CHAPTER II

Outline Overlord

(January-July 1943)

Organization for Planning

Several months elapsed before the Casablanca decisions to go ahead with ROUNDUP plans and preparations began to bear fruit. In these months the European theater convalesced slowly from the TORCH bloodletting, reasserted its independence, and turned again to face northwest Europe across the English Channel.

Recovery was difficult, for, ever since the TORCH decision, the Mediterranean had enjoyed a ruthless priority on all resources of war. As already noted, TORCH had drawn top U. S. and British personnel into what was first a planning group and later became Allied Force Headquarters (AFHQ), which under Lt. Gen. Dwight D. Eisenhower carried out the North African invasion. At the same time General Eisenhower retained command of ETOUSA, the headquarters controlling U. S. forces in the United Kingdom. Despite the difficulties of this dual role the arrangement was preserved in order to insure that TORCH might draw at will on American resources in England. When Eisenhower moved to the Mediterranean, he appointed an executive deputy theater commander, Maj. Gen. Russell P. Hartle, to manage theater affairs in the United Kingdom. Hartle served in this capacity from 2 November 1942 to the end of January 1943. Then, according to plan, with TORCH firmly established, AFHQ and ETOUSA were formally split. Early in February Lt. Gen. Frank M. Andrews was named commanding general of ETOUSA. New theater boundaries gave ETOUSA responsibility for operations in the whole of Europe except the Iberian Peninsula, Italy, and the Balkans.

It was a large theater but, when General Andrews took over, it was occupied by only a handful of the U. S. Army. Before TORCH swept the larder, U. S. forces by the end of September 1942 had built up in the United Kingdom to about 188,000 men, including one armored and three infantry divisions. In the course of the next five months, TORCH took three of the four divisions, and a total of over 150,000 troops. Although partially replenished by shipments from the United States, net U. S. strength in Britain had fallen to 107,801 by the end of February

This was the low point. The build-up thereafter began to recover slowly. However, the one division passed over by TORCH, the 29th, remained the only division in the United Kingdom until the fall of l943.

TORCH interfered even more drastically with the air corps build-up. The new Eighth Air Force was only beginning to accumulate its striking power when it was required to form the Twelfth Air Force to support TORCH. It surrendered to the Twelfth Air Force about half of its complement of aircraft (1,100 planes) and much of its key personnel including its commander, Maj. Gen. Carl Spaatz. General Eaker, who took command of what was left, complained that still worse than the loss of planes was the loss of priority on organizational equipment, spare parts, and replacements of aircraft and personnel. The net result was that U. S. participation in the bomber offensive against Germany was set back eight or nine months and did not begin to become effective until the spring of 1943.

Stock piles of supplies and equipment that had been accumulated in the United Kingdom to maintain a cross-Channel operation were also drawn into the Mediterranean, in some cases at a rate even faster than the movement of troops. Thus the level of supply of some items actually declined for the troops that remained in Britain. In addition monthly delivery of supplies to the United Kingdom which in September reached almost 240,000 long tons had dropped in February to 20,000 tons. BOLERO shipments began to pick up slowly in March but did not regain the September rate until July.

In the meantime planning for ROUNDUP continued under the aegis of the Combined Commanders. The new combined planning staff ordered at Casablanca was slow in taking shape. The difficulties, though relatively minor, seemed to require a large amount of discussion. Casablanca had been vague about both the mission and the form of the new staff. The specification that it would function under a chief of staff to an unnamed supreme commander implied that the planners could henceforth be regarded as the nucleus of the headquarters that would eventually control the operations. Beyond that, Casablanca recalled that a "special inter-allied staff" had already been working "for some months" on cross-Channel plans, and suggested "this special planning staff should be adapted to the new conditions and strengthened by the addition of American personnel. They should work, under the direction of the Supreme Commander (or his deputy until he is appointed), in conjunction with the nucleus of his combined staff in London." But all this was not much more than a collection of working notes by the Combined Chiefs, reminding themselves in a general way of the nature of the problem they would have to solve later by means of a directive actually establishing the organization they recognized as needed. By the end of February the British Chiefs of Staff had drafted such a directive, but it provided for a predominantly British organization, not very different from the Combined Commanders. Addressed to a British chief of staff for cross-Channel operations, it directed him to report to the British Chiefs of Staff and charged him temporarily with the command responsibilities of the supreme commander, pending the latter's appointment.

This draft, as might have been expected, was unsatisfactory to the Americans, who amended it to make the chief of staff for cross-Channel operations

responsible to the Combined Chiefs and limit his responsibility to planning. They added further that the Commanding General, ETOUSA, should be considered as the direct representative of the United States Chiefs of Staff and that he should be consulted on all plans with respect to the employment of United States forces.

The American amendments were promptly accepted by the British and the new directive was approved by the Combined Chiefs on 5 March. However, the question of when the new staff should be organized and what planning-responsibility it should have was not thereby settled. The British Chiefs of Staff recommended delay. They understood that BOLERO build-up plans had been changed and that few American troops would actually be present in the United Kingdom during 1943. They reasoned that the current arrangements for planning by the Combined Commanders were therefore adequate and should be continued. Under the circumstances they were reluctant to spare the necessary senior officers to form a special staff. Instead they suggested appointing a chief staff officer to the Combined Commanders, to be charged with "co-ordinating and driving forward the plans for cross-Channel operations this year and next year." This appointment was actually made, pending American approval of the other suggestions. General Brooke selected Lt. Gen. Frederick E. Morgan, and the Prime Minister and the Secretary of State for War at once approved the nomination. The U. S. Chiefs of Staff agreed to General Morgan's appointment but not to the reduced planning arrangements. The Combined Chiefs consequently turned again to consideration of the special combined staff. The directive of 5 March was reintroduced for fresh debate, and the month of April witnessed an interchange of proposals and counterproposals. Out of this came a revision of planning tasks. The conviction had grown since Casablanca that no operations against the Continent, even of limited scale, would be possible in 1943. The order to plan such operations was therefore struck out and instead planners were directed to draw up a plan to keep the Germans guessing about Allied intentions during the year.

Although this change in mission was the only basic alteration made during more than a month of discussion, one issue was raised that revealed an important difference in attitude between the U. S. and British Chiefs. This was the question of the target date for the 1944 cross-Channel invasion. Casablanca had specified only the year: "an invasion in force in 1944." The March 1943 directive read: "full-scale invasion in the spring of 1944." The British struck out "spring" in their first attempt at amending the directive. The Americans, in their reply, restored it. The final directive compromised: "A full scale assault against the Continent in 1944, as early as possible."

The Combined Chiefs finally issued a directive on 23 April. By that time the new organization was already well under way. General Morgan had been told in March that, whatever the final arrangements, the chief responsibility for planning cross-Channel operations would be his. He was handed a file of planning papers

and required to make recommendations on the form that he thought the staff should take. On the understanding then that the supreme commander would be British, General Morgan recommended a British organization headed by a British chief of staff. He asked that the chief of staff be invested with "plenary powers, temporarily to impersonate the commander-to-be." This body should be the nucleus of an Allied headquarters, and General Morgan advised against the establishment of any British GHQ. He wanted, on the other hand, to have British, Canadian, and American army headquarters set up as soon as possible. Allied headquarters would deal directly with the armies until such time as the build-up of forces in the United Kingdom warranted the interpolation of army group headquarters. The Allied staff, General Morgan felt, should effect a "complete amalgamation of the British and American personnel, sub-branches being headed by American or British officers as found suitable." On the other hand it would be desirable to keep British and American administrative affairs separate. He recommended a thorough integration of the various services throughout the echelons of command as low as army. Finally he asked for a grant to his own organization of "the highest possible degree of autonomy, at least in the operational sphere. In short, what General Morgan had in mind was a compact planning and co-ordinating staff which should enjoy the maximum freedom in carrying out its mission of preparing for cross-Channel operations and which would represent as completely as possible an integration of all services of both nations, combined to plan and ultimately to carry out the supreme effort of the Allies against Germany.

In general the staff established in April 1943 conformed to General Morgan's concept. It was christened COSSAC after the initial letters of Morgan's new title: Chief of Staff to the Supreme Allied Commander (designate), and its principal staff officers met officially for the first time on 17 April. General Morgan was not immediately given either the executive power he asked for or quite the untrammeled direction he requested over "all offensive enterprises of whatever kind initiated from the United Kingdom." He was, however, granted sufficient power to tackle the task, and his attitude from the beginning was that of an executive rather than a planner. He told his staff at their first meeting that they should not consider themselves planners. "The term, 'Planning staff' has come to have a most sinister meaning-it implies the production of nothing but paper. What we must contrive to do somehow is to produce not only paper; but action." This would not be easy in view of COSSAC's lack of executive authority, but despite that General Morgan said: "My idea is that we shall regard ourselves in the first instance as primarily a co-ordinating body.... We differ from the ordinary planning staff in that we are . . . the embryo of the future Supreme Headquarters Staff." He wanted to model his staff on that of Marshal Foch at the end of World War I-"a really small body of selected officers who dealt with the major decisions on broad lines, the day-to-day work of the war being delegated completely to commanders of army groups."

