V. Tactical Experience Gained during Joint Employment

Experience of this kind must, of course, be limited to certain, specific points of view. The conclusions drawn in the fields of small-scale tactics and weapons technology were no doubt manifold -- yet their detailed description would contribute little to the purpose of the present study.

Instead, we have emphasized the experience pertinent to certain, very specific principles of commitment of a purely tactical nature, principles which could be tested and evaluated thoroughly during the course of Operation YELLOW (Gelb).

The body of experience applicable to the conduct of operations of fairly large antiaircraft artillery forces, involving problems which concern the establishment of independent units for assignment to support operations on the ground, will be discussed later on within the framework of the final evaluation of Operation RED (Rot).

1) In view of the wide geographical dispersement/of the typical commitment of the Antiaircraft Artillery Corps, the fact that the enemy situation was often unclear in specific areas made imperative not only extremely close cooperation between the antiaircraft artillery regiments and the Army corps (i.e. Panzer crops), but also an unusually firm command system for all the units of the Antiaircraft Artillery Corps.

The guiding principle was the determination to keep all the units on the move towards the front, irrespective of whether the Army happened to be advancing or pursuing the enemy.

2) Any enemy attempt to mount a tank assault was to be met immediately by the defensive fire of the antiaircraft artillery batteries.

As far as antitank operations were concerned, any enemy tanks which succeeded in breaking through

were to be thrown back by the fire of the 88 mm antiaircraft artillery, whose batteries were to be brought up to the front without regard for other considerations. The 88 mm batteries had proved to be especially effective against the enemy tanks.

All elements of the Antiaircraft Artillery Corps, including those units employed primarily in defense against enemy air attack, had orders to move immediately into positions favorable for antitank operations and to take all steps necessary to guarantee effective antitank operations.

The fact, substantiated repeatedly by experience, that the enemy tanks did not advance further than the German artillery positions, in other words that they were employed tactically and not strategically (since they had no promising targets at this range) forced the Germans to set up antitank weapons at the advance artillery positions. For under these circumstances, the batteries located further to the rear had no chance to fire.

3) During the course of the fighting, nearly all the batteries and battalions of the Corps had been employed in the attack on bunkers and armored cupolas in the enemy fortifications. During the course of these actions it had become clear that the firing positions had to be established as close as possible to the targets. Fire was laid on in the usual manner, and the success achieved was great.

4) As a matter of principle, the antiaircraft artillery units were assigned to air defense missions only when these happened to arise during other mixed operations. It never happened, for example, that an antiaircraft artillery unit was moved forward for the express purpose of taking over the air defense of a

particular installation. Such missions, when they occurred, were a natural corollary of the events already in progress.

In order to meet the increasing threat from the air to the marching routes utilized by the Army, the batteries and battalions of the antiaircraft artillery forces which happened to be located along these routes had no choice but to assume responsibility for a certain amount of air defense activity. Those elements which were "resting" preparatory to future assignment were asked to assign at least small units to air defense operations.

Since the antiaircraft artillery units were always employed in the most advanced combat area, the reports of enemy aircraft never reached them. Thus, excellent training in aircraft identification was a sine qua non for these units. The time spent in this activity paid very great dividends.

VI. ~~The Results of Combat~~

The first phase of the offensive, Operation YELLOW, came to an end on 30 May 1940; the balance sheet for the antiaircraft artillery units was as follows:

82 enemy tanks had been destroyed by direct hits; numerous others had been damaged;

110 enemy aircraft had been shot down.

In addition, numerous fortifications and steel and concrete forts had been beleaguered and destroyed, among them:

the fort at Eben Emael (by the "Mixed Battalion Aldinger")

the forts at Flemalle and De Pontisse (both part of the Liege fortifications)

the forts at Marchovelette, Malone, and Bersillies (all part of the Namur fortifications)

the fort d'Heren-Fontaine and that of les Sarts (Maubeuge).

B. The II Antiaircraft Artillery Corps during Operation RED (Kot)

On 30 May 1940, when the majority of the German Armies had reached the Channel coast and when the encirclement battle of Flanders and Artois had been brought to a successful conclusion, the first phase of the offensive in the West had come to an end (Operation YELLOW).

The II Antiaircraft Artillery Corps had begun to regroup its forces for defensive operations in the south; from this point on, its mission was to protect the defensive front along the Somme between St. Valery and Ham -- particularly the important bridgeheads at St. Valery amd at Abbeville -- against enemy tank and air attack. With relatively few forces, the Corps also provided cover for the redeployment operations carried out by the Army in preparation for the continuation of the offensive.

Further developments can be divided into four phases:

1) ~~Defense of the Somme Sector (1 - 5 June 1940)~~

On 5 June the right wing of the Army front (Army Group B) was supposed to advance to the attack, while the offensive on the central sector and on the left wing of the overall front (Army Group A) was not to begin until 9 June.

The II Antiaircraft Artillery Corps was to support the Fourth Army (as it had done during the course of Operation YELLOW) on the right wing (the command headquarters remained at Ribeaucourt, fifteen miles northeast of Abbeville, for the moment).

Prior to the beginning of the offensive, the Antiaircraft Artillery Corps retained the mission of protecting the bridgeheads over the Somme at St. Valery and

Abbeville, as well as the one at Amiens (at least temporarily); the protection of the bridgehead at Amiens was taken over before the beginning of the offensive by the I Antiaircraft Artillery Corps, which was assigned to positions adjacent to those of the II Antiaircraft Artillery Corps. (It would seem that the right wing of the overall front had developed into a point of main effort for the antiaircraft artillery forces, although there is no specific information available on the employment of the I Antiaircraft Artillery Corps.)

During this period of preparation, the II Antiaircraft Artillery Corps released quite a few forces for assignment to the I Antiaircraft Artillery Corps. Among these were the 103d Antiaircraft Artillery Regiment ("Regiment General Goering"), with the I Group, 103d Regiment, the IV Group, 103d Regiment, the II Group, 43d Regiment, the I Group, 7th Regiment, and the I Group, 8th Regiment -- in other words, a total of five heavy artillery battalions. In addition, the "Mixed Battalion Aldinger" was deactivated and its units distributed among other regiments.

At this time, the following units were also available on the Somme front:

201st Antiaircraft Artillery Regiment - comprising the I Group, 6th Regiment, the I Group, 64th Regiment, the II Group, 26th Regiment, and the 73d Light Antiaircraft Artillery Battery. The Regiment was responsible for the protection of the bridgeheads at St. Valery and Abbeville.

202d Antiaircraft Artillery Regiment - comprising the I Group, 23d Regiment, the I Group, 37th Regiment, the

I Group, 61st Regiment, and the 74th Light Antiaircraft Artillery Battery. At first the Regiment was assigned to the area behind the sector of Doullens, where it was held back for emergency employment by the Corps. It temporarily assumed responsibility for protection of the bridgehead at Amiens, until it was relieved by the I Antiaircraft Artillery Corps.

As regards the external course of combat during the first phase of operations, ground attacks on the bridgeheads were repulsed on a number of occasions, countless enemy tanks were destroyed, and enemy air attacks were successfully countered. The climax of this period was represented by a French attack carried out by some sixty tanks on the bridgehead at Abbeville; this attack was turned back successfully and the entire enemy attacking force destroyed. There were no Army antitank forces employed along this particular sector of the line.

2) The Advance from the Somme to the Seine (5 - 14 May 1940)

As of 4 June, the II Antiaircraft Artillery Corps was deployed as follows for the support of the Army offensive which began on 5 June and covered the area between the sea and Amiens (the Corps was prepared to devote itself exclusively to the support of the Army):

Unit	Strength	Support of:
201st Antiaircraft Artillery Regiment	a) I Group, 6th Regiment; I Group, 23d Regiment; and 73d Light Antiaircraft Artillery Battery	XV Panzer Corps, right wing
	b) the newly established "Group Wolf", with the I Group, 64th Regiment and the II Group, 26th Regiment	II Army Corps, middle sector
202d Antiaircraft Artillery Regiment	I Group, 37th Regiment; I Group, 23d Regiment+; and 74th Light Antiaircraft Artillery Battery	XXXVIII Corps, left wing

In addition, in this operational area a total of three heavy and two light battalions from the Army were employed, units which were to remain tactically subordinate to the II Antiaircraft Artillery Corps for the remainder of the action.

+ Translator's Note: Editor, please check; the same Group seems to be assigned to two different regiments!.

All together, then, the following units were available for action in the operational area of the Fourth Army:

6 heavy battalions and 2 light battalions (II Antiaircraft Artillery Corps)

3 heavy battalions and 2 light battalions (Army antiaircraft artillery forces)

9 heavy battalions and 4 light battalions

In view of later developments, we are justified even at this point in regarding all the above antiaircraft Artillery units (both Luftwaffe and Army) as one single tactical instrument.

On 5 June the Fourth Army, supported by the II Antiaircraft Artillery Corps, launched its attack, whose purpose was to force the enemy back to the lower course of the Seine.

Combat areas and advance routes can be seen on the accompanying map[15].

The attack was supported from the air by fighter and bomber units from the I Air Corps.

There is no source material available on the detailed development of this offensive, since there are a number of chronological gaps in the operational orders of the II Antiaircraft Artillery Corps. Nevertheless, as the map in Appendix 73 indicates, it is possible to reconstruct the general progress of the command agencies of the Corps, i.e. of the command headquarters.

When this first operational phase of Operation RED (Rot) came to an end on 14 June, the military situation was approximately as follows:

The antiaircraft artillery regiments and battalions had accompanied the Army Corps and had already taken over the protection

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15 - See Appendix 73.

of the German panzer forces at the bridgeheads over the Somme. This created a secure base of operations -- a broad bridgehead driven between Rouen and Paris -- for the continuation of the Fourth Army offensive from the Seine to the Loire. At the same time, the antaircraft artillery units undertook to protect the bridges over the Seine and the advance routes leading to them against enemy air attack.

The distribution of the antiaircraft artillery forces among the Army corps remained the same as at the beginning of the advance except that the point of main effort had shifted on 13 June from the XXXVIII to the II Army Corps, i.e. towards the middle sector (two antiaircraft artillery battalions were affected).

On 12 and 13 June, the combat group of the 201st Antiaircraft Artillery Regiment, which was following along the outermost right wing of the XV Panzer Corps, was employed for the first time in firing on naval targets when enemy attempts to evacuate troops from St. Valery en Caux on the Channel coast were frustrated. Six enemy transport ships were sunk, and two destroyers, a number of transport vessels, and numerous smaller craft were damaged.

There are no statistics available concerning the other successes achieved during this period. Nevertheless, the following telegram from Goering, received by the II Antiaircraft Artillery Corps on 12 June, provides some indication:

> "Have just received news that the 200th enemy tank has been destroyed by the II Antiaircraft Artillery Corps; herewith my congratulations and my sincere appreciation for the highly effective commitment of the Corps."

The second phase of combat ended with the relieving of the II Antiaircraft Artillery Corps to a considerable degree, whereby the majority of its forces were freed for further offensive employment in support of ground operations. As of 14 June, the antaircraft artillery units of the newly created "Air District Belgium" took over the task of protecting the Seine crossing points (military bridges).

3) The Advance from the Seine to the Loire

In general, the basic situation was the following: by 14 June the enemy had been destroyed in the operational area of the Fourth Army bounded by the Somme, the Seine, and the Channel coast; on the same day, elements of the Eighteenth Army occupied Paris.

For the next phase of the offensive towards the south, which followed immediately, the Fourth Army was assigned the task of advancing west of Paris into the deep-lying flank of the French Army and to prevent the intervention of newly-landed British forces.

The II Antiaircraft Artillery Corps was to continue supporting the Fourth Army by means of antitank and antiaircraft operations.

On 15 June, the II Antiaircraft Artillery was deployed as follows in preparation for this task:

201st Antiaircraft Artillery Regiment - with the I Group, 23d Regiment, the 73d Light Antiaircraft Artillery Battalion (with the Army units I Group, 33d Regiment, 93d and 86th Light Antiaircraft Artillery Battalions, which had been tactically subordinated to the Corps and were located along the right wing); in the Dieppe - Le Havre - Rouen area to support the XV Panzer Corps.

Group "Wolf"	- with the I Group, 64th Regiment, the II Group, 26th Regiment, the I Group, 6th Regiment, and the Army's I Battalion, 13th Regiment (also tactically subordinate); in the central sector to support the II Army Corps.
202d Antiaircraft Artillery Regiment	- with the I Group, 37th Regiment, the I Group, 61st Regiment, the 74th Light Antiaircraft Artillery Battalion, and the Army's I Battalion, 3d Regiment (tactically subordinate); along the left wing to support the XXXVIII Army Corps.

Until they were finally relieved by the antiaircraft artillery units of the Air District Belgium, a number of units from the II Antiaircraft Artillery Corps were tied down in the Seine area by their assignment of protecting the bridges.

There is hardly any source material available pertaining to the advance between the Seine and the Loire. Beginning on 18 June, however, a shift in emphasis started to make itself felt in the character of the missions of the antiaircraft artillery units -- from this point on, the protection of the Luftwaffe ground organization became an increasingly important part of the activity of the antiaircraft artillery forces.

On 18 June, the majority of the 202d Antiaircraft Artillery Regiment was withdrawn from the advance and employed in the protection of the ground organization installations in the Paris area and in the area south of the Seine below Paris.

By 20 June the Fourth Army had reached the Loire and set up bridgeheads on the southern bank near Nantes and Saumur. Cherbourg and Brest had been taken. The French Army faced certain collapse.

The next mission of the Fourth Army was to extend the bridgeheads further south of the Loire and to clear up the area

north of the lower course of the Loire. The II Antiaircraft Artillery Corps was supposed to support the Army in this operation, but at the same time, it was to assign "a fairly strong force to the protection of the ground organization installations around Paris and in the area between the Seine and the Loire, west of the line Paris - Tours".[16]

As of 21 June, the following assignments and deployment actions went into effect:

One half of the II Antiaircraft Artillery Corps continued to support the Fourth Army, as follows: the 201st Regiment was assigned to support the XV Panzer Corps in the Cherbourg and Brest areas, and the 103d Regiment (apparently reassigned to the Corps in the meantime) to support the II Army Corps in its attack on Nantes.

The other half was assigned to protect the Luftwaffe ground organization installations, as follows: the 202d Regiment was given the mission of protecting the airfields of the I Air Corps (in the Evreux area) and those of the Fighter Commander 2 (in the Paris area), and the Group Wolf the task of covering the airfields of the I Air Corps around Le Mans, and later those around Rennes.

With the signing of the armistice conditions on 22 June, the operations of the II Antiaircraft Artillery Corps in support of the Fourth Army came to an end for all practical purposes; the Army was to continue pursuit operations across the Loire and along the Atlantic coast towards the south.

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16 - Corps order dated 20 June 1940.

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4) The Regrouping of the II Antiaircraft Artillery Corps to Provide Protection for the Luftwaffe Ground Organization Installations.

The new mission of the II Antiaircraft Artillery Corps -- presumably as of 26 June -- was the protection of the ground organization installations of the Second Air Fleet in the area Dunkirk - Le Havre - Rouen - Doullens[17].

The strategic Luftwaffe had begun preparations for operations against military targets in the British Isles.

To begin with, this fundamental change in mission required the assembling of all the widely distributed antiaircraft artillery units, their withdrawal from the offensive, and their transfer to the new area of operations far behind the front. For a number of units this meant a march route of some 450 miles.

Some of the units, namely those which had been assigned to the protection of the ground organization fields south of the Seine and those assigned to the Cherbourg and Brest areas in support of the Fourth Army, had to remain in these areas for the time being until they could be relieved by units of the I Antiaircraft Artillery Corps. (The 103d Antiaircraft Artillery Regiment was returned to the I Antiaircraft Artillery Corps at this point.)

The majority of the units of the II Antiaircraft Artillery Corps were ordered to get under way to their new area of operations immediately.

On 27 June, the II Antiaircraft Artillery Corps (reinforced by two antiaircraft artillery regiments from the Air District Belgium) stood ready for action in the following

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17 - Corps order dated 23 June 1940.

areas with the following assignments:

The majority of units were stationed in the area Ghent - Calais - Le Havre - Rouen, with the task of protecting the ground organization of the Second Air Fleet;

Some units were stationed in the Calais - Boulogne area, with the task of protecting the Army artillery forces along the coast;

Some units were stationed in Boulogne and Le Havre, with the task of protecting the port installations there.

In any case, the II Antiaircraft Artillery Corps -- with its reinforcements -- was now exclusively at the disposal of the Second Air Fleet.

C. The Experience Gained during the Campaign in the West

The fundamental body of experience gained during the joint operations of the II Antiaircraft Artillery Corps and the Army, as well as the early tactical lessons taught by these operations, have already been pointed out in Section A of this Chapter, dealing with the first phase of the offensive, Operation YELLOW.

