily, urging, indeed, not only on attack on the submarine fighter industry but on all fighters. In a paper dated April 4, it argued that all British and American bombardment forces should, in the first stage of the proposed offensive at least, be concentrated against the Axis, especially the fighter force, to secure a climax of all other objectives. For, it maintained, 60

the most formidable weapon being used by the enemy today against our bomber offensive is his fighter force—his single- and twin-engine fighters—by day and night. In addition to the elimination or serious depletion of this force, would be the greatest contribution to the continuance of the joint heavy bomber offensive of the U.S. and the U.K.

After the principal target systems had been determined, there remained to be elaborated an operating plan to accomplish the destruction of the 70 specific objectives of which the system consisted. For this purpose Admiral H. J. Butler, composed of naval, ground, naval and rear, and plans personnel of the U.S., U.K., and a high air force. 

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light of operating experience, what force of planes would be required
to do the job and what chronological order of attack against the six
target systems would make best use of the increasing forces being made
available. This operational plan, together with the list of targets,
became known as the "Plan for the Combined Bomber Offensive from the
United Kingdom," or, more briefly, the CBO Plan. It received "un-
qualified endorsement" by the Commanding General, ETOUS.*, the Chief
of Air Staff, RAF, and the Air Officer Commanding-in-Chief, RAF Bomber
Command. 81 Later in April General Eaker brought the plan to Washington. 82

It was a comprehensive and impressive report which Eaker presented
to the JCS on 29 April 1943. 83 In order to accomplish the mission of
the bomber offensive as set forth at Casablanca the plan provided for
the neutralization of a given percentage of each industrial system
agreed upon. Destruction of the submarine building yards selected
would reduce current submarine construction by 89 per cent. Destruc-
tion of 43 per cent of German fighter capacity and 65 per cent of
German bomber production was provided for. Of the ball-bearing pro-
duction, 76 per cent could be eliminated by destroying the targets
selected. The attack on oil was made clearly contingent upon certain
already planned attacks against Ploesti from the Mediterranean. Should
that effort succeed, it would then, but only then, be necessary to
attack the oil installations in the Ruhr in order to exploit the advan-
tage gained in Rumania. Together these attacks would account for 48
per cent of Germany's oil production. Provision was next made for
destroying 50 per cent of the synthetic rubber capacity and nearly all
of the tire production of Axis Europe. Finally, the elimination of several selected plants producing military transport and armored vehicles should have a considerable, though not readily measurable, effect on enemy strength. "The cumulative effect of the destruction of the targets comprising the systems just listed will fatally weaken the capacity of the German people for armed resistance," QED.

But there was one overriding consideration which the planners declared would, temporarily at least, alter this order of priority. The GBO Plan warned that the Germans, recognizing the vulnerability of their vital industries, were rapidly increasing the strength of their fighter defenses, especially on the Western Front. Too German fighters were taking constant toll of Allied bombing forces both by day and by night, "not only in terms of combat losses but more especially in terms of reduced tactical efficiency." If their number were materially increased, "it is quite conceivable that they could make our daylight bombing unprofitable and perhaps our night bombing too."

For this reason, the plan concluded, with more force than clarity, "German fighter strength must be considered as an Intermediate objective second to none in priority."04

As finally determined, target priority in the GBO Plan stood as follows:

(1) Intermediate objectives:
   German fighter strength.

(2) Primary objectives:
   German submarine yards and bases.
   The remainder of the German aircraft industry.
   Ball bearings.
   Oil (Contingent upon attacks against Ploesti from the Mediterranean).

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(b) Secondary objectives in order of priority:
Synthetic rubber and tires,
Military motor transport vehicles.

It is not the province of this study to evaluate the CEO in terms of positive results, but later events and subsequently acquired information cast on the planning phase a degree of light the implications of which cannot at this point be entirely ignored. This is especially true with regard to target selection. Generally speaking the bomber offensive succeeded. It is, therefore, not a question of explaining any failure in attaining ultimate objectives. But it now appears that over-all target selection might in a few instances have been improved and the bombing force have been utilized more effectively.

Electric power might well have been given a high priority. Nonfriction bearings might well have been accorded a lower priority. Probably more important than either the inclusion of bearings or the exclusion of electric power was the failure to concentrate at an earlier date on oil and to appreciate the vital interdependence of synthetic oil, synthetic rubber, nitrogen, and other elements in the vast chemical complex. Submarine installations received no doubt an undue weight of bombs. But in that case the choice was dictated not by industrial analysis but by what was felt to be strategic necessity. The attack on transportation, when it came, was decisive, but it is probable that it could not have been undertaken directly at an earlier date without overwhelming force and complete concentration of effort. It must be remembered, of course, that contingent factors of a purely operational nature which could not have been foreseen affected the results of the offensive. The dry bomber force, for example, was not
built up so rapidly as had been planned, a fact which made it impossible to strike the ball-bearing industry as rapidly and decisively as had been anticipated. The GBO Plan had made it very clear that a successful initial attack on that industry would demand the immediate concentration of effort on the remaining elements of that system in order to exploit the initial success. The fact remains, however, that the final choice of targets in April of 1943 did not correspond in every respect to the points of most extreme vulnerability in the German war economy.

Was, then, the method of industrial analysis, in this instance identified especially with the COA, an effective instrument for the appraisal of strategic objectives? Did it result in a more penetrating choice of target systems than had hitherto been achieved? It may be instructive before answering these questions to examine some of the priority lists which had been drawn up by U. S. agencies (British examples are not available) prior to the work of the COA.

APD-1, prepared in AAF Headquarters and dated 12 August 1941, had envisaged a strategic bombardment attack on German industry by an American bomber force and arranged the industrial systems in the following order of priority:

Electric power
Transportation
Oil and petroleum supplies
The morale of the German population

As a possible "intermediate" objective, the accomplishment of which might be essential to the destruction of the above target systems, the German Air Force would have to be neutralized by attacks on air bases, aircraft factories (both engine and airframe), and aluminum and magnesium factories. In addition, other lines of action, such as the *SECURITY INFORMATION*
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bombarde of submarines would, in the possibility of force by the necessity
of maintaining the security of the country.

"Air for the initiation of air force bombardment in the British
isles," also emanating from headquarters, W.E. and dated 15 March 1942, to
had selected some 111 targets within four categories in the following
priority:

1. Aircraft industry
   2. Electric and motor power
   3. Chemical and fuel
   4. Rail and water transportation

NCR 69, issued 9 September 1942, constituted the most thorough
attack of this date by U.S. agencies. It had arrived at the
following list:

1. Electric and motor power
2. Aircraft industry
3. Chemical and fuel
4. Rail and water transportation
5. Transportation systems
6. Submarine building yards
7. Transportation systems: building, testing, repair, work, cradling,
yards, and emale
8. Aircraft industry
9. Chemical and fuel
10. Rail and water transportation

It was becoming a commonplace in strategic thinking, the destruction
of the air force would be a prerequisite to any systematic reduction of
Germany's war potential. And as to submarines, it was estimated it was
becoming clear that something drastic, involving temporary diversion
of strategic bombing forces, would have to be done. These considera-
tions in fact dictated the priorities for Eighth Air Force operations
during the fall and winter of 1942. With the directive under which
the mission histories began their data, and, by 20 October which
supplemented it, listed submarines, aircraft, and transportation in
this order.66 Similarly, the Canol area directive of 21 January 1943

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has listed priority targets in the following order:

