

*Designer's Notes  
and Campaign Analysis*

# **France 1940**





# Designer's Notes

A game is not like a book. A game can talk back. For this reason we give the game's designer a chance to talk back also. What he had in mind, and what the game says to some people may not always be the same. And, finally, there is the problem of figuring out just what the game is supposed to be saying. That's what we're going to try to do here.

First, it is necessary to explain some general background on why **France, 1940** was designed. The subject has always been a popular one. The campaign was, after all, the first real test of the "blitzkrieg". But it was a rather one-sided test. The Germans smashed the Allied armies so decisively that they did not have to face a large "western" army again for three years. Most people assume that, because of the magnitude of the German victory, the Allied armies in 1940 didn't stand much of a chance. That's a fairly correct assumption. And that was the main reason why it took so long for a game on this period to appear.

However, it was only a matter of time before we were able to develop the design techniques that would enable us to handle the subject. Along with these new techniques we had to also develop historical material on the campaign which would enable us to make a playable game out of it. Much of our historical material is included in the **Fall of France** article. How this material worked its way into the games is something else again.

When developing a game certain decisions must be made before you can go any further. First you have to define the time and space factors. This means, in plain English, what scale the playing board will be, how much "real time" each game turn will consume and what size units the playing pieces will represent. Even at this point we had to make some unorthodox decisions. For one thing, we did not include the entire campaign area. The "Rhine Front" (the Alsace-Lorraine area, for the most part) was left out. This was done for two reasons. For one thing, not much (of military importance) could (or did) take place in this area. Also, in order to realistically re-create the effect of motorized units making, and exploiting, holes in the front line, a small scale was needed. To include the Alsace-Lorraine area would have meant a scale of 1:1,000,000. By

using the scale we finally adopted we got that down to 1:660,000. In other words, the scale went from 16 kilometers per hexagon to ten. So much for that problem. This taken care of, many other aspects of the game had to be designed around this "constant".

The size of the military units represented in the game is largely determined by the scale of the playing board. By using zones of control this gives a maximum "front" for one unit of 30 kms. This, oddly enough, just happens to be the frontage allocated to a corps (of three divisions) during that period. That solved a lot of problems, because to do the game on the divisional level would have meant over a hundred units for each side. Even though the corps of all the armies varied somewhat, we found it possible to get away with using "standard" corps. Each corps-size unit (with certain exceptions, such as Dutch, Belgian and some British corps) is assigned three infantry divisions. The motorized units, however, required special handling. These were much less numerous than the infantry (non-motorized) divisions and were used much more flexibly (that is, independently). In particular, a motorized corps had to be capable of spreading its divisions out once behind the enemy front. Therefore, it was quite obvious that the mobile divisions could not be used as corps-size units, they **had** to be division size.

Next came a rather complex problem, the determination of the "combat strength" of the units. Normally, when designing a game, you can determine the combat strength of units simply by "counting rifles" (and making allowances for critical non-material factors also). After that you can make changes in the combat strengths according to how the game prototype develops. This is known as the "Letting-the-Game-Design-Itself" technique. The game model really isn't doing that much work. All you're doing is using the inherent "feedback" principle in a game to gain additional information. This is what a game is really meant to do; "feedback" data so that the game may be further modified. Published games are simply games that are frozen in their development so that people can play them for the historical information they contain, or simply as entertainment. Getting back to our "educational" use of the games, we soon



found that the infantry units were undervalued (or the motorized units overvalued, take your pick). We went through two completely new sets of "combat strengths" plus numerous changes on certain key units. The German armored divisions, for example, went through many changes (as did, to a lesser extent, the Allied armored and motorized units). First, we had to determine what the exact relationship was between the armored vehicles and more conventional weaponry. We already had considerable information on "conventional" (for the period) organization and weapons. This as a result of the work on the "1914" game as well as a later "1918" game (published by another company). Motorization and armored vehicles were something else again. The best way of determining their effectiveness was to simply set the prototype game up and play it out. We soon discovered (after double-checking our results with the historical record, such as it was) that the position of armored and motorized units was not as simple and straightforward as it appeared. Armored and motorized units were, by virtue of the greater carrying capacity of their engine-driven vehicles (as opposed to horse-drawn transport in the regular infantry units), capable of generating considerably more firepower, man-for-man, than regular infantry units. But it appears that this was not their primary asset. What made the motorized units (with or without armored vehicles) decisive was their **speed**. This speed varied. In the German armed forces, the tanks were built so that they had sufficient speed to keep up with the trucks. In many Allied armored units, the tanks were built with only infantry support in mind. Not only were the engines of the Allied tanks smaller (proportionately) than their German counterparts, but their gear trains (and other components of the running gear) were not designed for rapid road movement. The Allies intended most of their tanks to move no faster than infantry could walk, and designed their vehicles accordingly.

This accounts for the slowness of many of the Allied armored divisions. The Allies did attempt to form armored divisions on the German model, but their tank industry was already behind the Germans in their ability to build "fast" tanks (the Russians and Americans, it should be noted, were not, and one of the most efficient "fast" tank running gear mechanisms was invented by an American, Walter Christie, and was used most widely and effectively by the Russians). Even with the enormous speed of motor vehicles, the speed of motorized units was not that much greater than "foot" divisions (using horse drawn transport). This is reflected in the game. German

motorized units can move sixteen hexes a turn, "foot" infantry can move only six. Of course this speed must be reflected in other ways than just in crossing distances. Motorized units could also close with and engage enemy units more quickly. They could also break off contact with enemy units more quickly and also filter (infiltrate) past overextended enemy units. Motorized units were, therefore, the latest proof of the Napoleonic maxim of "Mass times velocity equals impact". Napoleon coined the phrase and used this method, as did many successful armies before him.

Many things made the 1940 campaign unique. One of the most obvious factors was the disparity between the Allied and German armies. The Germans won a quick and relatively "cheap" victory. One question we had to answer while designing the game was "how cheap". The traditional explanation for the massive German victory in 1940 was, in addition to their generally superior army, the march of the German motorized forces through the Ardennes and across the Allied rear to the Channel coast. This move did, in fact, give the Germans a great victory. But as with most great victories, it was the result of negative factors (the stupidity of the Allied high command in leaving the Ardennes lightly defended, etc.) as well as positive ones (the superior German motorized forces). But in an historical game it is highly unlikely that you will find an Allied player as stupid as the original Allied commander.

This, of course, forces us to consider the alternatives. It also forces us to face the possible alternatives. In the end, it impels us to reach a conclusion as to what would happen if the Allies had not been as stupid as they originally were. Many historians claim (or suspect, depending on how much they want to commit themselves) that the Allies could have stopped the Germans if only they hadn't let themselves be outmaneuvered by the German advance through the Ardennes. Our conclusion was that, given two players of equal (this is important) ability, the Germans can't lose. In fact, their victory will be, in some respects, more crushing than it originally was. Take, for example, the evacuation of the British forces at Dunkirk. This operation gave Britain a valuable cadre of trained soldiers with which to rebuild its armies. Had the British army in France been lost completely the British would have been in a far worse position after France collapsed. They would have had practically no troops to face a possible German invasion. In addition, there would have been no troops to send to North Africa. The Germans may well



have won there also, as a result of this. In most games played, the Germans are prevented from striking through the Ardennes simply because no sane Allied player will leave that sector undefended. To make the main effort against the Maginot Line (which can be broken with a combination of armored units and heavy artillery) would be futile, a breakthrough there can be too easily contained. So, in most games the German player will make his main effort through Belgium and Holland, with armor supported diversions against the Ardennes or Maginot line. In a case like this, the British army is usually destroyed trying to hold the line. The British units are usually heavily engaged because of their high combat strength and high speed (the result of motorization, but not as efficiently used as in German or French motorized divisions). If forced to fight in the open, and without the "benefit" of a "Dunkirk" the British army will usually be lost. The rest of the Allied forces usually fare no better. In a word, given the historical situation, we concluded that the Germans couldn't lose.

Now this is a hell of a thing to admit. That the game is hopelessly unbalanced. However, there is hope; this is why we have included all of the "What If . . . ?" Orders of Battle for both sides. Given a few changes here and there and the Allies could have stopped the Germans. In the best of circumstances, however, it still won't be easy. The German army is just so much bigger than the Allied forces. The Germans were uniformly trained and equipped (except for some divisions which were armed with captured Czech equipment, which, however, was quite good). Allied divisions varied considerably in strength and efficiency. Rather than bring a large number of additional variables (which would have to be reflected in the "What If . . . ?" Orders of Battle and would entail a large number of new playing pieces) we have standardized the French infantry units. We have varied the small number of British units according to their actual corps strength. You can see by the additional British units need, how burdensome the number of units would be if this were done to all Allied units. While the Allies had the same number of divisions as the Germans, these units varied considerably in quality. This was particularly true with the Belgian units, and to a lesser extent with the French. Tactics and weapons had changed since 1914 to the extent that the **attacker** now had the advantage. The Germans had an "edge" (reflected in the combat strength given to German infantry units) that made it easier for them to attack and more difficult for the Allies to do so.

The different Orders of Battle were derived, for the most part, using the data found elsewhere in this booklet. Once established, the different units (including air units and the Maginot Line, which contained a considerable number of troops) in each OB (Order of Battle) were rated on the basis of their movement allowance and combat strength, the numbers added up and a total "strength" arrived at for each OB. The OB's were then ranked and numbered according to strength (the strongest being OB number 1). All the other OB's were compared to the strongest and a comparative percentage was derived for each OB (with the strongest one being 100%). These ratings failed to account for one major factor in the game, the "edge" the generally higher German combat strengths give to the German player. We are assuming that this factor is offset somewhat by the fact that the German player is forced to attack in all games. At this point we found that some very good (read "balanced") games could be had by playing around with the various OB's until you found two that suited the capabilities (which are rarely equal) of the two players.