On the whole, this experience was also applicable for the activity of the II Corps during the second phase, Operation RED.

The following points, referring to experience gained during the second phase, are listed in order to supplement what has already been said:

1) Not only during the forward dashes characterizing the thrust to the Channel, but also -- to an even greater degree -- during the strategic defensive operations of the latter part of the first phase and the beginning of the second phase,

the antiaircraft artillery forces distinguished themselves especially as an effective instrument of defense on the ground -- specifically along the Somme sector between 1 and 5 June.

It is not exaggerating to call the battalions and batteries of the II Antiaircraft Artillery Corps assigned to the bridgeheads south of the Somme (so decisive for the continuation of the offensive) the "backbone of the defenses". These units managed to repulse successfully the repeated attempts by the French to attack the bridgeheads with tanks. The brunt of these actions was borne by the 88 mm batteries, which were highly successful -- but at the expense of heavy losses.

At the same time, the effective protection of the crossing points was of indispensible importance if the second phase of the offensive, to be launched from the bridgeheads towards the southwest, was to begin on schedule. The significance of these positions was all the greater in view of the fact that the Allies -- for the last time in this campaign -- carried out repeated air attacks on the Somme crossing points; they had realized the strategic significance of them in the military situation which then existed.

2) During the course of the advance towards the southwest, a new method was evolved in the support of Army operations, a method which is somewhat contradictory to the principles followed during the first phase of the offensive, but which developed quite naturally out of the experience gained during this period.

During the course of Operation YELLOW, the commanders of the II Antiaircraft Artillery Corps

had met the requirements of the often unexpected shifts in the point of main emphasis in Army operations by means of almost daily changes in the composition of the individual antiaircraft artillery units and by their frequent reassignment to other sectors. During Operation RED, however, from the first to the last joint operation with the Fourth Army, the same antiaircraft artillery units were assigned to the same Army Corps (apart from certain minor alterations in the internal composition of some units).

Thus the Antiaircraft Artillery Corps had begun its employment as a self-contained unit; the organization within the Corps became progressively looser until it reached the point where the Corps was broken down into small units to be distributed in accordance with the tactical situation.

In other words, the command function was decentralized, and the cooperation between the Corps and the Army was, at the same time, intensified.

At this point the question arises whether it would not have been more appropriate to make the Antiaircraft Artillery Corps tactically subordinate to the corps of the Army, especially in view of the fact that the individual elements of the Fourth Army had such widely divergent operational areas in an overall theater which was growing more and more extensive.

3) During the first phase of the offensive, the II Antiaircraft Artillery Corps had worked together almost exclusively with panzer units; during the second phase, only to a limited extent.

As a result, during the first phase the antiaircraft artillery units had usually been incorporated into the marching columns of the panzer units

and had come to be looked upon practically as a "panzer support weapon". And the Antiaircraft Artillery Corps, as a fully motorized, strategic, mobile unit, was especially well suited to such employment.

4) The relationship between the Antiaircraft Artillery Corps and the Army antiaircraft artillery units, each operationally subordinate to a different command headquarters, was quite clear -- as far as the Luftwaffe was concerned, at least.

From the very beginning, the distribution of missions between the antiaircraft artillery units belonging to the Luftwaffe and those belonging to the Army was envisioned as follows: the so-called Army units were to assume responsibility for protecting the Army from enemy air attack, while the units of the II Antiaircraft Artillery Corps were to be primarily responsible for the direct support of the Army in ground operations ("assault artillery", "antitank weapon").

Towards the end of the first phase of operations, however, the Army suddenly seemed to have forgotten about this agreement. The Halder Diary[18] indicates that there were differences of opinion between the Commander in Chief, Luftwaffe, and the Commander in Chief, Army, regarding the employment of the Army antiaircraft artillery units: "Difficulties in connection with the employment of the Army antiaircraft artillery forces. They wanted to go ahead originally, but now the Luftwaffe antiaircraft artillery units are pushing ahead and leaving the Army units the task of providing protection in the rear."

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18 - Entry dated 29 May 1940.

This distribution of missions, however, was exactly what the Commander in Chief, Luftwaffe, had had in mind from the very beginning, and was in compliance with the agreement reached between the two High Commands before the start of the offensive.

But even without benefit of a new ruling from superior headquarters, the cooperation between the two antiaircraft artillery groups soon achieved a mutually satisfactory compromise in day to day operations. There were local signs of such effective cooperation, based on the good will of both sides, even during the first phase of the offensive (Operation YELLOW).

For Operation RED, a clear and unequivocal solution was found -- via the proper channels, i.e. on the basis of an agreement between the Army and the Luftwaffe (Army - Luftwaffe Antiaircraft Artillery Corps). This solution was the "tactical" subordination of the Army antiaircraft artillery battalions to the Regiments of the II Antiaircraft Artillery Corps. A uniform command system was evolved for the joint antiaircraft missions of the two groups, a system which was also extended to cover their antitank missions, which were usually combined with the antiaircraft operations in any case.

This was the only possible way to ensure that the antiaircraft and antitank artillery forces were employed rationally and in such a way that they could meet the exigencies of necessary shifts in the main emphasis of operations; it also guaranteed that none of the units should be forced to sit around idle simply because it happened to belong to another headquarters.

The solution adopted only goes to show, however, that a weapon assigned to serve the Army in both antiaircraft and antitank operations

ought to be placed under the command of the headquarters which is responsible for the conduct of ground operations in a particular area or on a particular sector, in other words, that such a weapon should be assigned to the commander of the ground operations -- with no strings attached.

Despite the fact that the II Antiaircraft Artillery Corps, which was subordinate to a "foreign" headquarters, was able to fulfill its missions to the full satisfaction of both Wehrmacht branches (thanks to the understanding and harmonious coordination between Army and Luftwaffe commanders), experience has shown that in future the overall command in a given area of ground operations must lie in a single hand, in that of the responsible Army commander.

5) The situation changed radically when the Army operations came to an end and the Antiaircraft Artillery Corps lost the mission for which it had been primarily created[19]. With its -- to begin with -- partial, and later exclusive assumption of responsibility for the protection of the Luftwaffe ground organization against enemy air attack, the II Antiaircraft Artillery Corps returned to its original mission -- antiaircraft operations. And since these operations served the units of the strategic Luftwaffe (Second Air Fleet) exclusively, the Antiaircraft Artillery Corps had -- in every sense of the phrase -- "returned to the Luftwaffe".

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19 - We refer to the original assignment of missions on which the activation of the Corps was based (Part I, Chapter V).

This transfer of the Antiaircraft Artillery Corps into far distant areas and completely different missions at short notice was an indication of the special character of the antiaircraft artillery forces as a highly mobile, strategically employable instrument in the hands of the Commander in Chief, Luftwaffe.

Thus, thanks to the mobility and effectiveness of this weapon, the deployment operations of the Luftwaffe in preparation for the attack on England could rely from the very beginning on adequate protection of the necessary ground organization installations.

The rapid withdrawal of the antiaircraft artillery units from their assignments with the Army could not have been effected so quickly and smoothly if these units had been officially subordinate to the Army.

And in this particular case it can be assumed that the withdrawal action was accomplished so smoothly only because the Army operations had come to an end in any case, so that the Army no longer required the services of the antiaircraft artillery forces.

6) On the other hand, the following item of experience argues for the maintenance of an independent antiaircraft artillery force under the command of the Commander in Chief, Luftwaffe:

Both during the first phase of the offensive (Operation YELLOW) and during the second phase (Operation RED), it was only due to the uniformity of the command of the II Antiaircraft Artillery Corps through the Second Air Fleet (loose though these command ties were) that the Corps was relieved at such an early date of missions which tied a good many of its units down in the rear area in air defense operations.

On two occasions, the Second Air Fleet -- through the antiaircraft artillery forces of its local organizations, the VI Air District Command, or rather the Special Duty Air District Staff, and the Air District Belgium -- took over the task of providing antiaircraft protection for the occupied areas, thus freeing the units of the II Antiaircraft Artillery Corps for more active employment elsewhere, in other words for their real mission.

This system of uniform antiaircraft defenses during a strategic advance into enemy territory would not have functioned so smoothly if the antiaircraft artillery forces stationed in the Western theater had been under different commands.

Thus, there are only two possible choices -- the antiaircraft artillery forces, irrespective of whether their missions are more closely allied to the operations of the Army or the Luftwaffe, must remain under uniform command, either that of the Army or that of the Luftwaffe.

The solution adopted in 1940 was by no means ideal; instead, it represented an unsatisfactory compromise, but a compromise which turned out to be successful.

7) There remains the following to be said regarding the internal organizational structure of the II Antiaircraft Artillery Corps: all in all, this organizational structure proved satisfactory. Nevertheless, as the offensive progressed and the available body of experience grew in scope, it became clear that, as far as the ratio of heavy to light antiaircraft artillery batteries was concerned, the emphasis was gradually shifting to the heavy batteries, i.e. the 88 mm units. The reasons for this shift are obvious. The 88 mm units had proved to be the only really suitable weapon against the enemy tanks, thanks to the armor-piercing capability of their shells, and their reputation grew

more and more impressive, with the Army and the Luftwaffe alike.

This

was augmented by the fact that, during the defensive operations along the Somme, elements of the II Antiaircraft Artillery Corps had to be assigned to missions which belonged essentially to the Army antiaircraft artillery forces (the combatting of enemy positions, artillery batteries, and enemy reserve troop assembly points), because the latter were not numerically strong enough to cope with all the necessary missions. Thus, if it appears that a change in the ratio between these two elements (i.e. heavy and light batteries) is desirable, such a change should be accomplished in favor of the 88 mm batteries.

The rest of the "apparatus" of the Antiaircraft Artillery Corps -- especially the signal communications and supply systems -- seems to have been excessively extensive and -- perhaps -- awkward. Nevertheless, the employment in the West proved beyond a doubt that these systems were fully utilized and that they played a significant role in the successful execution of the command function. Without them, the employment of the antiaircraft artillery units could not have been so flexible or so adaptable as was required by the development of the Army operations.

8) In closing, we must come back to the basic problem, which led to the establishment of antiaircraft artillery units for participation in ground operations in the first place.

In accordance with the original, theoretical planning, these antiaircraft artillery units were to be primarily "assault artillery", designed for employment in "antitank defenses".

Quite apart from the question whether or not the organization of the command function was appropriate, it must be admitted

CHAPTER XI

The Balance-Sheet of Operation YELLOW (Gelb)

Operation YELLOW was only a part of the overall campaign in the West, but it was the first step in the campaign and, as such, decisive.

This statement is particularly true as far as the Luftwaffe was concerned. For all its problems in command and employment, particularly the extremely important aspects of strategic air warfare and effective cooperation with the Army, found solutions during the course of Operation YELLOW! Operation RED, which followed, brought only repetition -- and under less complicated circumstances.

Consequently, it is quite possible to formulate certain conclusions and certain precepts based on the experience gathered during Operation YELLOW alone, and from the point of view of objectivity, we are perfectly justified in doing so. The review contained in this closing chapter is intended to fulfill this purpose.

But before we start setting up the actual balance-sheet of Operation YELLOW, it may be appropriate for us to review once more the part played by it in the overall development of the events of those weeks.

For, from the point of view of overall planning, the campaign in the West in 1940 was no more than a part of a far-reaching strategic

that both missions were fulfilled, and in a manner which was decisive to the successful outcome of the Army operations.

Thus, the degree of success ultimately achieved clearly justified the creation and employment of the Antiaircraft Artillery Corps as a strategic, mobile instrument in operations on the ground.

9) The statistics given below reflect the success achieved in combat by the II Antiaircraft Artillery Corps:

During the period from 10 May to 24 June 1940, the Corps scored the following successes:

204 enemy tanks destroyed, countless others damaged;

214 enemy aircraft shot down;

17 enemy fortifications and armored forts destroyed under attack;

6 enemy transport vessels sunk, other vessels damaged;

2 enemy destroyers damaged.

These figures are balanced by the following losses sustained during the same period:

Dead: 7 officers, 84 non-commissioned officers and enlisted men;

Wounded: 17 officers, 304 non-commissioned officers and enlisted men;

Missing: 1 officer, 11 non-commissioned officers and enlisted men.

Materiel Losses: 8 artillery pieces (88 mm),
4 artillery pieces (37 mm), and
12 artillery pieces (20 mm) were destroyed or damaged by enemy action.

concept, which extended from the theater of operations in France, Belgium, and Holland towards the north as far as Narvik, in the northernmost part of Norway. And in the last analysis, the mission of this entire, tremendously long (for the concepts of that time) front was the uniform conduct of war against England. At the time with which we are presently concerned, the preparations for this war were being carried out.

The relationship between these two fronts, separated as they were by the sea, has been described in the first chapter of this study, in which the chronological and strategic interrelations between the Weser ~~Operation~~ Maneuver (Weserübung) and Operation YELLOW were discussed.

Despite our consistent attempt to emphasize the strategic connections between the two operations, it is clear that our detailed treatment of Operation YELLOW and the necessarily exclusive concentration on its individual phases must inevitably have let the reader forget the role played by the northern theater of operations.

On the other hand, separate consideration of the two theaters of operation would be justified only if one limited oneself to the Army and Navy forces employed in Norway. It is quite true that there was no real connection between the Army and Navy operations in the north and the Army and Navy operations in the Western theater.

The situation was entirely different as far as the Luftwaffe was concerned.

Despite the fact that certain Luftwaffe elements being employed on the northern front

could be withdrawn in time for their scheduled participation in Operation YELLOW on the Western front, a good many Luftwaffe units were still tied down in Norway -- presumably contrary to the original expectations of the Wehrmacht High Command and the Commander in Chief, Luftwaffe. The absence of these units in the West made itself painfully felt.

Whether and, if so, to what extent flying units were exchanged and shifted from the northern to the western theater of operations during the course of Operation YELLOW, and whether and, if so, to what extent units from the Fifth Air Fleet participated in operations in the western theater are questions which cannot be answered without exact study of the campaign in Norway -- and the author was not in a position to study the Norwegian campaign in detail. In view of the distribution and deployment of the units of the former X Air Corps at the beginning of the Weser ~~Operation~~ Maneuver, both of the above premises are quite within the realm of possibility[1].

But in the connection with which we are concerned at present, the answer to the question whether and to what extent the Luftwaffe forces in the north and the west may have cooperated is, in any case, of no more than secondary interest. The important thing is that we must understand that -- from the point of view of the far-reaching strategic planning involved -- the campaign in the West inevitably loses some of its significance; it was not an end in itself, but simply a part of a larger strategic concept. Nevertheless it was the campaign in the West which decided the military situation (at that time) in favor of the German Wehrmacht.

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1 - The reader is reminded of the map in Appendix 30.

For a number of reasons -- the lack of adequate source material, for example -- the following balance sheet of Operation YELLOW cannot be fully comprehensive or entirely complete. A number of important aspects have had to be left out. In addition, this final, retrospective examination has been governed by the same principle as has guided our previous accounts -- namely the wish to emphasize the strategic aspects of the command and employment of the Luftwaffe and to supplement these aspects with tactical accounts and statistical summaries only in special cases.

Thus the following chapter will be divided into these sub-headings:

A. The Objectives and Successes of Operation YELLOW

B. Evaluation of the Enemy by the Germans

C. The Mission of the Luftwaffe

D. Evaluation of the Initial Results Achieved

E. The Air Tactics of the Allies

F. The Important Lessons Learned from Operation YELLOW

G. The Command Function

H. Successes and Losses (Statistical Summary)

I. The Employment of the Luftwaffe against Enemy Naval Targets.

A. The Objectives and Successes of Operation YELLOW

The war planning of Luftwaffe leaders had been carried out on the basis of strategic thinking which ran far ahead of the conditions actually obtaining in reality.

As a result, the Luftwaffe was later forced to wage the war from standpoints tantamount to complete negation of the principles formerly recognized as valid and to a total return to the exigencies of reality.

The spectacular success of the blitzkrieg in Poland led to the blitzkrieg in the West; the tried and true recipe for success was repeated.

This meant renunciation of the theory of an "independent strategic air war" and a return to the reality of "close cooperation with the Army". And the success of the campaign in the West -- particularly of Operation YELLOW -- seemed to vindicate this thinking on the part of Luftwaffe leaders.

In reality, however, this thinking of the moment had been prey to a discrepancy, a discrepancy which failed to lead to any far-reaching conclusions. Experience and success offered a substitute solution for the moment, but not a program for the future. Luftwaffe leaders adhered stubbornly to their traditional Continental thinking in spite of the fact that the theater of operations was expanding. Blinded by the momentary success which had been achieved as a result of a specific combination of time, space, and personnel strength factors, they had

failed to make the transition to a future development which would inevitably have led to the establishment of strategic, long-range goals.