- Submarine construction yards
- Aircraft industry
- Transportation
- Oil

It is obvious that the OI's priorities have total target systems
and no answer to the issues as even tentatively by notes that
did to earlier lists, and in some instances they failed to come as
close. In other words, the systematic approach to the problems
by the OI obtained, in an overall sense, as and result no more
satisfactory than that achieved by the efforts of the earlier analysts.
This fact, however, does not mean that the efforts to apply more
or less scientific aid to the problem of target selection was
merely concluded, in barely means that conditions were not entirely
favorable to a project carried out at that level. Insofar as it
was possible to resolve the problem on the basis of facts, rather than
inponderables, there could be no limit to the valid application
of a scientific method. And potentially it was a matter of ruthlessly
methodical investigation. Out actually there existed in almost
every instance a serious shortage of reliable information, and the
resulting forecasts to be credible by intelligent guesswork and an
clever use of analogies. In dealing with this class of inexactitudes
and approximations the social scientist as such finds himself in a
position of no special advantage over the military strategist or
any other intelligent layman or laycliffe. Theology may be, by
virtue of a considerable cut unaidedly indiscriminate educated
lead an investigator for advice. The trend of this story is obvious.
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and has frequently been described as strategic bombing, probably more than any other strategic undertaking, requires on one complete body of intelligence data possible. Without it, strategic bombing cannot succeed-the air armada remained, if operation succeeded notably—but only at the expense of such indecisive effort.

Air Operational: Plan for Formation of the 6th

As presented by General Arnold, the plan of operations was divided into four phases, each marked by an increase in the size and capabilities of the American bomber force. In initiating the effort, realize, the authors of C-2 left no course to the nature of the air war as a whole. In every social body of information, there is, not therefore, a real conclusion as to the authors or authors and time to resort to highly theoretical calculations.

In the experience of the High in 12 months against murderous targets it is concluded that 100 bombers day during each successful mission could inflict devastating destruction on the part of the target area within 1,000 feet of the aiming point made by firing from altitudes of 20,000 to 25,000 feet. Such targets were accordingly evaluated in terms of the number of circles of 1,000-foot radii in which destructive effects had to be centered. From still smaller circles required for such destruction was calculated on that basis.

As for rate of operations, the Eighth Air Force had averaged six missions over the preceding half-year. Smaller also indicated that at least 300 aircraft must be in the theater to make possible the dispatch of 100 on operations. The date 500 planes estimated on
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On January 5, 1943, the OCMH recommended that Allied Bomber Command:

- Should attack the oil plants in the Kiel area and at Hamburg. This would not, however, be possible to start before the late summer for the force of 250 planes required for deep penetrations. Consequently, division during the first phase of operations (April to July) would be limited to the range of fighter escort or to objectives not demanding flights deep into enemy territory. Targets in this phase would consist mainly of storage tanks and not too distant aircraft installations. Only the latter called for long distances of attack on oil installations to exploit prior attacks on Kiel, with a very-long-range attack against the oil industry.
- During the next phase, from July to October, the ranges in heavy bombers should reach 1,100 and objectives 1,500-2,000 miles from the base area in a single sortie.
- A concentration against the Kiel area would be feasible with fighter aircraft and aircraft factories as well as airfields and repair facilities.
- By the end of the striking force would be used for this purpose, the remaining planes in 1943 to continue the attack on submarine construction yards. During the third phase, to December, the German fighter force would continue to be shattered and the other German forces would be weakened. During this phase, the striking force would have to be adequate to perform all its major tasks: by January 1, it should number 1,740 aircraft. The second phase, during the early months of 1944, should...
see the entire Kleing force used to sustain the effect already
produced and to prepare the way for a combined or series on the
Continental. As late aish these tanks 2,700 heavy bombers would
be ready by 31 March 1943.

The plan had no specific provision for the use of U.S. units in
bombardment. But it clearly indicated that a large bomb set could
be required for supplementary attacks against all strategic targets
in the rear. They would be particularly useful for attacking
enemy fighter airfields in order to aid the passage of the heavy
bombers, until the bombing of the enemy aircraft industry had
made its effect felt. For these purposes, and for the final phase in support
of cross-Channel operations, an eventual force of 650 heavy bombers
should be in the theater by 31 March 1943. In addition, of course,
there would still times be a need for an extensive airelan fighter
force to protect the bombers and to assist in the reduction of enemy
fighter strength.

For the integration of all U.S. Army operations in the Combined
offensive the 520 plan only a surprisingly internal provision.
"Fortunately," it said, "the capabilities of the two forces were
entirely complementary." It argued that the most effective results
from strategic bombing would be obtained by directing the combined
day and night efforts of the U.S. and British bomber forces to all-
out attacks against targets to which were mutually complementary, in
a campaign to eliminate decisively a limited number of essential
target systems. After such a campaign, it was believed, in general, that

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upside industrial objectives or, and the point usually
attacked by night the entire industrial with true objectives, to
being to depend on the tactical situation.

This plan does not attempt to preserve this for further or
the industrial area. It simply recognizes the fact
but the precision targets are being by the air
force. In daylight, the targets should be selected and
completed by being shot and against the surrounding
industrial area at night. Fortunately, the industrial area
to be attacked are in actual identity with the industrial
area which the industrial area is and which the selected
for the operation area. The, in other words, the
area, the city, the other principal
i.e., the area, to include all the area
principal significance. At night, the precision tar-
y to be used for an air
force.

In the course of the plan, through the JCS has a number of
little positions. It is our intention to talk about the
proposed conditions of forces. The need should be pointed out
allocation of time to elaborate it to the operational objectives which is the
substantially in a fashion by land effort.10 The key in the
area, however, raised an objection to this, the JCS concluded in
view of the central plan, in reality, and they recall a decision
of the JCS concerning priority of future operations in which the, in,
together with land and air, be the basis to which operations
in the previous future. In the air, only the JCS approved
the JCS plan, presented by the land, recommended planning it
to the JCS. About practically, consistent with the final projection
objectives, Figure 1, and, in current strategic objectives,
C.3.100, and the JCS presented the plan to the Combined
Chief. The war, noting in principle progression with the idea, the

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Before we can adopt the plan, involving the commitment of forces in large part requires strategic decisions, and it involves the entire course of the campaign. It is no longer a question of concentrating the combat forces in the British Theater of Operations, but has been shifted to the Middle East and to the Indian region. It is agreed that the essential prerequisite is the Eighth Army in the Middle East, which is now returning to its previous role. The initial primary problem is the question of the future conduct of the offensive, and it is vital to maintain the primary emphasis on the allocation of forces, especially the British and U.S. forces in the Eastern Mediterranean. The decision regarding the allocation of forces is critical to the overall strategy of the campaign. It is agreed that the commitment of U.S. forces to the Mediterranean region is a priority, and it is essential that the forces are employed in the most effective manner in preparation for the invasion of Sicily. The invasion of Sicily will be the first step in the liberation of Italy and the disruption of German forces.
certain of success. With the American view, the CAS plan, calling as it did for a cross-Channel invasion as soon as the bomber offensive had completed its final phase in April 1944, was in perfect accord. The British, on the other hand, were reluctant to make too firm a commitment in that direction for fear it might "tie our hands" regarding plans in other directions.92

At the same time the British representatives agreed that the intensity of the bombing campaign would have a material effect on any land operation, whether in northwestern Europe or in the Mediterranean area, and that it should not be reduced except after "critical examination." Sir Charles Portal, without maintaining that the utmost priority should continue to be accorded to SICILE, expressed deep concern for the rate of that undertaking. The important thing about the CAS plan, he emphasized, was to be found not so much in the "tremendous effect" it promised on German production and morale, as in the proposed elimination of the German fighter force, which, he believed, was growing so rapidly that every week's delay made the task of defeating Germany more difficult, no matter where the principal effort was to be applied.93