Speaking of "equal skills" in players, we found that with two players who were either not very skillful, or simply not that familiar with the game, there was a tendency for the Germans to **lose** when the two "historical" OB's are used. What this points out is the importance of the mobile units in the game. In the historical OB's (OB's 2 and 11) we found, however, that even without the mobile units the Germans usually won. Again, this is a result of the overall German superiority. We conducted some tests to discover this. In one series of test games, we deleted all of the German mobile units, added four infantry corps to the starting OB and one to the turn three reinforcements. The Allied OB remained the same. The Germans usually bludgeoned their way through to victory. We also tried a series of games in which neither side had mobile units. In this case we added eight French infantry corps to the Allied starting OB. Again, the Germans were able to win, although in both of these "variants" the Germans had a harder time of it. In fact, we discovered a method whereby the Allies could win most of the time. This involved carefully timed withdrawals so that the Germans would destroy a minimum of Allied units while also not reaching Paris by the end of the game. What this experiment proved was the importance of mobile units. In games where the German player is not experienced in their proper use, they will be lost, and without them the German player will usually lose the game.



The OB's in which the Maginot Line is absent are particularly interesting (the Maginot Line, in the OB strength computations, was made equivalent to 5.5 French infantry corps). The front is now widened considerably, thus putting the Allied player at a greater disadvantage, for now the Germans may make their main effort south of the Ardennes with some chance of success. Even more so since the Allies must prevent the Germans from getting a large number of units off the south edge of the board. In effect, the Allies now have a longer line to protect without the necessary additional units with which to do it. Most of the strongest Allied OB's lack the Maginot Line. These usually provide for a very fluid game, i.e. games in which mobile units play a prominent part. Not surprisingly, it is in these OB's that the Allies have many more mobile units than the Germans. It is well worth your while to play these OB's, not only for their historical interest, but also because they usually provide more interesting games.

One of the more complicated tactical elements of the 1940 campaign was the use of airpower. Without airpower the Germans are worse off than without their mobile units. Air units were able to concentrate far more efficiently than mobile land units. In addition, they were able to perform a wider variety of tasks. Strangely enough, the chief effect of the successful use of air units was not their destruction of ground units and installations (it is true, that air units did accomplish considerable destruction). But this was not what made them successful. The key was cooperation with friendly ground units. In supporting ground units directly (Close Support Missions) the air units cleared the way for ground units. Not completely, of course, but enough to give the attacking ground units an "edge". This, of course, is how we reflected this effect in the game. A more indirect assist of friendly ground units came in interdiction missions. By disrupting key enemy movements at the right time, friendly ground units were greatly assisted in accomplishing their mission. The remainder of the aircraft missions are concerned with defeating or inhibiting enemy air units. The utility of this is quite obvious. Aircraft losses are handled like losses on land. That is, unless the unit is crippled (destroyed as a unit) it stays in the game, with "attrition" losses being considered more of a logistical problem (both air and ground units had a certain amount of "reserves" to draw upon for this purpose). This technique, is important to remember for ground units. In many games using the historical OB's, the Germans will lose very few, if

any, units. This does not mean that the Germans did not take losses, they did. And their losses were quite heavy, as is shown elsewhere in this booklet (it should be noted that many of these losses were concentrated among a few units, particularly mobile units, some of which lost a third or more of their strength.) But the point is not so much losses within a unit as the ability of that unit to continue functioning as a unit. In the original campaign, the French lost numerous units totally, even if not all the men lost were killed or wounded. The combat resolution system was constructed to re-create the total loss of units caught in a situation where they were simply overwhelmed and ceased to function as a unit. The whole point of the campaign is to have as large an effective army as possible at the end of 20 days. In the original campaign there was another German offensive after the time period covered by this game ended. The Germans had to rest their units and get their logistical system in order before they could overrun the rest of France. The object of the game is to see if they Germans can put themselves in such a position, as they actually did in 1940. Had they failed to do this, the Allies might have been able to recuperate. That would have meant World War I all over again, something the Germans could simply not afford to let happen.

Another factor not easily incorporated into the game was the "idiocy factors" of the original campaign. These were the mistakes made in the original campaign that no sane player, with the situation so clearly laid out before him, would make. These idiotic decisions had a decisive effect on the outcome of the original campaign. What could be done with this seemingly critical aspect of the original situation? We divided the "idiocy factors" into two groups. First, there were those factors which we felt could be built into the game. These were primarily "engineering" or "mechanical" factors. In addition, these "idiocy factors" were rather long range in their implications and implementation. In other words, these factors included such elements as unit organization and equipment design and production. Also included, to a limited extent, were the tactical doctrines laid down for divisional and corps-size units. What we have left are the idiocy factors over which the players should exercise control (that is, the factors affected by the "high command"). Some of these we attempt to re-create with the **Dyle Plan Game** in the game rules. But short of re-creating the mentality of



the Allied (and to a much lesser extent, the German) commanders, this is impossible. All we can do is show you what happened originally, give you what explanations are available for these actions, and leave you to your own devices. As for advice on the best strategy and tactics to use, the best we can do is discuss the use of "solitaire" play.

You might as well have confirmed what many of you already suspect. Most of the games (or any game of this sort) are played not with two players but with **one**. This accounts for some 60+% of the "games" played. Why? Often the reason is that someone wants to "play" the game and there is no second player available. But perhaps more often, the reason is that someone simply wants to see for himself what can be done with the situation recreated in the game. A detailed description of what can be done with the game involves more material than can be presented here. Most of the "good moves" can usually be discovered using some common sense and solitaire play of the game. In the course of this, you may uncover what you feel are "unrealistic" aspects of the game. This game has been carefully tested and researched and in most cases you will be searching down a blind alley. For example, the stacking limitations may seem a bit off. Actually, the stacking limitations were based more on the problems of command control than on the physical limitations of an area. In cases like this we had to consider the most decisive factor. In this instance it was command control. So if you complain about the seeming idiocy of allowing no more than three brigades on a hex when adjacent to it there is a hex with three **corps** (each the equivalent of six or so brigades), there's not much we can do for you. We have already considered the problem and made a decision.

The game is not perfect: no conflict-simulation game is. But we have tried as much as possible to avoid error in fact or interpretation. You may not agree with many of our decisions as they appear in the game. But you must remember that each element of the game is related to many other elements. Change one and you affect many others. Keep that in mind when you feel compelled to suggest an "improvement" in the game . . . we always do.

—James F. Dunnigan  
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# The Fall of France

by Albert A. Nofi  
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With the German defeat of France in 1940 a major era in European history came to an end. France, one of the Great Powers from the Middle Ages, and intellectual, cultural, and emotional homeland of the West, was no more. The significance of those events in the Spring of 1940 was soon lost in the rush of greater conflict as virtually the entire world plunged into war for five more years; yet, of all the changes wrought by the war, none is more durable than the fact that France is no longer the leader of the West in politics, war, art, culture, or emotion.

A bare twenty years before this total defeat France had stood triumphant over her ancient enemy from across the Rhine. How, then were the roles to come to the reverse in so short a space and with such devastating effect? That is the theme of this Campaign Analysis.

While it is true that the roots of France's fall in 1940 go back at least as far as the establishment of the Third Republic in 1870 — and perhaps as far back as the Revolution of 1789 — it is outside the province of this article to consider the long-range historical causes of the defeat, or, for that matter, the political and constitutional ones either. Our primary purpose is to consider the immediate causes of France's fall from power, from 1918 through 1940.

The main concern of this article will be with events, chiefly of a military nature, in France from 1930 on, with a particular emphasis on the Spring of 1940. German events and developments, while of importance, will be covered only by way of comparison with the French, in as much as Germany and her Armed Forces have been discussed extensively in these pages earlier.

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The article, The Fall of France, was originally published in issue No. 27 of **Strategy & Tactics Magazine**, Copyright 1971, Simulations Publications, Inc., New York, N.Y. and is used with permission.

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Also not impinging upon this discussion will be the extremely involved and important political developments in France between the two world wars. There is neither the space nor the time for such discussion.

## I. General Background

France's triumph in 1918 was deceptive to say the least. Vast armies of Britons and Russians and Italians had helped shoulder the burden of the long years of fighting, and, in the proverbial nick of time, the United States had thrown young, energetic armies of her own into the balance in 1917-1918. Though France always maintained the largest armies on the Allied side she would never have been able to survive and win without Allied help, and may well have lost even with that help had not the Americans arrived.

The victory had been a costly one. Roughly one out of four military age Frenchmen had fallen during it, or one in twenty-eight of the population, a higher loss-ratio than any other state except Serbia. This loss, chiefly in young, vigorous males, had a serious effect on the birth rate, which never had been particularly high. During the war, with so many young men off at the Front, the birth rate fell off appallingly — indeed it fell off so seriously that the birth-years 1915-1919, when called to the colors in 1935-1938, were termed "the empty years," and barely 65-70 divisions could be mobilized. After the war there was a brief "baby boom" as husbands and wives got acquainted again and soldiers married their sweethearts, but the basic trend remained unaltered and by the mid-1920's France's birth rate was the lowest in Europe.

Another great casualty of the war was France's morale. The finest manpower, the choicest lands, the greatest factories, the most historic shrines had all been destroyed in the long, bloody conflict. By a great effort of will France had set aside her partisanship, had met the enemy and repelled him, and had rebuilt her shattered industry, farmlands, and treasures. But the appalling memory still lingered, and Verdun, site of the greatest battle of the war, became the symbol of a weakening will to fight.

