CHAPTER VI

Preliminary Operations

The French Resistance

When the Germans conquered France in the spring of 1940, they sealed their victory with a symbolic flourish. It was as though by dictating the terms of humiliating armistice in the historic railway carriage at Compiegne they meant to prove not only that France was beaten but that she was helpless even to save her dignity in defeat. So it must have seemed in the railway car and so, too, throughout most of the country. But there were still a few Frenchmen who experienced the fact of defeat and witnessed the symbol of humiliation without accepting the finality of either. In 1940 they could not have seemed very dangerous to the conquerors or, for that matter, very potent to themselves. Their reaction was spontaneous and personal. Yet they were the seeds which, nourished by arms and Allied organizers through four years of occupation, grew into an underground army numbering about 200,000 men-an army that after the Allied landings in June 1944 impressed Allied leaders as having made a substantial contribution to the defeat of the enemy.

During the first two years of the occupation, the Resistance movement developed separately in the occupied and unoccupied zones. When the Germans finally moved into southern France in November 1942, Resistance leaders were faced with the problem of bringing some sort of unity out of the anarchy of rival groups. At that time the northern zone had six independently organized groups; the south had three. Only one organization, the communist Front National, which operated through the Francs Tireurs et Partisans, extended control over both the northern and southern zones. Between the other groups there was virtually no co-ordination. Their separateness was due not only to the fact that as clandestine organizations they lacked regularized communications; more importantly they were divided by differing shades of political opinion. The French Resistance cannot be viewed as a simple revolt against the enemy, although opposition to the Germans was, of course, always the prime motive. It must be seen also as a movement aimed, at least by its leaders, at eventual national independence. Whoever controlled the underground would evidently be in the strongest position to control the liberated nation.

The chief impetus toward national unification came from General Charles de Gaulle's headquarters in London. General de Gaulle began in 1940 the formation of a special staff, later known as the Bureau Central de Renseignements et d'Action (Militaire) (BCRA), charged with the organization, direction, and supply of the Resistance. Contacts between de

Gaulle and the native Resistance were established through agents supplied by the British. The BCRA worked for nearly two years (from the summer of 1941 to the spring of 1943) with Resistance leaders to amalgamate the Resistance groups. Their work culminated in the formation of a National Committee (le Conseil National d e la Resistance) which met for the first time in Paris on 27 May 1943. The committee under the presidency of Georges Bidault included representatives not only of the main Resistance groups but of the principal political parties as well. Politically the new National Committee recognized General de Gaulle and the London committee as trustees of the interests of the French nation and responsible eventually for founding a French government on democratic principles. De Gaulle's personal representative, Jean Moulin, was selected as political leader of the Resistance. Militarily the committee created an underground army (l'Armee Secrete) under the direct command of General Delestrain (known to the underground as General Vidal. The Army was elaborately organized on a regional basis and regional commanders selected. Primarily this organization was intended as a framework for the ultimate open co-operation of the French underground with the Allied armies.

Much of the success of this first de Gaullist national organization was illusory, for it is evident that the Gestapo was aware of its progress and waited only for its completion before striking in June 1943 with wholesale arrests. De Gaulle's representative died under torture. General Delestrain was shot. The leadership of the underground army was decimated. The national organization was shattered, and Resistance groups throughout the country suffered heavy losses.

In the widespread catastrophe, however, there were some encouraging facts. By tipping their hand in the summer of 1943, apparently in the expectation that Allied landings were imminent, the Germans revealed the fatal weaknesses of the highly centralized underground organization in time to permit the establishment of a new system of control before D Day. Furthermore, although the underground suffered severe personnel losses both among native resisters and among agents, a surprisingly small percentage of supplies was lost and, on the whole, the supply reception committees were able to continue operations in most parts of the country.

Despite their losses, the Resistance groups displayed a remarkable resilience, and reorganization began at once. It is impossible in short space to describe the many ramifications of the new organization. In general it may be said that a nominal national unity was retained while sabotage and paramilitary action were controlled regionally. The Germans continued to make periodic arrests of Resistance leaders, but the new decentralization localized the damage to the movement.

Concurrently with the organization of the Resistance for eventual overt

activity, both the BCRA and a purely British organization, the SOE (Special Operations Executive), were concerned with encouraging, directing, and supplying immediate and continuing sabotage. The SOE was formed in November 1940 and made the responsibility of the Minister of Economic Warfare-a responsibility that was added to the minister's duties as head of a department. The first mission of the SOE was to investigate the capabilities of the French Resistance, stimulate passive resistance in French industry working for the Germans, and study the possibilities of forming an underground army. As it began to work through agents in the field, the goal of encouraging passive resistance was gradually supplanted by the more ambitious aim of developing French Resistance into a strategic weapon that could be directed by Allied headquarters against military objectives in conformity with the master Allied plan.

The SOE did not attempt to interfere directly in the indigenous organization of the Resistance. The British were content to deal with the groups as established and confine their efforts to setting up and maintaining communications between the Resistance and London. The main task at first was to supply the resisters with arms and sabotage equipment. Later the SOE undertook to direct and co-ordinate Resistance action in accord with the OVERLORD plan.

The first SOE agents parachuted into France in the spring of 1941. Among them was a French radio operator, Begue. Through Begue, contact was made with some of the Resistance groups and arrangements made for the first supply mission flown on the night of 7 July 1941. Containers packed with explosives, small arms, flashlights, and a radio were parachuted to ground organized by members of the Resistance. Location and markings of the grounds had been previously reported to London by Begue's radio. This was the first of many "shipments" of arms to the French underground which would forge out of the will to resist an effective weapon of war. But success was still far in the future. The year 1941 ended for the SOE in failure. Through treachery most of the British agents in the field were arrested, including Begue, and the slender communications link with London was snapped.

The lesson drawn by the SOE from this experience was the impracticability of canalizing control through a central communications channel. Not only was the single communications channel much too vulnerable itself but it required the multiplication of contacts between agents and Resistance groups and thus increased unnecessarily the risk that treachery or indiscretion would compromise a widespread organization. Henceforward the aim of the SOE was to create independent groups with independent communications with London. During 1942, seventeen radio operators, as well as thirty-six other agents, were parachuted into France. As communications became relatively secure and continuous, supply

missions were flown in increasing numbers. Additional personnel and materiel were also landed by small boats plying between Gibraltar and the southeast coast. Deliveries by sea were especially important during the winter when bad weather all but prevented air drops. The total amount of supplies sent during the year, however, was very small. In twelve months of operation, for instance, only a little over one ton of explosives was dropped to saboteurs.

SOE efforts to supply the Resistance movements were always handicapped by insufficient air transport. In 1942 and through most of 1943 two squadrons (of approximately twenty aircraft each) were employed to carry out SOE missions. The SOE continually begged for more aircraft, but every plane assigned to it had to be diverted from the bomber offensive and the Resistance seemed like a nebulous kind of operation to feed at the expense of dropping bombs on German industry.

Furthermore, throughout 1943 the SOE program to supply the Balkan guerrillas had a higher priority than its operations in western Europe. All this meant that, although from time to time additional planes were available for SOE operations in France, the supply never kept pace with the growing demands from the field.

These demands forced repeated examination of what role the Resistance could be expected to play in the liberation of France and how much reliance could be placed on it. Planners tended to be cautious. First of all, it was difficult to get any accurate assessment of the actual or potential strength of the movement. Second, there was always a danger that the movement might be emasculated by arrests on the eve of invasion. Third, even though much had been done to organize the various patriot groups, it was certain that control of their activities would be difficult and incomplete. COSSAC, in drawing up the original OVERLORD plan, decided to regard Resistance activities as a bonus and to place no reliance on them to accomplish strategic objectives.