On 18 May, after considerable discussion, the CCS approved the CAS plan as presented.94 And the conference finally decided that the CAS would, as planned, culminate in a cross-Channel invasion for which 1 May 1944 was selected as the target date. Operations in the Mediterranean were to consist only of action calculated to eliminate Italy. In addition, it was decided to launch bombing attacks as soon as possible from Mediterranean bases against the Floesti oil fields. The question of priority among these specific undertakings for 1943 and 1944 was happily avoided, for, after balancing available resources with
requirements more thoroughly than at any previous meeting, the conference concluded that all were possible, and that, broadly speaking, "there are sufficient air forces to meet all requirements in all Theaters." 95

In compliance with the decisions made at TRIDENT, the C/AS, RAF, in whose hands, as agent of the CJS, the direction of the bomber offensive rested, issued on 10 June 1943 to the Air Officer Commanding-in-Chief, Bomber Command and Fighter Command and to the Commanding General, Eighth Air Force a directive to govern the OBO. This paper confirmed the primary object of the bombing campaign as set forth at Casablanca, and incorporated the essential elements of the CBO Plan as adopted at TRIDENT. Of the necessary coordination between the two forces involved, it was stated: "While the forces of the British Bomber Command will be employed in accordance with their main aim in the general disorganization of German industry their action will be designed as far as practicable to be complementary to the operations of the Eighth Air Force." The British Fighter Command would, "consistent with the needs of the air defense of the United Kingdom" (which, by the way, had been left entirely up to the RAF), be employed to further the bomber offensive. The American fighter forces would also be employed in the furtherance of the bomber offensive in accordance with the instructions of the Commanding General, Eighth Air Force and in cooperation with forces of Fighter Command. The allocation of targets and "the effective co-ordination of the forces involved" was to be ensured by "frequent consultation between the Commanders concerned." 96

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This letter of coordination... of crucial importance to us. In the overall plan of our operations, an effort, so far - planned and outlined to the cooperation between the two areas. In this area, it has been generally agreed that the Chief of Air Staff, the Chief of Combined Offensive, as a representative of the Combined Offensive, and the Air Force could coordinate their actions. In this respect the Combined Offensive would nothing to the Combined Offensive... in the creation of a Combined Offensive...

At the meeting, the Chief, General, and we agreed to form the Combined Offensive...

Under current directive, on the 10th June, the Combined Offensive...

planning process was set up. The body was to consist of representatives from the Air Force, the Combined, and the Combined...

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After careful analysis & evaluation, which should be presented well in
advance of requirements, and also critical examination of the tactical
execution of these plans. It is impossible to reply for the
conduct of operations, which required the responsibility of the Com-
manders concerned.96

Despite these remarks as to loss, it was not realized in the
organization of the O.C. in 1910 Plan and the directive of 16 June
1915 both purposely avoided committing an army to a rigid adherence
to the particular objectives they set forth. The action of the
United States, for which these items systems appear to have been
primarily devised, would "be for practical" less elucidated by
that of the 15th Order Command. It was "fortunate" that the objec-
tives of the two forces collabar for the most part coincide, but it is
also fortunate such coincidence of effort can be explicitly used
in necessary part of the plan, however much otherwise we have consid-
ered it essential for practical purposes. An entire disorganiza-
tion was still involved in keeping the army according to oilily
divided operational picture and, insofar as the newest to bring
above the general disorganization or the one army in attacking civil-
ian morale as a primary objective, it was to eaiistence differed
radically from that upon which the 1915 Plan had been created, it
was probably inevitable, therefore, that the A Forces would continue
to operate along lines not so nearly limited and originally intended. The
combined seizing effort did not in place of the joint
intervention until late in the campaign, but at night in the cri-
cial sector not in the direction late on pre-judged axis.

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bombing a shadowy one, and when the importance of enemy oil and transportation had become so apparent as to leave little doubt regarding the primary objectives. Meanwhile the participants labored at times under a sense of frustration originating in the largely unresolved dichotomy that continued to characterize the bomber offensive.
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AAFAC</td>
<td>Army Air Forces Antisubmarine Command</td>
</tr>
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<td>AAFRHI</td>
<td>Army Air Forces Reference Histories</td>
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<td>AAG</td>
<td>Air Adjutant General</td>
</tr>
<tr>
<td>A.C.A.S.</td>
<td>(British) Assistant Chief of Air Staff</td>
</tr>
<tr>
<td>AG/AS</td>
<td>Assistant Chief of Air Staff</td>
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<td>A/C/M</td>
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<td>AFAP</td>
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<td>AFAESP</td>
<td>Assistant Chief of Air Staff, Plans</td>
</tr>
<tr>
<td>AFCAS</td>
<td>Chief of Air Staff</td>
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<tr>
<td>AFCE</td>
<td>Automatic Flight Control Equipment</td>
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<td>AFDAE</td>
<td>Deputy Chief of Air Staff</td>
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<td>Management Control</td>
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<td>Director of Military Requirements</td>
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<td>AFDT</td>
<td>Director of Technical Services</td>
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<td>ARDB</td>
<td>Directorate of Bombardment</td>
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<td>AFGRS</td>
<td>Director of Ground-Air Support</td>
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<td>ASF</td>
<td>Air Force Service Command</td>
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<td>ASHO</td>
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<td>Adjutant General, War Department</td>
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<td>A/M</td>
<td>Air Marshal</td>
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<td>ASF</td>
<td>Army Service Forces</td>
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<td>BEW</td>
<td>Board of Economic Warfare</td>
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<td>G/AS</td>
<td>Chief of Air Staff</td>
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<tr>
<td>CBI</td>
<td>China-Burma-India</td>
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<tr>
<td>CBO</td>
<td>Combined Bomber Offensive</td>
</tr>
<tr>
<td>CCS</td>
<td>Combined Chiefs of Staff</td>
</tr>
<tr>
<td>CG</td>
<td>Commanding General</td>
</tr>
<tr>
<td>C-in-C</td>
<td>(British) Commanding in Chief</td>
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<td>COA</td>
<td>Committee of Operations Analysts</td>
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<td>European Theater of Operations, U. S. Army</td>
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PART 3

Subject I

1. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

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6. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

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9. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

10. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

11. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

12. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

13. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

14. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

15. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

16. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

17. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

18. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

19. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

20. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

21. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

22. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

23. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

24. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

25. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

26. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

27. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

28. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

29. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)

30. (a) (b) (c) (d) (e) (f) (g) (h) (i) (j) (k) (l) (m) (n) (o) (p) (q) (r) (s) (t) (u) (v) (w) (x) (y) (z)
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"We are not ready to make any public announcement in connection with our future air planning. There are ideas which we should keep in our minds. It looks that way to me."

10. See originals, pp. 10-69, for fuller treatment of both criteria and e. g. decisions.

12. AD-1, 12 Aug. 1941, in files, Office of Security Officer.


22. I. V. 1943, pp. 73-76, in CIC files.
1. Although the decision was one taken in the European theatre by senior military leaders, the first action by senior commanders operating out of the U.S. was taken on 8 July 1942 by the crews of the LST's of Lt. Sp. (L) W. F. K. Sedgwick. Purposes for this operationally first landing consisted of four airfields in Allied. It was not a very successful effort, three of the planes having failed to drop their loads on the target, to having been destroyed, and only one having achieved the objective, but with unserved results. History, first to be seen, activation on 17 August 1/2, p. 111.

7. Air Intelligence, Navy Intelligence Division, 1/1, 2 Oct. 1942, in A-2 lib, 1103.
11. Ibid.
14. Ibid.

15. Ibid.
16. Ibid.
18. First 1103, mission 2.
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10. Listed, as appropriate, in the ports.