All of these factors had the net effect of demonstrating to the most far sighted statesmen that France was not, indeed, a major power any longer. As early as 1919 an American-British-French alliance for defense had been proposed by **Frenchmen** only to be rejected by isolationist minded Anglo-Saxons

on both sides of the Atlantic. To compensate for the loss of major allies, France cast about for minor powers to join her. Thus Poland, a "natural" enemy of Germany if there ever was one, joined in alliance with France, as did Roumania, Czechoslovakia, and Yugoslavia in the Balkans and Belgium in the West. This coalition, it was felt, would be so greatly superior to Germany that Germany would never dare to raise the spectre of war again. Yet no real effort was made to maintain the alliances. In 1936 King Leopold of Belgium took his nation out of the alliance and "neutralized" it, failing to learn very much from his father's experience with the problems of neutrality in a great-power dominated world. France made but feeble efforts to convince him otherwise.

Likewise, France's political and military leaders — particularly the latter, who falsified information **en masse** — frittered away chances to strike out at Germany's rising power by permitting Hitler to acquire the Rhineland, then a real army, then Austria, and finally Czechoslovakia. Meanwhile, France's other allies, Yugoslavia and Roumania, had more or less gone Fascist themselves. A feeble attempt to place Mussolini's Italy in the anti-German camp ended with the Ethiopian War (1934-1935), in spite of Pierre Laval's efforts to get France and Britain to ignore the minor tyranny to concentrate on the major. The fear of war, the revulsion against it, was just too great to overcome. It would even influence those who, one would have expected, would welcome the chance for another go at Germany: the Army.

## II. The French Army, 1918-1939.

During World War I, France had evolved a very effective retirement and replacement system for her generals. An enormous number of inefficient people were sacked, and younger, more vigorous men commanded France's armies by 1918, men such as Foch, Petain, and Weygand.

At the war's end, however, the effective and forward looking regulations for the retirement of officers were modified into virtual ineffectiveness. The age for retirement was raised until it became almost nonexistent. Thus, when Marshall Petain retired as head of the Armed Forces in the mid-1930's he was nearly eighty years of age. The younger, more vigorous men with forward looking ideas found it difficult indeed to move upwards in such an army, while the old crocks at the top saw to it that little change was wrought in "their" glorious army of 1918.



**The Theory of the "Continuous Front."** In 1914 the French Army had but one theory of war: **attack!** The troops went forward in droves, and were slaughtered in droves. This continued until 1917 when the more cautious influence of Petain brought a halt to the senseless slaughter. By that time the French had a few new misconceptions. The chief of these was that a well organized defense line could not be broken, and that, in order to win a war, all one had to do was to sit tight behind the trenches and wait for the enemy to exhaust himself trying to break through. Once this point had been reached you could then go over to the offensive yourself and mop up the remains in a short time, with a minimum of effort and loss. This theory had the added advantage of meaning that no French general could ever again be sacked for ordering men to their deaths.

Actually, even by 1918 standards, the "continuous front" theory was out of date. Perhaps in 1915 or 1916 it had some validity, but by 1918 two techniques had been evolved which had both demonstrated their ability to break the deadlock of the trenches: tanks and infiltration tactics.

Tanks, a mechanical solution to a mechanically viewed problem, were essentially armored, mobile gun platforms. They could resist the fire of machine guns, the infantry killer par excellence, and carry their own machine guns forward to the point where they could reach the enemy's infantry. The French quickly adopted the idea of the tank from the British and used swarms of them in their 1918 drives, against an already beaten enemy. The technique seemed an aberration, however, since even in 1918 German anti-tank arms had been able to knock out tanks.

Infiltration tactics, a "philosophical" solution to a philosophically viewed problem, were a German invention. Essentially they entailed short, furious bombardments followed by rapid infantry attacks which attempted to avoid any strong points. The troops would move forward as best they could and leave the strong points to be mopped up by troops in the rear. The Germans used these with great success during the early part of 1918, nearly winning the war in the process. "**Nearly**" is, of course, the key to all this. They **HAD** failed to break the front, ergo the front was unbreakable. The logic was impeccable and the French generals ate it up. Neither tanks nor infiltration tactics could break the continuous front.

Having decided that the continuous front was the way to do it, the French inevitably moved

one step further: if earthworks and barbed wire were virtually impregnable, then how much more so would a reinforced concrete and steel fortified zone be?

The seeds of the Maginot Line had been sown.

**The Maginot Line:** The French have always been among the most accomplished fortification experts in the West. From Vauban in the Seventeenth Century onwards, their fortifications engineers were among the most talented in Europe. As the concept of the "continuous front" took hold of the imaginations of the French High Command and people, inevitably the possibilities inherent in an extensive, deep, heavily fortified defensive zone lying across Germany's main invasion route into France became more attractive. This would be "continuous front" on a grand scale and with a vengeance. No German Army could possibly break through with sufficient force as to resist well delivered, swift counter attacks from mobile reserve forces.

Thus it was that in the late 1920's and early 1930's the Maginot Line — named after a minister of war who lost an arm at Verdun in 1916 — captured the imagination and pocket-book of the French nation.

The basic concept was not as regressive as it at first seems. The fortified zone was not considered impregnable, merely difficult to penetrate. Mobile forces held behind the line — in fact it was a fortified "zone" and not a line — would be able to contain any German breakthrough which might occur (though such were considered to be unlikely) and would form the basis for an eventual advance into Germany, after the Germans had exhausted themselves.

Ideally a defensive zone extending from Switzerland right across Europe to the sea would have perfectly sealed the country — insofar as the "continuous front" theorists were concerned — but France could not afford the price in either money or manpower. As a result the main defensive sectors were along the Lorraine frontier with Germany, roughly from Strasbourg to the Ardennes. The Rhine frontier was held by reconstructed German forts of pre-1914 vintage reinforced with some new positions, the river being considered a sufficient obstacle to any serious German advance. From the Ardennes to the sea there were the older fortified cities of Lille and Maubuge, though these positions were not reconstructed. Otherwise there was little in the way.

Could the French have succeeded in extending the Maginot Line to the sea? Probably not. The line as built cost some seven billion



(7,000,000,000) francs, a portion of that cost being due to the rampant inflation plaguing France — and the world — at the time. To cover the additional 240 miles of frontier from Montmedy to the North Sea near Dunkirk would probably have more or less doubled the cost, even considering the considerably easier terrain the work would be done in. Roughly, the 87 miles actually built cost 80.5 million francs per mile. The actual investment in fortifications for the other, longer, portion of the frontier was but 292 million francs — the cost of 3.6 miles of Maginot position.

Quite aside from the financial considerations there were questions of manpower which militated against any extension of the line to the sea. France was already short of manpower and any scheme of fortification on such a grand scale would have depleted her manpower reserves significantly. It must be borne in mind that in addition to manning the positions in the fortified zones, France had also to establish reserve mobile striking forces — just in case. Hence, unlike the wall of China, the wall of France could not completely cover the threatened sectors.

As built, the Maginot Line was a wonder to behold. Every position was carefully prepared after consideration of natural cover, suitability of observation, maximum arc of useful fire with minimal obstacles and dead ground, general suitability of the terrain for the construction of field fortifications and anti-tank obstacles, suitability of the terrain for the construction of hard surfaced roads for the rapid — and secret — transfer of reserves, and general all-round usefulness. Virtually everything was concealed below ground, and all fortresses were gas tight — just in case. Positions were mutually supporting yet capable of independent operation for an extended period. The entire system was linked together by an extensive series of subways and underground communications tunnels. Finally, the entire position was from five to ten miles deep, depending upon the sector, though the main line of defense only began between four and six miles from the frontier.

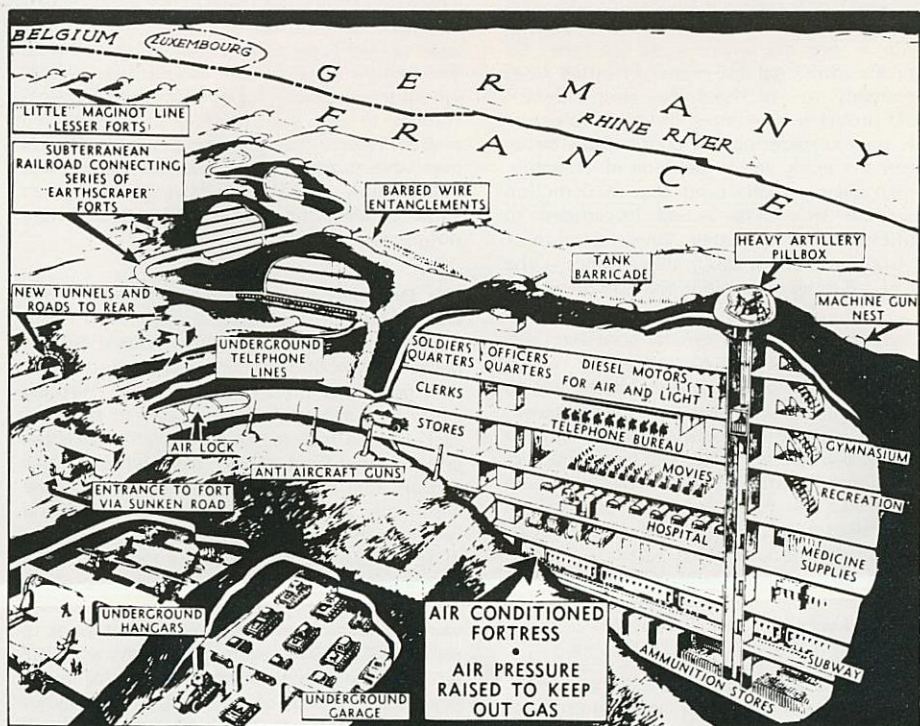
Due to the overwhelming expense one vital area of the Lorraine frontier was but lightly fortified. Between Saarguimines and Bouzonville was the **Sarre Gap**, some 30-35 miles of virtually unfortified positions, though plans did exist to flood several areas utilizing the Saare River and France's extensive canal system.