In criticizing the plan, the British Chiefs of Staff asked whether a more definite strategic role might not be assigned to the Resistance. A committee representing Army and SOE discussed the question and concluded that COSSAC's appraisal was generally fair but "it erred on the side of caution and did not emphasize the wide strategic possibilities." What the committee was thinking of was a national uprising. It believed that the sabotage of Resistance groups could not be regarded as a strategic weapon unless "backed by a general strike or by a rising on a national scale." Such an uprising, the committee thought, would be desirable from a military standpoint but might be politically objectionable.

Actually there seems little doubt that the concept of a national uprising,

which cropped up in discussions of Resistance from time to time, was always unrealistic. A French officer working for the OSS (Office of Strategic Services) commented that the "favorite notion" of mass uprisings "posited the existence of universal courage, whereas courage only inspired a few men-as it has always inspired the few rather than the many. And the idea of mass uprisings implied battling against modern tanks with the stone-throwing catapults of Caesar's time."

The decision apparently was that mass uprisings were at least sufficiently unlikely that no reliance could be placed on them. In February 1944 SHAEF's conclusion was still that Resistance activity must be regarded as a bonus. In view of this conclusion, the project of supplying the Resistance might have languished, but as a matter of fact it received a strong forward impetus. In the beginning of 1943, the Germans put into effect a forced labor draft in France. To escape this draft thou sands of young Frenchmen, particularly in central and southern France, broke into open rebellion. They formed maquis bands in hilly and wooded regions and began guerrilla warfare against the Germans and the collaborationist French Militia. SOE sent agents to contact these maquisards and began dropping arms and supplies to them. The maquis developed into an important movement by the fall of 1943. The Prime Minister then became interested and in January ordered that an additional thirty-five British aircraft be made available for arming the maquis groups of southeastern France. With this new transport strength, supply drops in February were increased 173 percent. Permanent assignments of aircraft for SE use rose steadily thereafter. In January, 50 successful sorties were flown; in April, 331; in May, 531; and in June, 866.

The increase in the tempo of supply deliveries reflected also the beginnings of American contributions of aircraft. In 1943 the OSS began operating through agents in France. The London headquarters of SO (Special Operations branch of OSS) collaborated with SOE and gradually amalgamated with the British agency. The amalgamation was completed by January 1944. That month U.S. planes flew their first successful supply mission into France. In late February, however, the chief of Special Operations, Col. Joseph P. Haskell, was still concerned over the small scale of the American contribution. He feared especially the political repercussions on American-French relations of allowing the British to continue carrying the main burden of supporting the Resistance.The State Department two months later warned the Joint Chiefs of Staff that the impression was gaining ground among the French that, whereas the British were doing everything possible to arm the French patriots, the United States was holding back for political reasons. Thus in May, twenty-five more U.S. aircraft were assigned to Special Operations over the protests of Air Marshal Sir Arthur W. Tedder who, doubting the value of the Resistance movement, considered the increase unjustified.

Air Marshal Tedder's doubts were unquestionably shared by many in the Allied command, and the effectiveness of the Resistance as revealed after D Day was very generally regarded with surprise. There had been signs of the capabilities of the Resistance to undermine the German military power in France, particularly in the monthly reports which SOE and later SOE/SO headquarters submitted to COSSAC and SHAEF from the fall of 1943 when Special Operations was placed under the general control of the OVERLORD command. But the signs were hard to read. Sabotage consisted of a number of more or less un-coordinated pinpricks chiefly against various war industries working for the Germans, railroads and canals, and telephone and telegraph systems. It was difficult to add them up and see what they amounted to in terms of damaging the enemy's total defensive capabilities in France.

The most continuous and probably most effective sabotage was that directed against the French railroads. Attacks were made to derail German troop and supply trains, to cut tracks, blow bridges, and damage locomotives. Directed by SOE/ SO headquarters, railway sabotage was greatly accelerated in 1944 and tied in to a certain extent with the Allied air offensive against enemy transportation. Damage done by saboteurs compared favorably with that inflicted from the air. In the first three months of 1944 the underground sabotaged 808 locomotives as compared to 387 damaged by air attack. However, in April and May, air attack was stepped up and accounted for the damaging of 1,437 locomotives compared to only 292 put out of action by saboteurs. Between June 1943 and May 1944 a total of 1,822 locomotives was damaged, 200 passenger cars destroyed, 1,500 cars damaged, 2,500 freight cars destroyed and 8,000 damaged. Reliable statistics on other forms of railway sabotage are incomplete. A report by the Vichy police records that during October and November 1943 more than 3,000 attempts were made by patriots to wreck some portion of the railway system. In November, 427 of these were successful major operations which included 132 derailments.

Despite the impressiveness of these figures, there remained some doubt as to the effect of the destruction on German military mobility. Since only a part of the capacity of the French railroads was being utilized directly by the German Army, much of the burden of the interruptions due to sabotage could be and undoubtedly was borne by French civilian traffic. On the other hand, Rundstedt in October 1943 noted with alarm the "rapid increase" in rail sabotage which he attributed to the heavy supply of arms and explosives that the British had parachuted to Resistance groups. He reported that in September there were 534 acts of sabotage against railroads as compared to a monthly average of 130 during the first half of the year. Although he did not assess the effect of this sabotage on his general preparedness for invasion, he made it clear that it was cause for

concern, which would become more serious at the time of the Allied assault. A measure of its seriousness was the partial substitution of German uniformed railway workers for employees of the SNCF (Societe National des Chemins de Fer). Between February and June 20,000 German workers were brought in chiefly to check locomotive sabotage.

As D Day approached, SOE/SO headquarters became more concerned with coordinating rail sabotage to relate directly to forthcoming military operations. It was not expected that Resistance groups could seriously interfere with the movement of local enemy reserves in the bridgehead area. The Germans had in effect quarantined the coastal strip to a depth o£ about thirty to forty miles inland and the Normandy Resistance groups, as a result, were weak and scattered. Work on the fortifications as done either by German labor, or by Frenchmen carefully checked for loyalty. Any strangers were immediately suspect and subject to arrest. Such organized groups as did exist were difficult to supply because of the heavy concentration of antiaircraft guns in the coastal zone. Outside the area, however, it was thought the Resistance might operate effectively to delay the movement of strategic reserves into the battle zone. The Resistance was therefore directed to prepare demolitions to be blown on order to cut the main trunk lines leading into the lodgment area.

The plan for cutting the critical military railroads (Plan Vert) was supplemented by a plan to interfere with road traffic (Plan Tortue). Both were developed by the BCRA under the general direction of SOE/SO headquarters. Approved by SHAEF, these plans were circulated to agents in the field, and saboteurs began placing their demolitions. It soon became apparent that effective road sabotage would require a large amount of heavy equipment which could not be delivered in time. Plan Tortue was therefore converted into a project for blocking enemy road movements through guerrilla action. As such, it contributed to the Allied victories after D Day. During the preparation period, however, more emphasis was placed on the rail plan. In May SOE/SO headquarters reported that 571 rail targets were ready for demolition and 30 road cuts were prepared. In addition to accomplishing the specific acts of active sabotage, Resistance leaders hoped to complete the disorganization of the French railroads by planned non-cooperation of the railroad trade union and management. It was estimated that in those ways serious dislocation of rail traffic in France might be maintained for eight to ten days after the Allied landings.

Since the date of the invasion could not be given to the Resistance in advance, arrangements were made to order the execution of sabotage plans by code messages broadcast by the BBC. Organizers were instructed to listen to BBC broadcasts on the 1st, 2d, 15th, and 16th of each month. If the invasion was then imminent, they would hear a preparatory code message. They would then remain on the alert listening

for a confirmatory message "B."

Forty-eight hours after message "B," code phrases would be broadcast directing that the various sabotage plans be put into effect. Since each of the plans had been drawn on a regional basis and each of the Resistance regions had separate code arrangements, it would have been possible to localize the sabotage activity in direct support of the landings. It was SHAEF's view, however, that it was preferable to obtain the maximum amount of chaos behind the enemy lines at the moment of landing, and therefore the signals actually used set all sabotage plans in motion at once. This decision reflected again the reluctance of Allied headquarters to depend on Resistance activity as a precision weapon to be used against specific objectives related to the general plan.