23. Ibid., Section 1.

21. Ibid.

22. For FOB 112, 27, 26, 27, 26, 14/2, 14/2, 14/2.

23. Ibid., 1120, as appropriate, in the ports, including the 112.

24. Ibid., Section 2. As especially on 11/1, as per.

25. Ibid., Section 2.

26. Section 2.

27. 

28. 

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SECURITY INFORMATION

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39. Ibid.; C1-IN-O4049 (10-10-42), USAFM to AEFAR, #244E, 10 Oct. 42, which gives 65.


42. Ltr., Eaker to CG 8th AF, 1 Nov. 1942, in papers sent to AFSHO files by Col. J. M. Parton.


48. These figures taken from CI-IN-O4049 (10-10-42); CI-IN-10602 (10-25-42), USAFM to AEFAR, #705E, 24 Oct. 42. Cf. First 1100, Mission #14.


51. Draft memo for Mr. Hopkins.

52. Ltr., Eaker to CG, 8th AF, 25 Aug. 1942, in AAG 385-F.

53. Spaatz quoted Group Captain Broadhurst, RAF, who claimed he had never, in 57 daylight sweeps escorting bombers, seen accuracy of bombing such as had been attained in the first three missions of the Eighth Air Force, and on those occasions the attacks had been made from only 10,000 feet. Ltr., Spaatz to Arnold, 24 Aug. 1942, in AAG 385-F.

72. 0 - 0.212 (-1.2), located to N 10, 1715, 1 sec. 10.

73. 16.9, 10.0 to small, 15, 28, 1894, in 10.

74. Int. 6.5, 10.5, 1.9, 10, 1892, 16 - 0.60, 12.5. 1st. 10, 1715, 1 sec. 10. 2nd. 10, 1715, 1 sec. 10. 3rd. 10, 1715, 1 sec. 10.

75. Dr., op. 39, 10. 42, "The third place," 10. 11, 1900, 1. 10, 10, 1897. 2nd. 10, 1715, 1 sec. 10. 3rd. 10, 1715, 1 sec. 10.

76. 1st. 10, 1715, 1 sec. 10. 2nd. 10, 1715, 1 sec. 10. 3rd. 10, 1715, 1 sec. 10.

77. 0 - 0.212, 1st. 10, 1715, 1 sec. 10.

78. 3rd. 10, 1715, 1 sec. 10.

79. 4th. 10, 1715, 1 sec. 10.

80. 5th. 10, 1715, 1 sec. 10.

81. Op., 1. 1894, 10, 1715, 1 sec. 10.

82. Dr., sta. 4. 10, 1715, 1 sec. 10.

83. Dr., op. 1. 10, 1715, 1 sec. 10.

84. Dr., op. 1. 10, 1715, 1 sec. 10.


86. Dr., sta. 4. 10, 1715, 1 sec. 10.

87. Dr., sta. 4. 10, 1715, 1 sec. 10.

88. Dr., sta. 4. 10, 1715, 1 sec. 10.

89. Op., 1. 1894, 10, 1715, 1 sec. 10.

90. Op., 1. 1894, 10, 1715, 1 sec. 10.

91. Op., 1. 1894, 10, 1715, 1 sec. 10.

92. Op., 1. 1894, 10, 1715, 1 sec. 10.
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98. Ltr., AD/1, 1-2, 8th Abt., to Col. J. J. O'Shurt, 20 Apr. 1912.

This course established a slight over-all loss in strength for September 1912. Cf. ltr., Arnold to Maj. Gen. G. B. Hasty, C3 Adm. 5 Oct. 1912, in AD 516, 1-A.

99. Ibid.

100. Ltr., Spatz to Arnold, 10 Sep. 1912, in AD 570, 1-A.

101. Ltr., ltr. to C3 8th Av., 10 Sep. 1912.


103. Ltr., ltr. to C3 8th Av., 10 Sep. 1912.


105. Ltr., ltr. to Adjutant Gen., 8 Oct. 1912, in AD 516, 1-A.


111. ltr. relative of ltr. received from C/S 51 Oct. 1912, in AD 516, 1-A. See O.G. Otr. 26 Nov. 12, in AD 2 Lib., 1-10367.

Chapter III


3. Evaluation, Tab 7, App. C.


5. Ibid., vol. 1, App. C. See also tab 6 for 1942: Air Force Div., C/O 1, 29 Nov. 1941, in AIR 6 files.


10. Ibid., vol. 1, App. C.

11. Ibid.


13. See C/O C, vol. 1, Nov. 1941; C/O Air Division, vol. 1, Nov. 1942; C/O Lbr., Strakey to Spatz, 28 Feb. 1942, in AIR 6 files. C/O Lbr., Arnold to Strakey, 2 Nov. 1942. This C/O 1br. is referred to here to be replaced from allocation to the 1940.


15. Ibid.

17. OSS Rpts. cited in n. 16 above. See also translation of memo from Col. Coustet, 30 Oct. 1942, in AAF 312.1-K.

18. First 1100, Mission /15.


20. 2d ind. (no basic ltr.), CG 8th AF to CG AAF, 15 Sep. 1942, in Plans IV-T #21.


22. First 1100, Mission /18.


27. First 1100, Mission /21; reports on missions n.19 to /27, in Tac. Mission Folders.

28. See below, p. 50.


31. Report from British source on information received from German Naval prisoner of war taken in December 1942, in A-2 Lib., K-18178.


33. Ibid.


41. Ibid.


44. Analysis of Results, in A-2 Lib., K-9226.


47. ltr., Stratemeyer to Spaatz, 26 Nov. 1942.


49. ltr., Eaker to Arnold, 26 Nov. 1942, in SAS 385; ltr., Eaker to Arnold, 11 Jan. 1943.


51. Evaluation, Tab G, App. F; Perforability of German Submarine Pens, ORS Special Rpt. #1, 8 Dec. 1942.

52. Ibid., p. 3; cf. Evaluation, Tab G, p. 3.

53. Analysis of Results, in A-2 Lib., K-9226. Admiralty was reported to be in agreement with the conclusions arrived at in this paper.

54. U.S. Strategic Bombing Survey [USSBS], AFO 413, Interview #59, Grand Admiral Doenitz, 28 June 1945, in APSHO files; cf. Strategic Aerial Bombardment of Germany, 30 Dec. 1943, in APSHO files.


