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THE EFFECT OF THE ALLIED AIR ATTACKS ON THE GROUND ECHELON OF THE LUFTWAFFE IN WESTERN EUROPE IN 1944

Study Prepared at Karlsruhe

by

Karl Gundelach

Captain in the ~~Bundeswehr~~

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INTRODUCTION

The scope of this study, which originally was to cover the period of the entire war, was eventually restricted to the year 1944. This was done intentionally because so many events were telescoped into that year that every topic, which could possibly be of interest for the purpose of this study, was covered by typical examples. In this connection the tremendous expansion of Allied air offensives shortly before and even more during the invasion must be especially mentioned.

The author would have liked to have had a wider selection of source material, mainly because he could provide hardly any information from personal experience. On the other hand, the realistic official data convey a more unadulterated and actually also more useful picture on the impact of the Allied air attacks.

The term "ground echelon" includes by definition all facilities, forces, and installations on the ground, which constituted the prerequisites for operations in the air. More specifically these are as follows:

The airfields and their fixed facilities such as hangars, workshops, maintenance and repair shops, depots, and quarters. Moreover, the ground staffs and services, which included the maintenance and repair personnel, the technical auxiliary

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services, the fire brigades, the guards, and the supply, transportation, and administrative services.

In a larger sense one might also include the aircraft departments and parks in rear areas, the aviation gasoline storage depots, the Luftwaffe construction units, and major elements of the air force signal communications units which support the flight security effort or the service and supply troops.

The ground echelon thus presents an extensive and complex entity, which includes the bulk of the Luftwaffe troops which are not part of the air defense forces.

Whereas in 1936 experts in Germany considered that 25 - 30 men would be needed to keep an aircraft flying, the ratio of ground personnel per plane rose steadily throughout the war, amounting to about 50 - 80 men in 1940, some 100 - 120 men in 1941, up to 250 men in the winter of 1941 - 42, and up to 1,000 men in the field and in the zone of interior toward the end of the war. [1]

However, this ratio varied during the period under review, dropping in the summer of 1942 in comparison to the figures of the preceding winter. The really incredible disproportion that existed toward the end of the war was the

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[1] See General a.D. (Ret) Rieckhoff, Wintererfahrungen in der Bodenorganisation der Flugwaffe (Winter experiences made by the Luftwaffe ground echelon) in "Flugwehr und Technik", Issue No. 12, December 1948, Frauenfeld (Switzerland).

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result of the catastrophic decline in the operational strength of the flying units. Moreover, the German ground echelon had to be disproportionately expanded because of the Allied air superiority or else the flying units would have been altogether incapable of taking to the air, which could be achieved only from camouflaged berths. But even then the size of the ground personnel staff varied from one area to another. The ratio was more favorable in theaters in which the Luftwaffe temporarily formed main efforts and was temporarily below average in sectors that had been uncovered of flying units.

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CHAPTER ONE

THE SIGNIFICANCE OF THE GROUND ECHELON IN THE AIR FORCE ORGANIZATION

1. The Air Force Directive No. 16

This service directive pertaining to the conduct of air operations, which first appeared in 1936 and which was re-issued in 1940 with some insignificant additions, XXXXXXXXX may be considered as the basic regulation that governed the conduct of Luftwaffe operations. It is XXXXX very regrettable that the real author, the truly animating spirit -- General Wever -- died so prematurely, thus being unable to complete his work and to contribute to its continuous development of new theories. For, it had been intended that Part VI of the directive would cover the topics of "Ground Echelon, Communications, and Lines of Communications", and there can be only little doubt that this missing part would have been another outstanding example of the author's ability to present his subject matter clearly and concisely. This part would thus have been an impressive monument to the general's great gift of giving a fully integrated picture.

Because of this deficiency, the directive that is

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available contains only individual references to the ground echelon, which are incorporated into its various chapters, pointing out the significance of the ground elements for air force operations and their conduct. Even so, these cross references indicate the existence of basic concepts and guiding principles of strategy and tactics, which were completely validated during World War II and which cannot be ignored within the framework of this study.

Paragraph 49, for instance, states that a sound ground echelon must be considered an essential element for the massed concentration of weapons. The same paragraph mentions the ground echelon's importance in offering effective protection to the ground forces against air attacks.

In paragraph 50 of that directive, the author points out that the combat forces can stay at the same air bases even if their attack sectors change. In this manner, the early discovery of offensive plans on the part of the enemy's reconnaissance forces becomes more difficult. But the same directive also mentions that, by remaining at the same air bases, the approach flights become overextended, thus handicapping the flying units. Moreover, by flying approach routes over one's own territory one actually relinquishes the equivalent distance in range over enemy territory. In this connection it is emphasized that such action would

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be detrimental to intervention in ground operations in the course of joint ventures with other armed forces services. In the further discussion of this point, which is of major importance, this study will show the disastrous consequences it had during the Allied invasion of 1944: at that time the air fields near the coast had been destroyed to facilitate the defense against Allied airborne landings. As a result, the German fighter-bombers could not offer effective support to the ground forces because their airfields were at such a distance inland that their range was insufficient without auxiliary tank.[1] But by 1944 it was no longer possible to switch to further advanced airfields, as suggested in Directive No. 16 in such instances.

The directive warns against concentrating strong forces within a narrow space. But if such a concentration must be made, paragraph 51 emphasizes that an effective ground echelon and sufficient antiaircraft defense measures should be taken to reduce the risk. Mobile units will make their identification by enemy forces more difficult by accentuating their mobility, proper camouflage, and by establishing dummy airfields (par. 109). This will be all the more necessary, if the enemy enjoys almost complete freedom of action, thus being able to restrict maneuverability of one's own flying

[1] See The Army Air Forces in World War II, Vol. III: "One of the basic principles for achieving maximum tactical efficiency is to establish the air bases as close as possible to the main line of resistance."

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forces, to reduce the radius of action, and to hamper command functions by destroying elements of the ground echelon and ~~XX~~ parts of the communications centers(par 104). The protection of the ground echelon is of primary interest to the flying units; it is of so much importance that, in the event of a reduction in the area of operations, even the temporarily unoccupied airfields will have to be protected.

Within the framework of the fundamental principles on which it is based, the directive also analyzes the importance of secure signal communications, which are characterized as "the life blood of air force command." Their proper functioning is a basic prerequisite for flying and ground operations. Moreover, they form an integral part of the ground echelon. The air-warning system is also considered in this connection, because it is ~~XXXXXXXXXXXXXX~~ an essential tool of the defence. Its effective organization and thorough training of personnel are geared to constant improvements on the field of signal communications. If the important targets that are to be protected are at short distance from the border or the frontline and the enemy aircraft fly at great speed, its effectiveness is questionable. In this case it might be necessary to commit flying patrols above one's own air space. This touches upon the problem of the early-warning outpost area, which became particularly important in western Europe after 1943 and which, because

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of the Allied air superiority, contributed to the German withdrawal from forward airfields deep into the rear areas.

The expansion of the ground echelon can take place only under centralized control, which is formulated as follows in paragraph 76:"The C-in-C of the Luftwaffe gives instructions for expanding the ground echelon well in advance. By securing and controlling the supply and replacement systems, he maintains the combat effectiveness of the air force."

While these basic principles, as formulated in Directive No. 16, formed the framework for the organization of the ground echelon, the years of actual expansion translated theory into practice. During these years many an airfield had to be planned and established in Germany, so that the practical experience became extensive. Field Marshal Kesselring devoted his time and energy to this task above all during the period from 1943 to 1936, leading his collaborators with never-tiring enthusiasm in this endeavor. Uniform types of training and fighter, bomber and reconnaissance airfields were being constructed. The success was immediately tangible since airfields simply shot up everywhere. In view of the dimensions of the new challenge, it is not surprising that mistakes were also made. During the course of these developments, the greatest deficiency uncovered was that every one of these airfields

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was too small and that the quarters and maintenance installations were too close to the edge of the runways. Quite apart from being thus exposed, these installations obstructed extensions of runways that became all the more necessary because modern aircraft constantly needed more space for starting and landing. In this sphere the Technical Office should have anticipated further ahead and should have specified its construction requirements, since such planning always covers extended periods of time. The construction of essential runways was part of the problem. In 1944, after the good airfields in France, Belgium, and Holland had to be abandoned, the Luftwaffe complained about a great shortage of airfields with satisfactory runways. In the Western Air Force Area Command, for instance, where 20 airfields suitable for jet aircraft were needed in 1945, there was only a single field that could be used.[1]

2. ~~Luftwaffe Service Regulation No. 90, Issued in 1938~~

The theoretical basis and guide lines for the construction of airfields were contained in the Luftwaffe Service Regulation No. 90, which was also issued in 1936. It was to constitute a rough outline only because it did not satisfy the requirements of the rapidly expanding Luftwaffe, which outgrew this framework. It was replaced by a revised issue that was

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[1] Rieckhoff, ~~Trumpf oder Bluff~~ (Trump or Bluff), Geneva 1945, pp. 51-4.

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published on 17 August 1938 under the heading: "Wartime Air Force Logistics (Supply Regulations)." [3]

These regulations include the experience factors from the buildup hitherto achieved, convey a complete picture of the present technical and organizational status, and simultaneously offer a preview of the future. Including its innumerable addenda and corrigenda, it forms a throughly reliable source for the continuous development that took place and indicates what really happened up to the end of the war, including most of the problems that were encountered. This regulation can therefore be considered as an official source for the description of the Luftwaffe's ground echelon.

For the purpose of this study, those parts of the regulation will be particularly emphasized which deal with the ground echelon in the field and which pertain to its buildup, expansion, and organizational structure. The regulation differentiates between the following types of airfields:

Controlling air bases,
peacetime air bases,
operational airports,
emergency landing grounds,
advanced landing grounds, and
dummy landing fields.

The first two categories, the controlling and peacetime ~~air bases, const~~ituted the peacetime stations of the flying

[3] Karlsruhe Collection

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service units. They were controlled by a headquarters staff and had all the personnel and equipment essential for administering the base personnel, conducting operations, and maintaining the aircraft. For this reason, they had not only hangars for aircraft but also maintenance and repair shops that were equipped to handle certain types of models of airplanes, a factor that was of particular importance during wartime: for instance, a specific workshop would be equipped for repairing bomber aircraft of the model Heinkel 111 or Junkers 88. But since the sites, sizes, and traffic density could not be concealed and the units were furthermore vulnerable when they were concentrated near the border for tactical commitment, the creation of operational airfields was implemented.

The operational airports were primarily intended for the employment of bomber, dive-bomber, and twin-engine fighter units in wartime. For this reason, these airfields had been prepared already in peacetime so that the flying units could occupy them within a few hours. Their proper concealment was of utmost importance; they were not supposed to be identifiable as potential airfields and were to be appear as much as possible as surfaces used for agricultural purposes. Their construction involved mainly the creation of a runway that was suitable for heavy bombers, the building

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of a connecting hard-surface road, a railroad branch line -- also considered as essential -- as well as the installation of a turntable, a fuel storage tank farm, a depot containing billeting utensils, maintenance tools, and operating equipment. Also needed were connections with the signal communications network, and ready availability of electricity and water supplies. In wartime the operational airports were administered by air base command headquarters, subordinate to which was one each air base maintenance company for the technical servicing of attached heavy units. For, such units had only limited organizational technical and repair personnel so that they had to rely on outside assistance for the resupply of their crews and for the maintenance and repair of their aircraft. It was therefore very important for them to be met by an air base maintenance company at the respective airport, whose personnel were equipped and trained for the care of the specific model aircraft. This was generally the case.[4] like in a hotel, the arriving units were provided with proper service for planes and crews (the so-called hotel system). The emergency landing grounds were destined for the employment of light units -- such as close-range reconnaissance, ground-support, and fighter units -- ~~and little, if~~ any, personnel were stationed at such fields.

[4] The author remembers how he arrived at an airport in Russia in the fall of 1943 together with his Heinkel 111 unit and accompanied by only the very essential technical personnel. The airport was serviced by a Junkers 88 air base maintenance company. This had a detrimental effect on the operational readiness of the author's unit until its own maintenance company arrived at the base.

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The commander of the incoming unit would assume command of the landing ground. The units were self-sufficient and their ground echelon had the necessary personnel, maintenance and repair equipment, and spare parts to take off and land at these fields, maintain and repair the aircraft unless they were so badly damaged that they had to be taken to a higher echelon repair shop. These units also had their field kitchens and vehicles to transport rations, ammunition, fuel, and items of equipment; they were fully mobile.

Advanced landing grounds were improvised fields in open terrain, which were often suitable only for the landing of individual aircraft. They were established as intermediate landing fields to facilitate the transmittal of orders and communications. They were usually situated in the vicinity of command posts of higher headquarters.

Finally, dummy landing grounds served to deceive the enemy air reconnaissance planes and attacking units. They were air fields that had been established at places were the terrain was considered suitable. A relatively small staff was located at such fields; the personnel simulated the presence of units and the conduct of air operations, using aircraft, dummy airplanes, vehicles, and other means for that purpose.

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The network of airfields created in peacetime was further expanded during the war according to directives issued by air fleet and air forces headquarters. Among these were also the directives pertaining to the reconstruction of airfields damaged by bombs. The same missions were assigned in Army operational areas, even if no Luftwaffe units were employed in such areas.

To complete this account, it may be well to mention that the ground echelon also included certain medical installations that were fully equipped at the peacetime airfields and at the emergency landing grounds so that they could satisfy all demands for taking care of the sick and wounded.

In July 1939, shortly before the start of World War II, the second part of the supply regulations was issued,[5] the contents of which convey data on the latest doctrine that prevailed at that time. Of primary interest in this connection is Part IX, Ground Echelon, which reads as follows under Section D:

"Installations at airfields and emergency landing grounds:

1. Airfields

Headquarters buildings,

buildings for quarters,

buildings for fire brigade,

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[5] Karlsruhe Collection.

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Aircraft hangars (depending on number of units, generally one hangar per squadron),

weapons repair shop,

radio repair shop,

motor vehicle repair shop,

ammunition storage dumps for 138-ton lots each,

storage tanks for special aviation gasoline,

storage tanks for 50,000 liters of motor vehicle gasoline stored in 2 containers of 25,000 liters each,

oil dump for aviation lubricants,

railroad siding, and depending on unit strength:

a. One workshop for one unit or a unit plus one wing headquarters with headquarters squadron;

b. One workshop and 1 weapons shed for 2 units; and

c. Two workshops and 1 weapons shed for 1 unit and 1 supply service branch.

2. ~~Emergency Landing Grounds~~

Emergency landing ground barn,

emergency landing ground grange,

five barracks,

ammunition storage dumps for 138-ton lots each,

railroad siding (Only for emergency landing grounds, 1st class with turntable; 2d class landing grounds were equipped with platforms that could be used to deposit railroad tractors at railheads and airfields),

Three field pipe lines with 27 gasoline pumps and 600 cubic meter storage space (See Section B for kitchen equipment, which was to correspond to unit strength present.).

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CHAPTER TWO

THE STATUS OF THE GROUND ECHELON IN WESTERN EUROPE

UP TO THE TIME OF THE START OF THE INVASION

During the campaigns that took place from 1939 to 1943 the ground echelon of the Luftwaffe fully proved its effectiveness in all theaters of war. It fulfilled all requirements, even though it should not be overlooked that failures occurred in individual instances. Both the planning and organizational buildup had proved to be fundamentally sound, and it was only necessary to adjust them to the prevailing circumstances.

The intensification of encounters with the Allied air forces in North Africa, which took place after 1942, and which continued also in Sicily and Italy in the summer of 1943, brought about a complete change in the situation. Because of the steadily growing air superiority of the Allies, the Luftwaffe had to organize a ground echelon that was and remained capable of commitment and effective performance despite this enemy superiority. This new task was particularly urgent for Third Air Fleet in the West, because that command would surely be faced with repelling the Allied invasion that was to be ex-

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pected. At that time the air fleet would feel the full impact of the Allied air superiority.

3. Status of the Ground Echelon on 1 January 1944

Based on the experiences made since the intensification of air operations and the Allied landings in Italy, the Third Air Fleet had reorganized and improved its ground echelon, but unfortunately these improvements were still being delayed.[1] The Luftwaffe had some 100 airfields at its disposal, which were situated within a 350-mile radius from Normandy. Some of these bases were well constructed and in good condition since they had been in use for many years, first by French airlines, then the French Air Force, then the R.A.F., and finally by the Luftwaffe. In view of the planned invasion of Britain in 1940 and because of the requirements imposed by the Battle of Britain, there were originally a great number of airfields near the Channel coast. In addition, there were bases suitable for bombers in the Paris basin as well as in the Belgian and Dutch rear areas. These fields were improved as much as possible, the runways extended up to 2,000 yards, and the billets and supply installations

[1] For further details, see General Plocher, Gruende fuer das Absinken der Kampfkraft der eigenen Luftwaffe und ihre Auswirkungen im Westen (Reasons for the Lowering of Luftwaffe Combat Effectiveness in the West and Its Impact), Spring 1944. Karlsruhe Collection.

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were extensively decentralized and camouflaged. The airfield organization was thus sufficient in view of the low strength of the available units, and there were also alternate facilities, if enemy action made withdrawal to same mandatory. But would all these preparations suffice for the event of an invasion?