The original COSSAC staff was divided into five branches: Army, Navy, Air,

Intelligence, and Administration and Logistics. Each branch, except Intelligence, was headed by two Principal Staff Officers, British and American. The Intelligence branch initially had only a single British head. The Principal Staff Officers, in turn, had separate staffs split vertically by nationality and horizontally into sections devoted to the preparation of the various plans for which COSSAC was responsible. Thus, for example, the Army branch headed by a British and an American Principal Staff Officer had two head planners (British and American) and under them British and American officers in three sections working respectively on plan OVERLORD, plan RANKIN (the plan for a return to the Continent under conditions of German collapse), and plan COCKADE (threat to hold the maximum number of German forces in the west in 1942). In addition there were three advisory sections. Naval and Air branches had more or less parallel divisions. The Intelligence and Administrative branches were subdivided by sea, air, and land; in the Administrative branch these subdivisions were doubled by nationality. The Principal Staff Officers were responsible for co-ordinating all joint problems before presenting them to COSSAC. Army, Navy, and Air branches prepared the outline appreciation's and plans. The Intelligence branch was to supply the necessary information about the enemy and the Administrative branch analyzed the resources called for. The Administrative branch was also responsible for developing administrative and logistical plans within the operational framework.

This organization, though fairly satisfactory at first, became cumbersome as COSSAC's duties and American representation increased, and as the staff took on more the complexion of a supreme headquarters. With the appointment toward the end of June of Air Marshal Sir Trafford Leigh-Mallory as Air Commander-in-Chief pro tem, the COSSAC United States and British air staffs were amalgamated into a single staff. This process of fusing nationalities into a single combined organization had started informally earlier. The Intelligence branch had had a single head from the beginning. The Administrative branch was integrated very soon after its formation under Maj. Gen. N. C. D. Brownjohn (British). On 16 July, General Morgan decreed that a single Operations branch should be formed with sections grouped functionally but not separated by nationality. Complete integration of the combined headquarters, however, did not take place until the fall when Maj. Gen. Ray Barker, Deputy Chief of Staff, announced the abolition of any division along national lines in favor of a purely functional organization.

It was impossible to keep COSSAC small. Even though the day-to-day work was in large part delegated to lower headquarters, the co-ordinating functions of COSSAC continued to expand up to the time when it came of age in January 1944 as the Supreme Allied Command. Not only did its planning duties increase to include, for instance, Civil Affairs and Publicity and Psychological Warfare, but it became imperative to assume the executive obligations implicit in COSSAC's responsibility for the cross-Channel operation. Thus in the fall of 1943 COSSAC took over the task of co-ordinating raiding and reconnaissance in

northwest Europe in order to relate those activities to the ultimate invasion and to the 1943 diversion program. A little later General Morgan assumed a similar responsibility for directing certain aspects of the partisan and underground movements on the Continent, so far as these were strategically related to the COSSAC plans.

While organization of the COSSAC staff proceeded, the British took steps to form their Army, Navy, and Air high commands for the invasion. The whole frame of the British field command was firmly established in the spring and early summer, and each of the service headquarters, preceding similar U. S. organizations by several months, became the nucleus of the eventual command over the combined invasion forces.

By July the Second British Army, the First Canadian Army, and 21 Army Group all had functioning headquarters. The 21 Army Group, under command of General Sir Bernard Paget, took over from the Home Defence Command all planning, training, and executive functions in regard to British expeditionary forces. General Morgan at once established close liaison with Paget's staff and depended on them thereafter for detailed information and advice on the employment of British ground forces. More than that, 21 Army Group became the principal advisers on ground tactics and all matters of army interest in the assault. This inevitably followed from the lack of any parallel U. S. organization. With V Corps still the highest U. S. tactical headquarters in the United Kingdom, the U. S. Army participated in COSSAC planning through theater headquarters, ETOUSA. In fact, since no table of organization was set up by the War Department for the U. S. half of the COSSAC staff, the American COSSAC planners functioned on detached service from the G-5 (plans) section of ETOUSA. Although both General Andrews and his successor, Lt. Gen. Jacob L. Devers, took an active part in the planning, they could not supply an organization parallel to the British for detailed examination of army problems. This deficiency was not remedied until October when First U. S. Army was established in England.

The British similarly outdistanced the Americans in creating naval and air commands for invasion. On 5 May the British Admiralty issued a directive to Admiral Sir Charles Little, Commander-in-Chief, Portsmouth, appointing him Naval Commander-in-Chief (designate) for the cross-Channel operations being planned by COSSAC. The appointment was in addition to his normal duties as commander of all British naval forces operating out of the Portsmouth area. To handle his new assignment he was authorized a special planning staff to be known as Naval Staff (X. His Chief of Naval Staff (X), Commodore J. Hughes-Hallett, who had commanded the naval force at Dieppe, became a member of the COSSAC staff in May.

All U. S. naval forces operating from the United Kingdom were at that time under Admiral Stark, Commander-in-Chief Naval Forces in Europe. As in the case of

the U. S. Army, tactical organization for the invasion was delayed until the fall when the Twelfth Fleet under Rear Adm. Alan G. Kirk was organized. Stark's headquarters, therefore, was charged with co-ordinating U. S. preparations for OVERLORD with ETOUSA and COSSAC, but had no specific tactical responsibility. Admiral Stark, in addition to supplying COSSAC with a U. S. naval staff, sent liaison officers to Admiral Little's headquarters and also to the Plymouth and Milford Haven Commands which were the bases from which the U. S. naval assault forces would sail.

The beginnings of a Royal Air Force organization for support of ground operations on the European continent were made in March 1943. Air Marshal Portal then proposed the formation of a "Composite Group Headquarters" within the fighter command, both to test ideas for organization for Continental operations and to function as a command if a German collapse should require a return to the Continent before detailed preparations could be made. The composite group, established on 19 March, grew rapidly into a full-scale tactical air force. The Tactical Air Force was formally recognized as existing from 1 June with Air Vice Marshal Sir John Henry d'Albiac in command. Again the U. S. parallel organization came late on the scene with the reconstitution in England of the Ninth Air Force in October.

Size and Shape of the Attack

When the COSSAC staff began work, it had a large amount of experience and data accumulated through two years of planning for ROUNDUP and through experimentation in minor cross-Channel operations. The most important practical experience came from the Dieppe raid in August 1942. The raid carried out under joint British and Canadian command and largely with Canadian troops-about one thousand British troops and fifty U. S. Rangers also took part-was originated in Mountbatten's Combined Operations headquarters in order to test amphibious tactics and techniques in a large-scale operation. The most ambitious attack on the French coast up to that time had been the raid on St. Nazaire in March 1942. But St. Nazaire was still only a hit-and-run commando foray. Dieppe was planned as a miniature invasion, involving the full use of combined arms and mass landings of infantry and armor with the object of seizing a beachhead. Except that there was no intention of holding the beachhead, Dieppe was drawn as closely as possible to the pattern of a full-scale amphibious attack. Specifically it was designed to test the newly developed LCT in landing tanks across the beaches and to find out whether it would be possible to take a port by direct frontal assault. It would also test naval organization in managing a considerable landing fleet (253 ships and craft), and air organization in gaining air supremacy over the landing area and providing support for the ground troops.

The raid was carried out on 19 August 1942 as planned. Tactically, it failed. Very heavy enemy opposition resulted in severe casualties and the planned

withdrawal nine hours after the touchdown was carried out under difficulties reminiscent of Dunkerque. Besides nearly 1,000 dead, about 2,000 Canadians were left behind as prisoners. Of 6,100 men embarked on the expedition only 2,500 returned, including an estimated 1,000 men who never landed. Although the cost was severe, the Dieppe raid provided some valuable experience both for the tactics of amphibious operations and specifically for the planning for OVERLORD. As concerned the latter, Dieppe seems in general to have impressed planners with the hardness of the enemy's fortified shell and the consequent need for concentrating the greatest possible weight in the initial assault in order to crack it.

Whether as a direct result of Dieppe or not, ROUNDUP planning in the winter of 1942-43 took a new turn. It had hitherto been assumed that attacks against the French coast should be widely dispersed in order to prevent the enemy from concentrating on the destruction of any one beachhead. In November 1942, General Barker and Maj. Gen. J. A. Sinclair, chief British planner, started on another tack. In examining the requirements for a suitable assault area for a major operation, they premised their study on the principle of concentration. Abandoning the ROUNDUP idea of many separate regimental and commando assaults, they assumed one main landing in an area capable of development into a lodgment for the whole Allied invasion force.