As a matter of fact, the post-D-Day rail-cutting program of the Resistance was extraordinarily effective. During June a total of 486 rail cuts was reported. On D plus 1 twenty-six trunk lines were unusable, including the main lines between Avranches and St. Lo, between St. LB and Cherbourg, and between St. Lo and Caen. All were sabotaged with multiple cuts. Road sabotage achieved at least one notable success in delaying the movement of the 2d SS Panzer Division from the south into the OVERLORD lodgment area.

Plans for employing the Resistance in action against the enemy after the landing included not only sabotage but direct military action. It was hoped that the maquis and possibly other Resistance groups might be able to engage some enemy forces in the interior which would otherwise be employed against the U.S. and British armies. The exact military employment of the underground obviously could not be planned in advance since its strength in any given location could not even be estimated. However, the bonus of having friendly forces behind the enemy's lines was considered sufficiently likely and sufficiently valuable that extensive preparations were made to develop and control it. In March 1944, SHAEF issued a comprehensive directive to the newly designated Special Force Headquarters on the use of Resistance groups in support of OVERLORD. In late May and early June headquarters and staff of the FFI (Forces Fransaises d e l'Interieur) were established under command of Gen. Joseph Pierre Koenig. Koenig set up a tripartite staff (French, U.S., British) in London and made plans for employing the FFI as one component of the Allied armies under the Supreme Allied Commander.

But although Koenig became a regularly constituted military commander his army remained nebulous. Because of the danger of compromising the security of Allied plans, it was impossible even to attempt to organize the FFI for specific military missions in advance of D Day. Therefore, in order to encourage Resistance groups to organize themselves for military action

and to get orders to them, three-man teams (Jedburghs) consisting of one French and one U.S. or British officer and a radio operator were formed to be parachuted in uniform behind enemy lines starting shortly before D Day. The sole assigned function of the Jedburghs was to provide communication links with the FFI command. On occasion, however, they were able to supply useful leadership for the groups to which they were attached. About a hundred Jedburgh teams were organized and eighty-seven of these were operational in France at one time or another.

A major handicap of the Resistance for military action was its inadequate armament, and especially its lack of heavy weapons. Partly to remedy this, both the Americans and the British organized special, heavily armed units to be parachuted behind the lines after operations began. They were to be used either independently on tactical missions or more often to stiffen the local Resistance groups. The American units were called Operational Groups and consisted of four officers and thirty enlisted men, entirely U.S. personnel. Eleven of these groups were sent to France after D Day, five from England and six from North Africa. British equivalent units were much larger. These were the SAS (Special Air Service troops whose operations were directed by Lt. Gen. F. A. M. Browning, Commander of Airborne Troops. Comprising almost 2,000 men, they included two SAS regiments of British personnel, two French parachute battalions, and a Belgian independent company. The SAS achieved notable success with the well-organized Resistance movement in Brittany, and in addition was able to carry out useful sabotage of railroads leading to the battle areas.

It is impossible to appraise the contribution of the Resistance toward softening the enemy in France before the invasion. Not only was there no systematic recording of the facts of their operations, but there was, in any case, no satisfactory yardstick by which to measure the effectiveness of an irregular force, whose role was strategic rather than tactical. Certainly the Resistance impaired the German military power both materially and morally. A fighter with a bee in his breeches is evidently not at his best. But just how much the bee contributes to his defeat is a question to which statistical method can hardly apply.

The Combined Bomber Offensive

Up to the end of 1942, bombing of German military targets was carried out without any clear-cut directive as to target systems, aims, or timing. Although target priorities had been sketched for the Eighth Air Force by the theater commander, the task of integrating the operations of both U.S. and British air forces according to a combined plan with a combined objective was first attempted at Casablanca in January 1943. The Combined Chiefs of Staff then agreed to order U.S. and British strategic air forces based in the United Kingdom to initiate a "Combined Bomber Offensive" whose

object would be "the progressive destruction and dislocation of the German military, industrial and economic systems, and the undermining of the morale of the German people to a point where their capacity for armed resistance is fatally weakened."

This dual aim recognized the divergent doctrines of the American and British air forces. The Americans believed that, through daylight precision bombing, critical sections of German industry could be destroyed so effectively as to dislocate the economic system and paralyze the German war machine. The British, feeling that daylight bombing would prove too costly, put their faith in night area bombing designed to destroy whole critical industrial and military areas. The Prime Minister tried at Casablanca to get the Americans to adopt the British view on the use of air power and persuade them to use the Eight Air Force for night bombing to reinforce directly the operations of the RAF. General Eaker and General Arnold defeated the suggestions, and the Casablanca directive recognized. the separate operations of the two air forces as two different but complementary contributions to a single task.

The primary objectives for both air forces in the new combined offensive were: (1) submarine construction yards, (2) aircraft industry, (3) transportation, (4) oil plants, (5) other enemy war industry. It was provided that these priorities might be "varied from time to time according to developments in the strategical situation." Further flexibility was provided in that the targets listed were to be attacked "subject to the exigencies of weather and of tactical feasibility." They might also be supplemented by "other objectives of great importance either from the political or military point of view." These "other objectives" were not defined, but the two examples given-submarine bases in the Bay of Biscay, and the city of Berlin-could have been taken to bracket a wide range of targets.

The Casablanca directive, though formally initiating the Combined Bomber Offensive, did not produce any immediate action. The Eighth Air Force, having depleted its ranks in order to found and nourish the Twelfth Air Force in the Mediterranean, remained for about six months desperately short of planes and men. It was not until the late spring of 1943 that the air force build-up in the United Kingdom resumed the tempo interrupted by the development of the Mediterranean theater, and it was only then that the Combined Bomber Offensive was implemented by a detailed plan.

The plan had been in the making since December 1942 when a Committee of Operations Analysts was appointed by General Arnold to prepare a report "analyzing the rate of progressive deterioration that should be anticipated in the German war effort as a result of . . . increasing air operations . . . against its sustaining sources." The committee on 8 March 1943 reported nineteen enemy industrial systems vulnerable to air attack.

Endorsed by the Eighth Air Force and the British Air Ministry, the committee's findings were embodied in a formal agreed plan which General Eaker submitted to the Joint Chiefs of Staff. From the nineteen target systems listed by the operations analysts, the air forces picked six key enemy industries, including seventy-six precision targets. The systems selected for attack were in order of priority: submarine construction yards and bases, aircraft industry, ball bearings, oil, synthetic rubber and tires, and military transport vehicles. Destruction of the seventy-six targets, it was believed, would 1 result in elimination of 89 percent of 1 the enemy's submarine industry. 43 per cent of his fighter aircraft production, - 65 percent of his bomber production, 76 percent of the ball bearing industry, 48 percent of his refined oil products, 50 percent of his synthetic rubber, and all of his tire production. "The cumulative effect," said General Eaker, "will 'fatally weaken' the capacity of the German people for armed resistance."

There were initial difficulties, however. General Eaker noted that the air forces' ability to carry out the planned program depended on rendering German fighter defenses ineffective. Actually, despite heavy losses, enemy fighter strength in the spring of 1943 was still increasing rapidly. If the increase continued at that rate, it was expected the Germans would have 3,000 fighter aircraft by January 1944. It was, General Eaker reported, "quite conceivable" that such an increase "could make our daylight bombing unprofitable and perhaps our night bombing too." The destruction of German fighter aircraft was therefore made an "intermediate objective second to none in priority."