Goering attempted to equalize the threats constituted by the Allied air superiority by constructing so-called Luftwaffe fortresses. They were an imitation of the British system of fortifications used on Malta and were to consist of airfield regions covering a large area.[1] After the necessary Luftwaffe reconnaissance, the most suitable road crossings were to be selected for this purpose; the roads were to be widened sufficiently so that they could be used as runways. Other existing roads were to be used as taxiways to the workshops and hangars, the villages were to be evacuated in the respective areas, and billeting and repair facilities were to be constructed, mainly out of concrete. Camouflage was to be considered from the outset of the construction. These major flying areas were to be provided with supplies, but the aircraft would not arrive until the very last moment to prevent their destruction from bombing. The construction effort was

1. In a conversation with Speer on 2 Oct 43. Karlsruhe Collection.

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most urgent in the south and west, and after that similar plans were to be prepared for the Reich. Speer suggested the use of Autobahn crossings and other suitable roadbeds. On 20 October 1943 the first construction phase was actually ordered; it included the construction of Luftwaffe fortresses in the areas north of Venlo, east of Laon, northeast of Orleans or northwest of Tours, east of Orange, south of Brescia, and in the Zagreb area.[3] Some of the installations were to be built partly underground.

However, this plan could no longer be executed; only in Italy some progress appeared to have been made,[4] whereas in the west of Europe the construction was apparently hardly begun. For, some important reasons existed already at that time, which spoke against the execution of this project. Third Air Fleet gave the following arguments for adhering to the hitherto practiced system of organizing the ground echelon:[5]

a. The construction of Luftwaffe fortresses would have fully committed all available labor and materiel for a long period. This would have meant that the entire remaining ground echelon would have had to be neglected, including improvements of fighter and night fighter fields

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[3] Secretariat of the Reich Marshal, Letter No. 1764/43. SECRET.

[4] Interrogation of Reich Marshal Goering, 1 June 1945.

[5] Third Air Fleet, Letter No. 3821/43, 6 Oct 43, SECRET. All three documents are in the Karlsruhe Collection.
In view of Goering's mental attitude, it is probable that the term "Luftwaffe fortresses" seemed most impressive to him.

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as well as extensions of runways for special (jet) aircraft. Finally, both materiel and labor were also needed to repair and recondition the airfields in the West that had been bombed.

b. The creation of Luftwaffe fortresses would have resulted in the concentration of aircraft -- particularly combat planes -- within a few air base areas in each theater of operations. In all probability fighter aircraft would also have to be shifted to those areas because their fields could not have been improved in the interim or be repaired after bombing attacks. But how could the fighters control such wide spaces, if their fields were not properly distributed over the entire theater of operations? Even with maximum camouflage the fortresses could not possibly remained concealed; on the contrary, they would attract continual bombing raids from which the German aircraft would not have a chance to escape.

For these reasons, the Third Air Fleet considered that these decisive problems could best be solved by adhering to the methods hitherto employed and improving same as follows:

a. Not a few Luftwaffe fortresses, but many dispersed airfields.

b. All available airfields should therefore be improved

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by using makeshift means, and new fields should be built in addition deep in the rear areas. For this purpose, the locally available forces and means would mostly prove sufficient in conjunction with the personal initiative and ingeniousness the responsible commanders were expected to display. This was more than doubtful in the case of the Luftwaffe fortresses.

c. All office staffs and installations that were not absolutely essential for airfield operations were to be shifted to nearby villages or to billets that were well concealed in their environment. Among these were:

(1) Field hospitals and medical installations;

(2) All signal communications and signal operations; they could be connected with the airfields by long-distance cables;

(3) Metereological stations that provided data and information; one metereological expert assigned directly to the airfield could act as consultant by interpreting the data prepared by the station;

(4) All general staff agencies;

(5) Fire brigade and service units. If they remained at the airfield, they would not be capable of commitment in time of emergency -- after air raids -- because they would be annihilated or blocked in their assembly areas by bomb craters.

(6) Mess and storage facilities, supply dumps, spare part

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depots, equipment issue points, small workshops such as tinsmiths, forges, fitters, and instrument repair shops, etc.[6]

(7) Truck convoys, motor vehicles, tractors, towing vehicles, tank trucks, etc., unless they were in immediate use.

(8) Troop billets. Wherever they had been moved to airfields for better defense against partisans or against airborne landings, they had to be shifted again to prevent losses. Proper guards and alert instructions were to insure the defense of these troops.

This type of organization was obviously very uneconomical and disadvantageous, but there was no other choice. The disadvantages will be described in the following; what it amounted to actually was that local authorities had to demonstrate organizing ability and ingenuity to overcome these handicaps.

The losses of aircraft suffered through four-engine bomber and fighter-bomber unit attacks had not assumed catastrophic proportions only because the German aircraft had been well dispersed far beyond the runways. Whereas at first it was still feasible to move the aircraft away from the edges of the runways and to hide them in forested areas that offered concealment, very soon this practice had to be changed. To

6 The proportions eventually assumed by the dispersal of Luftwaffe installations are shown by the following figures: 1943 -- 15 percent dispersed, 1945 -- 85 percent. According to a report by Pinagel, included in the Karlsruhe Collection.

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protect them against bombs and shell fragments, they were parked in blast bays made of dirt walls and were moved to the airfield proper by taxi-ways. At first the blast bays were satisfactorily camouflaged with nets together with numerous small arms set up so that their visible tracer ammunition would hamper the attacking fighter-bombers. This type of ground organization offered sufficient protection to begin with because dispersion over a wide area reduced the danger of effective carpet bombing considerably. Improvised multi-barrel mountings also proved effective in the field; at some points up to 80 barrels formed the defense, in which cases the fighter-bombers usually withdrew.

During the further course of operations, however, it became necessary to provide the blast bays with solid roofing, first of all because shell fragments, rocks, and dirt flying through the air damaged the aircraft from above. Moreover, the attacking bomber units dropped carpets of small-caliber fragmentation bombs over an area of 1,100 by 2,200 yards covering the dispersal areas that had been identified. Because of the density of the bombings, losses of aircraft and other materiel were inevitable, even though extensive dispersal measures had been taken.[7]

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[7] Extracted from a study prepared by the Luftwaffe Military History Branch (Eighth Branch). Karlsruhe Collection.

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The gradual improvement of the airfields can be observed from the diagrammatic sketches included in the appendix.[8]

In this connection it seems appropriate to examine the question of the airfields that had been destroyed or made unserviceable upon request of the Army. This problem makes the difficulties under which the Luftwaffe operated in Western Europe even more obvious. For, whereas airfields were being improved and even new ones were being built in 1944, precious ground echelon facilities that were available had to be destroyed because there were neither sufficient units to occupy the facilities nor could these airfields be utilized because they were too close to the coast and because of the Allied air superiority. In making its requests, the Army thought primarily of the possibility of Allied airborne landings and the employment of parachute units in certain areas, asking therefore either for immediate thorough destruction of the facilities or for well-prepared measures to make them unserviceable by installing obstacles or demolition charges.[9] These airfields were in the majority along the coast or situated in the coastal vicinity.

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8 See Appendices I - III. The photos of Appendix IV show the construction of anti-fragmentation blast bays as well as covered blast bays.

9 Letter O.K.W. (Armed Forces High Command) No. 02914/42, dated 23 Sep 42, classified Secret. Karlsruhe Collection.

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4. Further Developments in 1944

Towrad the end of 1943 the Luftwaffe High Command issued a number of orders and instructions on this subject, directing in detail the developments that were considered absolutely essential.[10] According to these instructions, the ground echelon was to be so prepared for the impending major engagements that friendly units could be preserved from absolutely certain mass bombings by effecting maximum dispersal. The Allied offensive punch would thus be dissipated and ineffective. This was particularly necessary in the case of the fighter aircraft, whose extensive dispersal over numerous airfields and emergency landing ground as well as frequent displacement to alternate facilities was absolutely essential for the preservation of their combat effectiveness. For this reason, they were to be moved to rear area airfields even over night and were to use forward facilties only to jump off.

These displacements were planned also for the event that heavy Allied air attacks against ground facilties led to the assumption that landings were imminent so that friendly units were threatened by destruction on the ground.

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10 O.K.L 2382/452 g.Kdos.Chefs., 3 Dec 43. R.d.L. and Ob. d.L. No. 8941/43 g.Kdos.Chefs., 4 Dec 43. Also, letter from Reich Marshal and Luftwaffe C-in-C, No. 8947/43 g.Kdos.Chefs. (top secret) Operations Branch, subject: Drohende Gefahr West (Threat in the West), dated 6 Dec 43.

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Primary importance was attached to deceiving the enemy and camouflaging the airfields. The measures to be taken were as follows:

a. To install aircraft dummies at unoccupied airfields, such asevacuated fields or facilities that had been identified by the enemy. In so doing, care ful attention had to be paid to the fact that imperfect dummies do more harm than good. For this reason, it was recommended that they be used rarely. Only occasionally was a dummy aircraft to be visible in one of the blast bays, in front of a hangar or on a runway. They had to be constantly switched around.

b. Deceptive air traffic was to be simulated with the assistance of training crews or replacement crews that had been recently assigned.

c. Deceptive radio and long-distance communications traffic was to be carried out.

d. Flak protection was to be simulated by establishing dummy positions that were to be occupied by minimum flak personnel.

Unfortunately, the Luftwaffe High Command also adopted the Army requests for the destruction of airfields that were situated near the coast and were not essential, issuing orders for the thorough destruction of such facilities. The action thus taken had the most detrimental effect because the Luftwaffe units had no more airfields from which they could fly into combat without auxiliary tanks. In view of the radius of

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action, Fighter-bombers were least of all capable of intervening in the defensive fighting around Cherbourg, which was altogether beyond their range.[11]

The Third Air Fleet advocated that further improvements deep in the rear areas of the theater were necessary and that runways be extended up to 3,300 yards in length.[12] Unfortunately, however, no materiel -- cement -- nor manpower were available, since both were being used on such higher priority projects as the West Wall as well as industrial facilities and air-raid shelters.

The Third Air Fleet, whose subordinate units had up to then been the II Fighter Corps as well as the IX and X Air-Corps, was assigned another headquarters at the turn of 1943-44 -- the II Air Corps. Having been employed in Italy up to that time, the corps had extensive experience in combatting superior Allied air forces; it improved the ground echelon on the basis of the experience gained in Italy, applying measures that frequently conflicted with the ideas held at Third Air Fleet headquarters.[13] This conflict of opinions also manifested

[11] G. Bloemertz, Dem Himmel am naechsten (Nearest to the Sky), Bonn 1952, p. 113: "It was our mission to keep the heavy bombers away from the invasion coast. The emergency tanks, weighing 1,550 lbs, were suspended to our planes; the distance was too long, we just had to drag them along."

[12] See General Plocher's study, op. cit.,

[13] Oberst i.G.a.D. (Colonel, GS, Ret.) von Heinemann, Invasion 1944 (Invasion 1944), Karlsruhe Collection.

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itself in the joint planning with Army headquarters, some of whose intermediate level commanders and staffs had a tendency of evaluating the Allied forces according to their experiences of 1940. They were firmly convinced that the Luftwaffe would be capable of achieving air superiority for at least a certain period over a definite, though locally circumscribed sectors.[14]

The airfields that had been constructed to comply with the requirements of the IX and X Air Corps for operations against Great Britain or across the ocean were mostly unsuitable for the use of combat units in view of the air superiority the Allies would surely have in the event of an invasion. The majority of these fields were situated in an area extending fron northeast of Paris across into Belgium. There was no widely dispersed airport system from which the defensive battle of the ground forces could be supported by Messerschmitt 109 and Focke Wulf 190 planes, whose range was so short. The responsible Luftwaffe area command headquarters had hitherto established airfields for stationary missions, based on the concept of fixed front lines rather than on that of mobile warfare. For this reason the essential development of a ground echelon according to the

[14] The question whether dive-bomber units equipped with Junkers 87 would be employed in this coming battle was therefore seriously under discussion on many occasions, the Army experts showing little understanding for the fact that the developments of recent years no longer permitted the commitment of such outdated aircraft. See von Heinemann, op. cit.

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most recent doctrine was unfortunately not properly undertaken.[15] Another unfavorable factor was the previously mentioned destruction of suitable terrain and available airports.

The dispersal of facilities had not been sufficiently implemented since many an essentail command post, signal communications center, and weather station remained within immediate bombing range at runways and parking areas. The large airports were not suited for close-combat flying units because they were to exposed to bombing; their value was mainly as supply bases. According to the experiences made in Italy, aifields had to be composed of several runways, which were blended into the terrain as much as possible and which were connected with one another, even if only by expedients. In contrast to established practices that were fully justified insofar as heavy bombers were concerned, dispersal area construction methods were to emphasize above all camouflage and then only protection against fragmentation bombs. All agencies that were of importance for operations had to be removed from the area that was susceptible to being bombed. Only those elements were to remain in the danger zone, which were immediately needed for the efficiency of operations. The development of the ground echelon was thus made subject to the requirements of the tactical air force units.

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15 Von Heinemann, op. cit.

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The available airfields were coordinated in groups of two to three fields.[16] In the immdeiate vicinity of each field two to four runways were newly explored and prepared for use so that each group of airfields had 8 - 12 runways, which were interconnected by taxiways and thus formed an integrated unit. It was planned that a wing or group would operate from each such airfield group. All facilities that were essential for operations were widely dispersed. The defense system emphasized camouflage, whereas the usual protective measures against fragmentation -- blast bays often XXXXXXX attract carpet bombing -- and other improvements were mostly neglected. The only really important issue was to build many good runways with good camouflage, because these runways were the basic operational tool.

This development was not fully completed by the time the invasion started, but the fields were shown on the maps as being ready for emergency use. They were concentrated in the northern area of the Franco-Belgian border territory, thus being unfortunately too far removed from the invasion coast. A very detrimental operational deficiency was constituted by the necessity of having to approach the invasion

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16 See Appendix V.

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area from the flank. The Allied Command's task of controlling the German fighter airfields offensively was thus greatly facilitated, since the Allied fighters could intercept their Luftwaffe adversaries already during the approach flight.

Moreover, it had not been possible to form an airfield group in the area west of Caen nor could the former fighter fields on the Cotentin Peninsula be repaired. These essentially good runways, which had been of good service as late as 1940 during the Battle of Britain and as operational bases against Channel shipping, had been so thoroughly demolished that it had proved impossible to make any of them somewhat serviceable, quite apart from the opposition offered by the Army against this project. The truly ideal concentration area for German tactical air units south of the invasion front was therefore much too narrow and was furthermore quickly destroyed. Whatever was achieved must be attributed to the ingenious initiative of local commands and their strongly developed ability to improvise. Another factor to be considered was that all construction work that was underway in the northern area of heavy concentration had been stopped.

The parking areas for aircraft were significantly increased and were even farther dispersed, some of them up to 1 or 2 miles. Taxiways were thus obtained by the use of available roads and

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paths. In some instances, contiguous terrain was first rolled and hardened, and then gradually drained, metalled, and eventually weatherproofed.

Guarding such areas was often a problem and could usually only be achieved by patrolling, which in turn increased the danger of sabotage.[17]

Finally, the protection of the troops was a very important problem. For this purpose, it was planned to construct short -- not long, interconnected -- sufficiently deep anti-fragmentation trenches as protection against flying large lumps of dirt and rocks, which had to be covered. In addition, foxholes had to be dug in great numbers and distributed over then entire area; their location had to be known exactly so that they could be searched after a bombing attack.

To protect the ground facilities, each airfield group was to be provided with 2 or 3 medium and 1 or 2 light antaircraft batteries. But this was not as urgent a matter because the danger of carpet bombings was minor compared to that of low-level attacks of fighter-bombers

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17 The author remembers an incident that occurred under similar circumstances in Romania in the late summer of 1944, when a Heinkel 111 of the 1st Group of the 4th Bomber Wing feel apart in mid-air.

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which would swoop down and mop up airfields occupied by planes. Against such attacks, however, the units proper were well equipped with defensive weapons. Antiaircraft artillery protection by medium batteries was essential for protecting the fully developed airports against carpet bombing.[18]

The above mentioned improvements and developments were introduced at all points in the Western Theater of War. The Luftwaffe ground echelon was being expanded and improved so that it would be capable of repelling the Allied invasion that was expected within foreseeable future. Because of the dimensions of this task and the shortage of labor and materiel, however, the day of the invasion occurred much too soon and the Allies hit the Luftwaffe long before the job was done.

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[18] The author remembers the conditions that prevailed in mid-summer and autumn of 1944 in Romania and Hungary, where the 1st Group of the 4th Bomber Wing used the large fully equipped airports only as bases, while the squadrons were dispersed at emergency landing grounds that had been previously reconnoitered. There, the aircraft were widely dispersed and well camouflaged against Allied fighter-bomber aircraft. Carpet bombing was directed solely at the major airports.

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CHAPTER THREE

THE ROLE OF THE GROUND ECHELON IN THE ALLIED OFFENSIVE PLANNING

5. The Basic Significance of the Objective

In the Allied air warfare doctrine a target was an object selected for an air attack. This object could be any of the following: aircraft on the ground or in the air, industrial plants, military ground forces, centers of government administration, war ships, railroad facilities, etc.

But since a people's capacity to conduct war is not based solely on such material foundations but is also affected by spiritual and psychological factors, their result, the so-called morale, must be included among the objectives.

Within the framework of the over-all national strategy, the purpose of which is the defeat of the adversary, air operations in the various theaters of war form the individual pieces of a puzzle. Among these pieces is the destruction of the enemy air forces on the ground and in the air.

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[1] For reference, see Elemente der Luftkriegsfuehrung, Ziele (Elements of Air Warfare, Targets), Air Force Science, Vol. II, published by the Air University at Montgomery, Alabama. (Translator's Note: The text does not show the paragraph to which this footnote refers.)