They then analyzed the conditions essential for such an area. It first had to be within range of fighter planes based in the United Kingdom in order that air supremacy might counterbalance the unusual hazards of a major amphibious assault. At the time the study was made, fighter cover extended only over the coast between Cherbourg and Knocke (in the northwest corner of Belgium). Further to insure air supremacy, the area selected had to contain airfields or sites for airfields which could be made available to Allied fighters at an early date.

The beach defenses had to be capable of reduction by naval fire, air bombardment, or airborne troops. It was desirable, obviously, that the beach defenses be as weak as possible, but the essential thing was that there should be a reasonable chance of neutralizing them. This requirement, in fact, ruled out only small beaches dominated by well-defended cliff positions and areas, such as the Netherlands, where the enemy could defend by large inundations which the Allies had no means of combating.

The selected assault area must permit the Allied rate of build-up to compete with that of the enemy. From this, other conditions followed. The area had to contain one major port that could be captured quickly. It was also desirable that a group of ports be close at hand with sufficient combined capacity, when developed, to support the entire force in later phases of the operation. Since there was no hope of being able to put captured ports into workable condition until about three months after the landings, it was equally important that the selected assault area

have beaches suitable for prolonged maintenance operations. They therefore had to be sheltered from the prevailing winds in order to insure continuous operations even in bad weather. More important, the beaches had to have sufficient capacity to receive and rapidly pass inland the required vehicles and supplies. The critical considerations here were not only the size and firmness of the beaches but also the existence of adequate vehicle exits and adequate road nets behind the beaches.

Having established the conditions essential to an assault area for a major invasion, Generals Sinclair and Barker then proceeded to examine various coastal sectors, matching each with the ideal. None fitted. Only one came close-the sector around Caen. The Netherlands was ruled out because it was out of the range of fighter cover, because its beaches were too exposed and, being backed by sand dunes, had inadequate exits for vehicular traffic. Finally the Germans could too easily defend them by flooding. A scarcity of beaches-and those small and exposed-disqualified Belgium unless enemy resistance was comparatively light and good weather could be counted on for at least a week to allow capture of the group of ports from Dunkerque to Zeebrugge. Actually German defenses of the sector were very strong, and therefore the feasibility of invading it would depend on a substantial lowering of enemy morale. The Pas-de-Calais coast, which ROUNDUP planners had regarded as the most likely assault area, was rejected for a major operation because the beaches were exposed, strongly defended, and dominated by high ground on which the enemy had emplaced artillery. The larger beaches had few exits, and the ports in the area had insufficient capacity to maintain a large force. Inadequate beaches ruled out the Seine sector as well, except as an area for subsidiary assault. It was noted that in order to use the ports of Le Havre and Rouen both banks of the Seine would have to be cleared. On the other hand, simultaneous attacks on both sides of the Seine could not be mutually supporting and would therefore be subject to defeat in detail. The Seine sector could be attacked with a reasonable chance of success only after a main assault in the Caen area. Brittany failed to meet any of the major requirements except as to port capacity. It was above all too far from Germany and a lodgment there would result in long lines of communication in the advance east.

The process of elimination left only the Caen sectors and the Cotentin Peninsula. Caen was desirable from every standpoint except the lack of adequate ports. It was therefore suggested that Caen be made the area of main attack with a subsidiary attack on the east coast of the Cotentin to insure the early capture of Cherbourg. Even Cherbourg, however, could not supply a large invasion force, and it was therefore deemed necessary to seize the Seine ports or the Breton group in addition. Decision on which group to secure would depend on the final objectives of the operation and the degree of enemy opposition expected. There were objections to both. To take the Seine ports would necessitate crossing the river. Dependence on the Brittany ports, as already noted, would mean long lines of communications. This risk, planners

thought, would be acceptable only if it were considered "essential to build up a large force west of and protected by the River Seine."

This analysis revised during the early months of 1943 was at last approved by the Combined Commanders on 1 March and constituted the basic appreciation for subsequent cross-Channel planning. The immediate result was a new outline plan-the final effort of the Combined Commanders before they turned over the planning job to COSSAC. The new plan, SKYSCRAPER, provided simultaneous landings on the Caen and east Cotentin beaches with four divisions in the assault and six in the immediate follow-up. It required in addition eighteen Commandos for special assault missions and four airborne divisions to interfere with the movement of enemy reserves. After the initial beachhead, including Cherbourg, had been established, planners assumed the next move would be to secure additional port capacity for the build-up. They advised advance toward the Seine ports, but thought the capture of Le Havre might well require a new landing northeast of the port in support of the overland attack. Advance would then continue northeast to open the port of Antwerp and establish the armies between the Pas-de-Calais and the Ruhr.

The avowed object of SKYSCRAPER was to provide a gauge of some of the major problems to be faced in the cross-Channel invasion. Chief of these was the large requirement for resources, especially in landing craft. Planners stated the case uncompromisingly. The requirement for ten divisions simultaneously loaded was an absolute minimum, they said. Even that would enable the Allies to take on only the present enemy force in the west, estimated to consist of an average of two coast defense divisions to each hundred miles of assault area. Furthermore the ten division assault force would suffice only if enemy troop movements could be completely blocked.

SKYSCRAPER set its sights deliberately high. It was an attempt to break the deadlock which the tangle of interrelated contingencies had imposed on ROUNDUP planning. Planners were pressing now for a decision. "If we are to plan and prepare for the invasion of Western Europe against opposition," they wrote, "it must be on the understanding that the resources considered necessary are fully realized and that it is the intention to provide them." Therefore, they concluded, "To defer the decision is to decide not to be ready." But the sights seem to have been set too high. The British Chiefs of Staff argued that the vague notion of "determined opposition" could not be used as a criterion for the number of assault divisions needed. They decided not to consider the general principles enunciated in the plan.

Some of the SKYSCRAPER ideas carried over into the OVERLORD planning, since many of the Combined Commanders' planners were transferred to the COSSAC staff. On the other hand, rejection of the SKYSCRAPER approach by the British Chiefs of Staff emphasized a break in the planning. The idea of pressing for increased resources seemed to have been discouraged in advance.

In any case a new beginning and a new approach were required. General Morgan made this point explicit when he told his staff to consider that much useful data had been collected but that no plan worthy of the name existed. They were to make the maximum use of previous planning studies in order to save time, but the problem, Morgan insisted, should be seen as something new-something to be tackled afresh as though no planning had gone before. He returned therefore to first principles and recreated the broad strategic frame.

The over-all conception he presented was of a major land campaign culminating in the invasion and occupation of Germany with forces totaling possibly a hundred divisions. The opening picture was of Anglo-Canadian armies concentrated in the southwest, and the main army waiting in the United States preparing to cross the Atlantic. The need for maximum fighter cover dictated that the assault should be made on the left flank, opposite the British forces. American forces might then be brought into the bridgehead and sent westward to take the ports through which the main American army from the United States could be disembarked. Since this plan would involve tangling administrative lines, it would perhaps be better "to contemplate the Anglo-Canadian bridgehead as the left flank guard of American assaults to be delivered further to the west." In any case the need for opening the Atlantic ports meant that the initial assaults were to be given a westerly rather than an easterly trend.

The broad perspective led General Morgan to only one positive conclusion as to the choice of an assault area: it must be in France. Although both France and the Low Countries contained sufficient deepwater ports to receive the American armies, it was not reasonable to suppose that the ports of the Netherlands and Belgium could be opened up by assaulting forces. "To demand of the armies of the advanced guard that they should cover the use of the group of ports of the Low Countries is to demand that they should in effect themselves fight the battle of Germany."

Landing Craft Requirements

Neither the precise area of the assault nor the question of whether one or many landings should be made was decided at this time. In large part, these decisions depended on the approximate scale of the operation. While General Morgan was conceiving the broad outlines of the operation, his staff worked to crystallize the concept in terms of landing craft and men. This problem brought them right back to basic difficulties faced by all the cross-Channel planners and solved by none of them. How could one calculate the size of the assault? What were the determining factors? The Combined Commanders had picked a figure of ten divisions, four in the assault and six preloaded to insure a continuous build-up during the time the craft used in the assault were returning or undergoing repairs for subsequent trips. All ten divisions were to land on the first four tides-that is, before the end of D plus 1. But the only basis for this requirement was the Combined Commanders' feeling that "a return to the Continent against

determined opposition" could not be successful with a smaller force. In rejecting the whole SKYSCRAPER idea, the British Chiefs of Staff pointed out that one could not estimate the number of divisions needed to overcome "determined opposition."