The Joint Chiefs of Staff accepted the plan outlined by General Eaker, and approved his requests for aircraft and personnel to carry it out. The Combined Chiefs endorsed the plan on 18 May 1943 at the Washington Conference. Finally the directive to initiate the planned offensive was issued on 10 June by Air Marshal Portal, British Chief of Air Staff, who had strategic direction over combined air operations. Air Marshal Portal interpreted the new plan to mean an all-out offensive against the German fighter air force and directed the Eighth Air Force to attack air-frame and engine factories and industries associated with them, as well-as aircraft repair depots, storage parks, and enemy fighter planes in the air and on the ground. These attacks were declared of primary importance and the order was that nothing should interfere with them. Only when "tactical and weather conditions" prevented attacks against enemy fighter plane targets should aircraft be used against what nominally remained the "primary objective"-submarine construction yards and operating bases.

The new offensive was slow in getting started. Between 1 July and 15 November the Eighth Air Force dropped 22,667 tons of bombs, but of these only 1,903 tons hit the enemy aircraft industry despite its overriding priority

as a target. In part, this relatively insignificant effort was due to bad weather during the fall and winter months. In part, it was due to the location of most German aircraft plants beyond U.S. fighter range, which made bombing prohibitively costly. Two raids on 17 August against the ball bearing plants at Schweinfurt and the Messerschmitt fighter aircraft factory at Regensburg demonstrated the impracticability at that time of deep penetrations by small forces. Losses on the Schweinfurt raid were 36 planes out of 300, or 12 percent, and on the Regensburg raid 24 planes out of 174, or almost 14 percent. These figures did not include damage. Repetition of the Schweinfurt raid on 14 October resulted in losses of more than a quarter of the attacking aircraft. Although the importance of individual targets might warrant acceptance of such losses, they were prohibitive if applied to any large portion of the routine bombing offensive.

While recognizing the difficulties, General Arnold severely criticized the whole record of accomplishment during the last half of 1943. Not only were the attacks on the enemy aircraft industry disappointingly small, but in general a far greater effort was devoted to secondary targets than to those whose destruction would vitally affect Germany's ability to continue the war. Only four vital industries, he said, were attacked and they were hit with only 20 percent of the total bomb tonnage.

General Eaker believed these strictures were unfair. Reporting in December 1943 on the progress of the Combined Bomber Offensive, Eaker said that, while only 62 percent of the planned forces for the offensive had been allotted, 66 percent of the task was already accomplished. Presumably that meant that 66 percent of the planned targets had been hit. But, since the objective of the offensive was not merely to hit targets but to destroy them and so dislocate German war industry and "fatally weaken" enemy morale, the statistics were neither a reliable measure of accomplishment nor a fair indication of the job remaining to be done. Although it was reasonably certain that the Germans had been hurt by Allied bombing during 1943, it was not true in December that only one-third more bombing on the 1943 scale remained to complete the task outlined by the plan for the Combined Bomber Offensive.

A more accurate measure of achievement was difficult to discover. From intelligence sources, the British Ministry of Economic Warfare and the Air Ministry attempted to estimate the effect of bombing on the total German war potential. They were optimistic. They thought the German war potential had been reduced by about 10 percent and that a "total decline of 20% in overall effort may well be fatal." The job, in other words, was about half done. Still more optimistically the report noted a "very much greater decline in some individual industries (e.g., ball-bearings and rubber), which may be near the point where they could cause the collapse of the whole war machine." Even if it were assumed that the intelligence reports on

which that estimate was based were entirely accurate and complete, the significance of the conclusion still remained as dubious as a doctor's pronouncement that his patient was 50 percent dead. Enemy capacity for, and speed in, convalescence was always an unknown factor.

Despite the general optimism in the theater at the end of 1943 over the effects to date of Allied bombing, it was recognized that the future hung in the balance of the still-unsettled battle for air supremacy. By fall, the bombing attacks had forced the enemy to keep about half of his whole force of fighter aircraft in the west. At the same time Eighth Air Force claims of enemy fighters destroyed in combat were estimated at 75 percent of current German production. On the other hand, since relatively few direct attacks were made on fighter production plants, German fighter strength was increasing despite losses. The heavy U.S. losses in the Schweinfurt raid in October demonstrated that, despite attrition of German fighters in combat, Allied air forces still did not have air superiority over more than the fringes of enemy-occupied territory.

General Arnold, commenting on the situation at the end of 1943, said: "It is difficult to appraise the present struggle for air supremacy as representing anything short of a major turning point in the war. What American and Royal Air Force bombers can do to the whole German war machine, once the German fighting force is rendered impotent, needs no comment. The issue hangs now on which side first falters, weakens, and loses its punishing power." Whether victory in the battle for air supremacy was regarded as a prelude to decisive strategic bombing or preparation for OVERLORD, it was accepted as of paramount importance.

With the idea of intensifying the bomber offensive, the Joint Chiefs of Staff in November proposed a revision of the plan to bring it up to date with the changed strategic situation. The relative importance of targets had changed since Casablanca. Submarine construction, for example, was no longer entitled to priority, both because the danger from U-boats had been greatly reduced by measures to combat them at sea and because in general the bombing of factories and pens had hitherto proved ineffective. New air bases had been acquired in Italy on which strategic bombers could be based and a new Mediterranean strategic air force (the Fifteenth) had been established. It thus became necessary to coordinate attacks and target priorities between the United Kingdom and Mediterranean-based air forces. Finally the OVERLORD D Day was approaching and time to establish the prerequisite air supremacy was short.

After some debate between the U.S. and British Chiefs of Staff over the advisability of concentrating on the Axis oil industry, a new directive was issued by the Combined Chiefs on 13 February 1944. The new directive dropped out the system of primary, secondary, and intermediate

objectives. U.S. and British bomber commands were ordered to accomplish the "depletion of the German air force . . . by all means available." Although other objectives were listed, the order clearly shifted emphasis away from the earlier general aim of dislocating enemy industry to the specific task of destroying the enemy air force.

In October 1943 the U.S. Chiefs of Staff had proposed the establishment of a strategic air force in the Mediterranean. It was observed that the Germans were meeting the air offensive from England by moving critical industries to the southeast and at the same time establishing a strong fighter shield in the northwest." Eighth Air Force losses mounted in October to a point where General Marshall expressed himself as "deeply concerned" over them. It was felt that these losses could be reduced if the enemy were forced to disperse his fighters in order to guard against bombing sorties from the Mediterranean. General Eisenhower was accordingly ordered to regroup the Twelfth Air Force under his command to form the Twelfth Tactical Air Force and the Fifteenth Strategic Air Force. The latter, consisting initially of six heavy bomber groups and two groups of long-range fighters, would be under the general direction of the Combined Chiefs of Staff and would be employed primarily against Combined Bomber Offensive targets. The plan was to build up the Fifteenth Air Force by 31 March 1944 to twenty-one groups of heavy bombers, seven groups of fighters, and one group of reconnaissance aircraft.

As soon as the Fifteenth Air Force was formed, doubts occurred as to the effectiveness of the machinery provided for co-ordinating attacks from the Mediterranean and the United Kingdom. Neither the liaison between Fifteenth and Eighth Air Force headquarters nor the "general direction" of the Combined Chiefs was thought adequate for the most effective exploitation of the whole offensive. The Joint Chiefs of Staff therefore proposed a U.S. strategic air command with headquarters in England charged with control of all U.S. strategic air operations in the European-Mediterranean area. Initially directly under the Combined Chiefs, the new headquarters would later be subordinated to the Supreme Allied Commander for OVERLORD. The original conception was that the Strategic Air Forces should command at first only U.S. forces but would, some time before D Day, take in RAF Bomber Command and constitute a strategic air command under the Supreme Allied Commander parallel to the tactical organization of the AEAF. The U.S. proposal, so far as it concerned unification of U.S. air forces, was given to the British Chiefs of Staff for comment at the Cairo conference of November 1943. The British objected chiefly on the grounds that the new setup would destroy the close co-ordination between the Eighth Air Force and RAF through the British Chief of Air Staff. They proposed instead that the authority of Air Marshal Portal should be extended to give him general direction of the whole bomber offensive against Germany. The British objections could be considered

only as advice, however, since Portal freely granted that organization of U.S. forces was the exclusive prerogative of the U.S. Chiefs of Staff. Since the U.S. Chiefs of Staff did not consider the advice sound, they proceeded according to their original proposals and ordered the establishment in England of headquarters of the U.S. Strategic Air Forces in Europe (USSAFE) under command of Lt. Gen. Carl Spaatz. At the same time that USSAFE was established, General Eaker was transferred to command of the U.S. Mediterranean air forces and Lt. Gen. James H. Doolittle took over the Eighth Air Force.