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Since achieving and maintaining control of the air space are prerequisites for a successful campaign both in the air and on the ground, the enemy air force becomes the primary target of the over-all effort. The operations conducted for this purpose may consist of offensive blows against the enemy air forces and their supply services as well as of the defense of vital targets within one's own theater of war by protecting these against attacks of enemy armed forces.

The organization of air forces within a theater of war consists of aircraft, airfields, and service personnel, each of which may become a lucrative target for an attack, depending on the prevailing circumstances. In this connection air bases are considered as really desirable targets because all elements of the enemy air forces are contained in them, such as aircraft, the airfields proper, and finally the personnel. Even though there is a possibility that attackers of an air base might find that the aircraft and also the personnel are absent, the destruction of these facilities in itself might be of decisive importance, if the loss of air bases induces the enemy "to abandon control over the air space of the theater of war.[2]

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[2] Elements of Air Warfare, Targets, op. cit.

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It is evident that the importance of individual airfields depends on their size, on the facilities available at these installations, and on their distance from the zone of action in the respective theater. Other factors to be considered are the number and quality of the personnel and of the aircraft. As an example, one might specify the German fighter base at Abbeville, which was characterized not only by the aircraft stationed there but also by its highly qualified experienced pilots. [3]

In attacking enemy air forces the most important targets can therefore be listed in the following priority:

a. The aircraft and their crews;

b. The airfields from which they fly and the personnel stationed at these bases;

c. The supply installations, and the maintenance and repair shops for the aircraft;

d. The depots with spare aircraft and materiel;

e. The installations serving for the training of crews and ground personnel. [4]

This account clearly indicates the importance attached to the attacks on the German ground echelon in Western Europe.

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[3] G. Bloemertz tells in ~~Dem Himmel am naechsten~~, ~~op. cit.~~, the story of this fighter unit which the Allies designated respectfully as the "Abbeville Boys" or according to the color of its planes "The Yellow Nox (sic)". This report from experience by Bloemertz will be quoted extensively by the author because it is factual and extremely interesting.

[4] The author remembers that for instance in January 1944 the 4th Group of the 4th Bomber Wing had to be shifted to the Bourges area because Allied raids interfered with its training of crews.

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One of the officially known objectives of the Allied air operations was to push back the German fighter squadrons to airfields situated farther eastward so that they would not have any advantage over the Allied fighters operating from across the Channel.

6. ~~The Conduct of Offensive Operations up to April 1944~~

The combat strength of the Third Air Fleet in the Western part of Europe and that of its subordinate units was at the beginning of April 1944 at a low ebb, amounting to about: [5]

	Actual ~~Strength~~	In Serviceable ~~Condition~~
Single and Twin-engine Fighters	343	180
Bomber aircraft	340	250
Ground-support planes . . .	29	13
Long-range Reconnaiss. Planes	80	28
Close Reconnaissance Planes	40	20

To these figures should be added the night-fighter units, which however were subordinate to the Reich Air Fleet headquarters and whose strength amounted to about 90 aircraft. [6]

In view of this extremely low strength in serviceable aircraft, the Allied air force military history states that "most of the bases were empty" and adds that the units shifted relentlessly from one airfield to another, completely dominated by the Allied air activity. [7]

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[5] See General Plocher, op. cit.

[6] See, Concentration of Flying Units (Aufmarsch der fliegenden Verbaende) Status of 25 April 1944, No. 1178/44, classified Secret, Karlsruhe Collection.

[7] The Army Air Forces in World War II, Vol. III, p. 163.

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Actually, the Allied air attacks were relatively minor at the beginning of 1944, mainly because more urgent tasks had higher strategic air operations priority.

During the months from January to March the R.A.F. was especially active in the Dutch-Belgian area, where it attacked mainly night fighter fields. This was carried out by combined attacks of Mosquitos flying as nuisance raiders and immediately tailing bomber units. Thei mission was to tie down the German night fighters on the ground so that the subsequent main stream of bombers would have free access to the Reich. These attacks were of greatly varying success; apart from those which obstructed the commitment of the night fighters little if at all, there were others, such as that of the night of 19 - 20 February 1944, when 100 bombers raided the airports of Leeuwarden, Deelen, Venlo, and Gilze-Rijen, that caused major damages so that the subsequent employment of night fighter was greatly hampered.[8] Aside from the airfields mentioned above, bombing raids during the winter months were launched against the following airports: Soesterberg, Twente, St. Trond, Tilburg, Melsbrok, Moorsele, Schiphol, Volkel, Eindhoven, and Arnheim.

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8 See the war diary of the I Fighter Corps. Karlsruhe Collection.

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The breakdown of these attacks by month shows the following figures: [9]

Month	~~No. of Attack Days~~	~~Attacked Fields~~
January	4	4
February	8	7
March	10	11

Direct hits scored on the runways had the most serious consequences for the night fighters, resulting often in delays in their commitment for many hours or in complete paralysis. On 20 February 1944, for instance, a daylight attack of 60 U.S. bombers on the airfields at Leeuwarden resulted in 5 hangars being burned down to the ground and 4 aircraft destroyed on the ground. Some 100 hits on the runway and several hundred bomb craters along the taxiways put the airfield out of commission for 2½ weeks during which no night fighters could take off and the 4th Group of the 1st Night Fighter Wing had to be shifted to the Quakenbrueck installation. [10]

Among the unwelcome nuisance effects was often the destruction of the entire light system of the airfield, which hampered the night fighter in particular.

In general, however, these attacks did not create insurmountable difficulties for the German ground echelon. Even in such instances as the raid on Trond on 21 February 1944, during which the airfield was badly damaged, the disaster relief crews

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[9] See war diary of I Fighter Corps, ~~op. cit.~~

[10] Extracted from the data of General W. Grabmann. Karlsruhe Collection.

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were able to make the airport fully serviceable in its essential parts within only 10 hours. [11]

The attacks on the ground echelon located within the area proper of the subsequent invasion, that is to say in France, were relatively minor during the first months of 1944, both with regard to the number of raids and the number of aircraft committed. At this time the Allied air operations command had more important missions to take care of and "this type of target had a lower priority." [12] Attacks were therefore launched only when other targets could not be bombed. These raids were performed mainly by tactical units -- such as twin-engine and fighter-bomber formations -- which committed weak forces that were to gather experience by conducting these attacks and were to exert pressure on the German units simultaneously. The damages caused to the airfields during these raids were very limited and had little pratical effect.

During April this situation changed, when the emphasis changed very clearly. Now also four-engine planes partidpated in attacks on German bomber and fighter airfields as well as on fields in France where the Germans still carried out training activities. In addition, the Allies launched air attacks on supply installations, depots, and Luftwaffe

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11 Order of the day of the Luftwaffe Area Command Belgium - Northern France, dated 13 March 1944. Karlsruhe Collection.

12 The Army Air Forces in World War II, Vol. III, p. 164.

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signal facilities, such as radio direction-finding sets, etc. The obvious objective was to smash the ground echelon.

In the last week of April, for instance, Lightning and Thunderbolt aircraft attacked several airfields in northern France, strafing and bombing the installations. At the same time some B-17 units, composed of about 100 bombing aircraft, assaulted the airfields at Metz, Nancy, Dijon, Le Culot, Lyons, and Clermont-Ferrand. In so doing, Allied fighter-bomber and fighter aircraft alone raided rear areas of the Third Air Fleet in less than 28,600 sorties during April, a considerable increase over the preceding month.[13] Altogether 41 airfields were attacked during that month solely in France.[14]

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[13] General Plocher, op. cit., p. 17.

[14] For the data concerning April 1944, see: The Army Air Forces in World War II, Vol. III, op. cit.

A German source, the situation reports of the Intelligence Officer of Third Air Fleet indicates, for instance, that in March 1944 the comparative figures were just one raid of 100 bomber aircraft on the St. Dizier airfield, during which 4 aircraft of the 1st Night Fighter Wing were destroyed.

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CHAPTER FOUR

THE NEUTRALIZATION OF GERMAN AIR BASES IMMEDIATELY PREPARATORY TO AND DURING THE COURSE OF THE INVASION [1]

7. Planning

On 17 April 1944 Eisenhower ordered the continuation of air operations against Luftwaffe units in a series of battles of attrition. A few days later, on 23 April, the Commander-in-Chief defined this mission by stating that air superiority above the invasion area was to be achieved and maintained by the Allied Air Forces. After having experienced the extensive air bombardments of February and March 1944, the Luftwaffe would not be capable of offering overwhelming resistance. Air operations above the Reich territory also had the purpose to keep the German fighter units away from the area that was subsequently to be invaded, i.e. to pin them down in Germany. The Allies were afraid that the German flying units would be held back on purpose and would be committed very carefully so that they would be available at the time of the invasion. This assumption was actually

[1] The Army Air Force in World War II designates this operation as the "Neutralization of German Air Bases."

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absolutely correct, because the German command intended to do precisely that.[2]

Thus, if there were still some German flying units that could offer active resistance to the invaders, it would be necessary to deprive them of operational facilities, which could be achieved only by destroying the air bases in western Europe. The planners of the invasion therefore emphasized the importance of these attacks from the very beginning. German fighters could be shifted from all the various theaters of war and also from the Reich in order to take part in repelling the invasion. The same was true of other combat aircraft, which could operate from airfields in the interior of France. So long as these bases remained intact, the danger existed. For this reason, they all had to be damaged. The ineffectiveness of this task was well recognized, for runways and landing strips, however thoroughly pockmarked with craters, in the morning could be ready for use already that same afternoon or evening. Damages to hangars, repair shops, and depots had no decisive effect in the long run. The Americans had made similar experiences during the campaigns in the Pacific

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2 According to an interrogation of Hermann Goering on 29 June 1945. Karlsruhe Collection. Thus, for instance, the intelligence report of the 5th Fighter Division indicates no sorties during the period 1 - 5 June 1944; on 31 May the division even shifted 13 Focke Wulf aircraft to Trier.

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where they had conducted operations from hastily improvised landing grounds and only with the most essential supplies of fuel, ammunition, and spare parts. In western Europe, however, they had little choice but to attack and inflict maximum damage on every usable airfield. In so doing, it was of utmost importance to carry out these operations so closely to D-day that the Luftwaffe would not have sufficient time to correct the situation. The three essential factors to be observed were as follows:

a. Continual observation in order to keep the Luftwaffe in its reduced status. [3]

b. Heavy bombing attacks, hitting deep into Reich territory immediately before and soon after the invasion, to prevent the German fighters from being shifted to France.

c. Launching major attacks on the airfields in France during the last three weeks before the invasion.

If the bombing was sufficiently accurate and the destruction thus caused involved vital installations, the time factor

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[3] See laso Air Force Directive No. 16, par 18: "The struggle against the enemy air force in enemy territory does not cease even though one might succeed in reducing the threat of enemy raids to a minimum during the course of the war. Even if one achieves temporary air superiority, one must always take into account that the enemy might regain the initiative by replacing his losses or introducing technical improvements. This might happen all the faster, the more time and quiet the enemy is granted to carry out his intentions."

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combined with the difficulties resulting from the chaotic traffic conditions would prevent the Luftwaffe from using the airfields that were most favorably situated. The bombing of the air bases around Caen was therefore to be delayed until the last three weeks before the invasion in order not to reveal the secret of the future landings. As an additional precaution the attacks were to be distributed over a very wide area. At the beginning of May the following plan was revealed: [4]

Around Caen, the center of the planned invasion, the airfields that were to be attacked were designated in two large semi-circles. In the first salient, within a radius of 130 miles around the city -- the so-called Area I -- 40 airfields were distributed as follows: the R.A.F. was to attack 8 bases, the Allied Expeditionary Air Force (A.E.A.F.) 12, and the Eighth Air ~~XXXX~~ Force was responsible for 20. Area II extended from the 130-mile line to a 350-mile semi-circle around Caen, reaching as far as Germany and the Netherlands. This mission was to be accomplished by the heavy day-light bombers of the Eighth and Fifteenth Air Forces, which were to cover 59 air bases. [5]

The respective headquarters were given extensive freedom of action in carrying out their mission and timing their

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[4] The Army Air Forces in World War II, Vol. III, p. 164: The plan proper originated from Leigh-Mallory.

[5] See Appendix VI.

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attacks. The location of the airfields around Paris and Lille was therefore most convenient for concealing the real intentions, all the more since the targets in Normandy were to be intentionally subjected to lesser attacks. The Allied Navies, however, insisted that the air base near Brest be heavily attacked in order to prevent the Luftwaffe from launching joint operations with German submarines against the Allied invasion fleet.[6]

The execution of the offensive plans began, and thus also "a monotonous period of destruction and repair."[7]

8. ~~The Execution of the Plans at the Beginning of May 1944~~

It is not the purpose of this study to give a day-by-day account of the operations conducted by the Allies against German airfields; instead, only the general course of these operations will be described in the following. The number of attacks launched against individual air bases can be gathered from the appended map.[8]

It is quite obvious that the Allied air forces were unable to conduct the program the way they had planned it.

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6 The Army Air Forces in World War II, ~~op. cit~~. Unfortunately, the German sources contain no information on the execution and results of the attack that had been requested.

7 Extracted from the U.S. magazine "Impact", Nr. 5, May 1945.

8 Appendix VI. The attacks were concentrated on the area on both sides of the Seine river.

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In addition to difficulties caused by the weather, "other obligations affected the execution of the plans." [9] The missions assigned to the Allied air operational command were so tremendous and numerous that, despite its great numerical superiority, the Allied air force could not execute all of these missions according to plan. Instead of using only bomber aircraft, the Allies occasionally had to employ fighter-bombers whose proper mission was to execute their bombing task and then make dive-bombing and strafing sweeps above the targets, thus working them over once more. The proportions of the requirements can be gathered from the example of the Fifteenth Air Force, which together with the Eighth Air Force was to attack 59 bases in Area II, but actually bombed only 2 of them, Luxeuil on 31 May and Valence on 1 June.

Since the Luftwaffe did not shift more units than usually to the airfields situated in the West even toward the end of May, the Allies stopped some of the raids altogether and reduced the intensity of others, even though the plan had not been fully executed. Other targets were given preference.

The American Air Force history considers the result of these operations as somewhat disappointing, since many vital

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9 See Footnote Nr. 6 on page 43.

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installations at the airfields remained undamaged. Only four targets in Area I -- unfortunately they were not further designated -- were considered as so completely destroyed that no further attacks were deemed necessary. Even though the German air force units continued to use the bombed airfields in general, one considered that the main purpose of the bombing program had been fulfilled so long as there were no longer sufficient bases within easy reach of the landing beached, to which the Luftwaffe could shift its units.

The attacks on targets in Area I had been given a higher priority, which can be gathered from the fact that for instance 32 out of 40 designated airfields were attacked and that 6,117 tons of bombs were dropped on them.

The following table shows the attacks launched on Area I: [10]

Date	Type of Attack Unit	Number of Airfields Attacked
May		
3	Bomber	4
11	Bomber	2
13	Fighter-bomber	1
15	Fighter-bomber	1
17	Fighter-bomber	1
19	Bomber	5
20	Bomber	6
21	Bomber	2
22	Bomber	5
24	Bomber	1
June 2	Bomber	4
3	Bomber and Fighter-bomber	2
4	Bomber and Fighter-bomber	2

10 Extracted from The Air Forces in World War II, op. cit., and from Intelligence situation reports of the 5th Fighter Division. Karlsruhe Collection.

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In Area II no such favorable ratio could be achieved, since the 59 listed airfields were far from being all put under attack.[11] On the contrary, "the great number of German air bases made it impossible" to attack all of them equally effectively and to fully exploit the results achieved.[12]

Aside from the destruction of airfields, the chaotic conditions of means of communications in France, and the great Allied air superiority, which made any major shifting of Luftwaffe elements to the West within a short time practically impossible, credit for the greatest achievement must be given to the four-engine bomber units. Their attacks on vital German industrial areas in the Reich prevented any such shift, even though it had been planned by the German top-level command.

This is why German bomber units did not fly a single sortie against the newly formed bridgehead on the first day of the invasion,[13] a fact which was considered as one of the most remarkable events of the entire war. Nor was the employment of German fighter aircraft of any real impact, mainly because they were unable to take off in close formation from their bombed-out air bases. Moreover, because of their

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11 Because of the inconclusiveness of the sources, no similar survey is provided for Area II.

12 Extracted from Impact, Nr. 5, May 1945, ~~op. cit.~~

13 General Plocher, ~~op. cit.~~

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small number, the fighters were unable to penetrate the umbrella of fighter protection the Allies kept open above the bridgehead.

The American Air Force military historian was justified in stating "that German resistance against the landings in Normandy was light in the air" and that in any case it was far less than expected by the Allied commanders.