In fact, however, no better estimate was possible. It was obviously absurd to forecast a year in advance the strength and nature of enemy opposition. The only possibility was to plan on the basis of German dispositions as they existed in the spring of 1943, assume a normal distribution of reserves, suppose that German commanders would take the best possible steps for defense, and add hypothetical calculations from logistical tables on the capacity of the enemy to move in reinforcements from the east. The net calculation, however, could easily mean nothing, since the number of unknown factors was very large and there was ample time for the whole picture to change completely before the Allies were ready to attack.

The attempt to find how large an assault would be required for the job thus broke down on the impossibility of judging with any realism the size of the job. The alternative was to calculate how large an assault might be practicable with resources likely to be available and then try to see how an operation of such size might be assured a reasonable chance for success. In May Commodore Hughes-Hallett, chief British naval planner, made a guess pending lengthy examination. He thought landing craft might be procured for simultaneous assault by four divisions including 16,000 men in armored landing craft and l2,000 vehicles in LST's and similar ships. A fifth division might be preloaded to land within twenty-four hours. But an estimate of the availability of craft was almost as shaky as an estimate of the need for them. Writing to General Handy in April, General Barker said: "Provision of landing craft . . . constitutes a continuing bottleneck which not only has to be met materially, but must also be overcome from the psychological and political aspects as well. In other words a shortage . . . can readily be made the excuse for failure to do operations which otherwise might prove practical." He asked General Handy for a clear statement on U. S. production and assurance that the United States could provide the necessary craft for a cross-Channel attack.

It was not easy to supply assurances on U. S. production of landing craft. In the first place the whole idea of using specially constructed craft in large numbers for amphibious operations was so new that no generally accepted doctrine had been developed. Thus in the spring of 1943 Admiral King was reported as saying: ". . . apparently now it is felt assaults cannot be made without specially designed craft." At the same time it was suggested that the landing craft bottleneck might be partly bypassed by larger use of "makeshift" craft such as barges and river "steamers."

Except for small personnel boats the U. S. Navy had had no landing craft at all until 1937 when it experimented unsuccessfully with a tank lighter. The first

successful vehicle landing craft was developed by Andrew J. Higgins, a New Orleans boat builder, but was not ordered by the Navy until September 1940 and not contracted for in large numbers until spring of 1942. During the first years of the war the majority of naval leaders resisted the development of landing craft as a foolhardy gamble with an untried weapon and a waste of resources badly needed for naval construction.

The initiative in development of large landing craft was left to the British who, for obvious reasons, were much more seriously impressed with the need for such craft. British experimentation with specialized landing craft began after World War I as a result of the invention of the tank. Whereas experience had seemed to show that personnel could be landed on hostile shores by the regular vessels of the fleet, the tank clearly could be beached only from a special ramp boat. In 1920 the British produced a tank lighter which, with very few changes, became the LCM(l) (Landing Craft, Mechanized). Too small to carry the medium tanks used in World War II, the LCM (l) was nevertheless kept in extensive use for transporting other vehicles and supplies. In 1938 the British at last abandoned the theory that special craft were not needed to land troops. In that year they produced the prototype of the LCA (Landing Craft, Assault), a small wooden armored craft for ship-to-shore movement of assault infantry. The first large orders for LCA's were placed in September 1939, and subcontracted to small boat and yacht firms. Engines for both the LCM and LCA came from the United States.

The LCM and LCA were designed for raiding operations. Production was undertaken only on a very small scale and mostly outside the established shipbuilding industry which was already working to capacity in attempting to meet vastly expanded requirements for merchant and naval war vessels. In June 1940 Prime Minister Churchill personally ordered the design and production of the first landing craft capable of carrying expeditionary forces. Worked out by the Combined Operations staff within the British Admiralty, this became the LCT (Landing Craft, Tank), designed to carry three 40-ton tanks and disembark them in three and a half feet of water on steep-gradient beaches such as those of Scandinavia. The first LCT was delivered in November 1940. Subsequent development of the LCT was comparatively rapid. In December 1941 orders were placed for the fourth model, LCT (4), the first landing craft designed specifically for the shallow- gradient beaches of the French coast. It was to be able to carry six medium tanks and to be capable of rapid mass production.

While the LCT-the basic vehicle-carrying landing craft of World War II-was being perfected, the British also began experimenting with a much larger ocean-going ship capable of discharging vehicles directly across the beach. Three shallow-draft oilers used on Lake Maracaibo in Venezuela were procured and converted to prototypes of the LST (Landing Ship, Tank) by cutting off the bows, installing bow ramps, and scooping out the insides to accommodate vehicles. Though designed with shallow draft, neither the converted Maracaibo nor the first model

LST proved satisfactory. Improvements were gradually worked out through experimentation and study by both British and American designers. The final result was the LST (2), an ocean-going ship capable of grounding and discharging vehicles on the shallow-gradient beaches of France. The United States undertook the entire production of the LST (2) for both British and American use.

In the spring of 1942 the United States began a program for the mass-production of landing craft for the 1943 cross-Channel attack as envisaged in the Marshall Memorandum. The difficulties of expanding a comparatively small landing craft fleet into one for major amphibious operations were enormous. The Navy, which was to co-ordinate the program, and many of the shipyards that were to carry it out were almost wholly lacking in experience. The program was superimposed on already swollen naval construction schedules. Contracts therefore had to be let to small boatyards and manufacturing companies for whom the construction problems posed were unprecedented. The LCT's and LST's were built on inland waterways and it became necessary to find and train crews to sail them to Atlantic ports. The U. S. Coast Guard, which formed the Ferry Command in July, undertook this task with almost no technically competent personnel. Typical of the greenness prevailing to some extent throughout the landing craft program was the story of a young Ferry Command skipper who, piloting his craft down the Niagara River at night, missed the turning into the Erie Canal and, despite warnings from the shore, sailed serenely toward the falls. By luck he ran aground a few hundred yards from the brink. He blandly reported afterward that he had seen the warning lights at the point where he missed the turning but had paid no attention because he could not figure out what they meant.

Lack of experience delayed the program but did not seriously jeopardize it. A more serious difficulty, and one which persisted throughout the war, since it had no final answer, was the establishment of priorities. The material requirements for landing craft, chiefly steel and marine engines, had to compete with other high priority building programs. The construction of a landing craft fleet in 1942 was completed only by the issuance of emergency directives and the creation of special expediting machinery. When the immediate emergency passed with the successful landings in North Africa, landing craft construction had to give way in the competition for materials to other war production which could claim greater urgency. The President's January list of "must" programs for 1943 omitted landing craft. Escort vessels and merchant shipping were a more immediate necessity. The need for escort vessels, in fact, was considered so urgent in the early months of 1943 that the machinery which had been set up to expedite production of landing craft was diverted to perform the same function for destroyer escorts. The 1942 landing craft program ended as scheduled in February with a record production of 106,146 light displacement tons. From then on it declined and in May was stabilized at about 60,000 tons monthly. This figure was carried forward for deliveries during the first half of 1944.

In March 1943 the question of increasing the production of landing craft, particularly for a cross-Channel invasion, came before the Joint Chiefs of Staff. The British at that time asked the United States to examine the possibility of increasing production, because a shortage of LCT's and LST's was likely to make a cross-Channel invasion in 1944 difficult. They added that Britain could not do anything about it since British production was already proceeding at the maximum rate. The British request was met with some suspicion. The Joint Chiefs were inclined to question whether the British were making full use of their own resources. Admiral King stated flatly that any substantial increase in the rate of production of landing craft would cause serious delays and conflicts with other programs. The Navy recalled with alarm the dislocation in naval construction caused by the 1942 landing craft program. After noting that the present schedules for delivery of craft during 1943 and early 1944 would "in no way near approximate previous deliveries except in the case of LST's," a Navy spokesman strongly recommended that no change be made in current production schedules. "It should be remembered that in order to get the present LST's on time we have to cut across every single combatant ship program and give them over-riding priority in every navy yard and in every major civilian ship-building company. We have not and will not for the next 6 months recover from all the derangements suffered from the last over-riding Amphibious Boat Program. In my opinion anything approaching a repetition of the previous program would be disastrous from a standpoint of all other Naval construction . . ."

Allotment of Resources, May 1943

From the point of view of the COSSA planners in London, the failure to take timely steps to increase landing craft production looked at best like shortsightedness and at worst like a deliberate attempt to sabotage the cross-Channel invasion. Washington, however, had a larger, more difficult perspective. The Joint Chiefs were concerned not only with a European invasion but with establishing the best possible balance of forces to carry on the global war. In the spring of 1943 they were still operating under the Casablanca statement of strategy which required that defeat of the German submarine should be a first charge on the resources of the United Nations. The German submarine had not yet been defeated; on the contrary the United Nations in March had lost a near record tonnage of shipping. Any decision to curtail the production of escort vessels would not therefore have seemed justified. Requests to increase landing craft production were at this time extremely vague. No one could say how many more LCT's or LST's would be required. No one could state categorically that the current production schedules would not yield sufficient craft for proposed operations. It has already been pointed out that the planners' estimates for a cross-Channel invasion had varied from a five- to a ten-division lift. By May the only conclusion reached was General Morgan's warning that although requirements of landing craft could not yet be forecast they would be "large enough . . . to present a very serious problem, which has no precedent."