59. Tac. Mission Folders #17 (Lille, 6 Nov. 1942) and #24 (Lille, 6 Dec. 1942).


69. Ibid.

70. Ibid. See also Intel. Narrative #26 in same folder.

71. Ibid.

72. CI-IN-10858 (11-25-42), USAAF to AG/AR, #239, 25 Nov. 42.

73. See appropriate mission reports in Tac. Mission Folders.

74. Ibid., Intel. Narrative #26.

75. See above, Chap. II.

76. CI-CUT-7903 (12-23-42), OSAF, AFAB to CG, 8th AF, K-1153, 22 Dec. 42.
77. Ibid.
78. CI-IN-11208 (12-26-42), Algiers to USFGR-AGMAR, #3083, 25 Dec. 42.
81. Ibid.
82. Ibid.
83. CI-OUT-3659 (1-11-43), CG AAF, AFAAP to CG 8th AF, #k-1313, 9 Jan. 1943.
84. Ltr., Eaker to Stratemeyer, 30 Jan. 1943, in LAG 312.1-B.
87. CI-IN-4417 (11-11-42), London to AGMAR, #38, AFN 307A, 10 Nov. 42; CI-OUT-2851 (7-11-42), USFGR to USFGR, 10 Jul. 42. Cf. ltr., Spaatz to CG ETUSA, 9 Nov. 1942; ltr., Spaatz to Stratemeyer, 7 Nov. 1942, in LAG 312.1-A.
88. CI-IN-825 (12-2-42), London to AGWAR, #1026, 2 Dec. 42.
89. Ltr., Arnold to Eaker, 2 Dec. 1942, in AAG 312.1-A; CI-OUT-4254 (11-13-42), AFDAS to CG 8th AF, #A-753, 13 Nov. 42.
90. CI-OUT-4254 (11-13-42); ltr., Arnold to Eaker, 2 Dec. 1942.
91. A/P Status Rpts., BOLERO Papers; ltr., Eaker to Stratemeyer, 30 Jan. 1943, in AAG 312.1-B.
92. See ltr., Eaker to Stratemeyer, 2 Jan. 1943, in LAG 370.2.
93. ORS Day Raid Rpts.; CI-OUT-4874 (1-11-43), AFDMC to CG 8th AF, #A-1335, 14 Jan. 43.
95. First L100, Vol. II, p. 458; CI-IN-1368 (11-4-42), London to AGMAR, #498, 3 Dec. 42.
98. Ibid., pp. 151 ff., especially p. 152.
100. ORS Day Raid Rpts., passim. See also Hist., VIII AFSC, Chap. V, p. 108.
102. Ibid.; ORS Day Raid Rpts., passim; Eaker Rpt., Tab E, Exhibit 3.
103. See cables, 8th AF, CW-IN-4417 (11-11-42), London to AGMR, #8, AFN 307A, 10 Nov. 42; Eaker Rpt., Tab E, Exhibit 3.
107. See Hist., 1st Bomb Wing.
108. First 1100, p. 395.
112. Evaluation of Defensive Measures, p. 36.
114. Evaluation of Defensive Measures, p. 94. These figures include bombers having received class E damage, which involved virtual destruction.
116. CW-IN-9057 (12-21-42), London to AGMR, #183, 20 Dec. 42.
117. CW-CUT-1338 (1-5-43), AFADB to CG 8th AF, #1-1260, 4 Jan. 43.


121. Ibid. See also Evaluation of Defensive Measures, pp. 43-46; Tactical Doctrine, 1st Bomb Wing, 1 Feb. 1943, in A-2 Lib., K-37105.

122. Ibid.

123. Evaluation of Defensive Measures, p. 46.


127. OR5 Day Raid Rpts., passim; Evaluation of Defensive Measures, p. 94; see above, pp. 73, 79-80.


129. Ibid.

130. Ibid.


134. Ibid.

135. Ibid.


139. Eaker Rpt., p. 4.
140. First 1100, pp. 395-6.
144. Prelim. Rpt. on Bomb Accuracy.
145. Tac. Doctrine, 1st Bomb Wing, 1 Feb. 1943.
Chapter IV


2. CCS 97/3.

3. JCS 30, 5 April 1943.

4. Ltr., Spaatz to Arnold, 23 Nov. 1942. See also discussion below, p. 136.


6. AJP-42, 9 Sep. 1942, copy in Office of Director, Joint Target Group (JTG).


8. JCS 152, 16 Nov. 1942.

9. Ltr., Kuter to Spaatz, 16 Sep. 1942, in AAG 383.3-F.


11. Minutes, Air Staff Meetings, 5 and 26 Aug. 1942; memo, CG AAF to C/S, 29 July 1942.


19. See below, p.185. See also ltr., Spaatz to Arnold, 10 Nov. 1942; Rickenbacker Rpt.; Butcher MS.


21. JCS 26th Meeting, 28 July 1942 (Ref. GCS 97); JCS 28th Meeting, 11 Aug. 1942 (Ref. JCS 97/2); JFS, 24th Meeting, 22 July 1942 (Ref. CPS 35/1).


24. JFS 24th Meeting, 22 July 1942.

25. Ibid.


27. Ltr., Spaatz to Arnold, 24 Aug. 1942, in AFG 385F.


29. AAFRH-2; ltr., Spaatz to Arnold, 23 Nov. 1942; ltr., Eaker to Arnold, 11 Jan. 1943, A-2 Lib., K-14347; JCS 152, 16 Nov. 1942, memo by CG AAF.


31. JCS 97/1, 11 Sep. 1942, memo by CG AAF; cf. JCS 152, 16 Nov. 1942.


34. Ltr., Stratton to Spaatz, 25 Aug. 1942, in APJIO files.


36. Ibid., Incls. B, C, and D.


38. Notes on JFS 33d Meeting, 2 Sep. 1942 (Ref. JFS 48).

40. Notes on JFS 33d Meeting, 2 Sep. 1942.

41. JCS 33d Meeting, 15 Sep. 1942 (Ref. JCS 97/1).

42. JFS 48/1/D, 7 Oct. 1942, which consisted of the minutes of JCS 36th Meeting, 6 Oct. 1942.

43. JCS 97/1, 11 Sep. 1942, incl. A, C, and D; notes on JFS 33d Meeting, 2 Sep. 1942.


45. JCS 33d Meeting, 15 Sep. 1942 (Ref. JCS 97/1); JCS 36th Meeting, 6 Oct. 1942; JCS 37th Meeting, 13 Oct. 1942.

46. AAFRH-1, pp. 112-13.

47. Memo, Roosevelt for Leahy, King, Marshall, and Arnold only, 24 Oct. 1942, in AFSHO files, 13th AF.


49. Memo for all Staff Directorates from C/AG, General Arnold's Opinion on How to Win the War, 2 Dec. 1942, in SAS 385; Minutes, A/S Meeting, 8 Dec. 1942, in SAS files.

50. See above, Chap. II and III.

51. Ltr., Spaatz to Arnold, 31 Oct. 1942; CL-IN-8691 (11-20-42), London to AG,JR, #5062, 18 Nov. 42; CL-OUT-7197 (11-22-42), AFDIS to CG ETO, #9-34,51, 22 Nov. 42; CL-IN-825 (12-2-42), London to AG,JR, #1026, 2 Dec. 42.

52. See below, pp. 166 ff.


55. GFS 49/1, 27 Nov. 1942.

56. IncL, B, GFS 49/1, 27 Nov. 1942, Minority Rpt., by member of USAAF. Cf. GFS 49/2, 5 Dec. 1942, memo, CG AAF to JCS.
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58. Memo for G/S from Handy, 8 Nov. 1942. Cf. Notes on JCS 42d Meeting, 17 Nov. 1942, in which a similar line of thought is expressed.

59. American-British Strategy, 7 Nov. 1942, copy in files of Cpn. Hist. Br., AFSHO. This paper was prepared by the British COS and brought to the U.S. by Air Vice Marshal Slessor for discussion and coordination with the JCS. It was presented to that body and then withdrawn on protest of Admiral King that it was not official since it had not been approved by the British Imperial War Council. Memo for S/O from Lovett, 15 Nov. 1942, in SAS 381. Cf. above, n. 17.


61. JCS 30, 1 May 1942; cf. ltr., Roosevelt to Mr. Donald L. Nelson, 1 May 1942, filed with JCS 30.


63. JCS 43d Meeting, 24 Nov. 1942 (Ref. JCS 134/2).

64. See above, p. 124-26.

65. I.F.O.-42.

66. Ibid.


68. Ltr., Kuter to Spaatz, 16 Sep. 1942, in AAG 391-F; Minutes, J/S Meeting, 29 Sep. 1942, in SHS; JCS 43d Meeting, 24 Nov. 1942 (Ref. JCS 134/2).