9. ~~Attacks after 6 June 1944~~

Even though the Luftwaffe was incapable to challenge the Allied Air Forces on the day of the invasion because of the reasons mentioned above and the ~~XXXXXXX~~ air battles above the Normandy territory did not materialize as expected by the Allies because they had achieved victory beforehand for all practical purposes, the struggle against the Luftwaffe ground echelon was by no means over. In fact, it was accentuated to a hitherto unknown crescendo. Almost the entire Allied air armada was committed for tactical operations during these decisive days, acting in accordance with the doctrine of Allied air warfare, whose primary and most important objective it was to achieve and maintain control of the air space in the critical area in order to deprive the enemy of his capability to launch attacks of his own from

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the air.[14]

On D-day the Allied Air Forces dropped the hitherto practiced division of air bases in France into Areas I and II; instead, they attacked the targets according to their priority. The following table shows the attacks launched during June 1944:[15]

Date	Type of Attack Unit	Nr. of Bases Attacked
7	Bomber and Fighter-Bomber	6
8	Bomber and Fighter-Bomber	3
9	No attacks	-
10	Bomber	3
11	Bomber and Fighter-Bomber	7
12	Bomber and Fighter-Bomber	8
13	Bomber	1
14	Bomber	7
15	Bomber and Fighter-Bomber	17
16	Bomber	1
17	Bomber and Fighter-Bomber	8
18	Bomber and Fighter-Bomber	5
19	Bomber and Fighter-Bomber	5
20	Bomber	1
21	No attacks	-
22	Bomber and Fighter-bomber	3
23	No attacks	-
24	Bomber and Fighter-bomber	7
25	Bomber and Fighter-bomber	11
26	Bomber	5
27	Fighter-bomber	1
28	Bomber and Fighter-bomber	10
29	Fighter-bomber	1
30	Bomber and Fighter-bomber	7
21 Days of Attacks		117 Airfields

14 Extracted from Field Manual 100-20, dated 21 July 1943.

15 All statistics presented in this section are based on the official intelligence situation reports of Third Air Fleet headquarters. Karlsruhe Collection. See also Appendix VII. The map shows the number of attacks on the individual air-bases in the West from 6 June to the end of August 1944. These attacks were concentrated on the area between Seine and Loire, the Paris Basin, and the northeastern part of France.

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From these attacks, which reached such overwhelming proportions, one might mention a few especially because they constituted the absolute highlights in view of the number of aircraft employed. They were the attacks of:

12 June with 550 bombers,
14 June with 1,150 bombers, 160
15 June with 500 bombers and fighter-bombers,
19 June with 360 bombers,
25 June with 430 bombers, and
30 June with 80 bombers and 500 fighter-bombers.

Although the data for the months of July and August are exact and equally conclusive, this study will refrain from establishing similar statistics for those months. Of more interest, however, seems to be the following table:

Month	~~Nr. of Attack Days~~	~~Nr. of Airfields Attacked~~
June	21	117
July	19	47
August	17	52

In considering the June figures, one must take into account that the first six days were not included because they were part of the pre-invasion period. But even so it becomes obvious that after July the Luftwaffe ground echelon was no longer considered as important a target as before. Among the more important missions flown in July and August, the following still seem to be worth special mention:

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On	6 July	780 bombers were employed,
on	8 July	100 bombers and 500 fighter-bombers,
on	14 July	300 bombers,
on	23 July	200 bombers and 100 fighter-bombers,
on	2 August	600 bombers,
on	11 August	330 bombers,
on	12 August	600 bombers,
on	14 August	300 bombers and 300 fighter-bombers, and
on	15 August	300 bombers.

In general, attacks on airfields were considerably reduced in scope. Bad weather, which hampered operations on a few days, was one of the causes, but the primary factor was that the Luftwaffe forces in western Europe constituted no longer an overhwelming problem. After mid-August 1944 the intelligence reports of Third Air Fleet headquarters therefore show more and more frequently such entries as "little activity" or "only few operations". Fighter-bombers assumed a more prominent role because the bombers were needed for other missions on a more extensive scale.

In this connection one might mention the attacks launched against the so-called special installations of the Luftwaffe. In July and August they were almost exclusively conducted by the R.A.F., whose unmistakable objective was to hit the facilities of the Luftwaffe signal troops.

Such attacks took place on the following days by attack forces listed below:

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On 16 July 150 bombers were committed,

on 12 July 4oo bombers,

on 15 July 70 bombers,

on 31 July 50 bombers,

on 2 August 100 bombers,

on 3 August 200 bombers, and

on 15 August 100 bombers.

Unfortunately, it has not been possible to obtain information on the results achieved during the raids launched by the above-mentioned forces.

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CHAPTER FIVE

THE DAMAGES INFLICTED UPON RUNWAYS AND AIRCRAFT

Among the great number of air bases attacked by the Allies a few have been especially selected as significant and illustrative examples, which indicate the varying but generally absolute success achieved by these attacks: [1]

~~Valence Airfield~~:

"At 0812 on 1 June 1944 the airfield was strafed. One Caproni aircraft, which was to be salvaged and had hitherto been used as decoy, was damaged."

~~Conches Airfield~~:

"At 2115 on 2 June 1944 some 70 four-engine bombers attacked in five waves. The runway, taxiways I and II as well as berths A and B were hit; Taxiway I was hit by 22 bombs, while 15 hits (duds) were scored on taxiway II. Airfield out of Commission. ~~Plate 2187~~ One hangar was destroyed ~~on the Square 2187 Tel~~. Radar equipment 20 percent damaged, other taxiways damaged. Boundary lighting, electricity and telephone wires have been cut. One soldier and two women auxiliaries were wounded."

[1] Unless otherwise indicated, the information concerning the attacks described in the following text is based on intelligence reports of the 5th Fighter Division. Karlsruhe Collection.

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The picture reproduced below represents an attack launched on the Conches airfield by 68 bombers on 27 September 1943.[2] The significance of this photo is as follows:

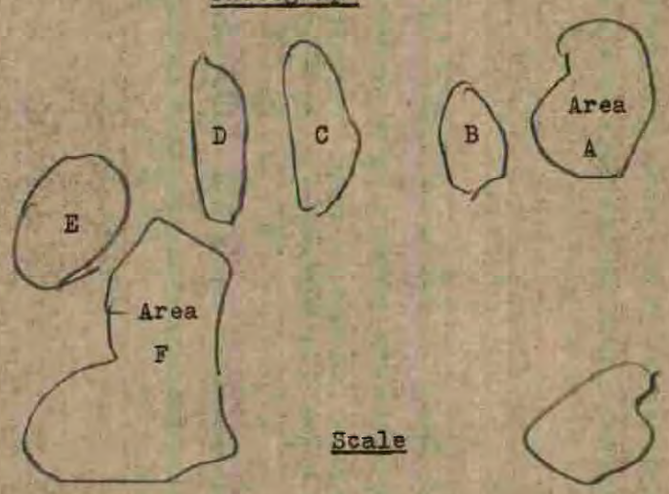
Areas marked A and B: bombs are detonating in the northern dispersal area for aircraft.

Areas D and E: additional bombs explode in the western dispersal area for aircraft.

Area F: The remaining bombs dropped on the runway.

The photograph shows that the western dispersal area was not fully hit so that approximately 10 aircraft blast bays were spared.

Photograph



2. Extracted from Impact, November 1943. Karlsruhe Collection.

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~~Chartres Airfield~~:

"Attacked from 2114 to 2135 on 3 June 1944 by 104 Marauder aircraft flying in 3 waves. Two carpet bombings. Some 200 craters on the runway, ~~Platz GMR~~ (airfield out of commission). On the taxiway, 47 hits. Electricity and lights cut. Three guns destroyed, one gun damaged. Repairs to airfield will take 10 - 14 days. The flak alert platoon suffered nine casualties who were burried alive."

~~Brettigny Airfield~~:

"Attacked from 2017 to 2044 on 4 June 1944 by 150 fortresses flying at altitudes varying from 12,300 to 13,200 feet, which dropped many ~~fragmentation~~ light-explosive and incendiary bombs. Airfield out of commission. Runway will be ready for use by the evening of 5 June. Most bombs landed outside the base. Two flak barracks were destroyed, two damaged. Two berth hangars were 100 percent destroyed, one repair shop was damaged. One Junkers 188 (sic) and one Messerschmitt 110 were completely destroyed. Another aircraft was damaged, and four men were wounded."

~~Vannes Airfield~~:

Attacked from 0830 - 0900 on 10 June 1944 with light and medium ~~fragmentation~~ light-explosive bombs dropped on the runway, taxiways, and dispersal areas. Dispersal area Nr. 2 was destroyed, the runway lighting of both runways was destroyed at 12 points. The boundary lighting was cut off. The cabel feeding the light-beam transmitter was interrupted at two points.

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Damages suffered by aircraft: 2 Messerschmitt 109s were 60 - 70 percent destroyed, 2 Messerschmitt 109s were 30 percent destroyed -- they belonged to the 2d Group, 53d Fighter Wing -- and 1 Junkers 88 belonging to the 2d Group, 1st Twin-engine Fighter Wing, was 10 percent damaged. After 2 July the runway leading from southeast to northwest could one more be used for landing." -- In other words, part of the runway could not be used for three weeks.

Dreux- St. Andree Airfield Group:

Strong bomber units attacked on 12 June 1944. At the time of the attack approximately 60 - 70 aircraft were distributed over the operational runways. The well executed carper bombing attack destroyed the principal runways 100 percent. Luftwaffe losses were 2 dead, 3 badly wounded, but only 2 aircraft damged. Operations were not hampered because the runways had remained ready for action." [3]

Aside from the major advantages offered by such carefully constructed operational airfields whose existence permitted the Luftwaffe to retain essentially its preparedness during the days immediately following the invasion, [4] during the course of the following weeks the lacking firmness of the foundation soil proved to be a serious handicap because the alternative

[3] Extracted from Oberst i.G.a.D.(Col., Gen.Staff., Ret.) L von Heinemann, Invasion 1944, cited above.

[4] See O.K.L. Lw Fuestb Nr. 2061/44 geh. (Ia/Ausb) (Training Br., Luftwaffe High Command Operationa Staff communication, classified secret. Karlsruhe Collection.

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fields were softened by continuous rainstorms as the season progressed so that these fields also could not be used.[5]

Even so, the system of creating airfield groups had to be retained also after the flying units were redeployed to the Reich. These groups, including improvised alternative fields that were hardly in condition to be used, were essential to carrying out Luftwaffe operations of any kind.[6]

~~Angreveux Airfield~~:"Attacked on 12 June 1944 by several waves of aircraft between the hours of 0813 and 1035. Two runways and the eatsern section of the base installations were destroyed. The repairs to the runways ~~XXXX~~ required four weeks."

~~Orleans-Bricy Airfield~~:"Attacked from 0746 - 0751 on 14 June 1944 by 200 Liberator aircraft flying at 16,500 - 19,800 feet, which dropped many ~~fragmentation~~ high-explosive bombs weighing from 11 to 1,100 lbs. On Taxiway 15, the middle runway, and the perimeter boulevard there were 25 deep craters. In~~XXXXX~~ addition, hits were scored on the other runways and all three parking areas. One hangar was 100 percent destroyed, 5 others from 10 - 40 percent, 1 Heinkel 177 was 100 percent and 1 Heinkel 177, belonging to the 4th Bomber wing, was 30 percent destroyed."

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[5]Bloemertz, ~~op. cit.~~, p. 119, also mentions that the alternative fields for fighter planes were inundated after every rainshower. The author remembers the conditions in Hungary in the autumn of 1944, where the alternative airfields offered good protection from Allied air attacks, but proved unsuitable for operational purposes because heavily loaded Heinkel 111 could not take off because of continuous rainshowers.

[6]According to the war diary of the Luftwaffe Headquarters West, entry of 26 September 1944. Karlsruhe Collection.

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~~Bretigny Airfield:~~

"On 14 June 1944 some 200 Fortresses protected by Thunderbolt fighters attacked from high altitudes from 0800 to 0907. The four-engine bombers dropped their loads, and the fighter escorts carried out low-level strafing attacks and dropped also some bombs. Several hundred ~~fragmentation~~ high-explosive bombs were dropped, 500 hits were scored on the runway, and about 30 on one of the taxiways as well as 60 on another one. The operations could be continued without interruption. The airfield itself was out of commission until midday on the next day, when a small strip could probably be used for landing purposes."

~~Le Boruget Airfield~~:

"The airfield was attacked from 0810 tp 0912 on 14 June 1954 by several waves of bombers totaling 150. A great number of incendiaries and ~~fragmentation~~ high-explosive bombs destroyed 5 hangars and severely damaged 3 others. One hangar for single aircraft was burned down in the parking areas, with five additional hangars of the same type about 30 percent damaged. Altogether 12 - 15 hits were scored on the ~~XXXway~~ taxiway, while the runway strip next to it was hit by 30 bombs. Airfield is out of commission."

~~Mondesir Airfield~~:

On 14 June 1944 4 times 48 liberator bombers attacked from 20,000 feet altitude from 0815 to 0818. They approached out of the sun, dropped smoke signals and bombs over the southwest section of the airfield. They dropped 600 bombs of medium and heavy caliber, including 8 to 10 incendiary bombs with

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time fuses. Several hangars were destroyed, some others heavily damaged. Many hits were scored on the western section of the runway. One Junkers 52 was destroyed, 3 were damaged, and two men were killed."

~~Villaroche airfield~~: "Attacked at 0920 on 14 June 1944 by 200 to 300 four-engine bomber aircraft protected by fighter escorts. Some buidlings and aircraft were damaged. Airfield out of commission. Three killed, 3 wounded. One Junkers 88 was 40 percent damaged, another 15 percent damaged -- both belonging to the 3d Group, 6th Bomber Wing. Taxiway I suffered 11 hits, Taxiway II was hit twice, and 160 bombs fell on the runway."

~~Rennes airfield~~:"At 1000 on 14 June 1944, 18 Boston aircraft carried out a high-altitude attack on emergency take-off strips, dropping 70 high-explosive bombs. Most of the bombs landed outside the installations. The emergency take-off strip was not hit."

~~Chateaudun airfield~~: On 14 June 1944 at 0752 hours some 90 - 100 liberators attacked, dropping demolition and fragmentation bombs. Both taxiways and the runway were heavily damaged. The lighting system was disrupted. The airfield could not be used, its repair would take 5 - 6 days. Many delayed action fuses. The aircraft losses were as follows:

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1st Group, 5th Night Fighter Wing: 4 Messerschmitt 110s completely destroyed and 2 were 60 percent damaged, 1 Junkers 52 was 95 percent damaged, and 4 Junkers 88 suffered damages varying from 25 to 60 percent.

1st Group, 2d Night Fighter Wing: 4 Junkers 88 completely destoryed and 4 were damaged from 25 to 60 percent while 4 others were damaged from 5 to 20 percent and 3 less than 5 percent/; 2 Focke Wulf 190s were 40 - 50 percent damaged. This early morning attack apparently surprised the flying units after their night operations.

~~Evreux Airfield~~: "Attacked from o745 to 0755 on 15 June 1944 by 130 Liberators and 20 Mustangs. Several hundred high-explosive bombs were dropped. Hits were scored on the runway, taxiway, and parking areas B and C. The time needed to repair the taxiway and runway was not yet known. The flak suffered two casualties -- wounded -- and road communications with Paris were interrupted."

~~Bordeaux-Merignac Airfield~~: Attacked by about 144 aircraft flying in 12 waves from 0824 to 0900 on 15 June 1944 above the target area. Their approach remained unobserved. Hits were scored on taxiway I and northern section of runway. Airfield lighting system and communications were disrupted. Five Heinkel 177s and 1 Focke Wulf 200 were completely destroyed, 4 or 5 other planes were slightly to quite severely damaged. Several hits were scored on dummy imstallations."

This air base was used by the 40th Bomber Wing, operating under X Corps headquarters and employed in air warfare above

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the Atlantic Ocean. Dispersal to another field -- such as an emergency landing field -- could not be carried out by the four-engine bomber unit except with great difficulties because of the ground echelon support it required.

~~Orange Airfield Group~~:"The bases included in this group were attacked from 1130 to 1203 hours on 15 June 1944; the attacks were carried out by numerous fighter-bombers of the Lightning and Mustang type. The raid showed the following results: The 3d Group, 77th Bomber Wing lost 3 Junkers 88, while 1 Junkers 88 and 1 Heinkel 111 were damaged. The 200th Fighter Wing lost 2 Messerschmitt 109, with 2 others heavily and 4 additional Messerschmitts slightly damaged. Moreover, one Junkers 52 was destroyed and 2 others were slightly damaged. Simultaneous attacks launched by fighter-bombers on the airfields near La Jasse, at Avignon West and East, at Istres, and at Aix-les-Milles had similar results.

~~Tours Airfields~~: "On 18 June 1944, from 2028 to 2103 hours 72 Liberators dropped 700 - 800 high-explosive bombs. They scored 35 hits on the runway, 15 on taxiway I, and 10 on taxiway II; most of the bombs landed outside the airfield. The lighting facilities, water and power supplies were interrupted. The direction-finder went out of order because of a dud. Airfield out of use, its repair time could not yet be established. Five enlisted men were wounded."

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~~Corme Deluse Airfield~~: Carpet bombing attack at 0907 on 19 June 1944, mainly on the runway. Bomb craters numbered 520, lighting, water, and power facilities out of order. The runway will be ready for operations by 22 June." This meant an operational stoppage of three days.

~~Airfield 7 G~~: "Attacked on 24 June 1944 from 0850 - 0900 hours by about 30 four-engine bomber planes which departed in the direction southwest to northwest. They dropped 130 - 140 high-explosive bombs, 70 - 80 of which hit the runway, while 25 - 30 landed on the take-off and landing strip. The signal platoon suffered 2 killed and slightly wounded. One tent was destroyed. The airfield could not be used for landing purposes. ~~Repair work seemed useless~~." [7]

This was one of the emergency landing fields designated by code number and letter, whose identity cannot be established from the available data. However, the Allies had apparently identified the existence of the field to such an extent that they employed a bomber unit to attack it instead of simply committing fighter-bombers.