It was with this basic uncertainty as to their needs that the British planners arrived in Washington in May 1943 to settle, among other things, the allocation of resources for 1944 operations in the European theater. The availability of resources was a planning problem and scarcely a whisper of it reached the high council chambers where the President and Prime Minister, with the advice of the Combined Chiefs, sought to mark out world-wide strategy. Yet the whole discussion was colored by the higher level debates on strategy and, in turn, decisions on landing craft made at planning level were to become pivots of higher strategy. For the future of cross-Channel operations in particular, the work of the planners in Washington in May was vastly more significant than the pronouncements of the President and Prime Minister. The repercussions of landing craft decisions were to be felt all during the following year until Churchill at last complained with some bitterness that "the destinies of two great empires . . . seemed to be tied up in some god-dammed things called LST's whose engines themselves had to be tickled on by . . . LST engine experts of which there was a great shortage."

At the Washington Conference the first British statement of requirements for a 1944 cross-Channel invasion included 8,500 landing ships and craft to provide a lift for ten divisions simultaneously loaded for the assault. American planners, comparing this figure with estimated production rates, came up with the conclusion that the demand was impossible of fulfillment. It was, in fact, so far out of line with reality that the U. S. Chiefs of Staff at once suspected the good faith of the British in proposing it. They wondered whether the impossible bill for shipping had not been presented to provide the British with an excuse for not doing the operation.¡ They ignored the fact that the estimate of ten divisions for the assault had been arrived at by combined planners in London and had been specifically agreed to by ETOUSA. In the context of British arguments at the Washington Conference for further operations in the Mediterranean and of their openly expressed doubts as to the feasibility of a cross-Channel invasion unless German strength in the west could be drastically reduced, the suspicion appeared logical. Admiral King, in particular, was convinced that the British had no intention of invading the Continent in the spring of 1944. He thought they would wreck the prospects of ROUNDUP "on the matter of the number of landing craft." General Marshall, taking a more temperate and optimistic view, agreed that ROUNDUP in its conception as a ten-division assault must be recognized as "a logistic impossibility" in the spring of l944.

It was clear, then, that to argue against the British concept of continuing attacks in the Mediterranean which the Joint Chiefs consistently maintained were incapable of decisive results it was necessary to reduce the size of the contemplated cross-Channel invasion to something within the range of logistic possibility. The Joint Chiefs discussed such an operation as a "glorified SLEDGEHAMMER" and conceived it as employing some twenty divisions, which meant scaling down the number of actual assault divisions to a logistically

reasonable force. Thus, their doubts as to the seriousness of British commitment to a Continental invasion in 1944, whether justified or not, helped shape their position that planning should be for an operation possible with the resources which would certainly be on hand in the spring of 1944. In other words the search for a tenable ground to argue against Mediterranean strategy predisposed the U. S. Chiefs of Staff to an acceptance of 1943 production rates as a limiting factor on the scale of Continental operations in 1944. It became politic to avoid discussing the possibility of increasing landing craft production. The issue had to be rescued from the quicksands of hypothesis.

It was. British planners arguing for a ten-division assault felt themselves on unsure ground. Rear Adm. C. M. Cooke of the U. S. Joint Planning Staff commented that each of the British planning papers seemed to contain a different assessment of landing craft requirements, and that their original figure of 8,500 had been "talked down" to 4,000. As the British Chiefs of Staff had previously admitted, there were no grounds for defending the arbitrary estimate of ten divisions in the assault except a feeling that overwhelming strength would be needed. Since this was obviously relative and no one could foretell what it would be relative to, the argument could not carry much weight.

The Joint Chiefs of Staff instructed their planners to re-examine American and British capabilities for supplying troops and landing craft. The planners reported that, assuming two operations in the Mediterranean after the conquest of Sicily, landing craft could be made available in the United Kingdom by the spring of 1944 sufficient to lift five divisions simultaneously, three for the assault and two for the immediate follow-up. They believed a "second follow-up force of two divisions can be floated by landing craft used in the assault on their first turnaround augmented as practicable by miscellaneous craft which can be provided in the United Kingdom." Detailed figures actually revealed a deficit of lift for 500 vehicles, but this was considered small enough to be acceptable for planning purposes. Troops available in the United Kingdom at the target date were estimated to total from twenty-six to thirty divisions depending on whether cannibalization of four British divisions proved necessary in order to find line of communications troops.

These planning figures were accepted without significant debate and it was agreed that General Morgan would be ordered to confine his plan to the detailed allotment of 4,504 landing ships and craft which planners figured would be available. In addition to the five divisions seaborne in the assault, Morgan would plan to use two airborne divisions for which he was allotted an admittedly inadequate number of transport aircraft.

The whole calculation was necessarily based on a number of highly debatable assumptions, which had not been agreed on by the various planning groups and which had not been tested by a large- scale amphibious operation against a defended coast. By May the COSSAC naval staff had adopted a "Standard

Method for Forecasting Landing Craft Requirements." But this was not used at the Washington Conference. The Washington estimates were based on quite different assumptions. For instance, while COSSAC allotted 3,000 vehicles to each assault division to be carried in major landing ships or craft, Washington planners figured 4,380.

The Washington estimates of the average capacity of the various types of craft also differed significantly from COSSAC's reckoning. These discrepancies are understandable when the nature of the problem of estimating ship capacities is considered. In the first place a "vehicle" is a flexible term covering everything from a l/4-ton trailer to a tank retriever. In actual loading for the operation, for instance, VII Corps LCT's carried from three to twenty-eight vehicles, depending on the type. In striking an average for an assault force, much depended on the exact composition of the force. Furthermore the average was not likely to obtain when applied to smaller units of the assault which, for tactical reasons, might have to be loaded without regard to economy of space. Thus, the higher the average capacity for planning purposes, the more inflexible the tactical employment of the force. Until the tactical plan was known, planning estimates would naturally vary according to the planner's knowledge of, or feeling about, the difficulty of the actual operation contemplated. Throughout the planning period it was generally true that the Americans tended to be more optimistic than the British about the difficulties of the assault and hence more willing to push planning figures upward toward the theoretical maximum. The most optimistic Americans were those on this side of the water.

One of the greatest weaknesses of the Washington calculations which fixed COSSAC's resources was that they did not take into account possible loss or damage to craft in the assault or the time required for ships to turn around and come back for the build-up forces. As one of the chief COSSAC planners pointed out, the provision of sufficient landing craft for the assault and first twenty-four hours did not necessarily insure an adequate build-up. The buildup would depend in large part on what ships came back from the assault. How long would it take them to return, how many would be lost, how many damaged, how fast could the damaged craft be repaired? It would have been impossible for the Washington planners to have arrived at any firm estimates along these lines because the choice of an assault area had not then been settled and consequently the nature of enemy opposition could not even be guessed at nor the length of the sea voyage determined.

Another important factor largely omitted from reckoning at Washington was the need for close-support craft. The principal types mounted guns, rockets, or mortars on LCT hulls or similar bottoms. They therefore had to be figured into the total production requirements for landing craft, even though they provided no assault lift. The failure to allot them in anything like adequate numbers, in fact, forced COSSAC to convert some LCT's and thus increased the shortage of landing craft.

The net effect of the Washington Conference decisions was narrowly to restrict not only the size of the cross-Channel assault but the degree of flexibility with which tactical dispositions could be planned. As planning progressed it would become increasingly apparent that the allocations agreed to by the Combined Chiefs of Staff in May 1943 were wholly inadequate for the job. But for the moment the figures were accepted without serious demur from any quarter.

It has already been suggested that this ready agreement to mount the cross-Channel invasion on a shoestring sprang at least in part from the context of the Washington Conference. American concern with getting a firm decision on a definite operation with a definite target date led to a willingness to accept an operation scaled to resources evidently within the capacities of the Allies. The British were not likely to take serious issue. They attached little importance to long-range commitments and consistently deprecated discussions of strategic principles. They were always more interested in the operation which came next on the war agenda.