69. Ltr., Kuter to Spaatz, 16 Sep. 1942; JCS 38th Meeting, 20 Nov. 1942 (Ref. JCS 134); JCS 41st Meeting, 10 Nov. 1942 (Ref. JCS 145).


71. Ibid.

72. JCS 38th Meeting.

73. Ltr., President to Nelson, 29 Oct. 1942, filed with JCS 146/10.

74. JCS 134/3, 26 Nov. 1942.

75. JCS 30, 5 Apr. 1942; JCS 41st Meeting.
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77. JCS 41st Meeting, 10 Nov. 1942. See also JCS 146 series passim; memo for AG/AS Plans from AG/AS 2-4, 20 Nov. 1942, filed with JCS 146/2, 24 Nov. 1942.

78. JCS 146 series, passim. See especially, JCS 41st Meeting, 10 Nov. 1942, JCS 146/2, 24 Nov. 1942, JCS 146/7, 7 Dec. 1942.

79. Memo for Col. Langmead, 25 Nov. 1942; JCS 45th Meeting, 8 Dec. 1942 (Ref. JCS 146/7); JCS 186, 4 Jan. 1943.

80. JFS 51/1, 20 Oct. 1942; JFS 43d Meeting, 28 Oct. 1942 (Ref. JFS 51/1); JFS 44th Meeting, 4 Nov. 1942; JCS 41st Meeting, 10 Nov. 1942, and attached notes.

81. Ibid. See especially JFS 43d Meeting, 28 Oct. 1942, JCS 41st Meeting, 10 Nov. 1942. See also memo for Col. Langmead, 25 Nov. 1942.

82. JCS 43d Meeting, 24 Nov. 1942.

83. JCS 146, 5 Nov. 1942.

84. JCS 41st Meeting, 10 Nov. 1942.

85. JCS 146/1, 17 Nov. 1942, Tab A; JCS 146/2, 24 Nov. 1942 (memo by CG, AAF) and attached papers.

86. JCS 43d Meeting, 24 Nov. 1942.

87. JCS 146/5, 30 Nov. 1942, containing ltr. Leinh to Nelson, 26 Nov. 1942. See also attached papers, especially ISR, AFDAG to A-4, 5 Dec. 1942.

88. JCS 146/6, 5 Dec. 1942.

89. JCS 186, 4 Jan. 1943.

90. JFS 62d Meeting, 3 Mar. 1943 (Ref. JFS 51/5); JCS 186/1, 6 Jan. 1942; JCS 5th Meeting, 18 Jan. 1943 (Casablanca); memo for CG AAF from Brig. Gen. E. D. Leyers, 25 Mar. 1943, in AAG 452.01-3; ltr. Lovett to Harry Hopkins, 25 Mar. 1943, in AAG 352.01; JCS 146/16, 6 May 1943; JCS 416/2, 10 June 1943.

91. JCS 45th Meeting, 8 Dec. 1942, and attached notes.

92. See above, Chap. I.

93. See above, Chap. II.

94. JCS 52d Meeting, 16 Jan. 1943 (Casablanca).


97. See above, present chap., and n. 96 above.


99. Ibid.; ltr., Spaatz to Arnold, 31 Oct. 1942. See also above, present Chap.

100. See above, present chapter.

101. Ltr., Spaatz to Arnold, 31 Oct. 1942; digest of conversation, Eisenhower and Spaatz, 29 Oct. 1942; memo, Spaatz to CG, STOSA, 19 Nov. 1942 (cf. memo, Spaatz to CG STOSA, 14 Nov. 1942); Meeting at Midwings, 23 Nov. 1942, in AIC 312.1-A.

102. Ltr., Spaatz to Arnold, 23 Nov. 1942.

103. Ltr., Arnold to Spaatz, 15 Nov. 1942; ltr., Arnold to Eisenhower, 15 Nov. 1942, both in Parton papers.

104. Eaker Rpt., Tab C, p. 3.


109. Eisenhower was authorized to submit the plan for STOSA AAF HQ to CCS in message OPD #606, 30 Dec. 1942. R&R, Arnold to Strattemeyer, 17 Dec. 1942, comment 3, AFAEP to AFGAS, n.d.
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114. See above; present chapter.


117. See above, present chapter.


119. See above, present chapter.


121. Ltr., Arnold to Eaker, 18 Nov. 1942, in AAG 312.1-A.


123. See above, Chap. I. R&R, AFNAS to AFNAS, 14 Sep. 1942, in AAG 381-F; ltr., Stremeyer to Spaatz, 30 Sep. 1942, in SAA 370.2; Rickenbacker Rpt.


125. Memo for 3/2 from Lovett, 15 Nov. 1942, in SAA 381. The subject paper is no longer attached to the memo, but is summarized therein.


130. Ltr., Spaatz to Stratemeyer, 14 Sep. 1942, in AAC 370.2; ltr., Stratemeyer to Spaatz, 30 Sep. 1942, in NAS 370.2. See above, Chap. II.

131. See above, Chap. II, p. 41, present Chap., p. 131; see also below, Chap. V, pp. 213-14.


133. COS 155.1; COS 57th Meeting, 15 Jan. 1943.

134. COS 55th Meeting, 14 Jan. 1943; COS 57th Meeting, 15 Jan. 1943; Casablanca Conf.; 2d Meeting, 18 Jan. 1943; COS 169; JCS, Conf. with the President, 16 Jan. 1943.

135. Ibid.

136. COS 57th Meeting; COS 165/2, 22 Jan. 1943.


139. Ibid.

140. Butcher MS, under d. 17 Jan. 1943.


142. COS 55th Meeting; COS 65th Meeting; COS 155/1.

143. Ibid.

144. COS 55th Meeting; COS 58th Meeting, 16 Jan. 1943; JCS, Conf. with President, 16 Jan. 1943.

145. COS 65th Meeting.

146. Ibid.

147. Memo for Maj. Gen. E. H. Giles, 8 Sep. 1943, in Plans, JCS Div., FO 38k.3 (4-29-43), Sec. II.

148. Ibid.
1. Figures have been taken from Statistical Summary of Eighth Air Force Operations, etc., and from Tactical Mission Reports [T/M Rpts.]. See below, Chap. VI, for discussion of the logistical situation.

2. See above, Chap. III, for discussion of the antisubmarine problem.


4. See above, Chap. IV.


6. Beginning with February, cables during this period which report Eighth Air Force missions to submarine or other objectives in occupied territory usually state that, weather conditions having made missions to Germany impossible, targets in occupied countries had been selected. Ex. CM-IN-14209 (2-29-43), USHIN to HAF, #10, 27 Feb. 43.


8. Ibid.; USSBS, German Submarine Ind. Rpt., 3 Nov. 1945, in AFSHQ files.

9. Ibid.

10. T/M Rpts., #31, 37, 46, 56, 59.


14. Ibid.

15. T/M Rpts., #30, 36, 38, 40, 51, 53, 55, 58, 61.


19. Ibid.

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21. Summary of Eighth AF Heavy Bomber Operations as Called for in the
CBO Plan, First Phase, 1 Jul. 1943, in GGA papers, file "Bomb
K-24265 which embodied the report of a Polish official who was
supposed to have had information from an eye witness.