The requirements for repairing a bombed-out runway were generally quite considerable, and in this instance they obviously exceeded the available facilities to a great

[7] Underscoring added by the author.

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extent. In filling bomb craters many flat craters proved in most cases more difficult to fill than a few large ones, mainly because it required fine dirt. In the case of large craters, the soil loosened by the explosion -- usually some 20 to 25 cubic meters -- was removed step by step until covered ground was reached. Then a layer of rough gravel was firmly set on top, and that was covered by another layer of dirt that was rolled. This alternating process was continued until the level grading had been accomplished. This type of repair was greatly facilitated if rubble and cinders were available from destroyed, but not burned-out, buildings at the airfield. The large surface of many flat craters caused the greatest difficulties because they had to be evenly and firmly graded. For, there is a considerable difference between an aircraft taking off or landing and a train slowly rolling across a spot that had been repaired after a bomb explosion.[8]

The following photo of an Allied bomber attack's results shows the Muenster airfield on 6 October 1944 with its runway in bombed-out condition.

[8] As reported by General Koller, ~~Der Letzte Monat~~ (The Last Month) pp. 11-12, Hitler complained on 14 April 1945 that the lazy Luftwaffe had not repaired within four days the bombed-out airfields at which the Messerschmitt 262's were stationed. The railroads would have accomplished that within a few hours. Koller replied that such fast aircraft would be destroyed unless the take-off and landing strips were carefully leveled and reinforced.

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Photograph
of
Muenster Airfield

In some instances, the Luftwaffe in western Europe used the expedient of painting over the repaired parts of the runway to simulate the existence of craters after the airfield had been restored. This apparently had the result that such airfields were not attacked for some time, the enemy believing that they were still out of order.[9]

Chateaudun Airfield:

"This airfield was attacked on 24 June 1944 from 0817 to 0820. Approximately 50 Liberators and Flying Fortress took part in the attack. They dropped about 800 - 1,000 high-explosive bombs, destroying the take-off strip and severely damaging the southern part of

9 General Galland made this statement on 23 October 1943 during a conference at Deelen in the Netherlands at which Goering, Milch, and others were present. However, it seems doubtful that such a procedure would have been successfull as late as 1944.

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the runway. The airfield was out of commission. One mushroom-shaped hangar was hit, two aircraft were completely destroyed, 1 plane was 40 - 50 percent destroyed, and 2 additional aircraft were slightly damaged."

Photograph of:
B-24s from Eighth Air Force
on 24 June 1944 hit airfield
at Chateaudun, France

The photograph shows the scope of the attack and indicates clearly at the same time that a major part of the parking areas were not hit, similarly to the attack on the Conches airfield described on page 53.

~~The Subsidiary Airfield at Soucelles near Angers~~:

On 24 June 1944, Allied bombers attacked the airfield from 0200 - 0220; another attack was launched by 25 Mustang aircraft on the same day from 1835 to 1910. During these two attacks considerable damages were inflicted upon the aircraft stationed at the airfield. They were as follows:

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A total of 14 Messerschmitt 109s were completely destroyed, and several other aircraft were slightly damaged.

The fact that this field was attacked twice on the same day also proves that it had been identified by the Allies. In view of the constant Allied patrol activity and supervision of the air space, the dust of one aircraft taking off was often sufficient to lead to the discovery of a German airfield. This could simply not be prevented, even though the German airfields were at some distance from the coast so that the apron serving for air warnings would be sufficiently wide. Another factor to be considered was that the fighter units generally preferred to station their aircraft as close as possible to the edge of the runway so that they would be able to take off at a moment's notice. The requirements of such immediate readiness obviously complicated the daytime camouflage problem immeasurably.

~~Villacoublay North and South Airfields:~~

"Attacked at 1945 on 24 June 1944 by four-engine planes. The following losses were suffered: 3 Messerschmitt 109s and 3 Focke Wulf 190s were completely destroyed; 3 Focke Wulf 190s, 1 Messerschmitt 109, and 1 Heinkel 111 were 25 percent damaged, and 2 Focke Wulf 190s were 5 percent damaged." During this attack the parking areas were particularly badly hit, while the take-off strip was spared, and there were only four bomb

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craters on the runway." [10]

Coulommiers Airfield:

"A bomber unit attacked at 2017 on 25 June 1944. The runway was hit at the level of Parking Area No. 2, both take-off strips were hit 5 times each, and near the East-West take-off strip the enemy scored 10 hits. The airfield was closed to non-organic aircraft, whereas the unit stationed there continued to operate. Emergency repairs were underway."

Avord Airfield:

"Approximately 80 Fortresses and 10 Lightnings attacked on 25 June 1944 from 0825 - 0835 hours. They scored many hits on the runway, and some 100 - 150 hits on the take-off strip. The airfield was out of operation. All lighting plants were destroyed. The lights illuminating obstacles and borders were partly out of order. Three Focke Wulf 190 aircraft were from 20 to 70 percent damaged."

Evreux Airfield:

"About 25 Thunderbolts attacked on 25 June 1944 from 1815 - 1830 hours at low levels in 110-yard strips, using medium-caliber high-explosive and incendiary bombs. The take-off strip and parking areas as well as several Focke Wulf 190 and Messerschmitt 109 planes were hit. A tank truck and other trucks were detsroyed, 2 men were wounded, and one civilian killed."

[10] Compare with Willi Heilmann, Alarm im Westen (Alert in the West), pp. 69 - 76. At that time the fighter groups were stronger than at the outset of the invasion, and they had just been equipped with the most recently manufactured aircraft. (Had agents betrayed their presence?)

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~~Villacoublay North and South Airfields~~:

"Night attack launched at 2400 hours on 25 June 1944. The following losses of aircraft occurred: 3 Messerschmitt 109 and 1 Fieseler Storch were completely destroyed; 4 Focke Wulf 190s were destroyed on the airfield, 6 more in the repair shop. Two Messerschmitt 109s and 1 Focke Wulf 190 were damaged." This was obviously a continuation of the preceding daytime attack.

~~Airfield X~~:

"On 27 June 1944 from 1950 - 2100 hours the 27th Fighter Wing reported low-level attacks by 60 Thunderbolts and Lightning planes -- their number could not be established -- covering them at high altitudes. German units returning from evening missions flown in the area west of Paris could not counterattack the Thunderbolts in a concentrated action because they had been dispersed during previous air combat and because the weather was unfavorable. Airfield Group X suffered only minor losses from low-level attacks at individual airfields."

~~Vertus Airfield (11 miles south of Epernay)~~:

"On 28 June 1944 the airfield was attacked from 2004 to 2107 hours by 20 - 30 Lightning aircraft approaching in several waves. They dropped 80 - 100 fragmentation bombs weighing 11 pounds each as well as some 110 lbs bombs. The airfield was strafed, the runway has several bomb craters, and the power plant is out of order. Two aircraft were hit on the ground, only minor material losses; 1 soldier killed."

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Chamfleury Airfield:

"On 28 June 1944 11 Thunderbolts and 9 Lightnings attacked, dropping 24 small-caliber bombs on XXXXXX wooded terrain and parking areas. They caused no damage."

La Perth Airfield:

"At 2112 hours on 28 June 1944, four Mustangs dropped 8 fragmentation bombs from an altitude of 3,300 feet and strafed the airfield. Hits were scored on the runway, and one tank truck was damaged."

As previously mentioned, the Allies employed small-caliber fragmentation bombs increasingly, if they wanted to inflict particular damage on aircraft stationed on the runways and in dispersal bays or other camouflaged areas. The following two photographs illustrate this point. The first photograph shows a stick of 110-lbs. bombs exploding between parked aircraft. They do not seem to have scored any tangible success. [11]

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[11] One 110-lbs bomb causes a bomb crater measuring 16½ feet in diameter with a depth penetration of approximately 6.6 feet into firm subsoil. These figures are XXXXXXXXXX derived from German experience factors.

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Photograph # 1

Photograph No. 2, on the other hand, indicates the very destructive effect of small-caliber fragmentation bombs dropped on such targets as aircraft. [12]

photograph # 2

12 The two photographs reproduced on this page represent German air attacks on Russian airfields.

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If the Germans expected considerable relief from effect of unfavorable weather, the their hopes were to be frustrated in many instances, as can be gathered from the following examples:

Guyancourt Airfield:

"The enemy aircraft attacked on 17 June 1944 from 1256 - 1258 under cover of clouds without ground visibility. Four aircraft hangars, and 3 repair shops were destroyed, the runway showed 50 - 70 craters, mostly in the western part. The airfield was not operational."

Villaroche Airfield:

"At 1310 hours on 17 June 1944 many aircraft, probably Fortresses and Liberators, attacked by dropping bombs out of the clouds without being able to discern their ground targets. The runway had many bomb craters. The take-off strip could be used from west to east and from east to west. One repair hangar was destrpyed."

Bretigny Airfield:

"Enemy aircraft attacked at 1300 hours on 17 June 1944 by dropping bombs out of the clouds. Ground visibility was zero. Take-off strip No. 1 and the runway were hit many times. Delayed action fuses complicated the investigation of damages. The airfield will probably be ready for full use within seven days."

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In concluding the events of June 1944, the author presents a survey of the German aircraft destroyed on the ground in western Europe: [13]

Total number of aircraft:	a. completely destroyed	-- 137
	b. badly damaged	-- 86
	c. slightly damaged	-- 126

Because of the disastrous transportation conditions, which simply made it impossible to transfer heavily damaged aircraft to the manufacturing centers in order to restore them to full combat capability, a large percentage of the badly damaged planes also had to be considered as definitely lost." [14]

Finally, one example each for the months of July, August and September:

~~Valence and St. Martin de Crau airfields~~:

"On 24 July 1944 after 1230 some 250 four-engine bombers attacked the airfields under the protection of fighter planes." [15]

These attacks were probably aimed at the Bongart Wing ~~that was operat~~ing against partisans out of the Valence airfield. [16]

[13] Extracted from Lw.Fuestb Ic/Meldewesen Nr. 54 407/44 geh. vom 23.7.44. Karlsruhe Collection.

[14] Compare with Goering's interrogation of 29 June 1945, cited above.

[15] Extracted from Lagekarte Ic Luftflotte 3, cited above.

[16] Immediately preceding the invasion and after its start the partisan movement had developed into a serious problem. Aside from assaults on transportation media and supply installations, the disruption of the communications network were particularly annoying to the Germans. Their neutralization was being carried out not only by ground forces but also by Luftwaffe units. The Bogart Wing took part in the fighting on the plateau of Vercors, east of Valence.

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The Cognac, Dijon, Beauvais, and Reims Airfield Groups:

During low-level attacks by fighter-bombers, which took place on 25 August 1944, 46 aircraft, including 30 Junkers 88, were destroyed on the operational strips of these airfields.[17]

Venlo Airfield:

On 3 September 1944 several hundred four-engine bombers of the Royal Air Force attacked this airfield.[18]

The attack was directed against the 1st Group of the 1st Night Fighter Wing -- equipped with Heinkel 219 planes -- and had such far-reaching consequences that the group had to evacuate the airfield and shift to Muenster.

In general, the approach flight to the targets became more and more difficult and time-consuming for the Germans, mainly because of the constant shifting of bombed-out units to airfields that were still intact; the same was true of the relocation of bombs and ammunition and the moving of the scarce POL supplies. This constant shifting caused additional losses.

It thus happened that the ground elements of flying units carrying out their relocation movement to a new airfield, found their point of destination had meanwhile been bombed out. To avoid such instances, the technical services moving

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17 See The Army Air Forces in World War II, Vol. III, p. 273. These figures have not been confirmed from German sources.

18 From a study by General a.D. (Ret) Grabmann. Karlsruhe Collection.

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from one location to another had to maintain constant contact even during the march movement so that they could be informed of "frequently occurring changes in destination." [19]

The measures taken to preserve the most essential functions of the German ground echelon took place during daylight hours under constant Allied air observation. Because of their absolute numerical superiority and great flight endurance, the Mustangs, Thunderbolts, Lightnings, Typhoons, and Spitfires reigned supreme over the air space in the West. [20]

~~The Allied Attacks on the Airfields Used by Messerschmitt 262s~~. Since this model aircraft, which had been so anxiously expected, could not be employed in western Europe or only used on an experimental basis, this question will be dealt with very briefly.

The development of the Messerschmitt 262 was expected to produce a fundamental change in the entire air operations in the West. Obviously, such results could be achieved only by commitment en masse. Therefore, the model was under no circumstances to fall into Allied hands prematurely. The directives

[19] O.K.L. LwFuestb Nr. 2061/44 geh./Ia(Ausb.) vom 2.8.44; Karlsruhe Collection.

[20] See Appendix VIII with the close-combat zones for British and American fighter aircraft marked as radius of action. -- Goering, also, stated in the above-mentioned interrogations that the Allied long-range fighter aircraft were one of the major reasons for the Allied air supremacy.

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issued on this subject far ahead of time stipulated for[21] this reason that the ground echelon supporting this model aircraft during the test employment in the field be so organized that the aircraft would be safeguarded from enemy seizure however unexpectedly the ground situation may develop. Moreover, the new aircraft could be committed only above friendly territory or above bodies of water up to 30 miles distance from the enemy coast. As late as autumn 1944 the order to fly at a minimum attack altitude of 13,200 feet had to be observed, so that employment of the aircraft uder existing weather conditions was simply impossible in the majority of cases.[22]

In response to repeated urging by the heavily engaged Third Air Fleet, the Luftwaffe High Command moved about 9 Messerschmitt 262s to an airfield in northern France during the second half of July 1944, even though the planes were not fully ready for commitment.[23] But the new unit had to be shifted soon afterward without major combat actions because its dependence on an especially complicated ground echelon increased the vulnerability of the airfield against air attacks to an extent that was no longer practical. Because of its weight of almost 15,000 lbs -- including a 550-lbs bomb --[24]

[21] Ob.d.L.Nr.8947/43 g.Kdos. Chefs.(FueStb.Ia) vom 11.9.1944.

[22] According to K.T.B. of Third Air Fleet, entry of 5 Sep 44. Karlsruhe Collection.

[23] See General Plocher's study, cited above. He mentions an airfield "near Reims". Another study, the Evaluation of the Air Situation Report of the Luftwaffe High Command by the Air Ministry, London, indicates the St. Quentin-Chartres airfield and as unit the Test Headquarters Schenk, later

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and its high take-off and landing speed, mile-long runways were mandatory. The improvised emergency airfield, that was occupied in the last moment and from which convential aircraft such as the Messerschmitt 109 with its 6,600 lbs or the Focke Wulf with its 8,500 lbs could be committed without difficulty, were things of the past. The problem of camouflaging such large fields was another problem. Onthe other hand, there was not such a great number of fully completed air bases in the West that the simultaeous destruction of the entire airfield system in the theater was an impossible or even unlikely occurrence. For this reason, the only solution was to withdraw the new unit to the territory of the Reich.[25] In this connection, it is unnecessary to do more than point out the growing disproportion between the number of combat and support personnel that is a salient feature of such technically complicated weapons.

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23 (Continued from preceding page)
redesignated as 1st Group, 51st Bomber Wing.

[24] Extracted from fighter staff conference minutes of 22 June 1944. Karlsruhe Collection.

25 In the Reich, however, these aircraft were under constant bombing attacks at such airfields as Achmer, Rheine -- where these planes as well as the Arado 234 were located, just as at Muenster-Handorf -- Hesepe, and Hopsten; finally, in March 1945 they were completely bombed out and destroyed. (This information was extracted from Impact, May 1945 issue.) For the above-mentioned reasons the new Messerschmitt could take-off only individually. The concentration of larger units than one flight took too much time and thus also fuel, which in turn meant a further restriction for the planes that had

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25 (Continued from preceding page)
started first and whose time of commitment was anyhow short-lived. To commit a squadron at a time was possible only if wider runways were available or several on one airfield. Otherwise, the aircraft would start at 2 or 3 adjoining airfields and meet in the air. But Germany did not have as many groups of such airfields as the constantly repeated air attacks of the Allies would have necessitated. As an emergency measure, suitable stretches of the ~~Autobahn~~ were used for the purpose, such as the one near Leipheim on the Danube, where 1¼ miles of Auto-~~bahn~~ were prepared by filling the central dividing strip with concrete. But this strip could only be used if the brakes were in excellent condition, and then not every pilot could do so because the Messerschmitt 262 did not sufficiently obey to the rudder during deviations to the left or right at speeds up to 100 miles per hour. Compare with Major ~~a.D.~~ (Ret) Bruecker, ~~Erprobungskommando - Me 262 - des Generals~~ der Schlachtflieger (Test Headquarters Messerschmitt 262 of the General of Ground-Attack Aircraft). Karlsruhe Collection

This dependence on such an extensive ground echelon, ~~XXXX~~ the existence of which would always be known to a potential enemy eventually led to a requirement for aircraft that could take off ~~XXXXXX XXXXXXXXXXXXXXXXXX~~ vertically.

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CHAPTER SIX

THE EFFECT OF AIR ATTACKS ON AIRFIELD INSTALLATIONS

Aside from the size and condition of the runway and the take-off strip, the condition of available troop installations and the capabilities for flawless conduct of air operations and for reliable maintenance and repair work represent the primary qualities of a ground echelon. The units committed in combat need such support. For this reason, it has to be shown how the Allied air attacks affected this complicated technical service organization by giving some significant examples.

10. ~~Buildings and Signal Communications~~ [1]

~~Bourges Airfield~~:

"The airfield was attacked on 4 June 1944 from 2005 to 2020 hours by 70 four-engine aircraft dropping high-explosive bombs. According to the information sofar obtained, only minor damages have been inflicted on installations at the airfield, while there were no losses of personnel."