To be sure, this is getting ahead of our summary of Operation YELLOW. Nevertheless, the critical formulation of such a statement is justified by the fact that all the later sins of commission and omission on the part of the Luftwaffe command, sins which led inexorably to the decline of the Luftwaffe and to the sharp decrease of its fighting power and its significance during the subsequent course of the war, can be traced back to the -- success of the campaign in the West.

The success achieved by the Luftwaffe in the West is undeniable. There is no doubt that it was decisive for the final outcome of the campaign -- not, however, for the final outcome of the war, as its leaders believed at that time.

It was decisive for the success of the campaign for the simple reason that the Luftwaffe managed to accelerate and shorten the overall operation to an undreamed of degree and contrary to all expectations -- quite apart from the actual and moral disintegration and destruction of the enemy forces brought about by Luftwaffe activity.

It is not belittling the achievement of the Luftwaffe to point out objectively that this second test of modern air power, like the first, was decided in favor of the German Luftwaffe because, in the last analysis, it happened to be a superior force pitted against an inferior one.

The overall superiority of the German Luftwaffe lay not only in such factors as higher numbers, greater technical advances, and better morale; its command system was also a definite advantage. In contrast to the disorganized and dissipated leadership of the Allied air forces, that of the German Luftwaffe was highly centralized and extremely firm, and fully capable of mastering the elements of personnel strength, time, and space.

In an attempt to summarize the significant factors leading to the success of the Luftwaffe, the following come to mind:

1) The uniform, firm, and yet flexible command system of the Luftwaffe
2) The numerical superiority as far as aircraft, especially bombers, were concerned
3) The technological superiority of Luftwaffe aircraft, especially fighters
4) The higher training standard in the Luftwaffe, at least in comparison with the Dutch, Belgian, and French pilots
5) The exploitation of the surprise factor at the beginning of the campaign
6) The utilization of new combat instruments (air landing forces)
7) Flexibility in the establishment of points of main effort (for example, concentrated operations against the enemy ground organization, followed by support of Army operations)
8) The systematic program for the achievement of air superiority and then air supremacy as a prerequisite for the factors listed below
9) Concentration on cooperation with the Army

10) Joint operations between aircraft and tanks, representing the most rapidly mobile weapons of modern warfare.

The thinking of German Luftwaffe leaders, from the very top down to the lowest-echelon unit leader, was dominated by the following qualities:

bold planning,

modern thinking,

readiness to take risks,

imagination and ability to improvise,

eagerness to attack,

ability to act independently.

On the Allied side, these qualities were balanced by the following:

inadequate organization,

slowness to react to a new situation,

poor morale as a result of clear recognition of existing deficiencies,

defensive rather than offensive thinking.

Thus the roles were unequal from the very beginning.

The course of events has been described in detail in the preceding chapters. It will be supplemented by the account presented in this closing chapter. The overall picture will then become clear.

It may be of interest, however, to compare the evaluation presented by the present study, based on historical examination from a vantage point chronologically far removed from the events in question,

with the evaluation made by the Commander in Chief, Luftwaffe, shortly after the conclusion of the events.

Therefore, we have included as an appendix the "Summary of the Employment of the Luftwaffe in the Operations in Holland, Belgium, and Northern France" (Überblick über den Einsatz der Luftwaffe in den Operationen in den Niederlanden, in Belgien und Nordfrankreich), which was issued by the Commander in Chief, Luftwaffe, shortly after Operation YELLOW had come to an end[2].

Although a good many of the statements made in this "Summary" are contradictory to the views of the author of the present study, it does provide a -- naturally slanted -- summary of the events as seen at that time by the Commander in Chief, Luftwaffe. And it is, of course, the views held at that time which are important in respect to the conclusions drawn from them.

The "Summary", which, incidentally, is the only available account and evaluation of Operation YELLOW by any higher-level Luftwaffe agency, is also characteristic in that it serves as proof of the so-called "intoxication with figures" which had notoriously befallen the top-level Luftwaffe leaders. In this particular case, the Commander in Chief, Luftwaffe, positively revels in statistics reflecting the successes achieved by the Luftwaffe; in other cases (already mentioned a number of times), the "Summary" was eagerly accepted as an infallible criterion for evaluating the fighting power and the performance potential of the Luftwaffe. And this, of course, was

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2 - Commander in Chief, Luftwaffe, Operations Staff, Intelligence, File No. 10641/40, Classified (I), dated 3 June 1940; Appendix 74.

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much more dangerous.

If one ignores such details, it becomes apparent that the end result of Operation YELLOW for the Luftwaffe was of incomparably greater importance from the historical point of view.

It meant that the Luftwaffe's advance area for the conduct of air warfare had been extended as far westward as the sea. The ground organization installations of Holland, Belgium, and northern France were in German hands and at the disposal of the Luftwaffe.

A basis for the waging of a strategic air war had been created, a basis from which -- to begin with -- the second phase of the offensive towards the south, Operation RED, could be provided with the necessary air support. At the same time -- and this was a possibility which pointed clearly to the future -- it was a basis from which the Luftwaffe could threaten the British Isles themselves.

As a first step the contact between England and the Continent had been broken; England had lost its advance base on the Continent. As a result of the consequent shortening of the approach route for the German aircraft and of the factors inherent therein (extension of operational range, reduction in necessary fuel loads, increase in possible bomb load, improvement in weather forecasting, etc.), the Luftwaffe was now in a position to threaten the British Isles directly and seriously.

But whether the German Luftwaffe had at its disposal the necessary means (long-range bombers and long-range fighters) to take advantage of this newly created possibility -- this was a question whose practical implications were coming to the fore

for the first time. It was at this point that the errors in planning of the Luftwaffe top-level command first began to become apparent.

A great deal more seemed to have been won as far as the conduct of defensive air operations was concerned. The sore point of home air defense operations -- the Ruhr District -- now lay far behind the German front line. A decisive success had been achieved from the point of view of overall planning for the conduct of operations against the West. Successful defense against the night raids on the Rhine-Ruhr District, raids which had become more frequent and more intensive during the course of Operation YELLOW, seemed to be only a matter of the organization and expansion of the aircraft reporting service, the night fighter forces, and -- the radar installations. And all this was quite apart from the newly created possibility of effective retaliation attacks on the British Isles themselves. The primary goal of the German Luftwaffe had been achieved.

The development of renewed cooperation between the Army and the Luftwaffe in operations directed against England itself was, under the circumstances, a possible next step but hardly a probable one. It is clear, in any case, that at that point no one in the Luftwaffe command was thinking of Operation Sealion (Seelöwen).

Luftwaffe leaders were farmore concerned with the problems arising out of the ground operations just completed and those about to begin.

Cooperation with the Army in the form of direct and indirect air support had led to the final, successful outcome of Operation YELLOW

in the shortest possible time and with very few losses. In short, the German offensive tactics, i.e. the blitzkrieg, had once again proved to be successful.

The rapid advance of the Army, far more rapid than anyone had anticipated, was due primarily to the fact that the Army -- thanks to the systematic and early achievement of air superiority and air supremacy by the Luftwaffe -- was able to carry on its operations on schedule without having to fear serious enemy interference from the air, and secondarily to the fact -- again thanks to the air situation created by the Luftwaffe -- that the Army could be effectively supported from the air in all decisive operations. This was quite different from the situation of the Allied armies, which were forced to operate without any tangible assistance from their own air forces. The success of the German armies was secured by the strategic and tactical employment of the Luftwaffe.

Nevertheless, it seems rather pointless to attempt to weigh the causes and effects of these jointly won victories against one another. And it would be unfair to attribute the success in the West to the Luftwaffe alone. The concept of their "cooperation" assures both service branches of their share in the final victory.

All the same we may regard it as a welcome proof of objectivity on the part of the Army when we find in the

War Diary of Army Group A an appreciative account of the performance of the Luftwaffe which could not have been more appropriately formulated by the Luftwaffe itself. This account carried even greater weight when we consider that it was intended as a part of the internal history of the Army Group, and was not prepared for publication like the many, usually rather effusive "letters of appreciation" from the Army to the Luftwaffe.

The text of this account, in the form of a War Diary entry by Army Group A, is an example of objective historical writing and speaks for itself[3].

The rest of the sections of this closing chapter have been organized with the following purposes in mind:

1) To summarize the Luftwaffe operations described in the preceding chapters from the standpoint of their overall context and significance and to clarify the prerequisites leading up to them.

2) To evaluate both German and Allied operations in terms of their success or failure.

3) To bring out the special lessons of experience gleaned from the employment of the Luftwaffe.

4) To corroborate the end results of the air operations with concrete stastical material.

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3 - See Appendix 75.

The conclusions to be drawn on the basis of the four points listed above are founded on facts. Nevertheless, it must be remembered that the facts available for evaluation are incomplete, occasionally contradictory, and leave a good many questions unanswered.

B. Evaluation of the Enemy by the Germans

The decisions of the Luftwaffe command regarding the missions and the deployment of the Luftwaffe were determined primarily by the operational planning of the Wehrmacht as a whole, and specifically by that of the Army.

Furthermore, the distribution of forces, assignment of missions, and determination of the order in which these missions were to be accomplished were dictated by the evaluation of the enemy by the Commander in Chief, Luftwaffe. The evaluation of the strength, fighting power, and fighting effectiveness of the future air enemy, as well as the evaluation of the tactics he might be expected to employ, were necessarily the basis for the strategic and tactical decisions made by the Commander in Chief, Luftwaffe.

And as a first step, of course, Luftwaffe leaders were faced with the question of deciding how and by what means the Luftwaffe wanted to and was able to achieve the elimination of enemy air power in order to make the Army operations possible. This was clearly a matter of the interrelationship between strategic and tactical air warfare, the points of main concentration inherent in both, and the sequence of strategic and tactical actions in terms of timing and distribution of forces.

As we have seen, it was decided to attempt to repeat the recipe for success which had worked so well in the campaign in poland -- elimination of enemy air power, accompanied by a simultaneous gradual shift of the point of main concentration to the coming primary mission, the indirect and direct air support of Army operations.

The main question to be decided was the timing of the shift of main effort and the distribution of forces necessary to accomplish it. And this could not be decided without a reliable evaluation of the enemy forces, i.e. an evaluation of the potential enemy counteroperations. The prerequisites for such evaluation, conforming as closely to reality as human frailty permitted, existed even before the beginning of the war and had been expanded by means of careful reconnaissance work during the so-called stationary war, i.e. during the winter months preceding the beginning of the offensive.

Any attempt at an accurate evaluation of the preparations initiated by the Luftwaffe command, i.e. by the office of the Commander in Chief, Luftwaffe, would necessarily entail careful and painstaking examination of the individual steps which ultimately led to the formation of an over-all picture[4].

The final result, which was based upon systematic evaluation of information provided by intelligence sources, the reports of the air attaches, foreign press releases, statements of prisoners of war, and -- above all -- on the aerial reconnaissance activity

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4 - The reader is referred particularly to the "Beitrag zur Operationsstudie Feldzug gegen Frankreich 1940" (Contribution to the Study on the Campaign in France in 1940), by Generalleutnant a.D. Schmid, dated 31 January 1955 (Karlsruhe Document Collection).

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of the special high-altitude aircraft attached to the office of the Commander in Chief, Luftwaffe, revealed a surprisingly accurate picture of the enemy situation, as it was later confirmed during operations.

Although we no longer have the so-called "Orientation ~~Booklet~~ File, France" (Orientierungsheft Frankreich), which contained the summary and evaluation of all these sources and the interpretation of their material by the Commander in Chief, Luftwaffe, it has proved possible to reconstruct the views prevailing at that time.

In order to permit evaluation of the extent to which these conclusions agree with or differ from the information given by the opposite side, we have included a comparative summary[5] which gives the strength of the French and British air forces stationed in France on 10 May 1940 according to German, American, and British sources.

On the whole, comparison of the four sources reveals no significant discrepancies, at least not so far as comparative strengths are concerned; the number of aircraft naturally differs somewhat. But in respect to the strength of the enemy forces, the evaluation issued by the office of the Commander in Chief, Luftwaffe, proves to be quite accurate. The only real error was the overestimation of the number of

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5 - See Appendix 76.

British units stationed in France[6].

The evaluation of enemy intentions based on the various sources listed above finds its clearest expression in the phrases used in the "Combat Instructions for the Luftwaffe" (Kampfanweisung der Luftwaffe) for the offensive in France[7].

Comparison of this evaluation of the air situation, prepared in the spring of 1940, with the subsequent events of May 1940 makes it clear that it was, on the whole, an accurate one -- with two exceptions;

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6 - For purposes of comparison, we are adding a statement by an Allied officer who presents the total strength figures of the French and British air forces without breaking them down into individual categories. In his book, Global Mission, General Arnold, former Commanding General of the US Air Force, writes the following;

"..... a French air force which never had more than a motley total of 2,000 aircraft, whose flying and ground personnel were a mixture of well trained, partially trained, and poorly trained, and which in any case was primarily employed in close-support operations for the French Army.

The Royal Air Force had 3,000 aircraft, alerted for the direct defense of the British Isles. The British -- luckily, as it turned out -- sent at most 500 of these, equipped for close-support operations, to the Continent as the so-called "Air Advanced Striking Force". The number of the "combined" Allied forces on the Continent means absolutely nothing."

Elsewhere, General Arnold continues; "The Allied air forces themselves had no regular tactical plan, no unified command."

7 - See footnote 4, this chapter; the "Combat Instructions" are quoted in Generalleutnant Schmid's contribution. See also Appendix 77.

1) It had overestimated the activity of the Allied air force leaders; the anticipated Allied attacks on the German ground organization installations and supply lines failed to materialize.

2) The "emergency reserve" of French bomber units assumed to be stationed in central France proved non-existent.

The office of the Commander in Chief, Luftwaffe, had accepted German principles of organization and leadership as a premise in the evaluation of the enemy plans and preparations and, consequently, had overestimated the latter.

As far as quality and potential performance were concerned, German Luftwaffe leaders had realized that the French air forces had only outdated equipment at their disposal, with the exception of the modern fighter aircraft, the Morane 406, which had been introduced in all the fighter units by 1941.

In contrast to the equipment, which was recognized to be out of date, the standard of training of the French personnel was assumed to be fairly high, although it was known that the majority of the French pilots had no more than a rudimentary knowledge of night and instrument flying.

French aircraft production was recognized to be inadequate to the needs of the French air force, especially in view of the fact that the majority of the fuselage and engine factories were located in the highly vulnerable area around Paris.

The combat effectiveness of the British air units was judged to be considerably higher than that of the French air forces.

All in all, German Luftwaffe leaders were well aware of the fact that the new Spitfire model was a match for the German fighter aircraft; they also recognized the high standard of training of the British crews.

As regards the combat effectiveness of the French and British air units, even the stationary war brought sufficient data for accurate evaluation -- "so far the French fighter pilots have avoided aerial combat whenever they can"; and in contrast, "British air crews go into combat for all they're worth."[8]

The evaluation of the Commander in Chief, Luftwaffe, was entirely accurate as regarded the deployment, strength, and combat effectiveness of the Belgian and Dutch air units.

Even the combined assembly and deployment of all the Allied air units had been accurately identified and evaluated -- as was later substantiated by the course of operations.

Viewed as a whole, then, the evaluation of the enemy situation by the office of the Commander in Chief, Luftwaffe, proved to be correct. Thus German air leaders were in a position to plan the strategic and tactical commitment of their forces on the basis of a realistic evaluation. Furthermore they were fully justified in accepting the quantitative and qualitative superiority of their own forces as a premise and in making this premise a part of their planning.

But it was not only the air leaders who were convinced of this superiority; the units at the front were firmly convinced of it as a result of the success they had enjoyed in their previous missions.

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8 - Both quotations are from Generalleutnant Schmid's study; see Footnote 4, this chapter.

C. The Mission of the Luftwaffe

The planning of air operations had been based on the evaluation of the enemy situation which we have described in the last section. It may be appropriate, however, to refer once more briefly to the starting position:

Prior to the beginning of the war, German air leaders had been firmly convinced of the doctrine of unlimited, independent strategic air warfare. The principles prevailing at that time, the theories of air warfare in the sense advocated by Douhet, had become recognized guidelines -- and not only in Germany.

These principles were soon modified by reality, however. Even during the campaign in Poland, the Luftwaffe -- after its easily achieved, rapid victory over the inferior enemy air forces -- was employed primarily in coordination with the Army. The success achieved by this procedure had far-reaching effects, and -- despite the fact that the conditions in the new theater of operations were entirely different from those in Poland -- it was decided to apply the same tried and tested recipe for success in the West, on an even larger and more concentrated scale.

Thus the thought of strategic air warfare was relegated farther and farther into the background in the Combat Instructions issued for the West. The mission of providing direct and indirect air support for Army operations occupied the foreground. Consequently,

the Luftwaffe, which had actually been created as a strategic weapon, was faced with the necessity of fulfilling both missions. The obvious solution, to divide the Luftwaffe into a "strategic" arm and a "tactical" arm, was never taken into consideration -- or could never be taken into consideration.