When General Spaatz arrived in England in January the Eighth Air Force was in the midst of its rapid build-up which had begun in the spring of 1943. There were then operating (as of 31 December 1943) twenty-five groups of heavy bombers plus three squadrons (which in March became a training unit) and eleven groups of fighters." Two of the latter groups were equipped with P-38's which, with additional wing gasoline tanks, had a range great enough to accompany bombers deep into Germany. The build-up of long-range fighters increased rapidly in the early months of 1944. At the same time belly tanks and wing tanks were added to all types of fighters to permit them to escort bombers at ever extending radii from their United Kingdom bases. By March the Eighth Air Force was strong enough so that bombing missions were deliberately planned to provoke air battles with the Luftwaffe. A series of large-scale raids on Berlin was inaugurated chiefly for this purpose, and though the bomber losses at first were fairly heavy (the maximum was sixty-nine on one raid) enemy resistance was at last crushed, and on the final missions over the German capital enemy fighters no longer flew to the attack. The peak of German fighter defense was reached and passed in February 1944, and even in that month the enemy was not able to inflict losses on U.S. bombers on a scale large enough to deter them from continued operations. By June U.S. bombers had virtually free range of the skies and could bomb strategic targets at will.

While the Eighth Air Force with the RAF Bomber Command achieved mastery of the air over western Europe, the tactical air forces were being built up to exploit this advantage in direct support of OVERLORD. In April 1943 General Eaker drew up plans to expand the Air Support Command of the Eighth Air Force for tactical operations. These plans were studied and revised during the summer. The outcome in the fall was a decision to set up a separate U.S. tactical air force comprising four major commands: the medium bomber, fighter, air service, and troop-carrier commands. Lt. Gen. Lewis H. Brereton, commander of the Ninth Air Force in the Middle East, was ordered to England with his staff but minus his troops and aircraft. On 16 October 1943 the Ninth Air Force was reconstituted in England, absorbing the Tactical Command of the Eighth Air Force. The latter contributed initially four understrength medium bomber groups and

several reconnaissance squadrons. The new Ninth Air Force grew rapidly during the first six months of 1944. By 1 June it controlled eighteen groups of fighters, eleven groups of medium bombers, fourteen groups of transports, and two groups of reconnaissance aircraft.

The Ninth Air Force was expressly constituted to support the OVERLORD ground battle and on 1 December 1943, as noted, it came under the operational control of Air Marshal Leigh-Mallory's AEAF. It was provided, however, that long-range fighters under Ninth Air Force command would support the Eighth Air Force bomber offensive until OVERLORD began. At the same time the medium bombers were to reinforce the attack against the Luftwaffe by raiding enemy coastal airfields and so driving enemy fighters inland. Such raids were carried out with particular effectiveness in the spring just before the invasion. But throughout the winter the medium bombers were largely diverted to attack the German V-bomb launching sites, the neutralization of which became for a time the priority mission of the entire AEAF.

Sites for launching pilotless aircraft were observed to be under construction in the summer of 1943, especially in the Pas-de-Calais area. By the middle of December photographic reconnaissance had confirmed the existence of sixty-nine sites. It was then estimated that the enemy might be able to begin a full-scale flying-bomb attack against England in February. The prospective enemy operation was called CROSSBOW.

Instructions were issued to the AEAF to bomb all sites that were more than half completed. In addition, certain sites were assigned to the RAF Bomber Command for night attack. Finally, orders issued on 15 December to the Eighth Air Force assigned "overriding priority" to attacks on CROSSBOW sites whenever weather conditions over northern France were suitable. The decision to divert any portion of the strategic air forces away from the primary mission of defeating the Luftwaffe was a measure of the seriousness with which the Allies viewed the enemy threat to the security of the British Isles and OVERLORD preparations.

Air attacks against the enemy CROSSBOW launching sites, beginning in December, continued until the last of the sites was captured by the invading forces. Before D Day the tactical and strategic air forces flew more than 30,000 sorties against CROSSBOW installations and estimated that they had succeeded in neutralizing eighty-six out of ninety-seven identified sites. At least seventy-four other sites, however, were not detected by Allied intelligence before the landings. The effectiveness of this program is difficult to estimate. Counterattack against the German rocket certainly postponed its use and reduced the scale of the eventual at tack on London in June 1944.

Long before the success of the AEAF air offensive became apparent, however, the seriousness of the CROSSBOW threat was largely discounted. The flurry of alarm in December was within a month replaced by sober estimates which calculated that, on the basis of the most generous assessments of German production capacity, the flying bombs could not be produced in quantity sufficient for a major offensive against London or against staging areas and ports to be used for mounting OVERLORD. For example, intelligence reckoned that the largest conceivable enemy sustained attack on London might mean that the average Londoner would be exposed to a rocket bomb explosion within half a mile of him once a month. Similar calculations applied to possible use of the rockets against an OVERLORD port area resulted in a similar conclusion of probable ineffectiveness. At least by March 1944, it was clear to SHAEF that German aircraft, with or without pilots, were not going to threaten seriously the success of OVERLORD.

The Bombing of French Railroads

With the threat of CROSSBOW waning and the defeat of the Luftwaffe apparently assured, the Allied command could decide how air supremacy might be exploited to insure the success of OVERLORD. Up to the end of 1943, planners had never proposed use of the strategic air forces during the preliminary phase on missions directly connected with the ground battle, although it was suggested that the heavy bombers might be sent in to attack German defenses about two weeks before the landings. Now the unexpectedly early success of the air forces in winning the battle for control of the air opened the possibility of committing them sooner in direct preparation for the assault.

In December an Allied intelligence agency had drawn up a short-term rail-bombing plan designed to block seventeen selected rail routes immediately before D Day. This recommendation was rejected by Leigh-Mallory on the grounds that to be effective it would require a concentrated bombing effort close to D Day which, because of the risk of bad weather and the probable pressure of other commitments at that time, could not be guaranteed. As an alternative, AEAF developed a plan for a three-month bombing attack against thirty-three targets in France and Belgium and thirty-nine in Germany to disrupt rail traffic into the assault area. The new plan drafted in the first half of January drew on an analysis of the Italian rail-bombing experience made by Professor S. Zuckerman, scientific adviser to AEAF. Zuckerman took the view that the Italian rail transport system had been virtually paralyzed through the destruction or isolation of servicing and repair facilities and destruction of locomotives, rolling stock, and track. The paralysis was brought about, he considered, by a total dislocation of the system achieved largely by attacks on marshaling yards where the servicing facilities were concentrated. If similar destruction was

to be accomplished in northwest Europe, planners estimated that it would take at least three months of concentrated effort and would involve at least part of the strategic air forces.

Preliminary discussion by the staff of AEAF and representatives of SHAEF brought forth no serious objection to the plan although Maj. Gen. P. G. Whitefoord, SHAEF G-2, expressed his belief that the first seven or eight enemy divisions brought into the battle area would come in by road and that therefore the rail plan, even if successful, would probably not affect the battle in the early stages. Despite this objection, the meeting decided that the proposed attacks and the principle on which they were based were sound. The number of targets, however, was considered inadequate. AEAF therefore revised the plan to include ninety-three targets, of which fourteen in southern France would be attacked by the Fifteenth Air Force from Mediterranean bases. The German targets were omitted. With these revisions AEAF and SHAEF representatives expressed themselves as satisfied that the plan represented the "only practicable method of dealing with the enemy's rail communications and that it satisfied army requirements." Attacks were to begin at once, but would be regarded as a bonus until operations in support of OVERLORD received precedence over the bomber offensive.