~~Le Mans Airport~~:

"Some 130 planes (four-engine) attacked at 0015 on 10 June 1944. Airfield out of order. Minor damages to

[1] The information has been extracted from intelligence situation reports of the 5th Fighter Division. Karlsruhe Collection.

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buildings and quarters. Other buildings and aircraft hangars suffered quite extensive damages. One building and 1 set of quarters were seriously damaged. One ammunition dump was destroyed. Three men were killed and 9 were wounded."

Bergerac Airfield:

"On 11 June 1944 at 0830 hours 50 long-range fighters launched a surprise low-level attack, dropping 15 bombs of 550-lbs caliber and strafing the installations. One barracks building was completely destroyed, while two others were slightly damaged. The telephone communications were interrupted. One man was seriously wounded."

Le Bourget Airport:

"The airfield was attacked from 0810 to 0830 hours on 14 June 1944 and again at 0912 hours on the same day. Some 100 planes participated in the raids. They dropped many high-explosive bombs and delayed action fuses. The laboratory building and the airport administrative headquarters were destroyed. The airport headuquarters building and the agricultural center were severely damaged. All quarters suffered slight damage. The radio beam installation for the runway, the water and power supply, the sound and keying devices of the airfield direction-finding set, and all long-distance wire communciations were disrupted."

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~~Mondeir airfield:~~

"On 14 June 1944 from 0815 to 0818 four times 40 Liberators attacked from 20,000 feet altitude. Many billets were severely damaged, one of the antiaircraft quarters buildings was slightly damaged. A direct hit was scored on the telephone exchange shelter."

"On 15 June 1944 from 0820 to 0830 hours 36 Halifax planes attacked in 3 waves. They dropped 180 high-explosive bombs, one wave dropping only delayed-action fused bombs. The billets at Guillerval were severely damaged. The fire brigade quarters were slightly damaged. One of the antiaircraft gun buildings was damaged, the gun being put out of commission. One flak searchlight out of order, one set of quarters damaged and another one destroyed. One gun position damaged. The chemical warfare and artillery equipment is partly damaged. Some of the packed aerial delivery containers are seriously damaged."

Angers Airfield:

"On 18 June 1944 from 2015 to 2036 hours 60 four-engine aircraft attacked the airfield, putting it out of commission. The administrative and headquarters buildings were destroyed. The Langloie Caserne was damaged. One man killed, two missing."

~~Laval Airport~~:

"Altogether 86 four-engine aircraft attacked on 18 June 1944 at 2045 hours, dropping about 800 high-explosive bombs. The

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airfield was temporarily put out of commission, with the adminstrative headuqarters and six unoccupied barracks buildings destroyed. The lighting system, long-distance telephone communications, water, and power supplies were interrupted. One men was killed, two are missing, and 16 were wounded."

During these attacks, the administrative buildings were in most instances badly hit and severely damaged so that they became unusable;[2] the same was also true of the quarters and barracks buildings. As an improvised protection against near hits, high splinter screens were erected at quarters, aircraft hangars, and other buildings. These screens offered protection against air pressure, flying fragments, and lumps of dirt, and they also proved useful against the spreading of fires.

Corme Ecluse Airfield:

On 19 June 1944 at 0907 hours enemy aircraft carpet-bombed the western part, inflicted splinter damages on hangars and completely destroying 5 barracks, while 17 others were damaged from 5 - 50 percent. Some equipment and rations were lost."

Chamfleury Airfield:

"On 28 June 1944 at 0621 hours 20 Thudernbolts dropped 80 - 100 high-explosive bombs in low-level attacks. The runway was usable for take-off. Long-distance wire were hit."

[2] During the warm season troops could be moved to tents. The author remembers having slept for several months in tents during the summer of 1944; they were put up at a distance from the bombed-out airfield.

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Le Bourget Airfield:

"On 28 June 1944 at 0817 hours 60 Fortresses attacked in 3 waves. One barracks building was slightly damaged, several hits and duds landed on the "De Rose" Caserne, and 2 houses were destroyed. The lighting system was partly interrupted, while the power, water, and wire system were completely disrupted. One men was killed, several others lightly wounded."

The disruption of the signal communications was to have a particularly detrimental effect, since signal units and their facilities are of such primary importance to air operations. Without signal communications not even the smallest unit can be successfully controlled. Included in this category are the long-distance teletype networks, which also depend on the general wirenet. To exercise control, commanders often had only radio communications at their disposal; the carefully laid-put command nets constituted a quick and secure means of transmitting orders.

The partisans, who were mostly re-supplied from the air, also contributed to the disruption of signal communications.[3]

[3] See p. 71, Footnote No. 16: Because of the disruption of the signal communications, for instance, the situation maps of the intelligence section of Third Air Fleet headquarters became increasingly more inaccurate and inconclusive. On 15 August it even became necessary to quote the British Broadcasting Company (B.B.C.) as source for information on attacks of German airfields.

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11. ~~Service Installations (Maintenance, Repair, and Technical Service Facilities)~~.

In the spring 1944 there was no other air fleet headquarters within the entire Luftwaffe, which was so amply supplied with field maintenance facilities and technical service equipment as the Third Air Fleet. The technical service support of the flying units therefore presented little difficulty for the time being. Another important factor was that the ground echelon personnel available at the airfields was generally competent, even though below authorized strength. The flying units proper had excellently trained personnel, the ground crews were old experienced maintenance man who could deal with any problem in the technical service field and were capable of rapidly restoring aircraft that were out of order.

Since the field maintenance shops were essentially non-motorized installations, one motorized unit was transferred to the Third Air Fleet area. This unit was assigned to the support of the tactical units, which needed it especially and most urgently because of the frequent moves from one operational airfield to another.[4]

It is only because of the outstanding technical support that was provided from the outset that the operational

[4] Oberst a.D. (Col. Ret.) L. von Heinemann, op. cit.

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readiness of the flying units could be maintained within the framework of possibilities despite the terrific impact of the Allied air attacks.

But the tremendous effect that these attacks had despite these measures can be gathered from the following examples: [5]

~~Paris/Orly Airfield~~:

"On 20 May 1944 about 90 four-engine bombers attacked the airfield. They launched their assault from high altitude with ground visibility and dropped 250 tons of bombs."[6]

Photograph of
Airfield under
Bombing Attack

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[5] Unless other wise stated, the examples have been extracted from the intelligence situation reports of the 5th Fighter Division.

[6] Extracted from ~~Impact~~, No. 7, July 1944.

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"On 24 May 1944 altogether 141 four-engine bombers attacked from a high altitude. They dropped 469 tons of bombs." [7]

The reconnaissance photograph reproduced below shows that two aircraft hangars were completely destroyed (No. 1 on photograph), one small hangar one-third destroyed (No. 2), and the administrative buildings(Nos. 3 and 4) were damaged.

Photograph
Showing
Bombed Areas
Numbered 1 - 4.

Vannes Airfield:

"On 10 June 1944 from 0700 to 0800 hours the airfield was attacked with high-explosive bombs of small and medium caliber. The lighting system along the edge of the runway was disrupted, the cable connecting the light-beam transmitter to the power plant was interrupted at two points.

7 Extracted from Impact, No. 7, July 1944.

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The technical service administrative buildings were destroyed, including the office and parts areas. Some of the equipment could be salvaged."

~~Orleans-Bricy Airfield~~:

"On 14 June 1944 from 0746 to 0751 hours 200 Liberators attacked from altitudes varying from 16,500 - 20,000 feet. They dropped many high-explosive bombs, varying in weight from 11 to 1,100 lbs. Previously damaged guided missile equipment stored in hangars was destroyed by a direct hit. The long-distance communications were disrupted. The lighting system was again destroyed. The airfield was out of order."

As previously mentioned, this airfield was used for operations above the Atlantic Ocean by the 40th Bomber Wing.

Le Bourget Airfield:

"Attacked on 14 June 1944 at 0812 hours by 250 Fortresses from altitudes varying from 23,100 - 26,400 feet. The following facilities were destroyed: 6 multiple aircraft hangars, 3 hangars for individual planes, 30 percent of parts of the repair installations, and 2 storage tanks."

~~Mondesir Airport:~~

On 14 June 1944 from 0815 to 0818 attacked by 4 waves of 48 Liberators flying at 20,000 feet. Several hangars destroyed, others heavily damaged."

[8] The original version was mistyped in German. The missiles were employed mainly against naval targets and consisted of Types FX and Henschel 293s.

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Chateaudun Airfield:

"Attacked on 14 June 1944 at 0752 hours by about 100 Liberator aircraft which dropped high explosive and fragmentation bombs. Also numerous long-delayed action fuses. Destroyed were 4 hangars completely, 1 hangar at 80 percent, 1 hangar at 60 percent, and finally 1 hangar was 50 percent damaged (all hangars were aircraft shelters). The repairshop was 15 - 20 percent damaged."

Guyancourt Airfield:

"This field was attacked on 15 June 1944 from 0713 to 0736 hours by several waves of Liberator aircraft. Two repair and maintenance shops were heavily damaged; 1 hangar was completely destroyed, several hangars slightly damaged, and one barracks building was damaged."

Merignac Airfield:

"On 15 June 1944 from 0824 to 0900 hours 144 aircraft attacked in 12 waves. The wire communications were disrupted. Four hangars were completely destroyed, 5 others were damaged. One "K" (Tr.: caserne ???) roof was completely destroyed."

This was also an airfield used by the 40th Bomber Wing for its Atlantic operations, just like the Orleans-Bricy airport.

Guyancourt Airfield:

"High-altitude attack, launched on 17 June 1944 from

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1256 to 1258 hours, out of the clouds without ground visibility. Four aircraft hangars and 3 repair shops were destroyed."

~~Villacoublay North and South Airports~~:

At 1945 hours on 24 June 1944 four-engine planes attacked the airports. The northern edge was particularly heavily hit. The parachute and spare parts storage areas, the refueling points, billets, and all hangars and buildings of the airfield headquarters situated on that side of the field were destroyed. The hardest blow for the fighter groups stationed at the airports was the destruction of the expensive and momentarily irreplaceable repair equipment, including 30 aircraft that were being repaired.[9]

~~Romilly Airfield~~:

"Fortresses attacked at 2030 hours on 26 June 1944; they destroyed armament plant II, hangar 4, parts 2 and 3 completely by scoring direct hits. Part I was partly damaged."

~~Meurmelon Airfield~~:

"Approximately 30 aircraft attacked on 28 June 1944 from 1915 to 2130 hours. They dropped about 30 high-explosive

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[9] Extracted from W. Heilmann, op. cit.

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bombs, which damaged 2 aircraft hangars 10 percent, 3 hangars in which there was equipment from 40 to 60 percent, and 1 hangar with equipment was completely destroyed. The lighting system was out of order for 24 hours."

The progressive destruction of an airfield is shown by the following three photos of the Nancy-Essey airport:[10]

Photograph No. 1
Showing the airfield
after the attack of
24 April 1944

During the attack of 24 April 1944 the hangars on the northern side of the airfield were the primary targets on which hits were scored.

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[10] Extracted from ~~Impact~~, No. 6, June 1944.

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Photograph No. 2
showing the airfield
during the attack
of 27 April 1944

On 27 April 1944 a total of 103 four-engine bombers dropped 172 tons of bombs. The smoke markings by pathfinders indicate the designated target area.

Photograph No. 3
showing the airfield
after the attack
of 27 April 1944

After the attack of 27 April 1944 it was found that in the southern part of the airfield, where the hangars were located, 2 double hangars were destroyed, another one half destroyed, and the fourth damaged by air pressure(Area # 1 on photograph). Some smaller buildings (Area # 2) simply disappeared.

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The destruction of the technical service facilities at the airfields had particularly serious consequences because it thus became impossible to carry out major repair work of aircraft in the field, these jobs requiring a considerable expenditure of items of equipment, spare parts, etc. [11] The precarious transportation situation made it equally impossible to return aircraft to the manufacturing plants. Thus, to maintain units at combat strength, it was necessary to constantly move up new aircraft. This fact explains also why the number of combat-ready aircraft never increased to any major extent despite the surprisingly high production figures attained even in the year 1944. [12]

By emphasizing qunatity, however, the quality of the aircraft unfortunately suffered: by subcontracting to a variety of manufacturing plants, major deficiencies occurred in the production of individual parts composing

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11 During his interrogation on 29 June 1945 Goering stated that the attacks on repair shops and hangars were not the principal factor contributing to the final destruction of the Luftwaffe; nevertheless, he emphasized that these attacks "obviously did contribute."

12 See the survey of the production in the last chapter of this study.

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the aircraft.[13] These deficiencies had to be compensated for in the field, in addition to the routine jobs.[14] It is only too obvious that the destruction of the technical service installations at the airfields had such particularly serious consequences.

12. Tank Farms

The Allied strategic air forces began to direct their attacks on the German oil production centers at Ploesti and at the synthetic plants in May 1944. Even though only 5,166 tons of bombs were dropped on these targets during that month,[15] these attacks resulted in a sudden drop in the German production: In June 1944, for instance, only 52,000 tons of aviation gasoline were produced against 156,000 tons in May, which in turn was only half of the March 1944 production figure. Speer subsequently stated that these attacks determined the outcome of the war.[16]

But the Luftwaffe units in western Europe did not notice much of this serious situation during the initial combat phase following the invasion. The careful positioning of supplies had prevented bottlenecks in aviation and motor vehicle gasoline from becoming apparent at this early stage.

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[13] Goering's interrogation of 29 June 1945, cited above.

[14] G. Bloemertz, ~~op. cit.~~, p. 190: "By their diligence, the mechanics had to make up for the deficiencies that existed at the aircraft production plants ...."

[15 & 16] ~~The Army Air Forces in World War II~~, Vol. III, p. 179.

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But since the transportation conditions became more and more difficult every day and the production dropped off, re-supply of sizable quantities could no longer be expected. For this reason, the available stocks had to be carefully nursed along. Moreover, the destruction of such storage facilities would of necessity have very grave consequences. The following examples demonstrate this point:

~~Bernay Airfield~~:

"On 12 June 1944 from 0917 to 0949 hours 27 Fortresses and 35 Liberators attacked in 3 waves. One aviation gasoline storage tank was emptied through leakage."

~~Orleans-Bricy Airfield~~:

"About 200 Liberator aircraft attacked on 14 June 1944 from 0746 to 0751 hours at altitudes verying from 16,500 to 20,000 feet. They scored about 180 hits on the airstrip. Altogether 7,890 quarts (1,972 gallons) of B4 gasoline, belonging to the quartermaster reserves and stored in barrels, were burned."

~~Guyancourt Airfield~~:

"On 15 June 1944 from 0713 to 0736 hours Liberators flying in several waves at 20,000 feet altitude attacked the airfield. The B4 gasoline storage tank farm was slightly damaged."

~~Cazau Airfield~~:

"On 19 June 1944 at 0930 the Allies carried out three carpet bombings. Direct hits were scored on the 50-cubic-

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meter tank above ground, and 38 cubic meters of B4 gasoline and 125 gallons of Lubricant 3 were burned."

Orleans-Briey Airfield:

"The airfield was attacked on 22 June 1944 at 0130 hours. One storage tank was hit so that 31 cubic meters of B4 gasoline were lost. The pumping installations were 25 percent damaged."

Coulommiers Airport:

"On 25 June 1944 at 2017 hours 12 aircraft attacked the field. The scored hits between airstrip East-West and the edge of the taxiway at a gasoline distribution point. The fire was extinguished immediately, and only minor losses of gasoline occurred."

Montbartier Field Air Force Storage Depot:

"On 25 June 1944 from 0910 to 0950 hours approximately 120 to 150 aircraft attacked from altitudes varying from 6,600 - 10,000 feet. A storage tank containing 500 cubic meters of B4 gasoline was hit, its contents began to leak, whereupon the remainder was removed by pumping; 60 cubic meters were lost. Three direct hits were scored on Tank III with the result that 150 cubic meters were lost. The pumping installation was destroyed. The water pumps stopped functioning." In a later report the total gasoline losses were given as 500 cubic meters of B4.

Bretigny Airfield:

On 25 June 1944 some 200 to 300 high-explosive bombs

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were dropped. Seven hits were scored on the tank farm, and the heating plant; power and water were cut off."

Le Bourget Airfield:

"On 28 June 1944 at 0817 hours 60 Flying Fortresses made a high-altitude attack. Most of the bombs hit the western section of the airfield up to the tank farm. Three hits were scored on the gasoline storage installation."

The above-mentioned careful supply policy for airfields, by which the gasoline stocks were stored in preparation for the invasion, led to some mistakes in the distribution. One fighter, squadron, for instance, landed at an emergency field south of Paris on 6 June 1944, where only 20,000 gallons of A3 gasoline were available, which were of no use to the squadron. The aircraft were immobilized for several days until the proper type of fuel could be moved up." [17]

A few comparative figures taken from the experience of fighter commitment for the defense of the Reich will show the proportions of the aviation gasoline losses suffered during the period under review. According to these figures, 80 cubic meters of C3 and the same quantity of B4 gasoline were to be available at fighter fields in the Reich.[18] The following pumping facilities were usually available: an

[17] G. Bloemertz, op. cit., p. 112.

[18] LuftgauKommando V, Quartiermeister Q I (Luftwaffe Area Headquarters V, Quartermaster Branch I), dated 25 Sep 44. Karlsruhe Collection.