Yet the retention of an "all-purpose" Luftwaffe, capable of meeting all the various demands made upon it, proved perfectly satisfactory under the circumstances -- as evidenced by the success of the campaign in the West.

As it was, the Luftwaffe could not be assigned two separate missions to be accomplished in sequence (i.e. first the elimination and destruction of the enemy air force and them the furnishing of air support for Army operations). Instead, both missions had to be accomplished simultaneously, and in this it was early recognized that the decisive factor in achieving success was accurate evaluation of the proper moment to begin the shift to ground support operations as the primary mission.

Flexibility of leadership became the determining factor in the successful conduct of air warfare.

By and large, the missions of the Luftwaffe can be briefly summarized as follows:

1) Primary mission: the destruction of the enemy air forces in the air and on the ground by means of attacks on

those ground installation airfields in Holland, Belgium, and northern France which had been identified as in use by the enemy. The main effort here was devoted to the destruction of the bomber and fighter bases.

2) Main Mission: the furnishing of indirect and direct air support for the advance of the Army.

This mission was to begin not after the elimination of the enemy air forces had been achieved, but rather at the same time as the mission described under 1), above.

The most urgent goals of the mission were the following:

a) to break enemy resistance in the border areas as quickly as possible.

b) to disrupt any enemy troop assembly activity in the Dutch-Belgian theater.

c) to delay the advance of the Anglo-French armies across the French border into the Belgian theater.

d) to keep the highway and rail systems in enemy territory under constant surveillance and to combat any enemy activity identified.

3) Secondary Mission: (closely connected with the main mission described in 2), above) to keep the Channel and the adjoining coastal areas under observation and to attack enemy shipping and unloading activity along the coast of the Continent.

4) Special Missions (limited in duration and area) to

carry out independently the two air landing operations, one against Fortress Holland and the other against the

Belgian border fortifications south of Maastricht, needed to facilitate the planned operations of the Army.

D. ~~Evaluation of the Initial Results Achieved~~

The success or failure of the first phase of an operation is usually decisive for the success or failure of the entire operation.

The German planning for the campaign in the West was deliberately directed towards the achievement of an initial success. The factors of surprise, superiority, and the utilization of completely new weapons all pointed to the probability of such a success. If one phase of the plan should misfire (the elimination of the enemy air forces, the rapid occupation of Holland, or the breakthrough through the Belgian border fortifications), then the successful accomplishment of the really decisive action, the breakthrough on the middle sector, would be placed in jeopardy, and new operational possibilities would have to be sought.

That every single phase of the initial plan met with success was due exclusively to the performance of the Luftwaffe -- and I make this statement without any fear of being accused of prejudice or arrogance. It was the tactical successes gained by the Luftwaffe during the first few days of operations which made it possible for the strategic plan to be carried out on schedule.

For this reason I feel that we are justified in summarizing these initial Luftwaffe victories once more and in

subjecting them to critical analysis, insofar as the preceding chapters have not dealt in detail with an evaluation of successes and failures.

Our summary will be limited to the following points:

1) Elimination of the Enemy Command System

A "twilight raid" by the Luftwaffe provided the signal for the overall attack. This raid was directed against known command posts and headquarters (all carefully documented by appropriate target data) of the Allies and thus, at the same time, against Allied signal communications centers.

This special mission was expected to bring particularly great success and to have long-lasting effects, since it could be assumed that it would effectively disrupt the enemy troop command system in the very first hour of the offensive. Thus, dive bombers, flying singly and manned by especially selected crews, were loaded with heavy bombs and sent up against these targets[9].

Even within the Luftwaffe Operations Staff itself, the views concerning the actual success of this raid differ widely. In the opinion of the Intelligence Officer, office of the Commander in Chief, Luftwaffe, the attack brought no tangible success; due to a dense ground haze, the crews were unable to locate the majority of

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9 - According to documents of the office of the Commander in Chief, Luftwaffe, the aircraft employed were dive bombers.

~~Footnote 9 (cont)~~

It seems much more likely, however, that they must have been Ju-88's, if only for reasons of range.

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the assigned targets, so that a good many bombs were unloaded over alternate targets such as railway depots. Thus the elimination of the enemy's command posts was not achieved at the beginning of the operation.

According to another source[10], the raid succeeded in "destroying the enemy's signal communications set-up", which -- if true -- was clearly a decisive achievement.

During the subsequent course of the operatiom, additional attacks were carried out against similar objectives; there is no information available regarding the results of these attacks.

2) ~~The Blow against the Enemy Ground Organization~~

The elimination of the Dutch and Belgian air forces was very quickly achieved. The majority of their combat aircraft were destroyed during the first raids on the airfields they occupied. Only a few of the Dutch fighter units had been alerted in time to escape destruction.

The first attack on the French ground organization came as a complete surprise to the French. And the surprise factor was exploited all the more completely in view of the fact that during the preceding weeks these areas had been the target of propaganda leaflets dropped from the air. The Ministry of Propaganda was hopeful that these leaflets would have an effect on enemy morale,

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10 - Based on excerpts from the personal diary of General von

Footnote 10 (cont)

Waldau, former Chief of the Luftwaffe Operations Staff; entry dated 25 May 1940.

while for the Luftwaffe they were merely a means to an end in that they provided an opportunity to drill the crews in nocturnal flights to the areas concerned and at the same time to dull the alertness of the enemy antiaircraft artillery forces.

Nevertheless, the first attack was not so successful as Luftwaffe leaders had anticipated. To be sure, according to the statements of the Commander in Chief, Luftwaffe, approximately 25 - 30% of the "bases aeriennes" had been destroyed, the majority of them airfields which would be sorely missed by the enemy in his attempt to stave off the breakthrough of the German Fourth and Twelfth Armies. In addition, some 25 - 30% of the French combat aircraft had been destroyed or damaged on the ground[11].

But these first attacks did not succeed in destroying entirely the runways of all the large and medium-size airfields. To begin with, the first attack was unable to cover all the airfields identified as occupied by the enemy. The first reaction to the attack was to transfer the French flying units to smaller, scattered airfields and at the same time to spread out

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11 - In "The War in the West in 1940" (Der Krieg im Westen 1940) (preliminary drafts in telegram style, compiled by Branch VIII), Microfilm D/9 of the Karlsruhe Document Collection, the following appears under date of 10 May: "First large-scale attack carried out in waves against French airfields in France, Belgium, Holland. Seventy-two airfields raided. 300 - 400 enemy aircraft destroyed on the ground. Hits scored on French bases at Metz, Nancy, Reims, Romilly, Dijon,

~~Footnote 11~~ (cont)

and Lyon. Airfields at St. Omer, Vitry le Francois, and Metz seriously damaged."

In connection with the above summary, the reader is referred to the detailed appraisal (fully documented) of the attacks on the enemy ground organization during 10 May which appears in the third chapter of this study.

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the aircraft parked on the ground and to improve their camouflage cover. And these smaller airfields, previously unknown, had to be hunted out by the aerial reconnaissance units. This, of course, took time. Moreover the bomber units originally assigned to operations against the enemy ground organization soon had to be withdrawn in part; some of them (particularly those equipped with Do-17's) were needed for direct Army support operations earlier than had been anticipated.

As a result, the final elimination of the French air forces actually took longer than Luftwaffe leaders had expected.

The attacks on the airfields in northern France which were being used by British air units brought very little tangible success. Even during the stationary war, German aerial reconnaissance of the British bases in northern France had run into heavy fighter defenses, so that intelligence on the deployment of the British air units remained incomplete until 10 May.

As had been anticipated, the first attacks were met by strong enemy resistance; it was the employment of the British fighter units which brought about the first German losses. It was not until the air battle over the Meuse sector near Charleville and Sedan that this resistance was finally broken.

3) The Air Landings

The victories achieved by the Luftwaffe in Holland and Belgium, victories which were of decisive importance for the systematic accomplishment of the overall operation, have been dealt with in detail in the fourth and fifth chapters of this study. Therefore they are mentioned once again here only in the interests of completeness.

These victories speak for themselves. The occupation of Fortress Holland and the seizure of Fort Eben Emael and the bridges over the Albert Canal were the actions which made possible the deceptive maneuver on the northern sector of the overall front, which effectively tied down the armies of Holland, Belgium, France, and England, and which thus eliminated the threats to the northern wing of the German Army and to the German homeland (Rhine-Ruhr District).

The employment of the Luftwaffe in these actions -- although it cannot be called a complete tactical success -- had very decisive strategic repercussions.

4) Operations in Support of the Army

At the very start, the two air landing operations mentioned above, one in western Holland and the other in eastern Belgium, had served the ultimate goal of direct support for the Army.

In addition to these, and simultaneously with them, the Luftwaffe -- despite the fact that its forces were already overburdened with the task of providing cover

for the air landing operations and the mission of combatting the enemy ground organization -- provided effective and decisive support for the Army's breakthrough action all along the rest of the front.

Three points of main effort can be distinguished:

a) Support of the Sixth Army by the VIII Air Corps and the II Antiaircraft Artillery Corps

b) Support of the Fourth Army by the I Air Corps

c) Support of the Twelfth Army by the II Air Corps and the I Antiaircraft Artillery Corps at the focal point of the operation.

It was out of these "border operations" that the decisive commitment of the Luftwaffe developed on the middle sector, in other words the employment of Luftwaffe forces along the Meuse sector and against the Maginot Line near Charleville and Sedan, employment which led finally to the uninterrupted advance of the German panzer units to the Channel coast. The successes of the II and VIII Air Corps and the I Antiaircraft Artillery Corps, all of which were assigned to direct support operations in behalf of the Army, also resulted in the disruption of the first and last "air operation" attempted by the enemy. The final result was freedom of action for the German Army to carry on its operation without fear of effective interference on the part of the thoroughly beaten Allied air forces.

Thus the breakthrough battle in the Charleville-Sedan area became an almost classic example of direct air sup-

port of Army operations provided by an air force which, at the same time, was still engaged in the struggle to eliminate enemy air power, i.e. to gain air supremacy.

The formation of a point of main effort on the ground had been augmented by the formation of its counterpart in the air.

In spite of the fact that the Luftwaffe units had quite enough to cope with in their other missions, from the very beginning of the offensive they systematically designated a part of their number to indirect support operations for the Army, and they continued to fulfill this obligation throughout the course of the operation.

The area of main concentration for units from both Air Fleets lay on either side of the French-Belgian border during the initial phase of operations. Thanks to their activity, the operations of the Allied armies were identified, weakened, and delayed.

During the subsequent phases of the operation, two separate areas of main effort developed for indirect support actions -- that of the Second Air Fleet, in the Belgian theater of operations; and that of the Third Air Fleet, deep in the northeastern corner of the French theater, in which preparations were being made for the large-scale breakthrough operation on the middle sector.

Thus the initial successes achieved in the indirect support of Army operations created the prerequisites for the systematic accomplishment of the German operational plan. Them, in proportion to the extent to which the operational areas drew together, indirect support gave way to direct support of Army operations.

5) ~~The Air Attack on Freiburg~~

Within the framework of the air war of the first few days of the offensive, an incident took place which deserves to be mentioned here in view of the fact that it has given rise to violemt controversy in the literature appearing both

during and after the war -- I refer to the attack on the city of Freiburg, carried out on 10 May 1940.

According to the opinion held at that time by the Luftwaffe Operations Staff, Freiburg had been erroneously attacked by German aircraft which had lost their way as a result of bad weather and had confused Freiburg with their real target, an area lying west of the Rhine in France. Recent investigations have served to substantiate this opinion[12].

E. The Air Tactics of the Allies

So far our account of aerial warfare during the campaign in the West has endeavored to describe the commitment of the German Luftwaffe, insofar as it can be documented or reconstructed on the basis of authentic documents. In our eagerness to clarify the strategic significance of these missions, we have described them in such a way that only the tangible successes achieved by them are apparent. Only in a few cases was it perfectly clear that in the struggle for air superiority and then for air supremacy the successes had to be literally fought for.

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12 - In support of this opinion, we have two written statements by Generalleutnant a.D. Schmid, former Chief of Branch V, Luftwaffe General Staff; in view of his former assignment, it can be assumed that his information is accurate. The first statement is as follows: "Contrary to contemporary and subsequent press releases, it must be stated that Freiburg was not attacked by French or British air units on 10 May 1940."
See also the "Vierteljahreshefte für Zeitgeschichte" (Quarterly for Contemporary History), Volume 4, 1956, April number: "Der Luftangriff auf Freiburg am 10. Mai 1940" (The Air Attack on Freiburg, 10 May 1940), by Anton Hoch.

It would be historically fraudulent, and at the same time a belittling of the actual performance of the Luftwaffe, if an account of this sort should create the impression that the Luftwaffe had won its victories effortlessly and without any resistance on the part of an enemy whose air forces did not deserve to be taken seriously.

Therefore it is imperative that we present an evaluation of the employment tactics and fighting power of the opposite side. There are no reliable sources available by the opposite side (and if there were, it is quite probable that they would restrict themselves to one-sided eulogies of the "heroism" of the Allied pilots).

Thus we have no alternative but to try to reconstruct the air activity of the enemy on the basis of the evaluations prepared at that time.

I. ~~The French Air Force~~

The evaluation prepared by the office of the Commander in Chief, Luftwaffe, of the organization, strength, equipment, and fighting power of the French Air Force -- although prepared before the war began -- proved on the whole to be accurate.

The organization of the French Air Force was fundamentally different from that of the German Luftwaffe. The concepts of organization and leadership which governed the Luftwaffe simply did not exist in France. Both the air forces and the antiaircraft artillery forces were part of the army, and most of them were distributed among the various elements of the army establishment. The reconnaissance and fighter

units were subordinate to the armies or to the corps. Still another part of the fighter forces, as well as the bomber forces, were under the direct command of the French Army High Command. The remainder of the fighter units, i.e. those assigned to home air defense operations, were subordinate to the various air district commands.

a) The Fighter Forces

As indicated above, the French fighter units were distributed among three separate command agencies; there was no uniform command and consequently no possibility of committing them en masse in a given operation.

While the majority of the French combat aircraft were really out of date, the fighter forces (which, however, were still in process of being modernized) had at their disposal one up to date model, the Morane 406, which caused quite a bit of trouble for the German bombers on a number of occasions. The French fighter squadrons were employed almost exclusively against the German bomber formations and operated with the help of a perfectly functioning aircraft reporting system, which identified the German approach flights in plenty of time to permit effective employment of the fighter units.

Thus it happened that nearly all the German bomber formations were picked up during their approach and attacked by the French fighters. On the whole, however, the fighters were really successful only when

they attacked singly flying bombers or bomber units flying without a fighter escort. Nevertheless, these tactics on the part of the French fighter forces were highly successful

in that, after the first costly experiment, all the German bomber missions had to be flown with an escort of single-engine or twin-engine fighters! And this remained true even after the Luftwaffe had achieved air supremacy in the southern theater of operations.

On the other hand the French fighter forces never managed to achieve air supremacy, not even temporarily or in specific localities. Nor were they able to provide an effective defense against the larger-scale German bomber raids so long as these were carried out with fighter escort.

Even the modern Morane 406's evaded aerial combat with the German fighters whenever they could, as we have already mentioned in another context. From the very beginning they were inferior to the Me-109 and also to the twin-engine Me-110 in terms of performance; only at low altitudes were they able to develop a relatively high speed. Thus it happened repeatedly that the French fighters, either before or immediately after contacting the enemy, withdrew in low-altitude flight behind the French front, only to reappear later on when the danger of combat was past. For this reason it took quite a long time until the French fighter arm could be entirely eliminated despite the fact that it had suffered serious losses as a result of the attacks by the German fighters and as a result of its own operations in defense of the German bomber raids.

The French never attempted to organize a strong fighter force for concentrated employment in either strategic or tactical defensive operations at the focal point of action. Such concentrated commitment would have been impossible in view of the dissipation of the French fighter units, a dissipation dictated by the rigid distribution of the units between the operational area and the home area, and in view of the fact that the individual units were subordinate to the various command headquarters of the Army.

These command headquarters, to be sure, employed the fighters fully, to the last serviceable aircraft. On the other hand, as long as the individual pilots did their best to avoid combat with the enemy, no real success could be achieved.

The French fighter units were not employed in low-level strafing raids; this, too, represented a basic difference between French and German fighter tactics.

b) ~~The Bomber Forces~~

Although the equipment of the French fighter units with the Morane 406 had been underestimated by German leaders (conversion to the new model was in fact much farther along than was believed), the effectiveness of the French bomber forces had been overrated. The task of equipping the bomber units with up to date models had not even been

started. Thus the French bomber units, with their old-fashioned equipment, were unable to play any role at all. After the first unsuccessful attempts to employ a few of these units during the first days of operations, French air leaders completely abandoned the commitment of bomber aircraft in close formation.