There seems but little question that, considering what the French expected, the Maginot Line would have been virtually impregnable. The heavily fortified zone would have made it virtually impossible for the Germans to penetrate it to any significant extent before the mobile reserve forces behind it would have been able to move up and deliver a telling and deadly blow. Unfortunately, what the French expected and what the Germans intended were not precisely the same.

**The Development of Mobile Warfare:** It is a widely held misconception that the French Army at the beginning of World War II did not believe in "mobile" or tank warfare, but rather in "positional" warfare. Actually, nothing could be further from the truth. In point of fact, France had accepted the tank since the end of the First World War, when it had proven able to help the infantry break loose from the stranglehold of the trenches and restore a measure of movement to the war. In 1940 France had slightly more tanks than the Germans, though many of these were obsolete. Certainly the French believed in a "mobile" war as well — they certainly did not want to repeat 1914-1918 again. As early as 1927 when asked what France would do if the Germans, instead of attacking the Maginot Line, went through Belgium again, Marshall Petain replied "We must go into Belgium." France believed in, and was willing to accept, a mobile battle in open country. Why the misconceptions? Primarily because what the French meant by "mobile warfare" was not the same as what the Germans meant by the phrase. And what the French thought were the proper ways to employ tanks was not what the Germans thought.

When the French Army thought in terms of "mobile warfare" they thought of 1918 or even 1914: relatively rapid advances by leg infantry. Tanks would be used as in 1918: to break loose the infantrymen from particularly tough resistance. By the mid-1930's, of course, Hitler had sided with people like Guderian: the tank — whose main asset was its high mobility and relatively great firepower — would, in combination with the old World War I infiltration tactics, move rapidly ahead of the plodding infantry, slipping through gaps in the enemy position and disrupting his communications, supply lines, and retreat. Eventually, the French caught on too. Indeed, one Frenchman, Charles DeGaulle, had been a very early theorist of mobile tank warfare and Guderian admitted his debt to DeGaulle. DeGaulle and Guderian were both colonels in the 1930's,





and both had the same ideas — Guderian had Hitler, however. The best that DeGaulle could do was Weygand.

Weygand was an old timer by the mid-1930's, not unlike much of the French High Command, but he was able to see possibilities in the somewhat radical ideas expressed by the armor enthusiasts. As head of the French Army in the mid-1930's he made a number of significant, but insufficient changes. For one thing, a number of the Army's infantry divisions were fully motorized. For another, he authorized the establishment of two "Light Mechanized Divisions," which were in reality rather well conceived armored task forces. But that was all. The primary purpose of these formations was not to wage truly mobile, "mobile" warfare, but rather to enable the reserves — as these troops were to primarily comprise — to move into battle more rapidly. No thought of infiltration or deeply penetrating exploitation drives. Merely a more effective way to move reserves.

When the war broke out in 1939 the successes of the German Panzer Divisions and Motorized Infantry in Poland were received with considerable shock. The implications of the Polish

debacle did not fully dawn upon the French, though they realized that apparently there was possibly some merit to the rather radical ideas of DeGaulle and his ilk. As a result, in late 1939 another Light Mechanized Division was formed and three horse cavalry divisions were dissolved, combined with odd-lots of armored units and reformed as five new "Cavalry" Divisions. In early 1940 the organization of proper Armored Divisions was undertaken as well. By then it was too late. Unquestionably, the French could have fielded an effective mobile force in 1940 only if they had begun to develop one in the mid-1930's — about the same time that the Germans did.

**Organization, Training, and Equipment:** The bulk of the French Army in 1939-1940 was composed of unmotorized infantry divisions. These units were little changed either in organization, training, or equipment from those which went "over the top" in the closing days of World War I. To be sure, there had been some minor organizational adjustments to reflect the need for greater anti-aircraft and anti-tank protection, the rapid improvements in communications equipment between the wars, and the introduction of motorized transport of artillery and supplies. Likewise some



adjustments had been made in equipment, with additional anti-aircraft guns being assigned, anti-tank guns making their appearance, and odds and ends like a new model of the Lebel rifle. Training had also not moved ahead particularly, although the problems of "tank busting" had been taken into consideration. Of course, these changes had not always been for the best and, in the areas of equipment, there were frequently shortages so that one or two divisions did not have any anti-tank guns when the war broke out. All in all, the French infantry in 1940 was pretty well prepared — for 1918. Unfortunately, circumstances had changed between 1918 and 1939 and a 1918 army was no longer what was needed.

This is not to say that the German infantry in 1940 was very much different from that of 1918 either. Though some improvements had been made in weaponry, and the supply of certain types of equipment was somewhat more generous, the German infantryman of 1940 was not unlike his counterpart in the *stosstruppen* in 1918.

On the other hand, the Germans did have something unique in the world at the time: an effective mobile force. While this was by no means a perfect weapon system — indeed its significant flaws would only emerge as the Allies became more proficient — it was considerably superior to anything anyone else had. So superior, in fact, that the Germans would probably have won the Campaign of 1940 no matter what plan they followed or what the French did.

**III. The French Air Force.** Until 1933 the French Air Force had been a part of the Army. In that year it was made an independent and coequal arm of defense. As in all air forces, there existed a serious split between the Douhet — "air power will render all other arms useless" — theory and those who believed that the Air Force should remain as an adjunct to the ground forces. As usual, the voices of compromise went unheeded. Actually, this quarrel — which went far towards creating effective air forces in nations such as Britain and the United States — neglected one of the most important aspects of the entire problem. In order to be effective, whether as a strategic striking force or army cooperation force, an air force needs aircraft. And to build aircraft an aviation industry is needed.

**The French Aviation Industry:** Between 1934 and 1938 France spent roughly 22.8 percent of her defense budget — exclusive of the

Maginot Line expenses — on her Air Force. For this enormous investment she received relatively little.

In France, aircraft production was still not on an assembly line basis, as it was in most other countries. Aircraft can be mass produced like automobiles: they do not have to be hand-crafted with the same kind of tender loving care that goes into ship or locomotive construction. Unfortunately, this hand-crafting was more or less what was going on in France during the 1930's.

In addition, relatively little capital investment — tools, dies, plants, and so forth — had been made in the French aviation industry after World War I. Thus the rather ludicrous spectacle of France, one of the major economic powers of the world, producing but 35 aircraft a month at a time when Italy, far and away a poorer country with a very weak industrial base, was turning out 200. In the mid-1930's, when the French began to get their heads together and look over their defense industries, aircraft production actually **dropped** for a time, due partially to the inevitable loss in production resulting from tooling up, and partially to the considerable confusion which resulted from the nationalization of the aircraft industry.

Thus, on the eve of the war in 1937 France produced only some 600 aircraft though in theory she could have produced 1,000. In the same year the Italians produced about 1,200 and the Germans something like 4,000! Nor was this all.

Because of the rampant confusion in the French aviation industry the unit cost for aircraft in France — aircraft in no way comparable to their foreign counterparts — was considerably higher. Thus, one of France's best fighters, the Morane MS.406, cost some 969,000 francs as against the much more efficient Hurricane's 1,247,000 francs. In addition, the Hurricane was in service nearly two years earlier than the MS.406.

Curiously, if the French had moved to improve their industry just a short time before they actually did, their Air Force would have been considerably more powerful than it was in reality. During the entire Campaign of 1940 the French Air Force actually **increased** in size as new lots of, for example, the D520 fighter were delivered. There were more of these modern aircraft in service at the end of the campaign than at the beginning. There was, in fact, nothing wrong with France's aviation industry that a good dose of Government



# EQUIPMENT AVAILABLE: THE BATTLE FOR FRANCE SPRING 1940

Class	French Army	British Army	German Army	Dutch Army	Belgian Army
MG	153,700	11,000	147,700	3400	3600
Mortars	8000	8000	6796	144	2268
A/T Guns	7800	850	12,830	88	144
Field Guns	8265	880	15,969	192	390
Heavy Guns	3931	310	2900	242	152
AA Guns	3921	500	8700	182	600
Tanks	3437	580	3227	—	—

Notes: As can readily be seen the Germans had a significant quantitative superiority in terms of artillery pieces over the combined British and French arsenals. It should be noted, further, that some 60 percent of the French machine guns were in reality automatic rifles, thus giving the Germans the edge in this category as well. The figures for Germany and France represent total available equipment, while those for the British represent that equipment actually sent to France before and during the campaign, and in most cases lost there. Figures for the Dutch army include material in her colonies (10-20%).