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emergency pumping facility, a trailer to an ambulance, a truck loaded with barrels or a dump with barrels that could be emptied by hand pump or pump assemblies.

These improvised means of fuel servicing indicate that one had proceeded to stor and pump gasoline at hidden locations. The aircraft therefore had to disappear immediately after landing and move to storage and pumping stations that were at some distance from the runway proper. Only thus could one hope to compensate for the losses of equipment, fuel, ammunition, etc.[19]

But the lengthening of approach, transportation, and taxiing routes led in turn to greater consumption of motor vehicle and aviation gasoline, quite apart from the added hours of keeping the engines running during extended taxiing. Another disadvantage was the wear and tear on tires -- rubber was another bottleneck -- by using bad roads which caused many breakdowns. The hauling of aircraft by tractors, etc., was often impossible because of the chronic shortage of diesel fuel,[20] quite apart from the fact that it was time-consuming. On many occasions, such emergency equipment as tailskid drawbars and carts were just not available.

The time element played an important part in this type ~~of technical~~ maintenance and refueling at camouflaged parking

[19] O.K.L. Lw.Fuestb.Nr. 2061/44 geh. (Ia/Ausb) vom 2 Aug 44. Karlsruhe Collection.

[20] In the war diary of the Luftwaffe High Command it is mentioned that fuel oil and Otto fuel (diesel oil) were mixed in order to preserve the motor vehicle gasoline stocks of the Luftwaffe. Karlsruhe Collection.

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areas insofar as the combat readiness of the units was concerned: the aircraft did not get back to flying as fast as it would have been necessary. The refueling proper took too much time, especially if the gasoline had to be pumped from barrels or taken from cans, which was even worse.[21]

As early as June 1944 the Heinkel 177 therefore had to be withdrawn from combat because of the shortage of fuel;[22] this resulted in a considerable weakening of the combat efficiency of the IX Air Corps. Moreover, the war diary of the Third Air Fleet has an entry for 1 September 1944, according to which the IX Air Corps could not fly any missions on that day because of the weather and fuel situation.

On 5 September a combat order was issued to the II Fighter Corps, stating that operational economy and careful planning for fighter units was especially necessary because of the extraordinary shortage of fuel and the difficulties in maintaining the ground echelon.[23]

Allied air attacks thus caused considerable losses of aviation gasoline stocks in the field in addition to the growing disorganization that led to the final defeat of the Luftwaffe.

[21] See L.Dv.90/2, pp. 141-3. Karlsruhe Collection. It shows the time needed for refueling by pumping -- machine and hand -- indicating that the differences were considerable.

[22] Goering interrogation, ~~cited above~~.

[23] Third Air Fleet K.T.B. (war diary). Karlsruhe Collection.

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CHAPTER SEVEN

ALLIED ATTACKS ON V-1 INSTALLATIONS

Despite the extraordinary significance attributed to Operation CROSSBOW [1] by the Allies, this study will cover that topic only slightly and only insofar as the flying units of the Luftwaffe were directly affected by this operation. All problems related to the V-1 should actually be considered within the framework of a separate study.

The preparations for the employment of the V-1 could not possibly be kept secret from the Allied military command. The net of agents spread over the occupied territories of western Europe was much too tightly knit and the construction work too extensive to achieve such secrecy. The very extensive network of steel and concrete structures used for launching the V-1 missile covered several hundred miles of the French coast. In its full scope it probably presented a construction program that had never been exceeded in peace or war. [2]

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1 Code name used by the Allies for all their operations against V-1 weapons.

2 Joseph W. Angell, ~~American Air Force Attacks on V-Weapon Launching Sites along the French Coast~~ (?). Kalrsruhe Collection.

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Because of the destruction of what the Allies designated "skiing" installations on account of their conspicuous appearance -- they were actually the fixed launching sites -- the employment of the V-1 had been repeatedly delayed. Finally, the Armed Forces Operations Staff designated 6 June 1944 as X-day,[3] but the first missiles were not launched until the night of 12 - 13 June. They greatly surprised the Allies because they were launched from so-called modified sites; these had little in common with the installations that had been originally erected from costly construction material and that had been completely destroyed by mass Allied air attacks. The only features the new sites had in common with these former ones were the launching ramps and one square building. The latter, carefully aligned with the ramp, served for the adjustment of the missile according to the existing wind velocity, the required flight time, etc. A compass built into the floor was one of the main features of this building. All other equipment that had to be under cover was carefully put away in adjacent farm houses and was well camouflaged.

The hits scored by V-1s in London caused serious worries and led to comprehensive countermeasures in the sphere of air defense as well as to renewed air attacks

[3] Oberst i.G.a.D. (Col., GS, Ret.) E. Walter, V 1 (Fzg.76) (The V-1 (Aircraft 76)). Karlsruhe Collection. Another code designation used by the Germans for the missile was Fi 103 (Fiseler Storch 103).

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on the part of the Allies. In so doing, they experienced occasional difficulties in diverting the essential aircraft to these attacks. The V-1 attacks had probably a not negligible influence on accelerating the British-Canadian armies' drive along the French coast toward the north.

The 155th Flak Regiment (W), which fired the V-1 missiles, therefore had to gradually withdraw the firing positions as the Allies approached the Seine River. Staring on its left flank, it removed the positions and then extended them along the right flank to the north in Belgian territory. The quick advance of the Allies, however, led to the complete withdrawal of the firing position and supply system in France and Belgium, with all facilities being taken beyond the Rhine into the Netherlands to the area around Deventer.[4]

Insofar as at all possible, the V-1 attacks on London were continued with the help of aircraft, every effort being made during the transitional period of withdrawal and redeployment to maintain the continuity of the attacks. Though outdated, the Heinkel 111 was the best suited plane for this purpose. Research in this field dated back to 1943, when German experts were afraid that the destruction of the expensive launching ramps in the West would jeopardize

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[4] See Walter, op. cit. This happened from the second half of September onward.

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the employment of V-1s altogether.[5] The Heinkel 177, which also was capable of carrying along a V-1, could not be employed because of the high fuel consumption; the Junkers 88 and the models derived from this plane could not be used for this purpose. It actually involved fixing the missile to the wing between the fuselage and the engine by a simple holding device. The aircraft flew at a low level above the water until it reached the launching point; there it climbed as fast as possible to the required altitude of 1,650 feet, where it launched the missile in the direction of the target. In so doing the chances of hitting a target of the size of London were not unfavorable.

That type of operation by Heinkel 111's was actually performed as early as the beginning of July 1944 by the 3d Group of the 3d Bomber Wing, which was directly subordinate to the Third Air Fleet headquarters. The records also mention the 53d Bomber Wing in this connection at the same date, whereas in reality the 1st Group of that wing did not start this type of operations until the end of September - beginning of October 1944 at the earliest.[6]

The following table shows the employment of V-1 missiles ~~during July 1944:~~[7]

[5] From GL(?) conference of 24 January 1944. Karlsruhe Collection.

[6] See Walter, ~~op. cit.,~~ and The Rise and Fall of the German Air Force, 1948, p. 345.

[7] Extracted from the invasion diary, 8th Branch, Chief of General Staff as well as the war diary and orders issued by the Third Air Fleet and the Luftwaffe High Command. Karlsruhe Collection.

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Date	Target	No. of Heinkel 111's Employed	No. of V-1's Fired at Target
8 July	London	10	8
11 "	Southampton	18	31
14 "	"	16	16
15 "	"	16	23
20 "	London	20	30
22 "	"	14	14
24 "	"	16	24
26 "	"	12	19
27 "	"	14	25
29 "	"	13	25
30 "	"	13	30
31 "	"	23	23

The most interesting feature of these operations was the launching of V-1's at the port area of Portsmouth - Southampton, which was apparently easier from aircraft than fromfixed launching sites.

The British, whose most urgent task was to counteract the V-1 for very obvious reasons, seem to have been ignorant this type of launching at first, since the records indicate that Venlo was attacked only on 15 and 27 August, Gilze Rijen on 20 July and 7 and 15 August. The success of these bombing attacks on the two airfields cannot have been very great, because the 3d Group of the 3d Bomber Wing did not displace to Muenster-Handorf and the northwest German airbases at Ahlhorn and Varelbusch until after the heavy attacks of 3 September[8] that were launched against the Dutch

8 See Chapter 5, p. 72, of this study.

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airfields. The Allied attack of 30 September, during which 703 R.A.F. and 100 U.S. four-engine bombers bombed the airfields in Holland at which V-1 launching units were suspected of being located, therefore did not achieve its purpose.[9]

During this final phase of the war, the achievement of combat readiness after such a redeployment, which was also connected with difficult re-direction of supply lines, etc., required a long time so that the bomber group launching the V-1 did not resume operations until 17 - 18 September, when 10 aircraft were committed.

On 5 September the last V-1 launched from a fixed ramp had meanwhile been fired at London, with the Allied ground forces in hot pursuit along the French coast. After the interval of almost two weeks until 17-18 September the British chronologist[10] therefore considered the launching of missiles from Heinkel 111's as a new phase in the struggle, thus giving a reason for the assumption that the British were not aware of the new launching method.

Almost immediately the bomber unit began to suffer crippling losses because the overloaded Heinkels were no match for the British night fighters -- primarily Mosquitos -- which were employed as defensive counterweapons. The take-off from the

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[9] From the notes of General ~~a.D.~~ (Ret) Grabmann. Karlsruhe Collection.

[10] Hilary St. George Saunders, ~~Royal Air Force 1939 - 1945~~, Vol. III.

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Iar bases in the Oldenburg area could not be concealed in view of the systematic search undertaken by the Allies. Because of the flak barrage areas, a fixed flight path was suggested according to the Third Air Fleet war diary. It led via Meppen--Meppel--Zuider Lake-- north of Amsterdam--north of Ijmuiden toward the ocean up to the release point. Used after 19 September 1944, this route resulted in losses.

The 53d Bomber Wing, a Heinkel 111 unit up to then employed in the Russian theater, made its first appearance in northwest Germany in October 1944, when its first group began operations in the West.[11] The 2d and 3d Groups were at that time still in Reppen and Grottkau, where they were being rehabilitated for V-1 employment. The wing was to assume responsibility for the entire V-1 operation. Since the 3d Group of the 3d Bomber Wing was no longer mentioned after that date, it might be assumed that that this group was integrated into the 53d Bomber Wing. This assumption seems to be confirmed by the distribution that took place in November 1944: the 1st Group of the 53d Bomber Wing was assigned to Varelbusch, Ahlhorn, and Wittmundhafen -- the former airfields of the 3d Group, 3d Bomber Wing -- while the 2d Group was stationed at Zwischenhahn, and the 3d at Eggebek, Schleswig, and Leck.[12]

During the autumn months the wing carried out these operations:[13]

September 1944 ..... 177 V-1's in 13 nights,
October ..... 282 V-1's in 20 nights,
November ..... 316 V-1's in 13 nights, and
~~December XXX~~ (1-13) 90 V-1's in 6 nights.

[11] Distribution of forces from "Exploitation of Air Situation Maps of the Luftwaffe High Command in the Air Ministry, London," cited above

[12] See ~~Rise and Fall of the German Air Force~~, p. 346.

[13] According to the Third Air Fleet war diary (After 21 Sep 44, Luftwaffen Kommando West) only 2 nights were used in September.

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The definite climax of these operations was reached on 24 December 1944, when about 50 aircraft were committed against Manchester.[14] This was also remarkable from another point of view since -- except for the previously mentioned attacks on Southampton in July 1944 -- this operation was the only V-1 concentration dropped on a target other than London. The last V-1 was dropped from a Heinkel 111 bomber on the night of 29 - 30 March 1945.[15] To complete the picture, a chart is added, showing the operational readiness of the 53d Bomber Wing during the winter months. It gives a rather positive impression that can be explained by the absolute reliability and sturdiness of the tried Heinkel 111 model by the ground staff that had many years of experience with the aircraft, and by the experienced flying crews.[16]

	HQ		1st Gp		2d Gp		3d Gp	
	Auth.	Avail.	Auth.	Avail.	Auth.	Avail.	Auth.	Avail.
20 Oct 44	2*	0**	21*	13**	40*	11**	15*	0**
20 Nov 44	2	2	26	21	22	15	39	20
20 Dec 44	2	2	40	28	36	27	39	28
20 Jan 45	1	1	37	25	33	29	30	24

Figures(marked with *) in authorized column give the authorized strength, those in the available column (**), the combat ready aircraft.

14 Hilary St. George Saunders, op. cit.

15 According to General Grabmann's study. Karlsruhe Collection.

16 Exploitation of Air Situation Maps of the Luftwaffe High Command in the Air Ministry, London, cited above.

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This satisfactory operational readiness of the 53d Bomber Wing can be attributed also to the extensive dispersion of the unit over seven airfields, which greatly reduced the air vulnerability. But probably the most important factor was that the Allies no longer attached the same high priority to attacks on V-1 bases which had been given to combatting these weapons before September 1944. On 3 September 1944, for instance, all strategic air force commanders in Europe were issued orders to delay further CROSSBOW attacks for the time being.[17] And three days later all Allied bombing attacks on fixed V-1 sites were stopped on the assumption that no further danger was theatening from ground-launched missiles. Excepted from this order were occasional blows aimed at the airfields that were used by Heinkel 111 bombers from which the missiles were launched.

This explains the facts that relatively little information is available on bombing attacks of the airfields used by the 53d Bomber Wing and that this unit fared relatively well. Its losses were caused primarily by British night fighters and accidents during flying operations, which were inevitable in view of the heavy load -- the V-1 -- carried by the Heinkels as well as because of the unfavorable flying weather in ~~autumn and winter.~~

17 Joseph W. Angell, ~~op. cit.~~, pp. 23-4.

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CHAPTER EIGHT

THE EFFECT OF ALLIED ATTACKS ON LUFTWAFFE PERSONNEL

13. ~~The Crews~~

As early as October 1943 Goering had availed himself of the opportunity to complain in a speech to some fighter pilots about their lack of aggressiveness, using very derogatory terms and reproaching them in a most dishonoring manner.[1] This speech was prompted by the low figures of aircraft shot down in the air defense operations over Reich territory, particularly during the attack of 9 October, when approximately 500 American four-engine bombers attacked without fighter protection from an absolutely clear sky, dropping their bombs over the east German aircraft plants at Marienburg, Gotenhafen (Gdinsk), Danzig, Anklam, and Neubrandenburg. During this operation the Americans lost only 53 planes, while 11 more might have been shot down.[2] There was no question of a complete destruction of all bombers, such as Goering considered as self-evident for this type of operation. He could therefore "hardly tolerate the humiliation suffered at the hands of ~~the enemy on this~~ day, when they had the impudence of flying

[1] On 23 October 1943 in Deelen (Netherlands) concerning "The Reich Air Defense Situation." Karlsruhe Collection.

[2] General ~~a.D.~~ (Ret) Beppo Schmid, ~~Der Einsatz der deutschen Luftwaffe gegen die Alliierten im Westen 1943 - 1945~~ (Luftwaffe Operations in Western Europe against the Allies, 1943 - 1945). Karlsruhe Collection.

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from the Schelde River straight across the entire width of Germany beyond the Weichsel River and back without being completely annihilated." He therefore ordered the fighter personnel to attack at any price and under any circumstances in the future. [3]

During the course of making his accusations, Goering had to concede, however, that the armament of the German fighter aircraft was not ideally suited and that in the long run the four-engine bombers could be fought more successfully only with heavier weapons. But all necessary measures had already been taken. Even so, the available weapons would suffice entirely to shoot down a four-engine bomber, if the attack was launched properly.

Goering also discussed the objection that had been raised against German fighter aircraft that were no match for the Allied models. He agreed that the Allied had some models that climbed better and were faster. But even that was not considered of decisive importance: the real issue was the will to give combat and shoot down.

In this connection one might state that the aggressiveness of the German fighter personnel was generally certainly not ~~below average, a fact~~ that had been proved in all theaters

[3] Goering's opinions were at that time also shared as a matter of principle by such other German Air Force leaders as Field Marshal Milch and General Galland.

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of war. In any case, there are sufficient proofs and incontestable testimonials available to eliminate any doubt.[4] But one has to take into consideration under which circumstances the fighters had to combat the Allied superiority in 1943 and even more during 1944. It is true that the German armament industry had succeeded in producing many thousands of fighter aircraft, making a gigantic and altogether surprising production effort considering the disasters that happened in 1944. Even though these aircraft were issued in the field, the most inflammatory speeches delivered by Goering could not change the fact that the production of the available outdated models could not keep pace with the constant improvements and new features introduced by the Allies in their aircraft production.[5] Only an entirely new model could change this situation, a real progress such as the ~~XXXXXX~~ production of the Messerschmitt 262, which however came too late and was not distributed in sufficient numbers to fullfil the needs of the units in the field.

To save gasoline, aircraft delivered to the units in the field were not properly adjusted: their engines had not been running sufficiently. This was to be achieved in the field, with newly assigned crews being given that job so

[4] See also B.W. Hillmann and G. Bloemertz, ~~op. cit.~~, and A. Galland, ~~Die Ersten and die Letzten~~ (The First and the Last), etc.

[5] Bloemertz, ~~op. cit.~~, p. 119: there, a squadron commander described the aircraft to a liaison officer of Hitler, assigned during the Invasion to serve with the Luftwaffe in the West, as "old, worn-out iron" and called the materiel and its manufacture defective.