For the British in May 1943, the next logical operation was a follow-up in the Mediterranean of the invasion of Sicily, which was scheduled for July. The main project for 1943, they said, was the elimination of Italy. "The collapse of Italy," said the Prime Minister, "would cause a chill of loneliness over the German people, and might be the beginning of their doom." The British Chiefs of Staff contended that Mediterranean operations were not only the most important immediate objective but that they were also essential in order to create conditions which would permit the mounting of ROUNDUP in the spring of 1944. In General Brooke's opinion, without further Mediterranean operations, ROUNDUP would not be possible before 1945 or 1946. In a detailed estimate of the probable situation in northwest Europe in 1944, the British planners concluded that the Allies could not hope to compete successfully with enemy build-up either on the ground or in the air unless the enemy's ability to reinforce his coastal defenses was weakened by forced withdrawals to take over the defense of Italy and Italian commitments in the Balkans. They pointed out that there were definite limitations to the weight which the Allies could throw against the Continent-limitations chiefly due to landing craft but also inherent in the nature of amphibious operations. To ignore these would be to risk entering a build-up race in which the Allies could probably never hope to achieve the necessary margin of superiority. Furthermore, failure to maintain the momentum of attack in the Mediterranean would cast away an unrivaled opportunity to inflict mortal in jury on Germany and would give her a chance to prepare to parry the final blow. "The final blow," they admitted, "can only be struck across the Channel; it cannot be delivered from the Mediterranean." But it was essential to do everything possible to exhaust and weaken Germany before the blow was struck.

With the conclusion the U. S. Chiefs of Staff agreed. It was the method they

challenged. They did not believe that such "minor" operations in the Mediterranean as were within the capabilities of the United Nations would draw German forces from Russia even if they resulted in the collapse of Italy. They believed, that the main effort against Germany in 1943 would have to be made by the Soviet Union and that the United States and Great Britain were incapable of effective intervention. On the other hand, the Soviets would probably still need help in 1944. The Western Allies could put themselves in a position to render really effective aid then provided that they did not dissipate their resources on side shows in 1943. Tentatively the Americans suggested that a limited bridgehead operation against the Continent might be attempted during 1943. But they did not press the point against British objections that the bridgehead would lock up the Allied divisions employed, cause the Germans to concentrate in France, and so make later invasion more difficult. The President expressed the gist of the American point of view at the first plenary session. He disliked the idea of possibly playing into German hands by committing large United Nations armies in Italy where they were in danger of suffering attrition. On the other hand he agreed with the Prime Minister that American and British forces should not be idle between the conclusion of the Sicilian campaign and the spring of 1944.

In the final decision of the conference the latter consideration prevailed. The debate was resolved more easily than similar debates at later conferences, because it did not involve an immediate choice between alternative courses of action. The Americans opposed Mediterranean operations not in themselves but only as they might delay attack on northwest Europe. The British opposed not the cross-Channel attack but only the exclusive devotion of resources to it which would rule out action in the Mediterranean. The British feared an immediate opportunity would be thrown away through narrow concentration on the main goal. The Americans feared that by taking the immediate opportunity the chance to pursue the main goal might be lost or seriously delayed.

The conference was able to straddle the disagreement. The Joint Chiefs of Staff secured a firm commitment on the size and target date for the cross-Channel operation. The decisions of the conference as they affected the plan which COSSAC would soon christen OVERLORD provided that "forces and equipment" should be established in the United Kingdom "with the object of mounting an operation with target date 1 May 1944 to secure a lodgment on the Continent from which further offensive operations can be carried out." The Combined Chiefs agreed to allot five infantry divisions for the assault, two infantry divisions for the initial build-up, two airborne divisions, and an additional twenty divisions to be available in England for movement into the lodgment area.

The decision on the target date was made without much debate. The Joint Chiefs of Staff first proposed 1 April as the earliest date when suitable weather could be expected and as the date that coincided with the conclusion of the planned bomber offensive designed to prepare the attack chiefly by knocking out German air power. General Brooke proposed a postponement of one month to

avoid the spring thaw in Russia and so permit the Soviet Union to launch a co-ordinated offensive. This was agreed. Admiral King even indicated that a still later date might be acceptable and he commented that target dates were seldom met anyway. The Joint Chiefs were mainly concerned that some date be fixed to pin down the commitment to the operation and insure a certain urgency in the planning and preparation.

The Joint Chiefs yielded to British arguments so far as to sanction further operations in the Mediterranean but only with provisos that strictly limited Mediterranean commitments. Each specific operation in the Mediterranean to follow HUSKY (the invasion of Sicily) was to be subject to approval by the Combined Chiefs of Staff. General Eisenhower, Commander in Chief in North Africa, could use for his operations only the forces already allotted to his theater. It was further agreed that four U. S. and three British combat-experienced divisions in the Mediterranean would be held in readiness from 1 November on-ward for transfer to England to take part in the cross-Channel operation. This was a particularly important decision in hardening the resolution to turn in 1944 from the Mediterranean to northwest Europe.

The COSSAC Plans

The decisions of the Washington Conference were made known to COSSAC late in May. In the meantime the COSSAC staff had begun developing plans for the three operations for which it was responsible. These included, in addition to the cross-Channel attack itself, actions to make the Germans believe the Allies would invade Europe during 1943, and operations to take place in case of German collapse.

COCKADE

The main objective of the diversionary scheme for 1943, planned under the code name COCKADE, was to pin German forces in the west by encouraging German expectations of an Allied invasion during that year. In addition, by including an actual amphibious feint, General Morgan hoped to provoke an air battle that would contribute to the destruction of, the German Air Force.

This over-all plan included three separate operations, each threatening a different portion of the enemy-held coast. The U. S. Army's allotted portion of the plan was Operation WADHAM, embodying a threat to the Brest Peninsula and designed to persuade the Germans into overestimating the strength of U. S. forces in the United Kingdom. The threat was carried out by forces under V Corps. At the same time British forces in Scotland simulated preparations for attack against Norway (Operation TINDALL). But the heart of COCKADE was Operation STARKEY directed against the Pas-de-Calais and designed to include, as an amphibious feint, a landing exercise, HARLEQUIN. Plagued, as usual, by the shortage of landing craft, COSSAC was obliged in the end to halt

HARLEQUIN short of embarkation, but the rest of the STARKEY plan was carried through, culminating in minesweeping operations in the Channel at the beginning of September.

It is peculiarly difficult to assess the effects of operations like COCKADE. Neither in the routine Allied intelligence reports nor in surviving German records is there evidence of specific and overt German reaction. No new troop dispositions were ordered in expectation of immediate invasion of France. On the other hand, the German defenders in the west were in some stage of alert during most of 1943 and it is plausible to suppose that knowledge of Allied activities contributed at least in some measure to their tenseness. General Morgan, though uncertain as to enemy reaction, believed that certain naval activity in the Channel and the flooding of the lowlands behind Caen and the Cotentin beaches might be "reasonably ascribed" to the feints. Whatever the full effect may have been on the enemy, COCKADE had one clear value for the Allies in providing experience for planning the successful diversionary activities of 1944.

Outline Overlord

The duties of COSSAC in supervising the execution of COCKADE continued, as noted, through the summer of 1943, but the staff's chief planning energies were turned at the beginning of June to the preparation of OVERLORD. Six weeks later they had written the outline plan. Before examining the details of that plan, it is important to observe its general character.

Outline OVERLORD, in the strict sense, was not an operational plan at all. It was not a blueprint for maneuver. No field order could have been issued on the basis of it, and no troop dispositions made. It was a plan for planning, not a plan for action. Its tone was discursive, not precise and peremptory. It reflected the fact that it was drawn by a staff in the absence of the commander, and it made a patent effort to refrain from tying the commander's hand, especially in examining the later phases of the operation. It was designed to answer the question implicit in the May decisions of the Combined Chiefs of Staff. Given certain resources, was an operation against the Continent possible in the spring of 1944 COSSAC arrived at an answer in Outline OVERLORD first by narrowing down the problem through rejecting courses of action that seemed impossible with the given means, and then by outlining certain conclusions as to the size and shape and limiting conditions, of a feasible operation. Within that outline, details were only tentatively sketched in.

Previous planning had already observed that geography placed rigid limits on the operation. Earlier planners concluded that only two geographically feasible assault areas existed-the Caen region and the Pas-de-Calais. Although the most recent appreciation made at the end of 1942 had rejected the Pas-de-Calais, General Morgan revived the idea. The Pas-de-Calais had certain obvious

attractions, inherent chiefly in its proximity to England. Morgan, though recognizing its disadvantages, was reluctant to dismiss it out of hand. He therefore ordered that the British Army operations branch of COSSAC prepare an estimate and outline plan for an assault on the Pas-de-Calais while the American branch worked on an operation against Caen.