22. The Strategic Bombardment of Europe, 10 Dec. 1943, prepared by
AC/13 Intel.


24. USNBS, Sub. Ind. Rpt.; ibid., interview #50, 28 June 1945, in
ATSHO files.


27. USNBS, Plant Rpt. #5, Focke-Wulf Aircraft Plant, Bremen.

28. T/I Rpts., 39, 41, 42, 43, 47.

29. Ibid., #41, 42, 47; Rpt., Air Intelligence, British Joint Staff


33. See above, Chap. IV.

34. See CGS 166/2, 15 May 1943 and enclosed msg., #79013, Andrews to
Marshall, 23 Apr. 1943.

#78/4061, 9 Feb. 1943, in A-2 Lib., K-16108; CGS Rpts., #P.1/4651,


38. JCS 341, 27 May 1943.


40. CGS 166/2; CGS 166/3 (embryonic proposals presented originally as
JCS 341); CGS 97th Meeting, 4 June 1943; memo., by O/H to all
AG/HS, 30 Apr. 1943, in CGS 385.
41. See above, Chap. IV.

42. Allan A. Ritchie, The Air Offensive Against Germany, New York, 1943.

43. New York Herald Tribune, 19 Feb. 1943, editorial; cf. memo for Arnold from Lovett, 19 Feb. 1943 and attached ltr., Foster to Arnold, 22 Feb. 1943, in SAS 385; Cl-IN-95731 (2-21-43), USFOR to AGWAR, #6595, 21 Jan. 43; see also memo for Stratemeyer from Sorensen, 13 Apr. 1943, in SAS 385.

44. See below, Chap. VI; ltr., Eaker to Stratemeyer, 19 Feb. 1943, in AAG 312.1-B; Cl-IN-4057 (3-8-43), USSCS to AIR, #300, 8 Mar. 43.

45. T/M Rpts.

46. Eaker Rpt.


48. T/M Rpts. #31.


50. See above, Chap. III.

51. T/M Rpt. #32.

52. Ibid. #37.

53. Ibid.

54. Ibid.

55. See above, Chap. III.

56. T/M Rpts. #36, 37, 46.

57. Ibid., #39; Cl-IN-2432 (3-5-43), USAIR to AIR, #221, 5 Mar. 43.

58. T/M Rpts., passim.

59. Cl-IN-14665 (2-22-43), USAIR to AIR, #41, 26 Feb. 43.

60. T/M Rpt., #45; Cl-IN-11505 (2-22-43), USFOR to AIR, #771, 21 Mar. 43; Cl-IN-10753 (3-20-43), USAIR to AIR, #707, 19 Mar. 43; ltr., Eaker to Arnold, 19 Mar. 1943, in AAG 312.1-B; ltr., Eaker to Longfellow, 24 Mar. 1943, in VIII Bomb Grp. Diary, under d. 25 Mar. 1943.
61. See above, Chap. III.

62. T/O Rpts., #30, 36, 38, 40.

63. Ibid.

64. Ibid.

65. Ibid., #39, 41, 42, 43, 47, 48.

66. Ibid., #43; Eighth Air Force Tactical Development, August 1942 to May 1945, prepared by 8th AF and HAF Eval. Ed., SID, 9 Jul. 1945, Chap. II.

67. T/O Rpt., #41.

68. Ibid., #49, 50, 51.

69. Ibid.

70. Ibid., #52; Ci-IN-12237 (4-20-43), USFOR to HAF, #867, 20 Apr. 1943.

71. Ibid., #52.

72. Ibid.

73. See above, Chap. III; 8th AF Tac. Devel., Chap. I.

74. T/O Rpt., #52.


76. USSBS, The Defeat of the German Air Force; 8th AF Tac. Devel., Chap. V.

77. USSBS, Defeat of GAF; An Evaluation of Defensive Measures Taken to Protect Heavy Bombers from Loss and Damage, Opns. Anal. Sec., Hq 8th AF, Nov. 1944, p. 94, gives 18.9 per cent for the month of June 1943. See also T/O Rpts., passim.

78. See above, Chap. III.


80. See T/O Rpts., especially #38, 42, 43.
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82. Hist., VIII Frt. Comd., in AFHQ files; 8th AF Tac. Devel., Chap. II; Eaker Rpt., Tab C; CI-IN-4168 (3-9-43), USAF to WAR, 1/311, 8 Mar. 43; CI-IN-450 (2-2-43), London to WAR, 1/333, 1 Feb. 43; ltr., Stratemeyer to Eaker, 7 Jan. 1943; radiogram, Allied AF to AGWAR, 1/408, 25 Jan. 1943; ltr., Eaker to Giles, 13 May 1943, in AAG 312.1-B; CI-IN-5642 (5-9-43), USAF to WAR, 1/215, 8 Mar. 43; CI-IN-5880 (3-12-43), USAF to WAR, 1/277, 11 Mar. 43; CI-IN-7903 (3-15-43), USAF to WAR, 1/570, 15 Mar. 43.

83. CI-IN-10127 (4-17-43), USAF to USFOR, 1/744, 17 Apr. 43; Hist., VIII Frt. Comd.

84. 8th AF Tac. Devel.; Eaker Rpt., Tab C; ltr., Eaker to Giles, 13 May 1943, in AAG 312.1-B; CI-IN-5642 (5-9-43).

85. CI-IN-7311 (4-14-43), USFOR to WAR, 1/375, 8 Apr. 43; ltr., Eaker to Giles, 17 Apr. 43, in AAG 312.1-B.

86. T/M Rpt., 1/54; Hist., VIII Frt. Comd.

87. T/M Rpts., 1/55, 56.


89. T/M Rpt., 1/60.

90. Ibid., 1/56, 57, 58, 59.

91. Stat. Sum., 8th AF.

92. T/M Rpt., 1/56 (see A-2 Lib. folder in particular).

93. Ibid.

94. Ibid.; CI-OUT-4825, CG AAF to CG ETO, 1/2-6631, 12 Mar. 43; CI-IN-8565 (3-17-43), USAF to WAR, 1/607, 16 Mar. 43.

95. T/M Rpt., 1/56.

96. Ibid., 1/58; ltr., Eaker to Giles, 28 May 1943, in AAG 312.1-B; CI-IN-13892 (5-29-43), USAF to WAR, 1/52, 11 May 43.

97. These figures are taken where possible from Stat. Sum., 8th AF. However, some breakdowns in Evaluation of Defensive Measures, compiled by ORS, 8th AF, are handier and have consequently been used. The two sources seldom agree in detail, but they are usually not far enough apart to affect any general conclusions based on them.
96. Ibid.
99. See above, Chap. III.


102. Ibid. See also CRS Rpt., VIII Bomb Comd. Bombing Accuracy, 1 Jan. to 15 Oct. 1943.


104. Ibid.; see also T/I Rpts., passim.

105. Ibid., esp. T/I Rpts., #59, 60.

106. Ibid.; cf. CRS Rpt., 12 May 1943, Comparison of Bombing Results in Relation to the Order in Which Participating Groups Reached the Targets.

107. T/I Rpts., #56, 57, 59; CG-1-11-14701 (5-29-43), USAF to AR, #D-1174, 28 May 43.

108. CG-1-11-10753 (3-20-43), USAF to AR, #707, 19 Mar 43; Ltr., Eaker to Arnold, 19 Mar. 1943, in AAG 312-1-B; CG-1-11-14701 (3-22-43), CG AAF to CG ETO, #8-6940, 22 Mar. 43.


3. CI-IN-302 (3-1-43), USAFR to TARM, #51, 1 Mar. 43; CI-IN-2926 (4-5-43), London to ARM, #5446, 5 Apr. 43. Cf. ltr., Anderson to Stratemeyer, 2 Mar. 1943, in AG 312.1-3.

4. In a letter to Arnold, 1 Mar. 1943, Air Marshal D. C. S. Evill said that Portal directed him to emphasize that "his" sole object in sending this message is that it may be available to you as support for action toward the build-up of the U.S. Bomber Force in U.K.