The decision was not as firm as it seemed. The formula with which the meeting concluded was the formula of the COSSAC planning days when plans for air and naval action were drawn up by the independent air and naval commands, submitted through the COSSAC machinery for Army approval and, after such co-ordination, approved. Agreement that the air plan "satisfied army requirements" reflected the habit of mind of regarding decisions as made by coequal service commanders. SHAEF was still very new on the scene and the idea of a supreme commander solely responsible for all final decisions affecting the operation he commanded whether they were primarily air, army, or naval matters had still not been absorbed. SHAEF, furthermore, had not yet been given control over the strategic air forces. The result was that, while Leigh-Mallory proceeded on the assumption that his plan was in effect and actually assigned rail targets to the Ninth Air Force in February 1944 as alternatives to its primary missions in support of the Combined Bomber Offensive, SHAEF was only beginning to study the plan. General Whitefoord, the day after the meeting, reported to the operations staff of Supreme Headquarters that the AEAF plan "may well be worth considering."

Quite different was the reaction at General Spaatz's headquarters, USSTAF (United States Strategic Air Forces). The suggestion that any large portion of the strategic air forces should be diverted from the bomber offensive and brought under control of AEAF for tactical purposes was regarded as threatening the completion of the vital primary mission of the strategic air

to defeat the Luftwaffe. An intelligence officer, after examining the AEAF plan, concluded that it would fruitlessly dissipate the striking power of the strategic air forces. He pointed out, however, that because of the peculiar command set-up which put Leigh-Mallory directly under Eisenhower the plan would not compete directly for favor with the Combined Bomber Offensive. He suggested that if the strategic air forces did not like the plan they would have to devise an alternative for submission to General Eisenhower. He concluded with a recommendation that "a quick and decisive effort be made to prevent the Strategic Air Forces being engulfed in the Zuckerman program."

General Doolittle, new commander of the Eighth Air Force, when asked for an opinion, replied that in no case should the attack on rail targets by strategic bombers be begun until after the German Air Force had been decisively beaten. His operations officer felt that this objective could be accomplished in short order "if we are not prematurely distracted." He believed further that the system of rail targets could be hit within the period D minus 20 to D Day and that this would be the most effective time to undertake the attack.

General Spaatz directed that an alternative plan be prepared "for operations to follow after accomplishment of the primary objective of the Combined Bomber Offensive . . . and for operations of the strategic air forces in the direct support of OVERLORD." USSTAF planners saw no merits at all in the AEAF plan. "Axis European transportation," they said, "cannot be recommended as a target system for strategic attack"; it was too extensive and would require too long to destroy. They estimated that "no military effect would be felt for more than . . . nine months" after the program was completed. As an alternative they suggested priority attacks on the German oil industry, with emphasis on gasoline, and secondary attacks on fighter aircraft, ball bearing, rubber, and bomber production. Only as a last resort should transportation centers in Germany be attacked when weather conditions forbade precise attacks on the primary targets. This USSTAF proposal, which became known as the "Oil Plan," was submitted to General Eisenhower and Air Marshal Portal on 5 March with request for the Supreme Commander's concurrence.

It will be recalled that, while the tactical air forces had been subordinated to the Supreme Commander at the end of 1943, the Combined Chiefs of Staff had been unable to agree on when and how the strategic air forces should come under Eisenhower's control. Although it was generally conceded that the Supreme Commander should command all forces (including the strategic air) which he needed in the actual battle, the British were opposed to turning over the heavy bombers to him before that battle. On 12 February, General Eisenhower received his directive from the Combined Chiefs of Staff, conspicuously lacking any clause on the control

of strategic air. At about the same time the AEAF rail plan was published and General Spaatz's opposition to it developed. All these circumstances served to give urgency to the settling of the command problem. General Eisenhower in the latter part of February 1944 brought the problem to the Prime Minister. Churchill was at first disposed to adhere to his original view that the Bomber Command should remain independent of the Supreme Commander while co-operating with him in support of OVERLORD. This was substantially the view advanced by the British Chiefs of Staff during the earlier debate with the U.S. Joint Chiefs and was as unacceptable to Eisenhower now as it had been then to General Marshall. Whatever its motive, it seemed to the Supreme Commander like holding back on what had been agreed on as the Allied supreme effort in Europe. If the British insisted on anything less than an all-out commitment to OVERLORD, Eisenhower told the Prime Minister, he would "simply have to go home." Churchill then did not prolong his opposition. He said he would agree to whatever plan Air Marshal Portal and Eisenhower together could work out.

The solution drafted by Portal and Eisenhower was a proposal to give the Supreme Commander "responsibility for supervision of air operations out of England of all the forces engaged in the program" in support of OVERLORD, the responsibility to pass when Portal, "as executive of the Combined Chiefs of Staff for the execution of POINTBLANK [the Combined Bomber Offensive]," and the Supreme Commander jointly approved the plan for air support. The Supreme Commander recognized that his control of air forces assigned to OVERLORD and the Combined Bomber Offensive would be subject to intervention by the Combined Chiefs of Staff. He also announced his intention of designating Air Marshal Tedder, Deputy Supreme Commander, to supervise "all operations under the control of OVERLORD." It was understood that the requirements of supporting OVERLORD would not absorb the total effort of the strategic air forces and that the use of the balance would be arranged by Portal and Eisenhower in accordance with the existing Combined Chiefs of Staff directive for the Combined Bomber Offensive. Supervision of this part of the air operation would be exercised jointly by Portal and Eisenhower.

This agreement, drawn up on 9 March, was approved on the 17th by the British Chiefs of Staff and forwarded to Washington. The Joint Chiefs accepted all the terms except the word "supervision." They preferred "command" and said so. But, after a "long and complicated" demurral from the British, they compromised on "direction."

Eisenhower would assume control when a plan of air support had been agreed upon. But agreement promised to be difficult. Opposition to the AEAF transportation bombing plan gathered during March. Various intelligence experts examined the problem and came up with unanimous

disapproval chiefly on the grounds that German military traffic required such a small portion of the French rail system that 80 or 90 percent of that system would have to be destroyed before troop and supply movements into the assault area could be affected. They further questioned whether prolonged attack could even sufficiently weaken the system to justify the expenditure of bombs. Air Marshal Portal was persuaded by their findings that the plan was unsuitable. General Brooke agreed and, questioning Zuckerman's interpretation of the Italian experience, suggested that rail bombing in Italy under much more favorable conditions than would prevail in France had actually been of doubtful value.

Despite all this opposition, the AEAF plan won a powerful advocate in Air Marshal Tedder. His advocacy led to fresh examinations. General Spaatz observed to General Arnold that since these examinations had proved adverse to the plan it was hoped by all concerned that "the AEAF plan will be repudiated by Tedder of his own accord, thus avoiding hard feelings." But Tedder did not repudiate the plan, mainly because he did not feel that the alternative oil plan would have effect on OVERLORD in time. At a meeting at the Air Ministry on 25 March presided over by General Eisenhower and attended by all the top airmen concerned in the air support question, Tedder outlined his views. The German Air Force, he felt, should remain the priority target, but the residual effort of all Allied air forces should be devoted to delaying and disorganizing enemy ground movements. It was important, he believed, to concentrate all the air forces on a single target system. In favor of the transportation plan he pointed out the already strained condition of the French railroads. In view of that, he felt that rail bombing could delay enemy preparations and, more important, it could so canalize rail traffic that it could be more easily disrupted completely after D Day.