## 1940: ARMORED FIGHTING VEHICLES

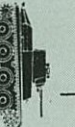
### FRENCH



Type	R35	H35	H39	FCM36	D2	B1	FT17	S35	AMR	AMC
Weight (tons)	10.8	12.5	13.2	14	22	35	7.4	22	7.8	16
Gun (mm)	37	37	37	37	47	47/75	37	47	25	47
Armor (mm)	45	34	45	40	40	60	22	55	13	40
Crew	2	2	2	2	3	4	2	3	2	3
Speed (MPH)	11.8	17.5	22.5	14	14	18	5	25	31	25
HP/Wt	7.6	6	9.1	6.5	6.8	10.8	5.2	8.6	10.5	11.2
Available	945	545	276	90	85	311	534	261	200	184



## BRITISH



## GERMAN

Type	A10	A11	MAC	A13	A12	Pz IB	Pz IID	Pz IIID	Pz IVD	Pz 38
Weight (tons)	16	13	5.8	16.2	28.6	6.6	11	21	22	10.5
Gun (mm)	40	MG	MG	40	40	MG	20	37	75	37
Armor (mm)	37	65	15	21	80	13	30	30	30	25
Crew	5	2	3	4	4	2	3	5	5	4
Speed (MPH)	16	8.1	35	30	15	25	34	25	25	26
HP/Wt	9.4	6.9	15	21	6.1	15	12.8	15.1	13.4	11.9
Available	126	25	402	30	75	1045	1095	388	289	410

## AFV NOTES

The data given for each vehicle can be given as follows: Type=the designation by which the vehicle was known. Weight=weight of the vehicle in tons. Gun=the caliber of the gun in millimeters. The penetration of these guns (at 500 meters, the usual "fighting" range) was as follows: French-37mm=25mm for the older models (found in the FT17, R35, H35 and FCM 36), the H 39's gun was longer with a penetration of about 40mm. The 47mm gun penetrated 50mm, the 75mm penetrated about the same while the 25mm gun penetrated about 20mm. British-the 40mm gun penetrated about 56mm. German-The 20mm gun penetrated about 20mm, the 37mm about 47mm and the 75mm about 54mm. The Armor thickness given was the

thickest to be found on the vehicle, usually in the front on the body or turret. The Crew size was important as it was found that the more men a vehicle had the more efficient it was in combat. The Speed given is the maximum road speed. Cruising road speed and cross country speed was largely dependent on the HP/Wt (Horse Power to Weight) ratio. The higher the HP/Wt the faster the vehicle would be when going cross country, or cruising on a road. Generally, a HP/Wt of 12 or higher indicates a very mobile vehicle. Anything under 10 could be best described as "sluggish." The Available figure indicates the number of that type of vehicle that were on hand to participate in the 1940 campaign (although it was not always the case that the full number did participate).



# COST OF UNITS VS. COST OF MAGINOT LINE

Unit	Cost of unit in F1,000,000	Number of units available for expense of Maginot Line:	
		per mile	for whole
<b>Motorize one division</b>			
100% trucks	78.75	1.02	88.74
80% trucks 20% tracked	115.5	.70	60.9
<b>Divisions:</b>			
Infantry (mobile)	175	.46	40.02
Armor	280	.29	25.23
<b>Aircraft:</b>			
Fighters	.7	115.1	10,013.1
Bombers — Med.	2.187	36.8	3201.6
Bombers — Hvy.	3.937	20.5	1783.5
<i>The Maginot Line extended for 87 miles, and cost approximately F.7,000,000,000, or 80.6 million francs per mile. It is possible, with certain qualifications, to measure this cost in comparison to the possible costs of other types of military units or usage.</i>		<i>explained. First, and most important, there is no guarantee that if the Maginot Line had not been built the funds would have been redirected to other military items; in fact, the French attitudes and the political implications of the act would seem to preclude any such allocation, although the exact amount which would have been allocated is obviously not determinable.</i>	
<i>These extrapolations are very simplistic, and assume certain items that must be</i>			

scrutiny could not have cured. That that scrutiny was late in coming sealed the fate of the French Air Force.

**Organization, Training, and Equipment:** There is actually not much that can be said about the organization, training, and equipment of the French Air Force. Air Forces have displayed a marked tendency to copy from each other and the French Air Force was not very different in organization or training than most other air forces, with the notable exception of the Luftwaffe. The big hole in training and organization was in army cooperation.

Though the French Air Force had originated, and existed for twenty years or so, as part of the French Army it had not developed any effective liaison with that army. Thus, corps and armored divisions were supposed to be

assigned Air Force reconnaissance aircraft yet most such units lacked such support, and dive bombing was an unheard of technique, at least in the Air Force.

Then, of course, there were serious problems of status and morale between the two services — just as existed (and still exist) everywhere else. The French Army did not think of the Air Force as a decisive arm. On a number of occasions during the 1940 campaign Air Force commanders would place their aircraft at the disposal of the Army, only to find themselves sitting around waiting for orders which never came. On the other hand, of course, the Air Force — like all air forces everywhere — was extremely status conscious, being the junior service, and suffering from something of an inferiority complex in dealing with the older services. This does not seem to have adversely



Second, there is the questionable ability of French industry to meet the demands of certain of these products. The heavy bombers could not have been produced at this time anywhere (the Short Stirling started coming off the assembly line in late 1940, the B-17 not until late 1941). The French automotive industry could never have supplied even the replacement vehicles in peacetime if 90 divisions were to be made mobile; this could only be solved by imports, which would have been politically untenable, and wreaked hell with France's already poor balance of payments situation. In virtually all industries, enormous expansion would have to be undertaken, but this would be offset by a lower per unit cost achieved in mass production.

Third was the manpower problem, one of people-poor France's major difficulties. By drafting all available, fit men of the proper age, and strong utilization of females in industry, they probably could have raised another million men, enough to fill the ranks, and support, the proposed extra 40 mobile infantry divisions. This would have been somewhat vulnerable to large losses, and the French would have been forced to break up divisions for men early in the campaign. Most importantly, no matter how much or where, the money would not have been spent on only one of the items, but rather on a mixture. For instance, they could have motorized about one-half the infantry divisions (45), added ten armored divisions, and expanded the Armee de l'Air by 1000

fighters and 500 medium (two-engine) bombers.

In detail each of the items must be examined, and fully explained. The motorization of the army (100% trucks) would have been a simple matter, but in view of the poor use the French made of what they already had (due to poor tactical doctrine and incredibly poor supply organization) there would have to be more than the material on hand to change the situation; however, it is possible that the more common use of motorization might have corrected many of these faults. The use of tracked vehicles, combined with one tank battalion (of which the French had 33 available), could have resulted in an armored infantry division much more effective than the DCRs and DLMs available. The increase in number of divisions is of questionable value after a certain point, although some could have been useful; improvement in quality of existing organizations would seem to be more important. The figures for aircraft ignore one important factor: the ground support element and training of pilots can cost from five to ten times the cost of the aircraft; aircraft are very expensive to maintain and it is unlikely that any thing short of a full-fledged air program would yield an important result.

Analyzing cost figures is an extremely sensitive job: the figures as shown lie by omission, and it should always be considered to what extent the pure economics of it is influenced by other areas.

by John Young

influenced the 1940 campaign but represents an interesting historiographical problem: would Army-Air Force cooperation been better if the Air Force had not been separated from the Army in 1933, or would it have been better if the Air Force had been created during or shortly after World War I?

In terms of equipment the French Air Force was behind all the other major powers, including Italy — though that power had had a bit of bad luck in continuing the production of the obsolete bi-plane fighter.

Only by retaining considerable numbers of obsolete aircraft on the active list was France able to muster 1,350 aircraft in 1938. Of these only some 500-600 were what might be

termed "first line." The rest were outdated, to say the least. The best bombers the French had were American, as was one of their better fighters. None of these was more than fair-to-middling when compared with Luftwaffe, or even RAF aircraft, and the bulk of French equipment was often of a still lower standard than that!

The curious thing about all of this is, however, that the French Air Force, for all its faults, put up a pretty good fight. It is difficult to say what motivates men to fight well under adverse circumstances, yet the case of the French Air Force during the 1940 campaign is an excellent example of precisely this. Though outnumbered and outclassed, the French Air Force did a credible job.



# STRENGTH OF PANZER DIVISIONS: May 1940

Division (AFV)	Infantry Battalions	Artillery Battalions	Other Battalions	Tanks					38	AC
				I	II	III	IV			
1(251)	2	3	M	30	100	65	56	—	56	
2(251)	4	3	—	30	100	65	56	—	56	
3(280)	2	2	M	109	122	31	18	—	56	
4(340)	4	2	M	160	107	41	32	—	56	
5(310)	4	2	R,A,E	140	110	36	24	—	56	
6(202)	3	2	—	10	40	20	—	132	56	
7(202)	4	2	M	10	40	20	—	132	56	
8(202)	3	2	M	10	40	20	—	132	56	
9(213)	4	2	M,A,E	100	75	20	18	—	56	
10(251)	4	2	E	30	100	65	56	—	56	

M = motorcycle; R = reconnaissance; A = anti-tank; E = engineer.

No two panzer divisions had the same organization.

AFV: Armored Fighting Tracked Vehicles.

AC: Armored Cars

## RELATIVE MOBILITY OF ALLIED TANKS, 1939-1940

Class	French Types	No.	British Types	No.
I	H39,S35,AMC,AMR2T	921	McCloyd, V6	334
II	H35,FCM36,D2,B1	1031	A.9,A.10	156
III	FT17,2C,R35	1485	"I", Matilda	100

**Notes:** The tanks are placed in classes based upon their relative mobility. (All German AFV were Mobility Class I.) Mobility Class II are vehicles somewhat slower than Class I, while Mobility Class III are more or less immobile monsters. The Germans had 2182 modern tanks (Pz II, III, IV, and 38) plus 1045 more or less obsolete, though still speedy, Pz I's. **Deployment:** the French put 307 Class II and 1408 Class III vehicles in 33 non-divisional tank units; all Class I and 724 Class II vehicles went into divisional tank

units; the remaining 77 vehicles were obsolete ones retained in reserve and eventually utilized. Virtually all the German tanks were in the ten Panzer Divisions. The British deployed 156 Class II and 124 Class I (and 30 Armored Cars) in their 1st Armored Division; 56 Class I tanks in each of two Reconnaissance Bdes; 100 Class III and 14 Class I vehicles in the 1st Army Tank Bde; and 84 Class I (and 38 Armored Cars) in four independent Cavalry Regiments.