From this point on, the bombers were employed only in individual missions, such as surprise raids at dusk or dawn or during bad weather periods against German advance airfields, occupied towns, bridge positions, and other targets of this kind. The effect of these "needle pricks" was negligible; most of the attacking bombers were brought down by the well-organized German defenses.

The fact that there were no enemy bomber formations to contend with, either over the field of battle or in the operational area as a whole, was decisive -- it meant that the operations of the German Army could proceed without fear of enemy interference from the air.

c) The Reconnaissance Forces

The employment of the French aerial reconnisaance units was doomed to failure chiefly as a result of the superiority of the German fighters.

But strangely enough, even before this superiority had been recognized or had had time to become effective, French leaders seemed quite uninterested in systematic aerial reconnaissance far behind the enemy front.

As a result, the leaders of the opposite side were operating "in the dark". One of the many consequences of this situation was the fact that the decision-seeking breakthrough of the German panzer wedge in the middle sector was recognized far too late to permit the organization of strategically effective countermeasures.

French aerial reconnaissance was a complete fiasco.

II. The British Air Force

The organization of the British air forces was radically different from that of the French; it was governed by principles similar to those in use in the German Luftwaffe.

The Royal Air Force, beside the Army and the Navy, was the third, independent branch of the British armed forces. Nevertheless, elements of the Royal Air Force -- from the very beginning -- had been slated for joint operations with the Expeditionary Corps; it was these elements whose task it was to meet the German Luftwaffe on the Continent.

From the first to the last phase of the campaign, the command system, the employment tactics, and the fighting morale of these units were vastly different from those of the corresponding elements of the French air force. In both offensive and defensive operations, the British pilots proved themselves aggressive, courageous, and stubborn; it was they alone who managed so often to disrupt German operations, even though they never succeeded in destroying them completely. They sacrificed them-

selves for their French allies, though they were just as inferior to the German enemy as the latter, as far as materiel equipment was concerned.

a) The Fighter Forces

In the early combat incidental to Operation YELLOW, the only British fighter units to put in an appearance were those equipped with the Hurricane model. Performance-wise the Hurricane was inferior to the German Me-109, which meant heavy British losses in aerial combat. Even so, from the very beginning the British squadrons showed no hesitation in hurling themselves at the German bomber units, among which they did succeed in creating rather serious damage. Nevertheless, the Luftwaffe gradually gained air superiority and then air supremacy over the British fighter forces.

The situation changed radically as soon as the modern Spitfire squadrons from the British home air defense system began to appear along the Channel coast. In this context the reader is referred to the previous accounts given in this study, accounts which make it clear that during the last phase of Operation YELLOW British fighters represented a very real threat to German air supremacy at certain periods and in certain areas.

b) The "Battle" Units

The Royal Air Force had at its disposal "close-support units" similar to those of the Luftwaffe, equipped

with close-support aircraft and intended for tactical employment against targets on the ground. Although these units

could not compare with the German dive-bomber units in performance or effectiveness, they carried out repeated attacks on German troop targets in the operational area, on marching columns, occupied towns, bridges, etc. These attacks were usually carried out in close formation, at very low altitude, and with an escort of fighters; the British pilots attacked stubbornly until their aircraft were destroyed.

These "battle" units and, with them, the bomber units being committed in accordance with the same principles and with the same mission, suffered their highest losses during the series of attacks on the Meuse crossing points near Maastricht, i.e. in the Charleville - Sedan area. The unusually high losses sustained by the enemy on this occasion were inflicted by the German fighters and antiaircraft artillery.

The British counter-defenses, already strong even at the beginning of the German advance in the northern sector of operations, were kept up in equal strength in the middle sector until the "battle" units were withdrawn after the costly mission in the Charleville-Sedan area of the Meuse sector, and the survivors transferred to the safety of the British Isles.

Although these stubborn attacks by the Royal Air Force tactical bomber units on German troop targets did cause damage and delays, not even the British pilots had beem able to halt the German advance. Nor had the British fighter units

been able to provide a really effective defense against the German bomber attacks.

Even so, the British pilots had proved beyond any doubt that they were worthy opponents in the air; it was they who bore the brunt of the Allied air war, in spite of their numerical and qualitative inferiority to the German Luftwaffe. (In the first few days of the fighting on the Continent, they were already preparing for their later achievement of superiority over the Luftwaffe.)

c) ~~The "Strategic" Bomber Fleet~~

This expression anticipates a later development in terminology. Yet the beginnings of this later development are already apparent in this first phase of the conflict between the Royal Air Force and the German Luftwaffe.

The penetration flights of the Royal Air Force into the German hinterland, which had been going on since the beginning of the war, but which had increased in frequency and scale soon after the offensive began, made it clear that British air leaders regarded the employment of their tactical air units on the Continent as an episode which, for the time being, had little to do with England itself. Instead, looking towards the future, they systematically promoted and developed two programs. One was an effective home air defense system, and the other a program of attack against the sources of the enemy's strength, located deep in the German

hinterland.

The future was to substantiate fully the appropriate-ness of this planning.

III. The Fiasco of Allied Air Planning

The numerical inferiority of the Allied air units to the forces of the German Luftwaffe was a fact known to both sides even before the beginning of the offensive.

The difference in quality, especially as regarded the French air units, did not become fully apparent until after the offensive was under way.

Under these circumstances, it seems all the more odd that Allied air leaders had obviously learned nothing whatsoever and had failed to draw the appropriate conclusions from the events in Poland and -- to a lesser degree -- in Scandanavia.

The German pattern for opening an offensive was well known: first a large-scale air attack on the enemy ground organization in order to destroy or eliminate the enemy's air forces, followed by a shift in concentration to joint operations with the Army. There was every reason to assume that the Germans would proceed according to the same or at least a similar pattern in the West as well -- which in fact they did.

It was disregard of the experience already gained and the conclusions to be drawn therefrom which led to the circumstance that the French air units -- in spite of the tenseness of the situation and the probability of an imminent German offensive in the West -- were still stationed at their peacetime airfields, where many of them were destroyed before they had a chance to go into action.

Even though -- from the German point of view -- the first attacks on the enemy (particularly the French) ground organization did not bring the anticipated total success, still they were effective enough to shatter the enemy command system and the fighting power of the enemy air units, both from the point of view of materiel equipment and from the point of view of morale.

While the German Luftwaffe, at least in the beginning, carried on strategic air warfare, from which it gradually shifted to purely tactical commitment in the form of cooperation with the Army, Allied air leaders restricted themselves from the start to the purely tactical principle of providing air support for the ground forces.

But truly effective commitment even in this limited scope was made impossible by the inadequate organization of the command function, by the numerical and qualitative inadequacy of the air units available for employment, and by the lack of a suitable aircraft model corresponding approximately to the German dive bomber.

Thus the British "battle" units and the bomber units assigned to work with them were fated to sacrifice themselves in missions which were often flown with complete disregard for danger but which were always desperate and usually costly in terms of losses and which, moreover, were frequently carried out without a fighter escort.

To the surprise of German military leaders, the anticipated employment of Allied air units in strategic missions had failed to materialize. Systematic counterattacks on the tightly concentrated and very crowded German airfields

by a combined force made up of French and British air units would not only have resulted in heavy losses for the German Luftwaffe, but would also have reduced the effectiveness of the German strategic and tactical air operations by a considerable degree.

Systematic attacks on the steadily lengthening German rear-area communications lines between the front and the Rhine bridges (on such targets as railways, highways, and bridges) would have succeeded in disrupting and delaying German troop deployment and transport operations, which would have gained time for the Allies to work out their countermeasures.

But nothing of this kind happened. Only on the field of battle itself did the Allies attempt to ward off the coming catastrophe -- and this by means of air support operations for their ground forces. This attempt was a failure.

And the fact that nothing was done, that no success was achieved, was not so much the fault of the courageous Allied air units as that of the command system and organizational structure under which they operated.

Precisely because the Allied air forces were numerically inferior to the Luftwaffe, they needed a truly uniform command system and a firm organization which permitted effective concentration of their combat ~~eff~~ strength. The disadvantages of a "coalition war" became apparent here for the first time.

In the last analysis, the failure of Allied air plan-

ning was due to the fact that Allied air leaders had learned absolutely nothing from the perfectly clear body of experience made available thus far by the German conduct of modern air operations.

Moreover, by permitting such widespread dissipation of their forces and by renouncing any thought of centralized and unified command, they deprived themselves of the initiative right from the start. Instead, they had handed it to the Germans on a silver platter.

A genuine concentration of forces did not take place until Dunkirk. Although during the early course of developments in the Continental theater of operations it seemed strange that British military leaders should withdraw their tactical units after the defeat at Charleville and that they should fail to respond to the pleas of the French government for additional British fighter units to strengthen the hard-pressed ground front, as soon as preparations were under way for Operation DYNAMO it became evident that the British attitude of reserve had been dictated by cool calculation and farsighted planning on the part of those responsible for British home air defense operations. The Continent had already been written off as a loss.

F. The Important Lessons Learned from Operation YELLOW

The concepts of "strategic air warfare" against the air power and the sources of strength of the enemy, on the one hand, and "air support of Army operations", both direct and indirect, on the other hand, had been developed into theoretical axiomatic requirements for the German Luftwaffe even before the war.

The theory had been translated into practice for the first time during the campaign in Poland in 1939. It proved to be entirely correct.

Accordingly, German air leaders decided to follow the same pattern during the campaign in the West.

Nevertheless there were certain factors -- the completely different conditions in the new theater of operations; the fact that the enemy had to be rated higher than in Poland, both in terms of number and fighting effectiveness; the more complex strategic aspects inherent in a theater of operations comprising both land and sea; (to name only the most important) -- which created new problems to be solved by Germany's military leaders. Thus new approaches had to be sought and found in the fields of strategy, tactics, and technology.

Let us now attempt to formulate the main conclusions to be drawn from the new approaches decided upon by German air leaders, conclusions which gradually became apparent as operations progressed. Neither the underlying purpose of this study nor the scope of the available source material permit us to be complete in our summary; we shall have to restrict ourselves to those conclusions which seem to be most significant. The individual aspects which come to mind will be mentioned "in telegram style" and then discussed briefly.

Of the two fundamental requirements mentioned at the beginning of this section (both of which were fully valid during the campaign in Poland), one was completely irrelevant in the campaign in the West -- strategic air warfare against the sources of enemy strength. For the few air attacks carried out on industrial plants and other similar targets in enemy territory

were utterly negligible, both in scope and in terms of the forces participating in them, in comparison with the other missions assigned to the Luftwaffe. Moreover, a good many of these targets were no more than alternates, to be raided only when the primary targets could not be located or, for one reason or another, could not be attacked.

The intensive air war against enemy shipping and enemy harbor activity cannot be classified as strategic air warfare against the enemy's sources of strength because it was clearly carried out as a part of the air support provided for the Army, regardless of whether the individual attacks were directed against Dunkirk or Marseille.

We can only guess why this particular goal of strategic air operations -- originally included in theoretical planning -- was so completely neglected in the West; there are no official documents which explain it. It can be assumed with a fair degree of certainty, however, that the concept of a blitzkrieg in the West, and thus the expectation that occupation of enemy territory would be extremely rapid, made the destruction of the enemy's sources of strength seem unnecessary.

Within the framework of the other theoretical requirement, then, the following sectors, and the conclusions pertinent to them, remain to be investigated:

1) The conduct of ground operations from the third dimension
2) The Luftwaffe as a substitute for antiaircraft artillery
3) Aircraft combined with tanks
4) Aircraft in antitank operations

5) Antiaircraft artillery in antitank operations

6) Aircraft in operations against naval targets

7) Strategic coverage of the flank from the air

8) Radar

1) The Conduct of Ground Operations from the Third Dimension

It was during the campaign in Poland that the conduct of air operations from the third dimension was practiced on a large scale for the first time.

The conduct of ground operations from the third dimension had been tried for the first time during the Weser Maneuver, but only on a very small scale and within a tactical framework.

The innovation, at the opening of the campaign in the West, was the application of the latter principle on an extremely large scale, and with a strategic rather than a tactical objective in view. For for both sides, the most surprising event of the beginning phase of the campaign was the employment of air landing troops in overwhelming strength against a purely strategic target.

These actions also marked the introduction of unexpected new weapons -- the freight glider and the hollow charge shell.

This brief mention must suffice, inasmuch as the actions themselves have been dealt with in detail in a previous context.

2) The Luftwaffe as a Substitute for Antiaircraft Artillery

Even during the campaign in Poland, the flying units had often taken the place of Army antiaircraft artillery; they had operated as an "artillery substitute" in support of Army operations. And this was true not only of the close-support group under the Special Duty Air Commander (Fliegerführer z.b.V.) but also of the long-range units

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actually assigned to strategic employment, for example in the breakthrough battle near Mlava and in the seige of Warsaw.

During the campaign in the West this type of employment (i,e, the utilization of air units as a substitute for antiaircraft artillery) became more and more common. Here, again, it was not limited to the units of the VIII Air Corps, but also included the "strategic" long-range air units.

The following actions may be mentioned as typical examples of the "artillery-wise" employment of air units:

a) the attacks carried out by the close-support and the long-range bomber units during the Army's breakthrough through the enemy border fortifications

b) the raids carried out on the fortifications and outer bulwarks of Liege, Namur, and Maubeuge

c) the raids carried our in preparation for and in support of the Army breakthrough at the fortified Dyle position

d) the elimination of the Maginot Line near Charleville and Sedan behind the Meuse sector in preparation for the breakthrough on the middle sector.

It was this artillery-type employment of the Luftwaffe alone which not only smoothed the path for the Army during this first phase of operations, but which above all saved the Army personnel and time, and this to a degree which can hardly be expressed in terms of figures.

But the artillery-type commitment of the Luftwaffe also played a tremendously important role during the last phase of Operation YELLOW, primarily in the destructive attacks carried out on the encirclement area, which grew narrower from day to day, of Flanders and Artois, attacks which led to the final breakdown in the morale of the Allied troops trapped there. The second instance -- and this seems almost self-contradictory -- was at Dunkirk. For the operations which top-level Luftwaffe leaders were inclined to classify as a typical example of strategic air warfare at that time were, in the last analysis, no more than artillery-type employment intended to break a tightly concentrated pocket of enemy resistance.

3) ~~Aircraft Combined with Tanks~~

During the campaign in Poland an attempt had been made (in the area west of the Vistula) to provide support for panzer units through the commitment of close-support aircraft. This experiment was undertaken from a purely tactical standpoint, and it was a decided success. The campaign was finished before there was any opportunity to expand this experiment from the tactical to the strategic field, as might have been appropriate in the area east of the Vistula.

On the basis of the experience, positive and negative, thus provided, the decision was made to combine large panzer units with large Luftwaffe units for joint operations during the campaign in the West. The units of the VIII Air Corps (close-support units) were selected for this.

The first attempt, of a tactical nature, was a complete success. This was the joint action of the close-support units and the relatively weak panzer units of the Sixth Army which resulted in the advance to the Dyle position ("the tank battle of Gembloux").

The second, and extremely decisive instance, in which both aircraft and tanks had been assigned strategic objectives, was the breakthrough from the Meuse to the sea, carried out jointly by the VIII Air Corps and the Panzer Group von Kleist.

The dive-bomber and close-support units smoothed the path for the panzer units along the front and protected them from enemy attack along the flanks. The combination of the Army's fastest weapon with the Luftwaffe's slowest one paid decided dividends in strategic operations.

New problems, whose ramifications inevitably led far beyond the immediate aspects of tactical cooperation to the fundamental aspects of organization, began to arise.

4) ~~Aircraft in Antitank Operations~~

This subsection requires somewhat more detailed treatment than the preceding ones, since this special aspect of employment, for various reasons, has not been adequately considered in the previous chapters.

The initial German successes of the first few days of the offensive had a decisive influence on the subsequent course of events

in the Western theater of operations. As both branches became more adept, the cooperation between the Army and the Luftwaffe improved day by day; once the shift to direct and indirect support of Army operations had been made, it became a determining factor for the final, successful outcome of the offensive.

At a very early date the significance of aircraft in antitank operations was recognized as decisive. For the first time in the history of warfare, it was proved that the aircraft is the most effective weapon which can be employed against a tank. This is true not only within the framework of joint Army-Luftwaffe operations right on the field of battle, but also -- and this was the real innovation -- in the attack and destruction of large-scale tank maneuvers by Luftwaffe forces operating independently.

Instances of the latter have been mentioned in the foregoing chapters. To begin with, the reader is reminded of the disruption of the French tank advance into Belgium and of the subsequent "tank battle of Gembloux" in the area of the Sixth Army. Most important of all was the employment of Luftwaffe units against the attempted Allied tank breakouts from the northern sector of the encirclement area near Cambrai and near Arras. Both these actions took place on the same day, and both were complete successes -- successes with far-reaching strategic impli-

which had been reconstructed on the basis of Luftwaffe documents, there seems to have been still another successful instance of the employment of aircraft against tanks. Unfortunately, no mention of it could be found in either Army or Luftwaffe sources.