This order was given early in June 1943 and about two weeks later the British planners had delivered their answer. They agreed with the earlier planning conclusion. An attack on the Pas-de-Calais, they said, must be considered strategically unsound. The British appreciation, embodied later in an appendix to the OVERLORD plan, reinforced the reasoning of earlier planners. The COSSAC staff found only four beaches in the Pas-de-Calais suitable for assault. These could receive a theoretical maximum of two assault divisions on D Day provided no delay were imposed by landing obstacles or enemy resistance. Since there were no ports in the region and the beaches were unsheltered, blocked, and heavily defended, it seemed obvious that the Allies' rate of build-up could not hope to compete with the enemy's. The expansion of the beachhead, moreover, to include major ports for the subsequent maintenance of the invasion force would require long flank marches east to Antwerp or southwest to the Seine ports, both across the whole front of the German army. They summed up: "Not only does the strength of the defenses demand a weight of assault which the restricted capacity of the beaches cannot admit, but the restrictions imposed by the beaches do not allow a rapid build-up. Further, even if assault were practicable, the geography of the area does not permit of the capture of sufficient ports to maintain the force, and the terrain does not allow of the defense and exploitation of the bridgehead by the occupation of successive natural obstacles."

Before the end of the month planners had ruled out assaults at Le Havre and on the Cotentin Peninsula. But with rejection of the Pas-de-Calais, the decision had actually been made that the main attack would take place in the vicinity of Caen. (Map II) Assault landings would be confined to three beaches (Lion-sur-Mer-Courseulles, Courseulles-Arromanches-les Bains, and Colleville-sur-Mer-Vierville-sur-Mer). This, General Morgan decided, was the maximum area that could be successfully attacked with the limited forces at his disposal. He rejected the earlier idea of a simultaneous landing on the eastern beaches of the Cotentin, although he recognized its value, and told the British Chiefs of Staff that he would like such a landing if he could have craft for an extra assault division.

As it was, the plan was to land two British divisions over the two eastern beaches in the Caen sector, one U.S. division over the western beach, and two-thirds of one British airborne division in the vicinity of Caen. In addition, various subsidiary assaults would be necessary by commandos and parachutists to neutralize key enemy coastal batteries, secure crossings over the River Aure, and form a defensive flank on the Vire. Details of these missions were left for

later planning.

D Day was, of course, not selected, but some of the weather and tidal conditions governing its selection were discussed. Since the target date (Y Day) was 1 May, D Day would fall some time during the month. There were likely to be twenty-three days in May on which the prevailing wind force would permit the beaching of landing craft. Quiet spells of four days or more could be expected twice during the month. But forecasting them was another matter. The odds were ten to three that a three-day spell of good weather could be predicted twenty-four hours in advance. The incidence of suitable weather for the airborne operation was still under investigation when the plan was issued, and it was simply noted that this would probably impose still narrower limitations on the choice of D Day.

The question of whether the assault should take place in daylight or darkness was not definitely decided though it was pointed out that the Navy required daylight in order to control the operations of a large fleet and in order to direct effective fire support. This requirement, the planners added, was likely to be decisive, even though, from the Army's standpoint, an approach to the shore by night would be desirable to help preserve surprise up to the last moment.

It was noted that the initial landing should take place about three hours before high water in order that a good-sized force might be landed on the first tide. Calculations to tie in weather, tide, and hours of daylight would be made only in later planning, when the optimum conditions for H Hour were finally settled.

The choice of the Caen area meant a decision to delay the capture of ports needed for the maintenance of a large invasion force. Cherbourg, even if captured early, would not be adequate to support the twenty-nine divisions which were to be put into the lodgment area. Throughout the initial phases of the operation a large proportion of supplies would have to be landed across the invasion beaches. General Morgan accepted the risk of prolonged beach maintenance because he counted on the completion of at least two artificial ports which were then being developed.

The bold and revolutionary idea of prefabricating ports in England and towing them across the Channel had been talked about in 1942, but experimentation did not begin in earnest until the summer of 1943. The essential ingredients of the artificial ports (which, in the prevailing fashion of code names, were called MULBERRIES) were the breakwaters to supply sheltered water in which small craft could ferry supplies to the beaches, and a floating pier (connected by treadway to the beach) at which larger vessels could unload directly into trucks. The solution at last developed for the breakwater was to combine sunken ships with the so-called phoenixes-hollow, floating concrete caissons about six stories high. The phoenixes were to be towed across the Channel and then sunk, by opening sea cocks, and anchored in position. The pier was developed as a

floating platform devised so that with the rise and fall of the tide it could slide up and down on four posts which rested securely on the bottom of the sea.

When General Morgan made his plan, depending on these devices, the MULBERRIES were still on the drawing boards. In fact, engineers were still experimenting with various breakwater devices and the vast concrete phoenixes had not even been ordered. This circumstance again underlined the tentativeness of COSSAC's approach. It was still necessary to assume resources that were not at hand and conditions that could hardly be foreseen.

For this reason, such things as the detailed composition of the assault forces were left for later planning. It was noted only that an unusually high proportion of armor and antiaircraft would probably be required in the first waves. COSSAC's view was that the Allies could count on surprise to get them safely ashore and through the first crust of the enemy's defenses. The critical phase of the operation would be the first battles with the enemy's reserves. Because enemy counterattacks could be expected from D Day on, the Allies needed to have the maximum of armor at their disposal as early as possible. "The normal German system," COSSAC observed, "is to concentrate reserves well forward behind threatened sectors, in order to get the maximum forces into action on D Day.... The crux of the operation will be our ability to land forces quickly enough, first, to hold the initial German counterattacks, and then to defeat and drive off the large German reserves which will be brought in against our bridgehead."

The basic problem was to establish and maintain a reasonable margin of superiority over the enemy. In this, General Morgan was handicapped from the outset by limitation of resources. The Combined Chiefs of Staff had instructed him to use three divisions in the assault and two in the immediate follow-up and had allocated a specific number of landing craft and ships for the simultaneous loading of these five divisions. When the COSSAC staff tried to match men and vehicles with allocated shipping and form five naval task forces each to carry one division, they found that a large percentage of the two follow-up divisions could not be tactically loaded and that they had more than 1,200 minor landing craft left over which were not seaworthy enough when loaded to make the long cross-Channel trip to Caen under their own power.

The fact that overheads such as antiaircraft and special engineer units would have to be landed on D Day and D plus 1, and that a high proportion of tanks would have to be carried in the assault, put an additional strain on shipping resources. The net effect was to compel reduction of the immediate reinforcements for the assault and delay their landing. On D Day only four follow-up reinforced regiments would be landed instead of two divisions as specified in the Combined Chiefs of Staff directive.

On D plus 1 only one and a third divisions could be landed instead of the two estimated by Washington planners. Furthermore, COSSAC warned that 75

percent of the vehicles in the D-plus-l buildup divisions would have to be loaded in ordinary shipping. Not only were there risks and difficulties in using large ships so early in the operation, but the units carried in them could not be unloaded in tactical order. It would take twenty-four hours after they got ashore before they could be organized and equipped for action. "It should be clearly noted," the plan warned, "that landing units in this manner means that the forces ashore on D Day are not reinforced until D plus 2 with formations operationally available, except to the extent of about a brigade group [regimental combat team]."

COSSAC was directed to employ two airborne divisions in the assault, but the allotment of 632 transport aircraft was far short of what was needed. This was not lift enough even for the two missions deemed essential: the capture and neutralization of the coastal batteries at Grand-camp-les Bains and Ouistreham-Riva-Bella and the capture of Caen. The capture of Caen alone was estimated to require a full airborne division. COSSAC's decision was nevertheless to employ airborne troops on both missions, with the main air landings in the vicinity of Caen. The planners felt that Caen, an important bottleneck in communications from the hinterland to the beaches, had to be seized "to avoid defeat in the early stages."

General Morgan was always conscious that the Allies, with such limited resources in the early stages, could hope at best for only a slender margin of superiority. It was thus essential to do everything possible to reduce the enemy's capacity to resist. Steps were to be taken immediately (as of July 1943) to soften German resistance by all available means: direct sea and air action, psychological, political, and economic pressures, and sabotage and deception. This softening was to constitute the preliminary phase of the operation and was to be systematized to produce conditions considered essential to the success of OVERLORD. During this phase the main effort of the Allied forces would be to reduce German fighter strength in western Europe, by bombing fighter production plants and airfields and by bringing the German fighter force to battle under conditions favorable to the Allies. At the same time, "but without detriment to the main aim," the Allied air offensive would continue the progressive destruction and dislocation of the German military and economic system and the undermining of the morale of the German people. It was expected that in these ways the Allies could insure themselves of absolute air supremacy by D Day. That was set as a condition for the operation "since only through air power can we offset the many and great disabilities inherent in the situation confronting the attacking surface forces."

In the preparatory phase, beginning an undetermined time before D Day, the air offensive would be intensified and begin to hit hard at the enemy's airfields and those portions of his transportation system within fighter range of the Caen area. Immediately before the assault, air attack would focus on rail and road nets directly feeding into the battle area. Not until the assault phase itself-a matter of

hours before the landings-would aircraft attack the enemy's beach defenses.