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that they become accustomed to the aircraft. If an Allied attack occurred while they were warming up the engines, the inexperienced crews had to evacuate the aircraft from the airstrip to avoid being caught on the ground. Because of their inexperience the often did not find back to the airfield of origin which was camouflaged; this usually led to forced emergency landings that caused heavy damages.[6]

The transfer of newly assigned units or of flying personnel replacements from the Reich to western Europe often took place under similar circumstances. Losses occurred already during the move because the inexperienced crews very easily lost their bearings in quickly changing tactical air situations and were thus forced to make off-field landings with their aircraft having run out of gasoline.[7] Moreover, most of the pilots were used to the completely finished air bases forming the Reich defense system. Their training in position finding and navigation was deficient, which was a consequence of their participation in mass operations that were controlled by central headquarters. During July 1944 the Third Air Fleet therefore organized the Fighter Transfer Command West, whose squadrons were stationed at Wiesbaden-Erbenheim, Mannheim-Sandhofen, and Cologne-Ostheim.[8] A special pilot led a group of 20 - 30 aircraft to their operational airfield from then on.[9]

[6] G. Bloemertz, op. cit., and also Galland, op. cit.

[7] O.K.L., Lw.Fuehrungsstab No. 2061/44 geh.(Ia/Ausb.), dated 2 Aug 44.

[8] Third Air Fleet war diary, Nr. 79. Karlsruhe Collection.

[9] During his interrogation on 29 June 45 Goering stated that losses were particularly high among the inexperienced fighter pilots, whereas they were within reasonable limits for the transfer of bombers

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But the major reason for this failure of the new crews was to be found in their training, which had been too short. Because of the shortage of gasoline, the pilots could not be given the absolutely essential number of flying lessons, which would have made them capable of unqualified mastery of their equipment in any possible situation.

It is only too obvious that under these circumstances the losses suffered in combat proper were inevitably very high. The following chart shows some figures derived from the operations of the 5th Fighter Division in June 1944:[10]

Day	No. of aircraft committed	Losses
5	--	--
6	121	8
7	275	29 + 1 on the ground
10	179	9
15	316	18 + 2 on the ground
20	283	18
25	377	32 + 12 on the ground
30	509	31

But these figures convey only the total losses suffered exclusively on combat, whereas the other losses caused by weather conditions, bad servicing, materiel deficiencies brought the loss figures at the climax of the invasion period up to 40 - 50 percent of the available strength, including the above combat losses. On the other hand, the losses of

10 According to the intelligence situation report of the 5th Fighter Division, cited above. Karlsruhe Collection.

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pilots amounted to 12 - 15 percent for the same period.[11]

A considerable percentage of these materiel and personnel losses can no doubt be attributed to the consequences of the Allied attacks on the Luftwaffe ground echelon. Because of these attacks the crews were eventually worn out and could not respond any more to the continuous demands. Their good-will cannot be questioned.[12]

In their operations against the overpowering superiority of the Allies, the Luftwaffe personnel could scarcely protect the German ground forces; they actually flew into their own destruction. The constant pressure of hopeless inferiority, the inevitable issue of the struggle, the reprimands from higher headquarters, the discredit in which the Luftwaffe was held by the other services without any fault of the individual -- all these factors created a tension during these weeks which was hardly bearable. Above all, the shortage of well qualified commanders made itself felt, of men who were capable of taking their units in formation off the

[11] Goering interrogation, cited above.

[12] It is doubtful whether the withdrawal of PX privileges, which Goering imposed on the Third Air Fleet on 19 September 1944, was the proper measure to stimulate the flying crews and ground staffs to better performances. (See Third Air Fleet war diary, No. 79, entry of 20 Sep 44.) Karlsruhe Collection. On the other hand, the American statement that the German crews showed "more aggressiveness than ability" seems to be a justified, though difficult to accept, comment.

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airfields, despite the constant control of the air space exercised by the Allies, and of leading these units against the Allied attack units. Orders were therefore issued to the effect that fighter squadrons that could not satisfy the operational requirements would be temporarily commanded by particularly experienced and specially qualified squadron leaders. [13]

14. ~~The Other Personnel~~

During his above-mentioned speech at Deelen, Goering also briefly ~~XXX~~ spoke about the ground personnel of the flying units. He stated that their absolute operational readiness was mandatory and ordered them to serve to the limit of their capabilities, just like the flying personnel. During the course of the war that undoubtedly happened and remained valid until the very last days. [14]

~~XX~~ The analysis of the withdrawal movements of the German Armed Forces after the invasion of Normandy led to serious recriminations directed by the Army against the Luftwaffe. Among these the statement was made that the over-inflated organization with its 650,000 men broke down ~~so that about~~ 500,000 of them fled like an undiciplined mob

[13] Goering's orders according to the Luftwaffe Kommando West war diary entry of 26 Sep 44. Karlsruhe Collection.

[14] See Bloemertz, ~~op. cit.~~, p. 190: "These people in their dirty coveralls believed in victory, and that gave them the strength to operate effectively." The author also remembers the unabated operational readiness of the ground crews of his bomber group to the very last days of the war. Almost all the Heinkel 111's were always ready for commitment.

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fleeing eastward.[15] This statement was certainly not valid insofar as the reliable ground personnel were concerned and was probably nothing but a gross exaggeration with regard to the great majority of the other Luftwaffe service personnel. In this connection one need only think of the anitaircraft operational personnel who had only too often been the last bulwark and support of the ground forces.

One cannot deny that some of the Armed Forces personnel -- including Army personnel -- who had lived a rear-area existence for many years and had thus forgotten what war was like, were seized by panic, conducted themselves improperly, and even in an undisciplinary manner under the pressure of ceaseless Allied air attacks. But the above ~~XXXXXX~~ over-all judgment is certainly unjustified and also unjust -- as is usually the case when such generalizations are made. The withdrawal of the Luftwaffe from France might not have been better, but it certainly was no worse than that of any other armed service. Any rear area shows signs of disorganization and demoralization under similar circumstances. One might simply remember the French Air Force in 1940, which was defeated on the ground and then drawn into the turbulence of the general withdrawal during which it perished.

[15] The Chief of the National Socialist Command Staff of the Army, General Ritter von Hengl, made this statement during a speech at Army Group B headquarters in the presence of Field Marshal Modl (See Luftwaffe Kommando West war diary, entry of 26 Sep 44. Karlsruhe Collection.

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Even though the ground echelon of the Third Air Fleet was very extensive, one must consider the dimensions of the occupied territories in the West which required that alternate facilities be available in sufficient number to make up for the repeated damages caused by the Allied air attacks. Also, the great variety of missions that had to be accomplished in western Europe, such as the operations against the British Isles, over the Atlantic Ocean, and in the Mediterranean necessitated the existence of a very large ground echelon so that the flying units could be deployed to suitable and well prepared airfields in accordance with the concentration of effort.

Moreover, one must not forget that the fighter planes employed to combat the Allied bomber units invading the French coastal areas and the Reich proper had to be deployed from their organizational bases to suitable jump-off fields and emergency bases, which again required a well integrated ground echelon with considerable personnel strength for the same reasons as mentioned above.

The withdrawal of Luftwaffe organizational units took place according to the orders that had been issued and could mostly be carried out in an orderly manner. However, much valuable maintenance equipment had to be destroyed because of the shortage of means of transportation and POL. This was also true of major items of intercept, air-raid warning, and air traffic safety control equipment which had to be abandoned

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by the numerically strong Luftwaffe troop units.

That all these units were not committed as combat troops during a time of the nation's greatest distress -- this was agreed upon with the C-in-C West -- caused some of the above-mentioned anger on the part of the Army. In most instances it was overlooked, however, that these specialized personnel, most of whom had been trained over a number of years, would be needed again at some other point, where they would have to be employed or else the operations of the the flying units would altogether cease.

Besides, the combat effectiveness of these troops, who had never been given proper infantry training, who were not equipped with infantry heavy weapons, and who were not properly equipped, would not have amounted to very much so that their commitment in the ground fighting would have been unreasonable and actually irresponsible.[16] Furthermore, these people had spent too many years in comfort in a rich country; they could not suddenly be transformed into lion-hearted fighters -- even less in an atmosphere of catastrophe under constant air bombardment.

At the time of the invasion the actual personnel strength of the Third Air Fleet was as follows:[17]

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[16] General Plocher, op. cit., characterized the possible employment of these ground personnel as treating them as "cannon fodder."

[17] According to the war diary of the Luftwaffe Kommando West, dated 26 Sep 44. Karlsruhe Collection.

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Total Strength	384,579
(Tr: Less Reich Labor Service)	
less Luftwaffe Women Auxiliaries.	16,109
Foreign and German civilian workers	45,331
thus: Officer, Warrant officer, noncoms, and enlisted men	323,139
plus Reich Labor Service	24,019
	347,158

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Even though the above-mentioned figure of 650,000 men thus proves to be a gross exaggeration, these figures still convey an impressive picture of the extensive personnel strength of the rear area services which were needed for maintaining the complicated and involved Luftwaffe organization in operation. On the other hand, it is most disconcerting that this sizable organization was not instrumental in achieving a better performance during the defensive fighting against the invading forces, a fact that is directly related to the hopeless numerical inferiority of the German flying units.

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CHAPTER NINE

CONCLUSIONS

The effect of the Allied air supremacy in western Europe and the role played by the continuous Allied air attacks can hardly be overestimated. Of all the individual factors that contributed to the success of the invasion in Normandy these two were no doubt the most significant since they affected almost every German operation and influenced every plan. The control of the flying units in the air, the improvement and equipment of the airbases, the transfer of units and their supply, the psychological conditioning and the morale of the flight and ground crews -- they all were diminished by the Allied air superiority and the continuous air attacks.

Some of the individual results produced by the Allied air attacks were as follows:

1. They destroyed the fortifications of the Atlantic Wall as well as the launching ramps of the V-1 missiles, thus channeling additional materiel and personnel to the damaged installations, which in turn could not be employed for their original task -- the improvement of the air bases;

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2. By destroying the fixed launching ramps for the V-1's, the Allied air attacks forced the Germans to use bomber units for the launching of the missiles, which were thus diverted from their assigned missions;

3. The strategic bombing attacks forced the Germans to retain radar equipment and antiaircraft artillery in the Reich, which could thus not be employed in Western Europe to protect the ground facilities of the Luftwaffe;

4. These air attack also compelled the Germans to keep their fighter aircraft in the Reich so that the airfields in western Europe were left without protection;

5. They smashed the principal airfields in western Europe and thus forced the German units to shift to the secondary fields with their makeshift equipment, which often caused damages to the ~~XXXXXX~~ aircraft because of their defective condition;

6. By their air attacks, the Allies forced the Luftwaffe to evacuate its principal ground facilities to the east of France, thus forcing the German aircraft to execute long approach flights, which in turn had a decisive detrimental effect on the air support given to the ground forces engaged in the defensive battle around the beachheads;

7. The attacks destroyed the German aircraft on the ground;

8. They destroyed the technical services facilities, the supply depots, and the gasoline reserves that had been

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carefully preserved for the time of the invasion;

9. The Allied aircraft were ever present, and by constantly threatening the German forces around the clock they made the troops ill at ease;

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10. Their constant pounding tortured and demoralized the forces;

11. They hit newly transferred aircraft and crews even before they arrived at their destination;

12. The attacks often resulted in inexperienced crews simply being unable to find their camouflaged airfields;

13. The attacks forced the German flying units to move without let-up from one alternate field to another.

14. These constant shifts caused additional losses of materiel and personnel along the overcrowded roads.

15. The air attacks forced the Germans to take one expedient after another, which were time-consuming and otherwise costly (camouflage, refueling at hidden parking areas, etc.)

16. The attacks forced the German units, and particularly their technicians and ground personnel, to turn the night into day in order to accomplish operational readiness, thus compelling the Luftwaffe to "go undeground;"

17. By exercising constant surveillance, the Allied aircraft prevented the Luftwaffe units very often from taking off at the right time and then only permitted the piecemeal commitment of the forces available at the airfields;

18. By such action, the Allied air forces reduced even more

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the anyhow greatly diminished punch of the Luftwaffe;

19. The Allied air attacks also destroyed the signal communications and air warning service facilities, thus depriving the German intermediate command of its "sight" which in turn complicated the operations and control of the flying units; and

20. By the far-reaching bombing attacks, the Allies produced effects where they were least expected.

Affected by these omni-hitting air attacks and this overwhelming air supremacy exerted by the Allies, the German Armed Forces, including the seriously afflicted Luftwaffe, receded to the borders of the Reich in the autumn 1944 -- a defeated multitude; the question was whether operations of real significance could still be carried out by these forces.

But in Germany, fighter production figures reached precisely during these dark autumn months the absolute maximum of the entire war: 3,110 in September, 2,789 in October, and 2,847 in November 1944.[1] To replace the combat aircraft that had been lost and to re-equip the flying units could therefore present no difficulties. Far more serious was the attrition of experienced pilots; their

[1] Extracted from Neuproduktion von Jaegern gem.Gen.Qu.Luftwaffe Genst. 6. Abteilung (Fighter Production Figures given by the 6th Branch of the Luftwaffe High Command Logistics Division), per 1945. Karlsruhe Collection. In his interrogation of 29 June 1945, cited above, Goering stated that the maximum German fighter production was 6,000 in January 1945.

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training until they were fully capable of flying combat missions was handicapped by the chronic shortage of gasoline. The latter was measured by the gallon and even by the quart when allotments were made to schools and replacement units so that only the most essential training could be carried out. With this type of training the young pilots were assigned to the units as replacements.

The units that had thus been rehabilitated by the addition of materiel and personnel were to be concentrated for one signle stinging blow at the turn of 1944 - 45. In so doing, the Luftwaffe was to relieve the Army, which was suffering heavily under the continuous Allied air superiority, such action being all the more necessary since the Ardennes offensive had ground to a halt.

Operation GROUNDPLATE [2] started on 1 January 1945, with 9 wings composed of about 1,000 German fighters -- Messerschmitt 109 and Focke Wulf 190 planes -- sweeping in large attack formations at low levels over Holland and Belgium, where they were to attack airfields with aircraft armament.

In evaluating this operation, one must consider what a tremendous planning effort, how many preparations and expedients had to be made at the end of 1944 in a Germany that was dominated by Allied airsupremacy in order to stage such an ~~offensive operation~~. The greatly impaired ground echelon

[2] Code designation for the operation. The listing of the participating units, their take-off fields, and targets have been made the subject of a study by General (Ret) W. Grabmann. Karlsruhe Collection.

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of the Luftwaffe had thus proved that despite enemy air superiority there are means of achieving ~~XXXX~~ operations ~~en masse~~, if every possible avenue of approach is used.

Even though not everything went according to plan during the execution of the operation -- thus, for instance, the outflying German wings werecaught in the massed antiaircraft fire of the German flak that had not been informed in time[3] and some ~~XXXX~~ elements were incapable of locating their designated targets[4] -- the attack proper constituted "a disagreeable surprise for the Allies",[5] the careful planning of which was later to achieve recognition from General Spaatz.

The losses suffered by both sides vary according to the reports, as is usually the case. While the German sources[6] indicate that 467 Allied aircraft were destroyed, the official ~~American History~~ speaks of only 156 planes lost, including

[3] G. Bloemertz, p. 207, ~~op. cit.~~; "The German antiaircraft artillery must have mistaken us -- we were flying across the fire of our own batteries. It was heartbreaking, since they scored hits with every burst." Bloemertz unit lost six aircraft which were shot down.

[4] Thus, two airfields in addition to Volkel, which were the targets of the 6th Fighter Wing were spared "as if by a miracle." See also the book written by the French fighter pilot Clostermann, ~~Die grosse Arena~~ (The Large Arena), p. 212. Extracts in the Karlsruhe Collection.

[5] ~~The Army Air Force in World War II~~, Vol. III, p. 665.

[6] Professor Percy Ernst Schramm, who kept the Armed Forces Operations Staff war diary gave this figure in his study, ~~Die Luftwaffe waehrend der Ardennenoffensive~~ (The Luftwaffe during the Ardennes Offensive), extracts of which are in the Karlsruhe Collection.

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36 American aircraft. This figure seems doubtful, even to Allied officers who witnessed the German offensive sweep.[7]

No official figures are available regarding the German losses. Rudel estimates them at 220 aircraft,[8] a German group commander who participated in the operation even mentioned losses of approximately 30 percent,[9] while an official spokesman of the Armed Forces High Command stated that they were so high that one could not visualize the repetition of such operations in the future.[10]

These were no doubt high loss figures, but more important than the aircraft were the pilots: the Luftwaffe could not possibly replace these experienced men -- some of the crews had flown for many years -- since good, experienced pilots and unit commanders were at a premium for quite some time. The Allies, on the other hand, also had no difficulty in replacing the losses of aircraft and

[7] Clostermann, op. cit.

[8] H.U. Rudel, Stukas.

[9] W. Heilmann, Das grösste Drama der deutschen Luftwaffe (The Worst Tragedy of the Luftwaffe), extracts in the Karlsruhe Collection.

[10] Professor Schramm, op. cit.

In his study, Die deutsche Luftverteidigung 1933-1945 (The German Air Defense 1933-1945), General Grabmann establishes on pages 1181-4 the following ratio of losses: Allied planes lost -- 800, German planes lost-150.

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in addition lost hardly any pilots during the entire operation. Even though the operation of 1 January 1945 must be considered as an expression of bravery and aggressiveness after the many reverses suffered during the preceding months, this day will go down as one of the costliest insofar as Luftwaffe losses of men and materiel are concerned. The German fighter arm never recovered from this New Year's morning of 1945.

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