As to the first priority of defeating the Luftwaffe there was no argument. Attacks on the German Air Force were interpreted further to include attacks on ball bearing factories. The debate then centered on what rail bombing might accomplish. Tedder did not claim that the proposed rail attacks would prevent all German rail traffic, but he did feel that, even in the light of intelligence estimates, the bombing would have useful military effect. Portal agreed that the efficiency of the enemy rail system could be impaired by bombing but thought that the damage could be absorbed by curtailment of civilian traffic and that the German Army would not be affected. War Office and Economic Ministry representatives in general agreed. Possibly 30 percent of the present efficiency of the enemy railroads could be pared off, they thought, but despite this possibility German military traffic would still get through. A British economic adviser added his belief that, although some food would evidently have to be carried for the civilian population, the Germans would be happy to get along without French industry.

General Eisenhower then cut sharply into the core of the question. As he saw it, the first five or six weeks of OVERLORD would be the most critical period, during which it was essential to take every possible step to insure that Allied troops got ashore and stayed ashore. "The greatest contribution that he could imagine the air forces making to this aim was that they should hinder enemy movement." He discounted the arguments that the plan would have less than the effect claimed for it by AEAF. In default of an alternative it was necessary only that the rail bombing have some effect, however small, to justify adopting it.

That the plan would have "some" effect was generally admitted and the discussion turned to whether there was any acceptable alternative. General Spaatz summarized his reasons for preferring the oil plan already outlined by his staff. Strategic attacks on the enemy rail system, he believed, would not affect the course of the initial battle, nor would the attacks be likely to force the German Air Force to fight. The oil plan, on the other hand, would evoke enemy reaction and so lead to attrition of the German fighter air force. It would, furthermore, directly weaken enemy resistance and so hasten the success of OVERLORD. Spaatz's view, in short, was that nothing the strategic air forces could do in the preliminary phase would materially affect the battle of the beaches, and that therefore they should devote their efforts to a plan which would achieve the maximum long-range reduction of German armed strength.

General Eisenhower did not agree. The oil plan, he felt, should be considered as soon as the critical phase of OVERLORD was passed, but it did not constitute an alternative to the rail plan. The decision of the meeting was that no alternative existed and the rail plan was approved subject only to General Spaatz's examination of whether the Eighth Air Force could carry out its portion of it. The plan was considered not to affect Bomber Command, whose night area bombing could be expected to have only a fortuitous effect on the German transportation system.

At the close of the meeting Portal warned of British Government opposition and asked that the War Cabinet be given an opportunity to consider the implications of killing French civilians in the proposed attacks.

Ever since the plan had been advanced, the War Cabinet had viewed as political dynamite the idea of bombing French and Belgian territory, particularly in attacks on marshaling yards which were generally located close to centers of population. Earlier in March the British Chiefs of Staff had refused Leigh-Mallory blanket clearance of his rail targets without Cabinet approval. Even after General Eisenhower had declared the plan essential to the military success of OVERLORD, Cabinet approval was still withheld. Estimates of civilian casualties likely to be caused ran as high as

160,000, of which it was thought a quarter might be killed. The Joint Intelligence Committee was invited to prepare an appreciation of French reaction. Pending its report, certain targets in relatively unpopulated areas were to be cleared individually. For about two weeks the Cabinet earnestly debated the question. Their opposition was at last overcome largely by the firm stand which the British Chiefs of Staff took that the program was a military necessity. On 18 April the Cabinet had cleared all rail targets except two in the Paris area. The Prime Minister however, continued to urge General Eisenhower to consider alternative targets the bombing of which would not kill more than a hundred Frenchmen per target. Only if study proved all other schemes militarily inferior could he concur that military considerations must override the political. At the end of April General Eisenhower directed the suspension of attacks on twenty-seven targets in heavily populated districts, including seventeen of the twenty-four targets originally assigned to Bomber Command. With modifications such as this and a system of warning the civilian population, casualties were kept down below the most optimistic estimates. On 16 May the Prime Minister had become reconciled to the program and, vetoing a proposal to call in French railway experts to assess the psychological effects of the bombing, he said, "I suggest that the matter should be dropped." As a practical matter it, of course, had been dropped and the transportation bombing program at that point was nearing completion.

On 14 April General Eisenhower took over direction of the strategic air forces in support of OVERLORD and three days later issued his directive for the transportation bombing. The over-all mission of destruction of the German military and economic system remained unchanged. The particular mission of the strategic air forces was first to deplete the German Air Force and destroy the facilities serving it, and second, "to destroy and disrupt the enemy's rail communications, particularly those affecting the enemy's movements towards the 'OVERLORD' lodgment area." Targets in eastern France and part of Belgium were allocated to the Eighth Air Force; Bomber Command was to hit western France and the area around Paris while the AEAF concentrated its efforts on northern France and Belgium. Although German targets were not included in the plan as approved in April, the Eighth Air Force before D Day dropped about 5,000 tons on railroad centers in the Reich and along the Franco-German border. Eisenhower also personally gave Spaatz permission to try out a series of heavy attacks on the German oil industry; these were initiated in March and continued along with the rail bombing. Attacks against oil targets began to assume the proportions of an all-out offensive about the middle of May, and on 8 June General Spaatz announced the destruction of German oil resources as the primary strategic aim of the U.S. Strategic Air Forces.

Bombing of enemy railroads in France and Belgium was carried out by all three air forces, and before D Day nearly all assigned targets had been hit.

AEAF reported good results. But outside the AEAF the program was carried on with general skepticism. A representative of 21 Army Group referred to it as "pinpricking on rail communications." The attacks were continued because they were believed to constitute the best that could be devised and because it was hoped they would have some effect. The hope, however, according to intelligence reports, was sheer delusion. A week before D Day the SHAEF G-2 reported that the whole rail bombing operation had accomplished nothing of importance. It had failed "so [to] reduce the railway operating facilities as to impair the enemy's ability to move up reinforcements and maintain his forces in the West." Although the attacks had probably imposed some slight delays and had laid some groundwork for effective tactical thrusts after the assault, it was still estimated that the enemy had three times the rail capacity needed for military traffic, four times the required number of cars, eight times the required locomotives, and ten times the required servicing facilities.

Seldom have intelligence estimates been so wrong. They were wrong primarily because the method of statistical evaluation took no account of either cumulative or critical damage. A machine only 10 percent worn out may still be incapable of functioning. Similarly, destruction of a single cotter pin, an infinitesimal portion of a machine by weight, nevertheless may precipitate the shattering of the whole mechanism. By D Day the Allied air forces, ably assisted by saboteurs of the French Resistance, had knocked cotter pins out of the railroads all over France, and the transportation system was on the point of total collapse.

The Germans had long anticipated that the Allies would preface their invasion of the Continent with a widespread attack on the Continental rail system. Rundstedt realized further that without an air force of his own he would be virtually helpless before such an attack. Interference with troop movement and supply was certain to be serious. Lacking sufficient motor transport even for its combat troops, Rundstedt's army was dependent almost entirely on the railroads for supply.

Certain measures might have been taken, both to lessen that dependence (by decentralization of the supply system, for instance) and to protect the railroads. Actually, little was done. The Commander in Chief West had to face the twin facts that France had been used for three years as a grazing ground for the rest of the German military establishment and that by the time Hitler recognized the imperative need for strong defensive measures in the west there were no longer any resources with which to carry them out.

The French railroads had already been weakened before the war by a series of financial crises which resulted in economizing on repair facilities and renewal and maintenance expenditures. The campaign of 1940

destroyed 500 way structures and 1,200 railroad buildings. But this loss was nothing compared to that caused by the depredations of the Germans during the occupation. Out of the 18,000 locomotives in France, 4,000 were removed to Germany, including a large percentage of the heavier types. More than a third of the rolling stock, which before the war amounted to 31,000 passenger cars and 480,000 freight cars, was also "loaned" to Germany. Personnel of the SNCF was reduced 20 percent and the quality diluted by calling back retired employees and increasing the proportion of unskilled workers.