On 17 and 18 May, the German panzer wedge (the XIX Panzer Corps, Guderian), which was advancing from the Meuse to the Channel coast, found itself in a precarious situation in the vicinity of Laon[13]. The French tank forces under General de Gaulle had launched a counterattack against the flank of the German advancing wedge and had managed to open a fairly serious gap. This undeniable initial success, however, was soon counteracted "thanks exclusively to the activity of the German dive bombers", which succeeded in eliminating the majority of the French tanks.

The above account is substantiated to a certain extent by the opposite side. In an American military history publication[14], it is stated that on 17 May the French 4th Armored Division, under the command of General de Gaulle,

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13 - Based on an essay by Major Georg W. Feuchter in the Swiss journal "Flugwehr und Technik" (Military Aeronautics and Technology), No. 2, February 1949, "Entwicklung und kriegsentscheidende Bedeutung der Luftkriegführung im 2. Weltkrieg" (Developments in the Conduct of Air Warfare during the Second World War and its Significance in Deciding the Outcome of the War), Section 2: "Der Luftkrieg bis zur Kapitulation Frankreichs" (The Air War up to the Capitulation of France).

14 - The Campaign in the West 1940, US Military Academy, West Point, New York, 1945 (pages 48 and 49 of the German translation, contained in the Karlsruhe Document Collection).

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had undertaken a foray of about ten miles, approaching Montcornet from the south, "without meeting serious German resistance. Obviously de Gaulle had advanced into an unoccupied sector, so that the attack was pointless." Two days later, however, on 19 May, de Gaulle attacked once more towards the north; "This time his forces moved forward to a point some six miles north of Laon before they were forced to withdraw by heavy enemy bombardment."

Finally, this encounter between aircraft and tanks is also substantiated in the -- undocumented -- notes of Branch VIII (Military History) of the Luftwaffe General Staff. The following entry appears under date of 19 May 1940[15]:

> "Dive-bomber, twin-engine fighter, and bomber units attacked an enemy tank column moving north in the vicinity of Laon and forced it to retreat."

Thus it seems established beyond doubt that an engagement of this kind did take place near Laon, even though the available accounts seem contradictory.

These three instances of the employment of aircraft against tanks (Laon, Arras, and Cambrai) proved conclusively that air units were capable of disrupting and dispersing enemy tank operations on their own, i.e. without

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15 - "The War in the West in 1940" (Der Krieg im Westen 1940) (preliminary drafts in telegram style, compiled by Branch VIII), Microfilm D/9 of the Karlsruhe Document Collection.

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any close connection with the operations being carried out by their own armies. These successes were augmented by the repeated attacks carried out by German air units on enemy tank assemblies or on tank columns advancing from the south towards the German defense front. Such attacks have been mentioned repeatedly in the previous chapters, particularly in connection with the account of strategic flank coverage by the Luftwaffe.

The lessons learned from these operations were to retain their validity throughout the entire subsequent course of World War II.

5) Antiaircraft Artillery ~~in Antitank Operations~~

For the first time the Luftwaffe antiaircraft artillery forces, organized into often reinforced regiments and battalions, appeared on the scene during the campaign in the West as a second highly effective weapon against enemy tanks. Their commitment within the framework of Army operations provided another surprise for the enemy.

Retrospective examination of events makes it clear that these two branches of the Luftwaffe -- the flying units and the antiaircraft artillery --, the one operating from the air and the other from the ground, frequently claimed the decisive role in providing effective defenses against enemy tank forces, defenses which the Army itself was not numerically strong enough to furnish at all times and in all localities.

In other words, the antiaircraft artillery forces of the Luftwaffe, as a strategic and mobile ground weapon,

represented a valuable supplement to the combatting of enemy tanks by means of aircraft.

In addition to this, on more than one occasion the antiaircraft artillery forces, employed as "assault artillery", were able to help the Army out of a critical situation.

These brief statements appear necessary in our summarizing conclusion in order to round out the picture. They have been condensed from the detailed account which appears in Chapter X.

6) Aircraft in Operations against Naval Targets

The employment of aircraft in attacks on naval targets and port installations had already begun on a small scale during the campaign in Poland. There, however, this type of commitment had had more or less the character of a supplemental or secondary mission in the geographically limited operational area around the city of Danzig, far removed from the focal point of the rest of the operations and closely tied to a strictly limited action.

It was during the Weser Maneuver that Luftwaffe units were first assigned exclusively to operations against naval targets on a larger scale and in a more extensive operational area. Both land and naval aircraft units were utilized, their aircraft especially equipped and their crews especially trained for the specialized mission involved (although both equipment and training in this field were still at a fairly early stage of development).

During the campaign in the West, on the other hand, for the first time Luftwaffe units

trained and equipped exclusively for employment in strategic air warfare over land and for tactical cooperation with the Army were utilized from the very beginning -- and to an increasing degree as operations progressed -- in attacks on enemy shipping and enemy-occupied ports along the Channel coast.

The result was a completely new kind of mission, and neither the equipment nor the training of the units concerned fulfilled the prerequisites for its successful accomplishment.

In meeting this challenge with success, the crews of the "drategic" Luftwaffe units soon became all-round fliers, confronted not only day by day, but hour by hour, with a series of completely different missions -- tactical intervention in ground operations as "substitute artillery"; indirect support of Army operations by means of attacks on rear-area communications lines; and now employment against enemy shipping and harbors.

The latter, however, cannot be interpreted as taking place within the framework of strategic air warfare over water; instead, it was carried out in close connection with the ground operations, i.e. with indirect support of Army activity. And this was the innovation!

7) ~~Strategic Coverage of the Flank from the Air~~

Operation YELLOW brought the only, really surprising new idea in the conduct of operations on the ground, namely the commitment of tank forces en masse for the achievement of far-reaching strategic goals. To amplify this somewhat,

it was the planning of a breakthrough operation on the middle sector of the front, to be carried out

with the aid of direct air support provided by strong close-support units of the Luftwaffe. This breakthrough operation was to decide the outcome of the overall operation -- as, indeed, it did.

This ground action was not only directly supported tactically from the air; it was also strategically secured by means of systematic and extensive coverage of the flanks by the units of the strategic Luftwaffe.

This was the truly new factor in Germany's modern concept of the conduct of war, and fundamentally it was the only really new idea to emerge from the office of the Commander in Chief, Luftwaffe. Although this new method of commitment was closely allied with the operations of the Army and ultimately provided a transition to the missions of indirect air support of the Army, still it did represent a new and hitherto unknown version of strategic air warfare, aimed at the independent achievement, by the Luftwaffe, of a decisive strategic goal.

And in this, for the first time we find a genuine instance of the formation of an effective point of main effort on the part of Luftwaffe commanders, a point of main effort within the framework of the cooperation between tactical and strategic Luftwaffe forces at the focal point of the overall operations

8) ~~Radar~~

For the last of the conclusions to be discussed here, our choice inevitably must fall upon a technical development, one whose significance first became apparent during Operation YELLOW,

although at that time German military leaders did not fully grasp the enormity of this significance. Very shortly thereafter, however, during the Battle of Britain, the overwhelming importance of radar was to become a determining factor -- in favor of the enemy. We are dealing here, of course, with radio detecting and ranging, which became familiar during the later course of the war under the abbreviation "radar".

At the time the war began, development had reached approximately the same stage in England and in Germany. Germany possessed the completed Freya model, a ground instrument used in aircraft warning services.

In the meantime technological development had progressed further in England, and very soon the German bomber units began to realize the effectiveness of this development. In this connection, let us recall the attacks of the 30th Bomber Wing, which were to be carried out over the Channel by aircraft proceeding along the coast from Holland, but which finally had to be discontinued because the British fighters were always alerted in time to head off the German aircraft.

During the air battle over Dunkirk, the effectiveness of the British radar network, greatly expanded in the meantime, became startlingly clear for the first time; nearly every German bomber unit was picked up in time, and the Spitfires were waiting for it, ready to go into action. This explains in large part the very heavy German losses.

After the battle at Dunkirk, an abandoned British radar set was found on the beach -- the secret was out[16].

G. The Command Function

It is hardly possible to present a conclusive and definitive evaluation of the command function of the German Luftwaffe during Operation YELLOW. For practically all the prerequisites required for a critical investigation of the Operation and for the formulation of a valid opinion on the basis of such an investigation are lacking. I refer here to the basic instructions issued for Operation YELLOW by the office of the Commander in Chief, Luftwaffe, to the orders issued by that office during the course of combat, and to the periodic situation evaluations based on the actual progress of events.

Nevertheless this lack of source material which might be presumed to lead us to historical truth is not so serious as it may seem at first glance. For in reality, the conduct of genuine strategic air warfare was in any case limited to the very first days of Operation YELLOW; and for these days it can be assumed that fundamental and long-range instructions must have been issued. The indisputable success achieved by the Luftwaffe after the beginning of the offensive proves conclusively that the planning carried out by the office of the Commander in Chief, Luftwaffe, must have been right.

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16 - From the book "Geheimnis Radar" (The Radar Secret), by Dr. Curt Bley, Rowohlt-Verlag, Hamburg.

This "strategic air war", however, which was directed centrally by the office of the Commander in Chief, Luftwaffe, soon gave way to "cooperation with the Army". The shift to the new mission began as early as the first day of the offensive.

With the shift, the real responsibility for the conduct of operations inevitably devolved upon the Air Fleets, which in turn were influenced far less by directives coming from the office of the Commander in Chief, Luftwaffe, than by the needs and requirements of the Army Groups they were assigned to support.

Thus uniform and centralized leadership by the office of the Commander in Chief, Luftwaffe, became more and more of a fiction. For it was the development of the ground operations which determined the operational decisions of the Luftwaffe field commanders.

As a result, in respect to both strategy and tactics, the office of the Commander in Chief, Luftwaffe, had very little opportunity to participate in the command function. The only possible avenue of intervention took the form of directives of more or less organizational character -- the distribution of forces, for example: the withdrawal of the Air Landing Corps, the exchange of the I for the VIII Air Corps, the transfer of the Close-Support Corps to the south for direct air support operations with the Panzer Group von Kleist, the concentration of Luftwaffe units in preparation for the offensive operation at Dunkirk. These are a few of the most important instances of such intervention.

But even these measures, although initiated by the office

of the Commander in Chief, Luftwaffe, were not really originated by that agency but were rather the result

of agreements and directives emerging from the top echelon represented by the Wehrmacht High Command.

It would be inaccurate to reproach the office of the Commander in Chief, Luftwaffe, with lack of initiative on this account. In the higher sense of the command function, Luftwaffe leaders had deprived themselves of the initiative the moment they deviated from the original concept of strategic air warfare and accepted the principle of air support for the Army.

Renunciation of the command of a strategic air war -- and with it renunciation of all centralized command -- had the inevitable result that the Commander in Chief, Luftwaffe, now began to interfere in the minor details of command in the field, and this to an ever increasing degree. There was a repetition of the same sort of thing which had been noted during the campaign in Poland. We lack the documentary evidence to substantiate these statements with facts. Nevertheless, the "interminable excited discussions" between Göring and the Commander in Chief of the Second Air Fleet regarding the attack on Rotterdam[17] are an indication that the Reichsmarschall's tendency to interfere in trivial matters was early given its ~~reins~~ head. Although in this particular instance there may have been political factors and aspects of international law which really justified the concern of the Commander in Chief of the Luftwaffe, the author is able to confirm from personal experience that there were many occasions on which the Luftwaffe Operations Staff, acting on Göring's orders, displayed uncommon interest in the commitment of individual air units, down to squadron level. It is clear

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17 - Kesselring, op. cit., page 47.

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that this sort of thing is more likely to disrupt and confuse the orderly course of command than to promote it. The traditional principle that top-level command should carry out its function of leadership by means of delegating authority rather than by issuing specific operational orders was ignored more and more as time went on.

The day-by-day development of the overall operation, which proceeded much more rapidly than military leaders had anticipated, created a situation in which all attempts to intervene "from above" invariably came too late, since events had moved on in the meantime.

The real function of command was carried out by the Second and Third Air Fleets and by the VIII Air Corps, which had achieved a more or less independent status.

A comment made at that time by the former Chief of the Luftwaffe Operations Staff is indicative of the fact that the methods of command espoused by the Commander in Chief, Luftwaffe, were even then encountering a certain amount of resistance on the part of his top-level staff. General von Waldau's statement is as follows: "A command agency which arrogates to itself the right to decide trivial details in the complex machinery of a technical service branch is bound to eliminate itself completely in practice."[18] He continues, in an entry written on the day before the offensive started, "A complex technical military instrument cannot be expected to cope with last-minute changes in plan."[19]

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18 - Diary of General von Waldau, Chief of the Luftwaffe Operations Staff, entry dated 18 April 1940, thus before the beginning of the offensive (Karlsruhe Document Collection).

19 - Ibid.

Under these circumstances there was no opportunity for real strategic and tactical leadership on the part of the office of the Commander in Chief, Luftwaffe; thus its influence was concentrated in the activity of the Quartermaster General (Generalquartiermeister). The latter's administrative apparatus functioned smoothly and successfully overcame the difficulties created in troop replacement and supply delivery by the unexpectedly rapid progress of the advance. The occasional deficiencies in the personnel replacement system were due less to the inadequacy of the apparatus administered by the Quartermaster General than to faulty long-range planning on the part of Luftwaffe leaders. This in turn was the result of the orders issued by the Supreme Commander, orders dictated by political rather than military considerations.

As a matter of fact, the duties of the office of the Commander in Chief, Luftwaffe, were by no means restricted to the West. They also extended to the operation going on in Norway and to the overwater air war against England, closely connected with the Norwegian action. It was the task of the Commander in Chief to coordinate these operations with the campaign in the West, which -- in the last analysis, was only a part of the overall offensive against the British Isles.

The concept of the air war against England seemes to have been uppermost in the mind of the Commander in Chief, Luftwaffe, throughout the course of the operations in the West.

German military leaders had early recognized the importance of the Channel coast for the conduct of later operations against the British Isles. German occupation of the coast would mean

not only that England would have lost its advance base on the Continent as well as its lines of communication to the Continent,

but also that it would have become aware of the imminent threat to the safety of the British Isles.

Yet, in consequence of the shortsightedness of German air leaders, the instruments needed to carry out the subsequent attacks on the British homeland were simply not available. The first of these was a long-range bomber (the He-111 and the Ju-88 were inadequate), and the second a long-range fighter. It was not until later, however, that these planning errors on the part of the Luftwaffe top-level command were to become fully apparent.

Quite apart from these plans and deliberations pointing to the future, the Commander in Chief, Luftwaffe, tried once more -- during the last phase of Operation YELLOW -- to regain control over the command of the strategic air war. He was not successful in this attempt. The Dunkirk Interlude provides striking proof of this statement. We have already pointed out[20] how the Commander in Chief, Luftwaffe, gained approval from Hitler for his plan to have the Luftwaffe destroy the British Expeditionary Corps single-handedly. In any case, Hitler finally agreed, and the outcome is common knowledge.

But this -- clearly negative -- outcome was brought about by two instances of faulty command:

1) excessive demands upon the troops

2) dissipation of the available forces.

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20 - See Chapter IX of this study.

The first factor, the excessive demands made upon the troops, has already been discussed in detail[21].

The second, the dissipation of the available forces, requires additional comment. At the very moment when all available Luftwaffe units were being assembled for a concentrated blow on Dunkirk, a number of attacks were flown in wing strength on the shipping port of Marseille on 1 and 2 June. It is obvious that these forces, employed on the Mediterranean coast remote from the area in which the decisive conflict was taking place, were sorely missed at Dunkirk.

Apart from this, the large-scale attack on Dunkirk was broken off at the most critical point, because the totally exhausted, battle-weary bomber and fighter forces from both Air Fleets -- after having participated in the last attack on Dunkirk on 2 June -- had to prepare for the attack on the French aircraft and armament factories near Paris which was slated for 3 June. The latter attack was dictated far more by political considerations than by the tenets of military planning.

Thus the conduct of "strategic air warfare", as resumed by the Commander in Chief, Luftwaffe, contented itself with half-measures which dissipated the strength of the troops and brought no tangible success.

And this was the end of Operation YELLOW as far as the Luftwaffe was concerned.

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21 - See Chapter IX of this study in connection with the comments of the former Commander in Chief, Second Air Fleet (Kesselring, op. cit.).

H. Successes and Losses (Statistical Summary)

Successes and losses can be expressed in terms of statistics as well as in terms of prose narration.

Successes can be measured by the sum of the enemy aircraft brought down by one's own aircraft and antiaircraft artillery and the enemy aircraft destroyed on the ground, while losses are reflected in the official figures of aircraft lost as a result of enemy action.