#### IV. The Allies.

Of the approximately 140 divisions confronting the Germans in the West in the Spring of 1940, about ten were Dutch, twenty-two Belgian, and ten British. Of these forces the most formidable were, of course, the British, but the others were forces to be reckoned with even if they did not reach the scale of importance of the French, or even the British.

**The Dutch Forces:** The Dutch Army was not particularly powerful, nor well trained, nor well equipped. Holland had not fought a real war in nearly 150 years, the only things occurring during that period being on the nature of colonial ventures or serious civil disorders, as was the case during the Belgian War for Independence (1830). Not surprisingly the Dutch treated their Armed Forces to a considerably amount of "benign neglect." On the whole the Dutch seriously believed that they would be left alone in the event of another war and were quite ill-prepared. Holland's ten divisions were considered an inconvenience by the Germans, not a threat; her fortifications a hindrance, not an obstacle

**The Belgian Forces:** If the Dutch were not considered a serious problem by the Germans, the Belgians were another story. They had 20 infantry and two cavalry divisions, and were at least as well prepared for war — albeit 1918 style — as the French. Experience in World War I had shown the Belgians to be a tenacious foe and no differences were to be expected in 1940.

The Belgians had been allied with France until 1936, when the new king, Leopold, had ended the alliance to trust in "neutrality." Still, the long influence of the French told and the Belgian Army held to the "continuous front" theory as faithfully as did the French. The Belgians even had their own fortifications in imitation of the Maginot Line.

The area between the "impassable" Ardennes and the Dutch frontier was heavily fortified, using a combination of newly constructed position plus the remnants of the defenses of 1914, particularly in the vicinity of Liege. One of the more vital links in this position was the fort of **Eban Emael**, which protected the northwestern approaches to Liege, through Holland. It was, in fact, "impregnable" to infantry attack. Unfortunately, the Germans did not attack it in the traditional way. Hitler, in addition to showing an interest in mobile warfare, had been also interested in the possibilities inherent in the use of airborne troops. Both the Dutch and the Belgians would be surprised by this "secret weapon."

In general, Belgian organization, training, and equipment was not unlike that of France, and it would seem that the Belgians were no less efficient than their friends. What the Belgians lacked — as did the French — was resolute, firm leadership.

**The British Expeditionary Force:** Man for man, or perhaps division for division, the BEF was probably the most formidable of all the forces in the 1940 campaign. Unlike the German or French armies, the entire British Army was fully motorized and actually had higher scales of equipment than either of these forces. Thus, while only about 10 percent the size of the French Army, the British Army had the same number of mortars, 20 percent of the AFV's, and slightly more than 10 percent of the field artillery. In general, however, the British were no better prepared by their training or organization than were the French: basically, they were ready to fight 1918 all over again. To be sure, the total motorization of the force was a significant progressive step but it had not come accompanied by the mobile tactics so long advocated in Britain by men like Liddel Hart. However, and an important "however," within the British Army, particularly in the tank forces, were a number of officers who had a considerably fuller understanding of the possibilities of armored warfare than anyone else on the Allied side. These would prove a boon when things tended to get rough. Though not perfect, the British Expeditionary Force was a damned sight better prepared than the French.

The most important aspect of British participation in this campaign was not, however, their land forces, but rather their air forces. The RAF was definitely the superior of the **Armée de l'Air** in just about every category and was more or less able to meet the Luftwaffe on equal terms, with roughly equal aircraft, though a large portion of the RAF contingent was composed of obsolescent aircraft, which would prove virtual death traps in combat.

Only Britain, of the two Allied powers possessed an air force of consequence and it was more consequential than the French Air Force itself. Taken as a whole the British Expeditionary Force was by far the most effective, most well-balanced Allied contingent, at least in terms of equipment: British generals do not seem to have been any less obsessed by World War I than French ones.

#### V. Planning and Preparing for War, 1935-1940.

Hitlerian Germany began open rearmament in 1935. Though many political leaders urged action, the French Government and High



**AIR ORDER OF BATTLE AND  
RELATIVE AIRCRAFT EFFECTIVENESS  
10 MAY 1940**

Class Kind		German Type	Quantity	British Type	Quantity	French Type	Quantity
I	Ftr	Me 109	1016	Hurricane	80	De 520	25
	Bmr	Do 17 Ju 88	630			LeO 45	60
II	Ftr	Me 110	248			MB 151 MB 152 MS 406 P-36 Po 631	675
	Bmr	He 111	480	Battle Blenheim	250	Bloch 174 MB 131	80
	Tac					Bloch 210 Bre 691	100
	DBmr	Ju 87	324			Ln40	50
III	Ftr			Gladiator	20		
	Bmr					Po 54 Am 143	35
	Tac	Hs 123	42	Lysander	100	Po 63	300

**Notes:** Aircraft are here classified according to relative effectiveness. Class I aircraft are the first class machines which, in the case of Britain and Germany, served through the entire war effectively; Class II are aircraft capable of service but which had to be used with a considerable amount of care if Class I types were about; Class III machines could cause some damage if unopposed but were in fact obsolete aircraft and extremely unsafe to operate against even Class II fighters. Abbreviations of type: Ftr = fighter; Bmr = bomber; Tac = tactical support aircraft; DBmr = dive bomber.

Command managed to find reasons to avoid taking military action right through the German attack on Poland — in all of this they were, of course, warmly supported by the British.

So anxious was the French Army to avoid operations against Germany during the period 1935-1938 that official intelligence presentations to the government were falsified on numerous occasions. Thus, the estimate of the number of properly trained men Germany could put in the field in the mid-1930's went from some 450,000 (a figure which had been used since the mid-1920's and included the 100,000 man "Versailles" Army, the militarized border patrol, and various paramilitary organizations with some real training) — a force with which the standing French Army

would have been adequate to deal with — to something near to a million — a force which would have required mobilization of the French reserves, which was precisely what the French government did not wish to do.

Actually, it is difficult to determine the precise degree of falsification which went on. It is certain that the High Command deliberately overstated the size and effectiveness of the Luftwaffe, which was depicted as some sort of monstrously effective force against which there was no defense. In this they were undoubtedly aided in their efforts by the outspokenness of many pro-German air power "experts," such as Charles Lindbergh, who continuously stressed the "overwhelming superiority" of the Luftwaffe even when that superiority was measured in a handful of



superior aircraft. Thus, in their calculations the French High Command never seem to have noted the strength of the RAF, yet assumed that Germany had 14-16,000 aircraft! After the victory over Poland this vaunted air superiority became more entrenched — though at this point with considerably more reason, for by now the Luftwaffe was, at least marginally, superior to both the Armée de l'Air and the RAF in both quantity and quality.

The precise reasons behind the considerable lengths to which the French High Command went to deceive its government are not clear. It was charged — in the midst of defeat — that treason was afoot but the suggestions seem rather questionable from the present vantage. It may, however, be possible that the French Armed Forces — dominated by the Army — felt that any military action against Germany before France was fully “ready” would be ill advised. And France would not be “ready” before 1941, when the final stages of rearmament programs of 1936-1937 would have been reached. This would certainly seem the most plausible explanation, though it is also certain that the inactivity of the French during the late summer of 1939 is totally inexplicable.

To be sure, France had not acted during the Czech crises of 1938 and 1939, though the Czechs had some 30-odd well equipped and effective divisions. But then circumstances were somewhat different. For one thing, it was “peace” and neither France nor Britain wanted the onus of having “caused” the war to be cast upon their shoulders. For another, many sincere people in both countries felt that the Sudeten Germans did, in fact, want to be part of Germany. Needless to say this was absolutely true. The Sudetenland had been forcibly incorporated into Czechoslovakia in 1919 to provide that nation with a “strategic frontier” against Germany. Somehow it seemed wrong to apply the principle of “self-determination of peoples” only to one’s friends — though it did not seem wrong to deny it to the Arabs, Algerians, Indians, and Africans.

At any rate, during all the earlier crises, right down to the Czech Crisis of 1939, France expressed no desire to act unless Britain committed herself fully. Britain would not do so beyond “the Royal Navy and maybe a couple of divisions,” so France did not act. Perhaps if Albert, King of the Belgians had been still about he would have cooperated, as he did in the 1920’s, but his son was of different timber.

Getting back to the military situation in September of 1939, however, we find no such problems. Both France and Britain were definitely at war with Germany and their ally, Poland, was in desperate need of succor as **blitzkrieg** was unleashed for the first time. A swift Allied advance to the Rhine was reasonable to have expected and, indeed, many Germans felt it to be inevitable. Yet, inexplicably, it did not occur.

Assigned to defending the Rhine frontier with France and the Rhineland provinces, were some 46 German infantry divisions, all but eleven of them being composed of reservists, replacements, **Landwehr**, and trainees. Among them was not a single tank, only some 300 non-divisional artillery pieces, and scarcely an airplane to be had. On the date the French completed mobilization, 4 September, they had 40 divisions in position opposing only 17 of the still assembling Germans. By the end of September there were some 70 French and two British divisions available, with over 3,000 tanks, 1,600 pieces of non-divisional artillery, nearly a thousand fighters, and over 700 bombers. The expected invasion of Germany never materialized however. Why?