8. CI-IN-302 (3-1-43), USAFR to TARM, #55, 1 Mar. 1943.


12. CI-OUT-3936 (3-11-43) AG/AFS ADFPU to CG ETO, #6-552, 11 Mar. 43.

13. The following extract from the summary of tentative assignment of tactical units, made in accordance with revised troop basis, ETUSA, and dated 16 January 1943, shows the monthly quotas planned at that time for the Eighth Air Force in heavy bombers:

<table>
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<tr>
<th>Units remaining in U.K. after withdrawal for Special Operations</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
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<th>May</th>
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Revised Troop Basis ETUSA, copy in files of Chief Br., AFCHQ.
14. JCS 238/3, 21 Mar. 1943; C: IN-13932 (3-16-43), London to AG-An, \#8194, 26 Mar. 43; CI-IN-72a1 (2-1-43), London to AEF, \#7242, 14 Feb. 43; CI-CUT-5113 (2-15-43), Hq AAF, A-3 to London, \#1-58B9, 15 Feb. 43; CI-CUT-2033 (4-9-43), Hq AAF, AFAFP to CG ETO, \#27-7303, 5 Apr. 43; ltr., Stratemeyer to Eaker, 8 Mar. 1943, in AG 312.1-B.

15. Ltr., Stratemeyer to Eaker, 7 Feb. 1943, in AG 312.1-A; CI-IN-2562 (3-5-43), London to AAF, \#6989, 3 Feb. 43; CI-IN-2178 (4-5-43), London to AAF, \#1333, 3 Apr. 43; ltr., Eaker to Stratemeyer, 26 Feb. 1943, in AG 312.1-B.

16. Ltr., Stratemeyer to Eaker, 7 Feb. 1943; memo for Arnold from AO/AS Plans, 25 Apr. 1943, in Plans, H-E-F-III-A-2 /2; CI-CUT-2033 (1-5-43), Hq AAF to CG ETO, \#27-7307, 5 Apr. 43. The direct effect of diversions, as far as heavy bombers were concerned, was felt mainly in the B-24's, which were considered more suitable than the B-17's for service in the Pacific and Asiatic areas and for antisubmarine patrol. Form SG-62's for Feb, May, and June 1943 (AB Allocations), in Off. of Stat. Control. See also AAFH-7.

17. Ibid.
19. Preshipment to the ETO, historical LBC prepared by Control Div., AAF.
20. CI-IN-9389 (2-1-43), London to AAF, 7354, 26 Feb. 43.
21. SEC. Monthly Progress Reports, see in each number Sec. 3, Transportation.
29. CL-OUT-10312 (1-30-43), CG AAF to CG ETO, M-5494, 29 Jan. 43;
CL-IN-424 (2-1-43), London to AG JNR, 1 Feb. 43.
32. JCS 313, 12 May 1943.
33. CCS 836 Meeting, 13 May 1943; CCS 235, 18 May 1943.
34. Hist., VIII AFGC, pp. 9-10.
35. Msg., AG JNR to USAFE, 16-7578, 14 Apr. 1943, in ibid., docs.
37. Ibid., pp. 6, 10-13.
38. CCS 214/1, 25 May 1943, Annex IV, App. A. See below, present Chap.,
for discussion of CBO Plan.
40. General Giulio Douhet, The Command of the Air, New York, 1942, pp. 50,
59-60, quoted in Air Force Objectives, an address delivered before
the Army Navy Staff College, 13 Aug. 1943, by Brig. Gen. Edgar P.
Sorensen, AG/JG Intel., in AF350 files (COA Papers).
41. See below, present chapter.
42. The following analysis is adapted from the more or less official
account contained in Air Force Objectives.
43. Vulnerability to Air Attack and Lists of Most Important Targets,
Air Targets Intelligence, Air Ministry, A.I.1(b), 24 July 1939,
Cf. Priorities for Bombing Attack among Economic Targets in German
Europe, En., 8 Jan. 1942; Lecture Notes on Air Targets Intelligence,
Organization and Duties of A.I.9 (Air Ministry). All the above
papers in A-2 Lib.
44. Considerable light has been thrown on this phase of the subject by
Lt. Col. Malcolm L. Moss, then chief of the Target Information
Section, A-2, and by Prof. Edward L. Earle of the Institute for
Advanced Studies, Princeton.
45. See copies of Air Estimates in A-2 Lib.
46. Ibid.
47. Notes from History of the Organization and Operation of the COA by

49. Ibid.

50. Notes from Hist. of COA.

51. Thomas: L. Lamont joined the Committee on 7 Jan. 1943. Ibid.


53. Ibid., file entitled COA General.

54. Ibid.; cf. reports to COA by subcommittees on the various industries examined. Complete file in A-2 Lib.

55. Notes from Hist. of COA.

56. See Subcommittee Rpts.

57. COA Rpt., 8 Mar. 1943.


60. Ibid.

61. Ibid.


63. See COA Papers, file entitled "Oil."


65. Ibid.

66. Ibid.


68. See above, Chap. III.


70. Ibid.

71. Ibid.
72. Ibid.
73. Ibid.
74. Ibid.
75. Ibid.
76. Notes from Hist. of COA.
77. Ltr., C. G. Vickers, LDF, to Portal, 3 Apr. 1943, in USSBS files, #322; see also attached detailed comments on COA Rpt.
78. Eckert Rpt., Tab E, p. 3.
79. Ibid. Cf. Notes from Hist. of COA.
82. Notes from Hist. of COA.
83. JCS Special Meeting, 29 Apr. 1943, ref. JCS 277. This paper presented by Eckert, which became JCS 277/1, is substantially the one finally adopted as CCS 217, which has been used as the basis for the analysis of the CAS Plan herein following.
84. Ibid.
85. INET-1, 12 Aug. 1941, in AFAET files, Office of Security Officer.
87. See above, Chaps. I, II, and III.
88. See above, Chap. IV.
89. JCS 277, 29 Apr. 1943. The schedule here proposed differed from that presented by Eckert only in the first phase when 864 rather than 944 heavy bombers were projected.
90. JCS 77th Meeting, 4 May 1943.
91. CCS 217, 14 May 1943; CCS 215, 13 May 1943.
92. GCS 85th Meeting, 15 May 1943; GCS 87th Meeting, 18 May 1943; GCS 219, 14 May 1943; GCS 232/1, 18 May 1943.
93. GCS 85th Meeting; GCS 87th Meeting; ltr., Portal to Arnold, 15 Apr. 1943.
94. GCS 87th Meeting.
95. GCS 242/6, 25 Mar. 1943 (final report on TRIDENT decisions to the President and the Prime Minister).
Because of the nature of this history, the sources of the information were found chiefly in highly classified documents of AAF, British, and Allied staff offices. As cited in the Notes, much reliance was placed on CCS and JCS papers; on British Air Ministry reports, correspondence, and analyses; and on the files of the Assistant Chief of Air Staff-5. Other sources frequently used include the files of AC/AS-2; interpretation reports, evaluations, and interviews in the A-2 Library; letters in the Air Adjutant General and Secretary of Air Staff files; reports of the Office of Strategic Services, Operational Research Section and Operations Analysis Section of Eighth Air Force, the AAF Evaluation Board, the Committee of Operations Analysts; the U. S. Strategic Bombing Survey; the Eaker Report; Statistical Summaries; and unit histories, cables, Tactical Mission Folders, and special studies in the Archives of the AAF Historical Office. The reference to "Butcher MS" concerns the manuscript copy by Capt. Harry C. Butcher, USNR, for his book My Three Years with Eisenhower, later published by Simon and Shuster: New York, 1946.
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