It must be borne in mind, however, that such summaries may well represent a source of error; not only do the German summaries contradict those complied by the other side, but the source material on the German side alone contains a number of serious discrepancies and fails to clarify a number of points.

The reasons for this are primarily the following:

a) subjective errors in the reports submitted by the crews

b) the definition of the term "aircraft losses", and its various subdivisions: total losses on either side of the front, partial losses behind one's own front, temporary elimination from action of aircraft and crews, etc.

c) the criteria applied to "success" and "loss"; experience has shown that the crews tend to exaggerate the degree of success achieved against the enemy while minimizing the losses inflicted by the enemy

d) the purpose behind the compilation and publication of such a summary (propagandistic motivation).

Even the available official German documents, which will be dealt with below in some detail, are by no means free of the inaccuracies cited above. For this reason, all statistics are to be viewed with a certain amount of suspicion. The comparison of one set with another may perhaps result in a composite picture not too far removed from reality.

The available official documents pertaining to the number of enemy aircraft destroyed by the Luftwaffe and the number of aircraft admittedly lost by the Luftwaffe are listed below:[22]

1) Compilation and publication of Allied and German losses based on the reports of the Wehrmacht High Command from 10 to 31 May 1940.

As far as reliability is concerned, it must be admitted that a certain propagandistic tendency cannot be discounted and that, consequently, the reports submitted by the Commander in Chief, Luftwaffe, for daily editing and publication probably are not complete. In addition it must be borne in mind that the reports sometimes included the successes reported from the Norwegian theater of operations, without consistently identifying this source.

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22 - See Appendix 78 and the attached commentary thereto.

During the month of May, i.e. during the course of Operation YELLOW, the reports of the Wehrmacht High Command indicate that a total of 2,598 enemy aircraft were destroyed, the breakdown as follows:

945 destroyed in aerial combat,
304 destroyed by the antiaircraft artillery forces, and
1,349 destroyed on the ground.

The same source indicates that only 402 German aircraft were destroyed.

2) In addition, in the "Summary of the Employment of the Luftwaffe in the Operations in Holland, Belgium, and Northern France"[23], the Commander in Chief, Luftwaffe, presents still another set of figures, this time restricted to Operation YELLOW.

According to this -- indisputably official -- summary, during the period from 10 May through 31 May 1940 the following numbers of enemy aircraft were destroyed, "without doubt", as the report indicates:

1,094 destroyed in aerial combat,
631 destroyed by the antiaircraft artillery forces, and
1,005 destroyed on the ground

2,730 enemy aircraft destroyed.

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23 - Commander in Chief, Luftwaffe, Operations Staff, Intelligence, File No. 10641/40, Classified, dated 3 June 1940 (distributed to all Luftwaffe headquarters and to the Wehrmacht High Command).

The above figures do not include enemy aircraft destroyed in their hangars, which, in any case, would be very difficult to estimate with any degree of accuracy. Comparison with the reports of the Wehrmacht High Command reveals that the "Summary" is slightly higher in the total number of enemy aircraft destroyed, but considerably lower in the number of aircraft destroyed on the ground.

3) The "Report of the German Wehrmacht High Command after Conclusion of the Fighting at Flanders and Artois" (Bericht des deutschen Oberkommandos der Wehrmacht nach Abschluss der Kämpfe in Flandern und in Artois), published by the Führer Headquarters on 4 June 1940, brings still another, even higher set of figures. This discrepancy can be explained by the fact that this report almost certainly contains at least a part of the figures pertaining to the operation at Dunkirk.

According to this source, during the period from 10 May through 3 June 1940 a total of 1,841 enemy aircraft were shot down (1,142 in aerial combat and 699 by antiaircraft artillery), and at least 1,600 to 1,700 "destroyed on the ground".

This would mean a total of:

1,841 aircraft shot down

+ 1,650 aircraft destroyed on the ground (the average between the figures given above)

3,491 enemy aircraft destroyed

The report indicates German aircraft losses as 432.

The reports described above were limited to Operation

YELLOW. Unfortunately we have no comparable source material pertaining to

the following phase, Operation RED. There are, however, a number of summaries which cover the entire period of the offensive in the West. Although there are gaps in these summaries, they may be useful and interesting for purposes of comparison with the figures already cited for May 1940. The following have been selected:

4) "Losses in Combat Aircraft" during the period from April through June 1940:[24]

According to this summary, the following aircraft were lost during the period covered:

close-range reconnaissance aircraft	231
long-range reconnaissance aircraft	106
single-engine fighter aircraft	579
twin-engine fighter aircraft	216
bomber aircraft	976
dive-bombet and close-support aircraft	187
transport aircraft	242
naval aircraft	90
courier aircraft	76
TOTAL:	2,694[25]

Even after deducting the following:

a) losses suffered in Norway from April through June,

b) losses suffered in transport, naval, and courier aircraft (a total of 608), and

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24 - Based on the documents of Branch VI, Luftwaffe High Command; these documents are dated 17 June 1945, thus after the end of the war (photostatic copy in the Karlsruhe Document Collection).

25 - The photostatic copy mentioned in Footnote 24 gives the total as 2,784 aircraft; this is apparently an error in addition in the source.

+ - Translator's Note: Editor, please check! I get a total of 2,703 instead of either 2,694 or 2,784! Also the total of "transport, naval, and courier aircraft" cannot possibly be 608 as indicated!

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c) the losses contained in the above table but pertaining to aircraft assigned directly to the offices of the Luftwaffe General, Army High Command, and the Luftwaffe General, Navy High Command,

we would be left with a considerably higher figure of losses for the "strategic" Luftwaffe than was given in any of the sources cited under 1), 2), or 3), above.

5) In conclusion, again for purposes of comparison with the figures cited above, let us refer to one more summary, an excerpt from "German Aircraft Losses" (Die deutschen Flugzeugverluste) from 1939 to 1944[26].

According to this summary, during the period from 10 May through 1 July 1940 (thus during the entire course of the offensive in the West) the following "combat aircraft"[27] were lost. "Lost" in this case refers to anything from 10% damage to total loss; the losses incurred in Norway are included.

bomber aircraft	635
dive-bomber and close-support aircraft	147
single-engine and twin-engine fighter aircraft	457
Total:	1,239 aircraft.

26 - Based on documents prepared by Branch VI (Quartermaster) of the Luftwaffe General Staff (according to a summary contained in the Karlsruhe Document Collection).

27 - What is meant is obviously those aircraft capable of being employed in operations at the front.

Summary and Evaluation

All the above figures, regardless of whether they refer to German successes or to German losses, are contradictory. It is absolutely impossible to reduce them to any common denominator.

Nor is it even possible to define what this common denominator should be -- at least not on the basis of the available source material -- as long as we are not in a position to define the criteria applied in each individual case.

In addition to the factors which we have already mentioned, the chief sources of error would seem to lie in the following (in respect to both "successes" and "losses"):

1) lack of differentiation between "combat aircraft" and other aircraft, and

2) lack of uniformity in defining the concept of "loss"; does it refer to the total destruction of an aircraft? on which side of the front? does it mean the loss of and aircraft, or an aircraft together with its crew? does it take into account the time required to make those repairs necessary to fit the aircraft for renewed employment? etc.

It can be assumed that the official German reports of German aircraft losses refer almost exclusively to total losses on the other side of the front, in other words that they include those aircraft listed as "missing". (It is only the summary cited under 5), above, which includes the percentage of damage.)[28]

As far as enemy losses are concerned, it would seem that

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28 - In this context, the reader is referred to the commentary which accompanies Appendix 78.

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the "Summary" prepared by the office of the Commander in Chief, Luftwaffe (see 2), above) is, after all, the most reliable, since it does not take into account the aircraft destroyed inside the hangars -- a factor which, in any case, is not subject to verification.

According to the Commander in Chief, Luftwaffe, then, and disregarding the many potential sources of error, Operation YELLOW resulted in the destruction "without doubt" of 2,730 enemy aircraft.

This still does not answer the question of whether the enemy can possibly have had that many serviceable aircraft at his disposal in May 1940!

In combination with the figure arrived at by the Commander in Chief, Luftwaffe, the summary derived from the reports of the Wehrmacht High Command is of interest in that it reveals the following progressive trends (Appendix 78):

1) the curve referring to enemy losses shows that the period of concentration on the struggle to eliminate the Allied air forces occurred during the first few days of the offensive; once air supremacy had been achieved, the curve began to go downhill, irregularly at first, but nonetheless unmistakably.
2) the curve referring to German aircraft losses reveals a comparable development.

All in all -- it seems impossible to reach a definitive conclusion regarding German materiel losses. It seems highly probable that the figures given in the sources we have cited refer to total losses occurring behind the enemy front.

As far as Operation YELLOW is concerned, these losses seem to be relatively slight, regardless of which source we select. On the other hand, we must not lose sight of the fact that Operation YELLOW was to be followed by an action characterized by extremely high German losses -- the Dunkirk Interlude.

The investigation of personnel losses is not nearly so difficult. Here we have authentic documents available, which provide information not only on actual personnel losses but also on the overall personnel situation at that time.

These statistics are presented below.

Losses in Flying Personnel during the Course of May 1940 (Operation YELLOW)

(excluding Norway)

Legend:

Column A refers to the total number of flying personnel listed as dead, missing, or wounded.

Column B refers to the numger of casualties (already included in the figures given in Column A) attributable to aerial combat or enemy activity.

Columns A and B - the figures in parentheses refer to the number of officers lost (already included in the total figures).

Period	Dead		Missing		Wounded	
	A	B	A	B	A	B
10 May thru 20 May	177 (30)	140 (25)	1414 (222)	1414 (222)	358 (50)	333 (46)
21 May thru 31 May	340 (66)	290 (19)	387 (63)	387 (63)	photostatic copy illegible	
TOTALS:	517 (96)	430 (44)	1803 (285)	1803 (285)	evaluation impossible	

The following remarks are important to the accurate evaluation of the foregoing table:

1) The figures are based on the so-called "10-day reports of the Luftwaffe to the Wehrmacht High Command" (10-Tage-Meldungen der Luftwaffe an OKW.)[29]. These reports were intended for internal circulation only; copies were forwarded to the Führer's adjutants and to a few top-level Luftwaffe headquarters. In other words, they were to be treated as confidential, which serves to increase their value from the point of view of reliability.

   The figures contained in the foregoing table have been compiled by the author on the basis of the "10-day reports" referring to the total losses suffered by the Luftwaffe (including ground personnel, antiaircraft artillery personnel, and signal communications personnel). The figures included in the table, however, refer only to flying personnel.

2) The table makes a distinction between the total number of dead, missing, and wounded (Column A) and the number of dead, missing, and wounded attributable to enemy activity (Column B).

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29 - The figures for the first ten days are based on: Commander in Chief, Luftwaffe, General Staff, Quartermaster General, Branch VI, No. 2532/40, Classified (IA), dated 12 May 1940. The Figures for the next ten days are based on: Commander in Chief, Luftwaffe, General Staff, Quartermaster General, Branch VI, No. 2822/40, Classified (IA), dated 3 June 1940.

The difference between the two sets of figures is explained by aircraft accidents in the operational area and in the home area (at schools, in training units, personnel replacement units, etc.). The number of such accidents seems to have been quite high.

In connection with the present study we are interested primarily in the losses attributable to aerial combat or enemy activity (Column B). As distinguished from aerial combat, enemy activity presumably refers to losses sustained on the ground as a result of enemy bombardment or fire from enemy airborne armaments. These losses were relatively slight.

3) The only tangible clue to actual losses is provided by the "missing" column. The figures for the first ten days are extremely high; those for the next ten days relatively low.

Even so, these figures (1,414 for the first ten days, 387 for the following ten days) do not permit any conclusions as to the number of aircraft missing. For from the single-seater Me-109 to the He-111 with a crew of four, all aircraft models were included in the loss statistics.

Be that as it may, the loss of more than 1,800 flying personnel, listed as missing, made a serious inroad in Luftwaffe strength during these three weeks alone. These were the "total losses" behind the enemy front which have been mentioned so often.

4) Apart from losses sustained in the home area, the number of dead and wounded could be confirmed only when

aircraft returned from the front with dead and wounded on board. These figures give us no clue whatever to the number and type of aircraft damaged.

5) The losses in officer personnel seem especially high. Since there is no information available as to the ratio of officer to enlisted personnel in the flying crews, it is impossible to calculate officer losses in terms of a percentage of the total losses.

6) Of special interest is the commentary prepared by the office of the Commander in Chief, Luftwaffe, to accompany his statistical summary. The following statement is made in connection with the first 10-day report (10 - 20 May), referring to "flying personnel":

> "At the present time, only the aerial reconnaissance units -- and these only to a certain degree -- are in a position to make up the losses incurred with trained personnel.
>
> The fighter units have only very young, inexperienced pilots at their disposal, and the bomber units only a small number of inexperienced crews."

And the 10-day report for the second period is accompanied by the following remark:

> "A fairly large group of flying personnel will be released from the schools in the near future; the breakdown is as follows:
>
> bomber crews with instrument flight training 166
>
> dive-bomber crews 40
>
> fighter pilots 60-70.

These crews are not enough to fill all the vacancies in the bomber units and thus bring them up to authorized strength, especially in view of the fact that the crews are young and need further training. On the average, however, there are more crews available at the front than serviceable aircraft."

So much for the Commander in Chief, Luftwaffe. His remarks permit the following three conclusions:

a) that the Luftwaffe personnel situation had become critical as early as during the course of Operation YELLOW; that the replacement personnel available to make up the losses were inadequate in terms of both number and training standard;

b) that, during the same period, the aircraft situation at the front had become so serious that -- despite the shortage in personnel -- there were no longer sufficient serviceable aircraft on hand; and

c) that the Luftwaffe would be going into the air battle at Dunkirk, into Operation RED, and into the later Battle of Britain with gravely depleted forces. For even if it proved possible to make up the losses quantitatively within a relatively short time, the quality would remain inadequate. Operation YELLOW had used up the best crews.

Conclusions such as these tell us more than all the -- doubtful -- statistics on German aircraft losses put together.

I. The Employment of the Luftwaffe against Enemy Naval Targets

The conduct of the over-water air war represented a special sector of the overall military planning and the overall conduct of operations.

The brunt of operations was borne by the X Air Corps, which not only provided air support for the ground operations in Norway, but also carried out the over-water air war against England in the operational area extending from the southern part of the North Sea to the Firth of Forth in the northernmost part of the British Isles.

In addition, the 9th Air Division (later the IX Air Corps) also carried out over-water air operations, first under the direct command of the office of the Commander in Chief, Luftwaffe, and then, after 23 May, under the command of the Second Air Fleet. The primary mission of the 9th Air Division consisted in laying mines from the air in the Channel waters along the eastern coast of England. Its secondary mission was the bombardment of targets in the Channel and along the Channel coast.

The Second Air Fleet, more specifically its IV Air Corps, also played a role in the conduct of air operations against naval targets. And it is the commitment of this particular element of the strategic Luftwaffe during Operation YELLOW which interests us in the present context.

It is clear that the commitment of the three troop elements mentioned above against England were integral parts of a unified plan worked out by the office of the Commander in Chief, Luftwaffe. There is no documentary evidence for such a plan. Thus we are restricted to examining the missions of those Luftwaffe units which

combined employment against enemy naval targets with simultaneous employment in indirect air support operations on behalf of the Army.

This combination was completely new and completely unique in the history of the conduct of air operations.

In the preceding ch-apters we have seen again and again how the Second Air Fleet was forced to detail large elements of its forces to uninterrupted attacks on enemy naval targets.

Let us now turn our attention to the question of what success -- tangible or presumable -- the Second Air Fleet achieved in the accomplishment of this mission, a mission which was bound to weaken the Air Fleet for its primary task of providing air support for operations on the ground.

The following pages contain two summaries:

1) The Employment of the Luftwaffe against Enemy Shipping in the Channel and against Enemy Ports Located on the Channel -- based on the reports of the Wehrmacht High Command for the period 11 - 31 May 1940.

2) A Comparison of the Summaries of Successes Achieved against Enemy Naval Targets Prepared at the Same Time by the Commander in Chief of the Luftwaffe and by the Wehrmacht High Command.