The answer will forever lie buried with the principals involved but certain points are evident. For example, neither the RAF nor the French Air Force wanted to get involved until they were better prepared for action. Indeed, it would seem that the Allies were, at this point, more interested in averting defeat than in achieving victory. Significantly in both London and Paris there sat the governments of appeasement. More significantly, both Britain and France had made strenuous last minute efforts to get Poland to reconsider her position vis-a-vis Danzig and the Polish Corridor! Indeed, it was only with the advent of Churchill that British attitudes changed from viewing the war as an essentially balance-of-power conflict to that of the survival of nations.

Whatever the causes of the Allied inactivity during 1939, the lack of resolution proved to be anything but transitory, as their preparations for operations in 1940 — when the whole weight of the German Armed Forces would be available against them — clearly demonstrate.

**Evolution of Two Plans:** With the subjugation of Poland, and the resultant transfer to the West of enormous German forces, the Allies began to prepare to meet what appeared to be an inevitable German offensive. This, in itself, is a key to their state of mind at this time: they prepared to meet a German offensive, not to take some positive action of their own.



Assuming the Germans would be foolish enough to attack the Maginot Line, the Allies calculated that they had nothing to worry about. The basic concept of the line seemed sound and with available mobile forces any breakthrough would have been rather handily repulsed by these. The assumption was, however, that the Germans would not be so cooperative as to take on the Maginot Line. Therefore there was but one other thing they could do: invade Belgium, and perhaps Holland as well. As early as 1927 Marshal Petain had set up the basic outline for such an eventuality when he noted, "We must go into Belgium" and the Allies fully intended to go into Belgium.

Going into Belgium had several advantages for the Allies, as opposed to waiting for the Germans on the frontiers of France. For one thing it kept the fighting as far from France's vital industrialized northern provinces as possible. For another it shortened their front somewhat and enabled them to add the 22 Belgian divisions to their order of battle. The main disadvantage was that it thrust them very far forward and out of the way should the Germans drive through the Ardennes, but that was unlikely, for Marshal Petain had once noted that the Ardennes was impassable to armored forces. Of course the old marshal had added, "If adequately defended," but that part seems to have been ignored. At any rate it was into Belgium that the Allies intended to go if the Germans did. But how far?

This presented a serious problem, for there were two schools of thought on the matter: one held that an advance as far forward as possible was desirable, while the other held that the advance should only be limited to improving the basic Allied defensive position. In the end, both plans were adopted, the former becoming the **D**, or **Dyle Plan** for the small river east of Brussels which was its object, and the latter the **E**, or **Escaut Plan**, named after the rather larger river in western Belgium which would be its objective. A proposal to advance to the Meuse-Albert Canal, only a few miles from the German-Belgium frontier was scrapped as being far too daring. The Belgians, on their part had already decided to make the Dyle their main line of resistance, and the Meuse-Albert Canal position an outpost line only.

In the end Plan D was adopted, with Plan E held in the backs of everyone's minds should they have to retreat. There were a number of reasons for this. Plan D permitted the Allies to cover Brussels and Antwerp, the latter desirable as a supply port for the BEF. It also seemed

likely that the Belgians would fight east of Brussels, rather than give up the city without a fight. By advancing to join them, a decisive battle might be brought about very early in the campaign. Then too, there was the problem of Holland. The **Schlieffen Plan** of 1914 fame had initially envisioned a German advance into that country, but this was later dropped. The Allies were laboring under the misconception that the Germans intended to use this plan again in 1940 and that Holland might therefore have to be aided as well. In this case, in addition to aiding Holland, the defense of Antwerp would be furthered by the occupation of portions of the southern Netherlands and of the islands of the Scheldt estuary. Thus, these areas were added to the Dyle Plan. Needless to say, the Escaut Plan provided none of these advantages, though it was considerably less audacious.

Looking backward, it seems more in keeping with the general lack of resolution on the part of the Allied High Command if they had opted for Plan E, rather than the somewhat daring Plan D, which would have required energetic, heroic leadership to bring off.

Both plans, E and D, were based upon one faulty assumption, however. This was that the Germans intended to repeat the Schlieffen Plan of 1914. Nothing was further from the truth.

The Germans had entirely rejected the Schlieffen Plan as unworkable, considering that it had failed once and that the Allies would have some idea of how it was supposed to work. The plan devised by their Army High Command, though often termed a variant of the Schlieffen Plan, had very little resemblance to that remarkable operation. The OKH plan envisioned merely the occupation of Belgium, Holland, and France north of the Aisne and Somme, not the total encirclement and destruction of the Allied armies somewhere in the vicinity of Paris, as Schlieffen had envisioned. To implement this, a very strong drive was to be made across Holland and northern Belgium towards the Somme, pushing the Allies into the south of France. It was a conservative plan, but one which was extremely realistic and, as will be demonstrated later, one which contained some interesting potentialities.

Even as the plan was being completed, however, it was being questioned by everyone from Hitler himself on down to various staff officers. One of these, Erich von Manstein, drew up some general proposals for an entirely different operation, based on an advance through the Ardennes towards the sea, with the intention of cutting off the northern portion of the Allied forces. Hitler was let in



on this, liked it and passed it on to OKH, which adopted it as its own, after some recrimination and a bit of modification. The driving force in this change of plan was Hitler, a point too readily forgotten in the light of his later "failures" as a military commander.

This was the plan adopted by the Germans: a diversionary advance into Holland and North Belgium, to lure the main Allied forces as far north as possible, and a main thrust toward the "impassable" Ardennes, using armored and mobile forces, with infantry to follow it up. To make sure that it would work, the entire Ardennes road movement was war-gamed out several times in advance, just to be on the safe side.

Thus, on the eve of the German offensive, a vague Allied plan of operations — vague in that it failed to outline what the Allies intended to do **after** reaching the Dyle — was about to be tested against a clearly stated, and carefully considered German plan.

## VI. The Campaign of 1940.

In general, the Germans were fully prepared for the operations which they launched on 10 May 1940. They achieved their victory within ten days: after that it was all mopping up and consolidation. The Allies, on the other hand, were considerably less well prepared, both materially and psychologically. The psychological failings were primarily confined to the higher levels of the respective Allied forces: the men were, with few exceptions, ready, willing, and able to put up ferocious resistance when called upon to do so. Their superiors, however, were uncertain as to precisely what they were to do. When Gamelin — Allied commander in chief — was informed of the German invasion of Belgium his reaction to Allied theater commander Georges' "It is the Dyle scheme then," was a laconic, "What else can we do?"

The Allies therefore went forward at full tilt, towards a position which most of their unmotorized infantry had great difficulty in reaching, though the motorized forces had no problems at all. In some cases the Germans had gotten there first, in the form of reconnaissance or long range patrol units. The Allies needed perhaps five days to consolidate the Dyle position; they had barely two. Meanwhile, of course, the main German thrust was further south on the Meuse near the historic city of Sedan.

The front at Sedan was held by a handful of second-line reserve divisions and a pitiful collection of light field fortifications. During the winter of 1939-1940 a substantial line of

concrete and earth field fortifications had been projected to stretch from the end of the Maginot Line to the North Sea but the extreme severity of the winter had prevented serious construction efforts and only very late had any real work been done. In the Sedan sector virtually nothing had been done. Of course, the Ardennes and the Meuse were considered sufficient obstacles as to prevent any German advance, and Petain **had** said that the forest was impassable, so there was no felt threat in this sector. To defend the Ardennes was the task of a Belgian light infantry division plus some French and Belgian horsed and mechanized cavalry. But their exact assignment was to impede the German advance through demolitions and to avoid combat. The initial Belgian demolitions actually slowed up the French more than the Germans. What would have been the case if the Belgians, and later the French, had offered serious resistance is a moot point, but a provable possibility exists that the German drive might have been seriously delayed. One Belgian battalion failed to get the orders to fall back and resisted bitterly, delaying the German advance in its sector for fully a day or so.

Whatever the case, by the fourth day of the campaign the Germans were over the Meuse in strength and France's only available counter-attack force, comprising an armored and a motorized infantry division, with one cavalry and a fine regular infantry division, had been frittered away in holding positions in an arc over 30 kilometers long, to prevent Germans from infiltrating to the Aisne. From then on it was all down hill.

As the German forces in northern Belgium kept up the pressure, their panzers in southern Belgium, along the French frontier, drove steadily westward. On 18 May, roughly four days after the Meuse had been pierced in strength, they were on the Somme near St. Quentin, two days later at Abbeville on the sea. The northern group of armies was completely isolated from the rest of France and only feeble counterattacks were undertaken to break out.

The sturdiest of these, the British counter-attack at Arras and DeGaulle's armored attacks from the south, were eventually inflated into tremendous victories which failed but for the lack of sufficient reserves to follow up. In fact, neither operation seriously discomfited the Germans once they determined their actual extent.

The rest of the campaign was essentially anti-climatic. The high romance and heroism of Dunkirk, the ferocious defense of the



# GERMAN LOSSES COMPARED: FRANCE VS. RUSSIA • SIX WEEKS OF EACH CAMPAIGN

**Notes:** *The basic intent of this table is to demonstrate that German losses during the six weeks long campaign in France were in fact roughly equal to their losses during the first six weeks of fighting in Russia a year later. Not shown are figures for Allied and Russian casualties for this period, since they are unavailable. The French, however, seem to have lost some 500,000 men prior to their surrender (KWP).*

*Russian losses, as nearly as can be determined, ran to at least 750,000. Thus, the French, with but 66 percent of the casualties suffered by the Russians, inflicted*

	In France	In Russia	% Ratio
Divisions	122	134	91.0
Casualties	155,000	213,000	67.1
Division Loss	1270	1590	79.6
Enemy Divisions	140	183	76.5
Casualties/ Enemy Div.	1107	1160	95.4

*losses upon the Germans in direct proportion to those inflicted by the Russians. All figures are approximate, with independent regiments and brigades being lumped into "divisions."*

Aisne-Somme position, and the final collapse of the French armies in the south all were more or less inevitable following upon the German success in crossing the Meuse on a broad front from Sedan to Namur.