Before Allied bombs began to fall, the SNCF was severely strained and lacked the usual reserve of excess capacity. Under constant pressure to increase loading, hampered by shortages perhaps most crucial in personnel and facilities for repair, burdened with a cumbersome mixed German-French management, and plagued with active sabotage and passive resistance on the part of a large number of workers and the French management, the French railroads were peculiarly sensitive to attack.

In anticipation of transportation difficulties to come, OB WEST on 3 January ordered the establishment of a strict priority system restricting rail shipments to the most important military supplies. Seventh Army had worked out and put into effect this system for Normandy and Brittany by the end of February. Up to that time no difficulties more serious than local delays were experienced through spasmodic Allied air attacks and sabotage. But in March the co-ordinated attacks began and the strained transportation system showed immediate signs of breakdown. Despite the regulation of nonessential traffic, 1,600 trains by the end of April were backlogged in France, including 600 carrying army supplies. In addition, valuable army supplies had been destroyed in attacks on marshaling yards; other supplies ready for shipment were held up in warehouses awaiting freight cars. Seventh Army, during the month, got a taste of things to come. In its sector, two major attacks on le Mans resulted in considerable losses of locomotives and cars and put the yards out of operation for several weeks. Since the beginning of 1944 railroads in the army area had suffered twenty-five air attacks and fifty-six reported cases of sabotage. The cumulative effect was to increase the backlog of trains feeding Normandy and Brittany from 30 at the beginning of the month to 228 at the end.

The five to six hundred locomotives destroyed in the OB WEST sector during March was nearly double the figure for February. But the acceleration of the tempo of attacks had only begun. OKW noted that in March the majority of Allied air attacks in France were still hitting Luftwaffe installations. In April the concentration shifted dramatically to railroads: there were 249 reported attacks as against 93 in March. Sabotage cases at the same time increased from 460 to 500. The first serious military effect

was the curtailment of supplies for the construction of the Atlantic Wall. In April the naval commander in Normandy was already complaining about the lack of steel and concrete due to the destruction of rail centers. Construction delays, he added, would be inevitable.

Countermeasures were discussed in a conference on 15 April between Field Marshal Keitel, Chief of OKW, and the Reich Minister for Rail and Road Communications (Reichsverkehrsminister) but no really effective measures were possible. Fighter protection could not be increased, since Allied bombing of vital targets in Germany continued unabated while Luftwaffe fighter strength deteriorated. Military leaves were suspended throughout the west on 25 April to relieve the pressure on the railroads. Additional restriction of nonmilitary traffic, which achieved a sharp curtailment of rail operations in France, brought a temporary improvement. Seventh Army noted that its backlog of trains had been reduced from 228 at the end of March to 120 at the end of April. Reduction in total traffic further cut the losses of equipment. But the statistical improvement indicated no solution to the problem.

Allied attacks were stepped up in May. Seventh Army reported "important destruction" during the first week and predicted that in case of a landing the enemy would be able to disrupt rail traffic completely, as he had done in Italy. The same conclusion had already led OB WEST to order the formation of truck companies under centralized control that would pool all available motor transport for supply in accordance with the critical tactical needs. The order was not easy to implement in view of critical shortages of motor transport. On 7 May Seventh Army had worked out the details of a scheme to motorize portions of certain infantry divisions in reserve as well as Kampfgruppen of the coastal defense divisions so that they could be employed in mobile fighting. The remainder of all units were to give up all transportation for the formation of motor companies under corps control-each company with a capacity of 120 tons. Units in the forward positions would bring their weaponing up to 75 percent of authorized allotments and secure three days' supply of all material needed to make them self-sufficient in combat. It was reckoned that it would take three days for resupply through the centralized transport system.

One German answer to Allied bombings, in short, was an attempt to reduce dependence on the railroads. The other was an attempt to keep the railroads in repair. Repair of bomb damage on rail lines and marshaling yards was generally not a difficult or time-consuming process. Even after very heavy raids on marshaling yards, traffic could almost always be resumed in a day or two. Evidently, however, widespread and constant air attacks could involve a very heavy total expenditure of man-hours for repair. The cumulative strain spread across theater boundaries. By the middle of January, for example, all the rail lines in Italy were broken and the

supply situation became so serious that two more railway engineer battalions were requisitioned, one from Russia and one from the west. At the end of March Rundstedt was called on to send another battalion to Italy. Although the French railroad system was then already beginning to suffer from Allied attacks the Italian situation was thought to be still worse. Rundstedt at the end of March was thus left with about three railway engineer battalions to supervise repair work on French railroads for military use. Laborers were drawn at first from the SNCF and from the civilian population as a whole. But when the coordinated bombings began to take effect in the spring extraordinary measures became necessary. Immediately 18,000 men of Organization Todt were taken off construction work on the Atlantic Wall to try to keep the railroads running. On 8 May OKW approved the withdrawal of an additional 10,000 men. Two weeks later Reich Minister Albert Speer noted after a conference with Hitler that the latter approved his view. "that in the west, even though building operations on the Atlantic Wall should be possible, the main duties of the O.T. [Organization Todt] should lie in the elimination of difficulties in transport, including those in the interior of France."

But repairs could not keep pace. To the systematic attacks on marshaling yards, the Allied tactical air forces in May added new damaging attacks on bridges over the Seine, Oise, and Meuse Rivers. These attacks, begun suddenly on 7 May, had not been included in the original transportation bombing plan because it was believed on the basis of experience in Italy that the weight of bombs required to knock out a bridge was out of all proportion to the military value of success. The first attacks were undertaken experimentally at the urging of 21 Army Group, which had little faith in the efficacy of general attacks on rail centers. Success was spectacular. Bridges were toppled along the whole length of the Seine from Rouen to Mantes-Gassicourt before D Day at a cost of only 220 tons of bombs to a bridge. On 26 May, all routes over the Seine north of Paris were closed to rail traffic and they remained closed for the next thirty days despite German efforts to repair one or two of the less completely damaged structures. German repair operations were kept under observation and whenever a bridge seemed on the point of becoming usable again it was re-attacked. The success of the first bridge bombings led to the development of a plan to close off the lodgment area. The first line of interdiction was set at the line of the Seine and Loire Rivers and a gap section between the rivers. The second line included bridges over a number of rivers on a general line from Etaples to Fismes to Clamecy and thence along the upper Loire to Orleans. Bridges on the Loire were not to be hit until after D Day to avoid defining the assault area.

On 21 May, known to the air forces as "Chattanooga Day," fighter-bombers opened attack on line targets, bombing open track and small stations and strafing trains and rail facilities. Seventh Army on that day recorded 50

locomotives destroyed in its sector. French records show 113 locomotives damaged during the day throughout France. Generaloberst Friedrich Dollmann, commander of Seventh Army, told Rommel the new attacks would bring a grave deterioration of the already strained transportation system and asked increasing use of motor transport. Before D Day 2,700 sorties were flown against line targets.

Transportation bombing before D Day had a far more profound effect on the ability of the German Army in the west to resist invasion than the Allies realized. Statistics were misleading. The number of locomotives destroyed by air attack was actually less than the number awaiting repair from normal deterioration; the physical destruction done to rail and servicing facilities was small; rail cuts were repaired quickly on the important military lines. But despite all these facts, which mathematically added up to negligible destruction, rail traffic in France actually declined 60 percent between 1 March and 6 June. More significantly, in the area most heavily bombed, the Region Nord, three-quarters of the normal traffic was knocked off the rails. In the Region Ouest (generally in the invasion zone), which was bombed relatively lightly in order to preserve security, traffic declined by only 30 percent, but immediately after the assault it dropped even lower than in the Region Nord. These results were to prove critical in the battle for Normandy.