The Employment of the Luftwaffe against Enemy Shipping in the Channel and against Enemy Ports Located on the Channel

(based on the reports of the Wehrmacht High Command)

Report Dated:	Area and Target	Warships Sunk	Warships Damaged	Merchant Ships Sunk	Merchant Ships Damaged
11 May	Between Calais and Dunkirk	-	-	2 (7000 T.)	-
12 May	Belgian-Dutch coast; naval units, transport ships, unloading activity	-	1 destroyer	-	3 trspts, 1 tanker
13 May	Off the Dutch coast	1 cruiser	1 cruiser	1 trspt (15000 T.)	7
15 May	Off the Dutch coast	2 cruisers, 1 destroyer	1 cruiser	1 (29000 T.), 4 trspts	-
16 May	Off the Belgian-Dutch coast	2 destroyers	2 destroyers	2 + 1 (12000 T.)	4
17 May	a) Off the Dutch-Belgian coast	1 cruiser, 1 gunboat	2 destroyers	1 trspt	-
	b) Off Dunkirk, in Dunkirk harbor	1 destroyer	1 cruiser	-	1
18 May	Off the Belgian-Dutch coast	1 destroyer	-	-	-

Report Dated:	Area and Target	Warships Sunk	Warships Damaged	Merchant Ships Sunk	Merchant Ships Damaged
19 May	Off the French-Belgian coast	-	1 destroyer	1 (6000 T,)	-
20 May	Off the French-Belgian coast	2 destroyers	1 destroyer, 1 gunboat	-	3 (15000 T.)
21 May	Off the French coast	-	1 destroyer	-	1 tanker, 3 freighters
22 May	a) Harbors of Ostende, Dunkirk, Calais, Boulogne, and Dieppe	1 cruiser	-	11	several
	b) Belgian harbors and off Belgian coast	-	-	-	-
23 May	Channel coast	-	1 destroyer	3 (20000 T.)	-
24 May	Channel coast off Boulogne	-	1 cruiser, 1 destroyer	6 loaded trspts	-
25 May	Coast of Belgium and northern France, in Belgian and French Channel ports	2 destroyers	-	7 (20000 T.)	-
26 May	a) Harbors of Zeebrügge, Ostende, and Dunkirk	-	-	-	1 trspt (10000 T), 2 smaller ones
	b) Off the coast of Calais	-	1 battleship	-	-

Report Dated:	Area and Target	Warships Sunk	Warships Damaged	Merchant Ships Sunk	Merchant Ships Damaged
28 May	Between Calais and Dover	-	1 destroyer	-	-
29 May	Channel off the Belgian-French coast	-	3 destroyers	-	2 trspts, 2 freighters
30 May	Dunkirk	3 battleships	10 battleships	16 trspts	21 trspts
31 May and 1 Jun	Dunkirk	-	3 cruisers	5 trapts	10 (total of 70000 T.)

Evaluation of the Preceding Statistics:

1) The above summary was compiled on the basis of the reports of the Wehrmacht High Command for the period from 11 through 31 May. It contains only the number of enemy ships lost as reported by the Luftwaffe; thus it does not include enemy ships sunk or damaged by the German Navy.

2) The purpose of the summary is to illustrate the intensity of the almost continuous commitment of the Luftwaffe against enemy shipping and enemy port installations on the Channel while Operation YELLOW was in progress, a commitment which had to be carried out in addition to and concurrent with the providing of air support for the Army. This is proof of the fact that German leaders had realized the strategic significance of these naval targets from the very beginning.

3) The figures given for sunk or damaged enemy warships and merchant ships are of minor significance in this connection, particularly in view of the fact that their accuracy is suspect. For experience has shown that the reports submitted on successes against naval targets by pilots accustomed to flying over-land aircraft only were often based on subjective assumptions. This was especially true at the beginning of the campaign, before these pilots, who had had no training whatsoever in the field, acquired the necessary experience.

4) Chronologically, the summary laps over into the next phase, the air battle of Dunkirk, and closes with the peak achieved in that battle. It does not include the later reports on successes achieved at Dunkirk.

Chapter X of this study, "Dunkirk - an Interlude", provides the necessary supplement to the above table.

5) In the light of experience, it must be admitted that the Wehrmacht High Command reports upon which the summary is based cannot be accepted as completely reliable source documents. Under the circumstances, however, they do fulfill the purpose at hand -- to prove that German conduct of long-range air operations was systematic and characterized by continuity.

The second purpose of our investigation is to form an opinion as to the scope of success achieved by the Luftwaffe in terms of sunk and damaged enemy warships and merchant vessels, including transport ships.

Authentically documented sources, such as would have been represented by the situation reports of the Commander in Chief, Luftwaffe, for example, are completely lacking. Thus our only recourse is to try to piece together the more concrete data contained in the concluding reports issued by the Wehrmacht High Command and the office of the Commander in Chief, Luftwaffe, on Operation YELLOW and to do our best to achieve an objective comparison of them.

On the other hand, comparison is only possible to a certain extent, since the preceding summary was limited to the Channel area, while the following compilations include the southern part of the North Sea, at least as far as the Luftwaffe is concerned. In addition, the preceding summary closes with the conclusion of Operation YELLOW, while the concluding reports of the Wehrmacht High Command and the office of the Commander in Chief, Luftwaffe, include the "Dunkirk Interlude" in its entirety, as well.

Nevertheless the summary which follows can provide a point of departure for evaluating the overall success of the strategic Luftwaffe in its commitment against enemy naval targets during the first phase of the campaign in the West.

A Comparison of the Summaries of Successes Achieved against Enemy Naval Targets Prepared at the Same Time by the Commander in Chief of the Luftwaffe and by the Wehrmacht High Command[30]

Type of Vessel Attacked	Wehrmacht High Command	C in C, Luftwaffe
Enemy Warships Sunk	5 cruisers 7 destroyers 3 submarines 9 other = 24	29 warships and auxiliary vessels, totalling 62,887 tons
Enemy Warships Damaged	10 cruisers 24 destroyers 3 torpedo boats 22 other = 59	60 warships and auxiliary vessels, totalling 186,825 tons
Enemy Merchant Ships Sunk	66 merchant ships and transport vessels	94 merchant ships, totalling 464,742 tons
Enemy Merchant Ships Damaged	117 merchant ships and transport vessels	114 merchant ships, totalling 403,320 tons 29 of this number, totalling roughly 105,000 tons, are assumed to have been destroyed, so that the first figure, above, would be 143 ships, with a total tonnage of 570,000

30 - The Wehrmacht High Command statistics are taken from the Report of the German Wehrmacht High Command after Conclusion of the Fighting at Flanders and Artois (Bericht des deutschen Oberkommandos der Wehrmacht nach Abschluss der Kämpfe in Flandern und Artois), published by the Führer Headquarters, 4 June 1940.

The statistics of the Commander in Chief, Luftwaffe, are taken from the report: "Commander in Chief, Luftwaffe, Operations Staff, Intelligence, File No. 10641/40, Classified, dated 3 June 1940".

The following comments seem appropriate in connection with the foregoing comparison of summaries:

1) The statistics of the Wehrmacht High Command clearly include the enemy ships lost during the "attempt to evacuate the British Expeditionary Corps with the aid of warships and merchant vessels". They cover the period from 10 May through 3 June, thus one day more than the statistics of the Commander in Chief, Luftwaffe. This is a discrepancy which is probably not very significant in view of the length of the period involved and the overall figures given.

2) The statistics of the Commander in Chief, Luftwaffe, are defined as "successes achieved by the Luftwaffe in employment against naval targets in the southern waters of the North Sea and in the Channel area", and cover the period from 10 May through 2 June 1940.

   The computation of the total number of merchant vessels destroyed is obviously wrong; 94 plus 29 equals 123, and not 143.

   Dunkirk is not specifically mentioned; yet it can be assumed with certainty that the report includes Allied shipping losses through 2 June.

3) The two sets of statistics are based on the same concept and criteria; thus there is no reason why they should not be compared.

   For this reason, the discrepancies and contradidions are all the more conspicuous. Nor can any explanation be found for them at the present time, the less so as

one must suppose that the two sets of figures must have been adjusted

prior to publication, since the summary of the Wehrmacht High Command was presumably based on the data submitted by the office of the Commander in Chief, Luftwaffe.

4) The computation of tonnage in the statistics provided by the Commander in Chief, Luftwaffe, leads us to doubt the reliability of the figures concerned. For it is absolutely impossible that pilots with so little training in over-water operations should have been able to estimate the capacity of the sunk or damaged enemy ships to within one ton. These figures must be viewed as highly exaggerated.

5) Consequently, our balance-sheet for the conduct of air operations against naval targets during Operation YELLOW must close on an uncertain, and therefore unsatisfactory note.

The danger inherent in a positive balance-sheet of this kind is, of course, that top-level military leaders may accept the statistics as perfectly accurate, as Germany's leaders did in this case; as a result, their deliberations and decisions on future operations were based on -- a fiction.

It is in order to point out the danger of such a development that our investigation of this aspect of operations has been so thorough.

Chapter XII

Concluding Remarks

This study in military history, covering the employment of the strategic Luftwaffe during the first phase of the offensive in the West in 1940, i.e. during Operation YELLOW, has now -- for the time being at least -- reached its conclusion. During the course of its preparation, it has become more and more apparent that it was developing into a torso without the appropriate appendages. The reasons for this development have been mentioned on several occasions in the preceding chapters.

And there is no doubt that it has ended as a torso as well. For I have been unable to elaborate the individual sections of the concluding chapter (Chapter XI) as I had planned. This is particularly true of the last two subsections of Chapter XI, which -- for the most part -- are composed of statistics and their evaluation. These statistical studies, completed at a relatively early stage, were originally intended to be no more than preliminary source material, to provide the basis for more detailed treatment of the operational aspects reflected in them.

Since this detailed treatment proved to be impracticable, the preliminary studies themselves have been included in place of the planned elaborations. This was done in order to permit the results of the preliminary investigations to be

evaluated and thus to play at least a secondary role in the conclusions discussed in the last chapter.

Apart from these deficiencies -- freely acknowledged by the author -- in the handling of certain aspects, there are a number of aspects which have not been considered at all, aspects which should have been covered if the study is to be viewed as a complete treatise on the employment of the strategic Luftwaffe.

From the very beginning, the introduction and elaboration of these aspects had to be eschewed, if the underlying purpose of the study was to be realized -- namely to point out the strategic significance of the employment of the Luftwaffe, both in the operations of the so-called strategic air war and in the missions dictated by the principle of cooperation with the Army. This purpose inevitably precluded the treatment of certain other, important aspects.

Before bringing the study to an end, we shall try to mention -- very briefly -- those aspects of operations which have not yet been dealt with or which have been inadequately dealt with.

1) The commitment of the fighter forces, specifically the units of the Fighter Commander 2 and the Fighter Commander 3.

The commitment of the fighter units has been mentioned only in relation to the overall mission of the Luftwaffe. No attempt has been made to formulate the body of experience gained and the conclusions drawn from the employment of the single-engine and twin-engine fighter units, or to evaluate the effectiveness of their tactical methods or their technical equipment.

2) Tactical and strategic aerial reconnaissance.

We have, in another context, referred to the importance of tactical and strategic aerial reconnaissance and have mentioned the contributions made by the reconnaissance units to the day-by-day conduct of operations. No mention has been made, however, of the confusion which prevailed at that time in the field of aerial reconnaissance or of the need for a clear delineation of missions and areas of responsibility by both Luftwaffe and Army headquarters.

3) The organization of the meteorological service.

The organization and activity of the meteorological service were of tremendous importance to both air and ground operations, especially in the West. For, in contrast to the campaigns which had gone before, the weather was a determining factor both in the establishment of operational deadlines and in the accomplishment of the operations themselves.

There is a definite need for a study on what possession of the Channel coast might have meant in terms of weather forecasting for the operational area represented by the British Isles.

4) The employment of the Luftwaffe signal communications forces as an instrument of command.

Unlike the study on the "Campaign in Poland in 1939" (Polenfeldzug 1939), which dealt exhaustively with the organization and commitment of the Luftwaffe signal communications forces, the present study has made no mention of these forces, although their activity was of great significance to the rapid conduct of operations in the West.

5) The over-water air war.

This subject could be dealt with only insofar as it was closely connected with the ground operations of Operation YELLOW. And this meant almost exclusively the commitment of the IV Air Corps.

It has been treated, however, in its overall context in a special study, which was intended as a part of this study on the campaign in the West. For the moment, we must content ourselves with referring the reader to this special study -- "Die Geschichte des F.D. Luft, der 9. Flieger-Division und des IX, Flieger-Korps von der Aufstellung dieser Kommandostellen bis zur Wende der Kriegsjahre 1940/41" (The History of the Air Commander‡, the 9th Air Division, and the IX Air Corps from the Date of their Establishment until the Turning-Point of the War, 1940/41), by Colonel (GSC) W. Gaul. It can be found in the Karlsruhe Document Collection.

6) The employment of the 9th Air Division.

Although the special study cited above does concern itself with the commitment of this specialized Division in mine-laying activity, the present study might have been enriched by an account of the coordination between this Division and the Second Air Fleet in the conduct of aerial warfare over the Channel area.

7) The problems of logistics and supply.

These problems could only be touched upon in the present study. Yet the solution of these problems was of paramount importance to the successful outcome of overall operations,

particularly in view of the rapidity with which events moved during the campaigh in the West.

+ - Translator's Note: Please see also Footnote 12 on page 262.

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8) The establishment of a ground organization in territory seized from the enemy.

The ground organization was a sine qua non for the rapidly shifting employment of both offensive and defensive air units towards the West. This study contains no information as to its establishment, organization, or method of operation.

9) Home air defense operations.

In the last analysis, the home air defense system was also a part of the "strategic Luftwaffe", since the Second and Third Air Fleets were responsible not only for the conduct of the air offensive, but also for the provision of defenses against enemy air activity deep in their respective rear areas. For at that time, the Reich did not yet have an independent and self-contained air defense force.

10) The units assigned to the Luftwaffe General, office of the Commander in Chief, Army, and the Luftwaffe General, office of the Commander in Chief, Navy.

The employment of these units has been ignored entirely, inasmuch as they were not a part of the "strategic Luftwaffe", despite the fact that their missions were often intimately connected with the overall planning of the Luftwaffe.

Actually, a separate, comprehensive study ought to be devoted to the sometimes inextricably interwoven interrelationship existing between strategy and tactics on the ground and in the air and to the problems arising out of the need for highly qualified person-

nel and up-to-the-minute technological development -- factors which cannot be separated from such a highly technical weapon as an air force. Within the framework of the present assignment, however, full treatment was not feasible, partly because of insufficient time, but primarily because of inadequate source material.

In contrast to the situation as far as Army records are concerned, the source material situation in the Luftwaffe has so far proved to be inadequate.

The collaboration between the author and the Army, i.e. those former Army members engaged in preserving the record of Army operations, has shown that as far as the Army is concerned, all the prerequisites are given for a comprehensive and -- above all -- accurate account of operations.

Above all, the Army had almost all the original documents at its disposal for its study on the campaign in the West -- directives and operational orders, reports and appraisals of effectiveness, war diaries and situation maps. To clinch the significance of this statement, let us stress once more that in the case of the Luftwaffe, there was not a single original document available.

The following must also be borne in mind: the two studies, one by the Army and one by the Luftwaffe, were prepared at the same time. Thus there was no opportunity to compare the finished studies -- which would have been extremely useful -- or, for example, to utilize the Army study as a basis for the Luftwaffe one.

Consequently, the author of the present Luftwaffe study had no alternative but to investigate personally the development of the Army operations and to describe them in sufficient detail to enable the reader to follow intelligently the Luftwaffe operations carried out in direct or indirect support of the Army.

For this reason it is quite possible that this study may contain inaccurate references to or evaluations of Army operations, defects which cannot be recognized or corrected until the Army study is available.

There is still another difference between the two studies.

The historical examination of ground operations is based not only on century-old tradition and experience. Today, as well, the criterion of such an examination is provided by the relatively slow -- in point of time -- pace of developments, developments which can be reconstructed, presented in visual form, and followed on the map from one day to the next or even from one hour to the next. A line of combat established ahead of or behind the original starting line is visible proof of the success or failure of a tactical action or operation. The employment of large-scale panzer units has done nothing to change this; it has merely accelerated the pace somewhat.

Thus all that was necessary was to point out the general differences between the old weapon and the new. The preceding chapters have attempted to do this.

If, at the close of this investigation, we were to formulate the decisive results of the air operations carried out within the framework of Operation YELLOW, we might do so in the following sentences:

German air leaders had renounced the possibility of conducting a genuinely strategic air war in favor of the tactical commitment of their forces. By providing direct and indirect air support for the Army, the Luftwaffe played a decisive role in facilitating, accelerating, and shortening the duration of Army operations on the ground.

It cannot be denied that the Luftwaffe was a determining factor in the successful outcome of the blitzkrieg. But this blitzkrieg was destined to be the last of its kind. This particular recipe for success had lost its effectiveness for the future; the prerequisites necessary to its application existed for the last time in the West in 1940.

Operation YELLOW had become a criterion in the question whether the conduct of air warfare could and should continue according to the tried and true principles hitherto applied. Top-level Luftwaffe leaders apparently believed that it should.

It was not within the purview of this study to investigate the repercussions which this misguided decision had for the future. In one or two places, we have alluded to a number of these repercussions which

could -- and should -- have been foreseen on the basis of the experience gathered.

This history of the conduct of the offensive in the West has attempted to draw a number of conclusions which, in the light of the experience of the future, will clearly reveal the mistakes of the past.