Among the many generalizations made of this campaign is that pro-German "fifth columnists" were extremely active, that French traitors deliberately lost the campaign, and that the French troops had no desire to fight. In no case have these allegations been proven correct. Some fifth column activity did in fact occur but did not materially aid the Germans; there seems no real evidence of treason having occurred on anyone's part; and French troops, with a few exceptions (mostly among poorly led, over-40-years-of-age, reservists) fought with remarkable tenacity. What is true, is that the Allied High Command was extremely lethargic and uninnovative. Victory in 1918 had made them blind to the potential of the internal combustion engine. Defeat had done more or less the exact opposite for the Germans.

## VII. A Digression: "What If ..."

It may seem a bit strange to consider hypothetical situations in an historical account but, if an historian is not merely to be a collator of facts relating to certain events he must be willing to consider the possibilities inherent in the situations discussed when certain of the facts are modified and viewed differently. Hence, this attempt at **reasonable** speculation based on **reasonable** modifications of the basic situation of 1940.

From the Allied point of view — and most of these considerations will of necessity deal with the Allies — a number of possible alternate

conditions might have been met. The most obvious of these is the possibilities inherent in France's **not** constructing the Maginot Line, but investing the seven billion francs in a mobile army. The Maginot Line cost only slightly less than the total cost of the rearmament program of 1936 before inflation. If France had been spending the Maginot money on rearmament, beginning that rearmament as early as 1934 or so, what sort of army might she have had by 1940? What sort of air force?

A reasonable speculation along these lines, that the Maginot Line funds would have been diverted into the regular army appropriations, would have France fielding perhaps as many armored divisions as Germany did, using mobile tactics and with an efficient ground support air force to aid it.

Another speculation, and considerably less imaginative, is to consider the possibilities inherent in France having merely a reorganized armored force based on the material and manpower on hand, but with improved training and doctrine. This would actually have cost very little and France could have had her Maginot Line **and** mobile army at the same time. France's colonial empire also presents some interesting possibilities. Something approaching fifteen divisions was garrisoning the colonies. How many could have been safely brought home? How many of the 60,000,000 colonials could have been mobilized and equipped for service in France?

Then, of course, there are the possibilities inherent in mobilizing naval personnel for infantry combat; the continuance of the French-Belgian Alliance past 1936; closer Franco-Italian ties; Spanish hostilities; closer



ties with Russia; and the list goes on and on, until we come to speculations about which little could have been done, such as a more reasonable birth rate for France or a milder winter in 1939-1940. Some of these speculations are more certainly more reasonable than others, particularly the possibilities to be considered in a merely reorganized and reoriented French armored force.

On the German side there are also a number of speculations, beginning with the possibility that Hitler might not have promoted mobile warfare when he did, through no Nazi-Soviet Pact, to no invasion of Scandinavia, to no "stop order" before Dunkirk, to the interesting possibility that the so-called "Manstein" Plan may not have been superior to the original OKH Plan at all!

Consider: the Manstein Plan envisioned cutting off the Allied northern armies by a swift thrust to the sea, but, given the already marked qualitative and quantitative superiority of the Germans vis-a-vis the Allies is it not possible that the more conventional, less daring plan of pushing the Allies south of the Somme might have knocked Britain out of the war along with France? Britain's only army was saved at Dunkirk, but no Dunkirk was possible for the British troops below the Somme during mid-June. The distance was too great for the British to reach with their air power — and it was Britain's ability to gain control of the skies over the beachhead which permitted Dunkirk to come to pass.

As can be seen, the possibilities for speculation in this campaign are rather numerous, and not all of them fantastic. Indeed, quite a number — such as a reorganized French armored force or German use of the OKH Plan — were very distinct possibilities.

### VIII. Conclusions.

The origins of the French defeat in 1940 lie deeply embedded in the history of the French nation over the previous century and a half, yet the military causes were not so deeply set. These lay in the same place the roots of Germany's successes are to be found: the Allied victory in 1918. While the Allies clung to outmoded concepts of warfare, the Germans, intent on avenging a defeat, and recognizing their probable defeat in another contest of attrition, hit upon newer, more novel ways of waging war. By no means were these techniques perfect, but the imperfections of Germany's enemies made her war machine seem invincible for years. If any nation ever

prepared to re-fight their last war, it was France in the period between her greatest triumph and her lowest fall.

### Bibliography.

The Battle for France in the late Spring of 1940 has produced a large number of volumes, most of which are generally useless. The best single, all-round account of the deep seated political, social, economic, and military origins of the defeat of France is probably Shirer's **The Collapse of the Third Republic**. For those principally interested in military events however this is helpful, but not exhaustive.

Chapman's **Why France Fell**, Taylor's **The March of Conquest**, Ellis' **The War in France and Flanders, 1939-1940**, Horne's **To Lose a Battle**, Draper's **The Six Weeks War**, and Benoist-Mechin's **Sixty Days That Shook the West** all cover the campaign rather extensively but all are limited in various ways. Thus, Chapman is primarily concerned with the French and sympathetic to them, while Horne, with the same concern, is somewhat hostile. Benoist-Mechin is a French apologist, while Taylor gives an objective, but German view of the affair. Ellis is objective but British, while Draper is interesting and fairly objective but suffers from having been done in 1944. All of them taken together, however, give a valuable picture of the events in question.

Various memoirs — which must always be consulted with care — included Churchill's **The Second World War**, **The Memoirs of Charles DeGaulle**, **The Rommel Papers**, Manstein's **Lost Victories**, Guderian's **Panzer Leader**, von Mellenthin's **Panzer Battles** and Weygand's **Recalled to Service**. None of these presents a particularly objective picture but all have something to contribute to the outline of events.

Technical information is not always easily obtainable, but Rowe's **The Great Wall of France** is very good for the Maginot Line and its lore; Green's **Fighters of World War II** and **Bombers of World War II**; and various publications on armor, particularly George Bradford's **AFV News** all were of considerable use.

German order of battle information was culled from the ultimate source, the **Kriegstagebuch des OKW**, or "Armed Forces High Command Day Book."



## IF THE FRENCH HAD FALLEN BACK TO NORTH AFRICA

*One of the more interesting, and more likely, "might have beens" of the Campaign of 1940 is the possibility that the French might have tried to carry on the war from North Africa after Metropolitan France had been overrun. Certainly a number of prominent government and military officials favored such a course, including Premier Reynaud. What would the outcome have been in such a situation?*

*Certainly a number of French field formations could have made it to North Africa to join those already there. Probably, however, there would not have been more than 15 or 20 division-sized units once everything available in Africa and England, plus escapees from France, had been gathered together. Most of France's first-line fighter strength seems to have been able to make the one-way trip from south France to Algeria, and perhaps some of the second-line aircraft might have made it as well. Unquestionably, virtually the entire French fleet — fourth largest in the world — would have made it to safety as well.*

*The biggest problem which arises out of this is whether the Germans would have tried for a final go at the French or would have tried the invasion of Britain anyway. In the latter case, the Battle of Britain would probably have been a bit more difficult for them, considering the air power necessary just to watch over the French. In the former case, however, we find tremendous vistas opening up.*

*In effect, the great, decisive air battle of the European Theater would have been fought over the Mediterranean and Tunisia, by Germano-Italian forces based in Sardinia, Sicily and Libya and Franco-British forces based in North Africa. The total sea dominance of the Allies would probably have prevented Axis reinforcement of the Italians in Libya until after the air battle had been decided. The problem, therefore, boils down to one of which side could pour the larger and better air force into the struggle.*

*The Axis would not have been able to make the effort over Tunisia which Germany alone made over Britain. RAF Bomber Command aircraft would still have been based in England and the Luftwaffe would have had to leave strong forces in France and Germany to counter these. In addition, the Italian Air Force would not have had sufficient first-line fighters to help much in that category, though their medium bombers would have been of considerable value. On the other side of the coin, of course, the picture is not particularly good either.*

*Even assuming that the French would have gotten most of their first-line aircraft to Africa, their ability to sustain a long air battle, spreading over several weeks, would have been hampered by a lack of industrial base upon which to draw for supplies, replacements, and new aircraft. The RAF, of course, would have been able to send in modern aircraft but would have been under great pressure to retain enormous forces for the defense of Britain.*

*In the end the whole operation just might have been decided by a land operation against Libya, where, in June of 1940, there were two full strength Italian infantry divisions and a dozen or so very weak ones. Perhaps a swift Anglo-French invasion with available forces from Tunisia on the west and Egypt on the east could have eliminated Italian resistance rapidly, leaving the entire North African littoral in Allied hands, thereby permitting them to gain a considerable degree of freedom over and on the Mediterranean.*

*An Allied defeat in the "Battle of Tunisia" would probably have finished off the Allies in the Mediterranean, though they would probably have won the war eventually anyway. An Axis defeat would most likely have totally altered the course of the war and perhaps shortened it considerably. For one thing, an Allied incursion in Europe might just have been possible in 1942 or even 1941 rather than 1943 — against Italy. Russia may have even been emboldened to enter the war of her own accord, and certainly Hitler would not have tried to pick off Russia if he had failed to knock out France.*