Important as it was thought to be to make the fullest utilization of Allied air power, it was considered still more important to conceal as long as possible the actual assault area. COSSAC planners believed that it would be possible to preserve a high degree of tactical surprise, for, the staff pointed out, "It was evident from the weakness of the local defenses that the Germans did not consider it likely that we could make an assault in force in the Caen sector." All preparations therefore should studiously avoid calling attention to the assault area.

Further to contribute to surprise as well as to reduce enemy strength in the invasion area, two major diversions were to be staged. One would be carried out from the United Kingdom: a feint aimed at the Pas-de-Calais coast to begin about D minus 14 and continue during the first two weeks of the invasion. It was to follow the general lines of the 1943 operation pointed at the same area and would include an actual expedition using some of the small craft which were unsuitable for the main assault. A second diversion would be mounted from the Mediterranean against the south coast of France to give the impression of an imminent major landing there. This was to start with a threat before the Normandy landings, but preparations would be made for an actual landing if German forces were withdrawn from southern France to meet the OVERLORD attack. Both of these diversions became tremendously important in later planning and in the invasion itself, but in the outline plan COSSAC did little more than suggest the idea.

Everything possible should be done before the invasion to reduce the enemy's capacity to resist on the ground and in the air. But this was a highly theoretical specification. How much capacity to resist could safely be left to the enemy? At what point could preparations be said to be complete and the necessary conditions for the invasion set up? The answer could not be securely pinned to reality, since it was patently impossible to estimate enemy capabilities so far in advance. The best answer was hypothetical. Rejecting the attempt to assess the actual enemy, General Morgan calculated the maximum enemy which in his opinion the Allies could take on.

Static troops defending the coast line were not taken into consideration; it was assumed that they would be defeated by the landing itself. Having got ashore, the invasion forces would be able, it was thought, to withstand counterattack by two German divisions. A third German offensive division could be in the area on the assumption that it would have to be held in reserve for the defense of the Cotentin. By D plus 2 the bridgehead could probably hold against attack by two additional enemy divisions. By D plus 8 the enemy should not have more than a total of nine offensive divisions in the area if the Allies were to have a reasonable chance of gaining their objectives. The Germans by that date would have had time to move all available divisions in France and the Low Countries

into the bridgehead area, except those pinned down by diversionary threats to other areas. It was believed that threats could keep a maximum of three enemy reserve divisions away from the bridgehead. In other words, the total German offensive striking force in France and the Low Countries on the invasion date should not exceed twelve divisions if the invasion was to succeed.

These calculations evoked considerable criticism. General Barker, Morgan's deputy, protested the inclusion of any conditional clauses in the plan because he felt that they would make the plan harder to sell in Washington. The U. S. Joint Chiefs of Staff, he knew, believed that the British were cool toward the idea of a Continental invasion, and he foresaw that specifications as to the maximum enemy forces that could be defeated in France would only reinforce their belief. The Joint Chiefs, in fact, reacted as General Barker predicted. Barker had to explain that the clause did not mean that the operation would have to be canceled if more than twelve enemy divisions could be brought to oppose it. COSSAC meant only that a maximum of twelve divisions could be defeated by the Allied ground forces; if there were any more, they would have to be reduced by air power or other means. This interpretation was accepted, and the conditions stood. Later on, however, at the conference with the Russians, they were again queried when Stalin simply asked: "And what if there are thirteen divisions?"

It was not so much a question as a needle jab to elicit further assurance of the Allies' firm intention to mount the operation. As far as General Morgan was concerned, it was not his business to settle Allied intentions, but it was his job to determine whether OVERLORD was feasible. Since his own resources were limited by directive and since no such limitation was imposed on the enemy, he could not very well return an unqualified verdict. As to the artificial rigidity of the conditions, the plan itself provided a qualification. "It will be realized that the conditions under which the operation might be successful do not depend solely on the numerical strength of the reserves available to the Germans. The scale of German resistance will depend on such things as the state of the French railways and the strength, quality, and morale of the enemy's front line units."

The first objective of the main assault was to secure a bridgehead including Grandcamp, Bayeux, and Caen by the end of D Day. Initial follow-up forces consisting of two regiments in each sector (British and American) would land on D Day and assist assault forces in consolidating this bridgehead. Subsequent expansion of the bridgehead would take the form of thrusts south and southwest from the Caen-Bayeux area to defeat the enemy west of the Orne River, outflank his forces between the Orne and the Dives Rivers, and finally secure sufficient depth to make the turning movement to attack up the Cotentin toward Cherbourg. These operations would cover the first eight days of the invasion; by that time twelve divisions would be ashore. During the next six days, expansion southwestward would continue while a force entered the Cotentin with the mission of capturing Cherbourg by D plus 14. An armored force at the same time

would strike southeast toward Alencon to cover the opening of airfields southeast of Caen. Eighteen divisions would be ashore on D plus 14 and the planners estimated that at that time "the German forces should have been decisively beaten.

After the capture of Cherbourg and the defeat of German forces west of the Orne River, COSSAC planners believed the enemy would fall back with part of his forces on Brittany for the defense of the ports there and withdraw the rest east of the Seine for the defense of Paris. It would then be up to the Supreme Commander to decide whether the Allies' next move would be to capture the ports on the Seine or those in Brittany. Although his decision would depend on estimates of his own and enemy capabilities at the time, COSSAC presumed that unless the Germans were on the point of collapse the Allies would be compelled to go after the Brittany ports in order to build up a large striking army with which to force the line of the Seine. To cover the entry into Brittany it would be necessary to drive the retreating Germans eastward in order to secure the line of the Eure River from Dreux to Rouen and thence the line of the Seine to the sea. This task would be carried out by British and Canadian armies while the American army was attacking Brittany. In these moves, the planners warned, five guiding considerations should be kept in mind: the vital necessity not to outrun heavily strained communications, the importance of early capture of a group of enemy airfields in the Dreux-Evreux region and of ground for the development of airfields in the le Mans-Chateaudun area, the value of the Seine below Rouen as a complete obstacle, the importance of Dreux, Chartres, and Orleans as centers of communication, and the value of the Coteaux du Perche as a bastion west of Dreux and Chartres.

In this latter phase, culminating on about D plus 0 in the occupation of the lodgment area proper bounded by the Loire and Seine Rivers, COSSAC put great stress on the development of airfields. By D plus 24, for instance, it was anticipated that twenty-seven Continental airfields should be in operation, on which sixty-two squadrons could be based. The securing of the lodgment area, planners figured, would be followed by a long period of reorganization and consolidation. The next phase, the primary objective of which would be the capture of Paris and the Seine ports, was conceived as a major operation which the Germans would resist heavily. Its completion would be followed by another pause of some three months while the enemy was cleared out of the whole of France south of the Loire and Dijon and the surrender of the Channel Islands was forced.

The maneuver thus envisaged an evenly spaced series of battles, evenly opposed. The planners blueprinted an operation in which the invading armies struck hard for an initial foothold, built up and pushed forward on all fronts to gain maneuver room, paused, gathering strength for the next push, and so proceeded by bounds, cracking the enemy lines with separate, massed, and carefully prepared attacks for each new objective. The plan did not foresee the

battle of attrition in Normandy nor the breakout that followed, nor the long-sustained armored drives in pursuit of a broken enemy.

Crushing defeat of the enemy, sending him in headlong and disorganized retreat, was a fortune of war which could be hoped for but not planned. Besides, by the terms of his directive, General Morgan was to plan not the annihilation of the German armies but the establishment of a lodgment area from which further offensive operations could be carried out. His attention was thus naturally focused on seizing and consolidating ground, capturing ports and airfields, and building up an army which could hold its gains and prepare to strike for further conquest.

RANKIN

Outline OVERLORD was finished and submitted to the British Chiefs of Staff for review before COSSAC got around to the third task: planning for occupation of the Continent in case of German collapse. RANKIN as the collapse operation was named, proved an exceptionally difficult concept to grasp and translate into a plan of action. In the first place it was not at all clear what collapse meant. SLEDGEHAMMER and ROUNDUP had both been made contingent on a kind of collapse and planners then attempted to define the concept. They came up with a rather vague notion of marked "deterioration of German morale," which seems not to have contemplated any failure of the Nazi government or any withdrawal of forces from the west. Rather it denoted a general weakening of the will to resist (as a result, of course, of a weakening of the means)-a nebulous idea at best. But nothing more specific was then needed. SLEDGEHAMMER and ROUNDUP both were planned by the British as operations involving the maximum available Allied forces as if to meet determined enemy opposition. Plans were then shelved pending some future intelligence estimate which might indicate an enemy situation sufficiently weak to give the attacks a reasonable chance of success.

OVERLORD, in contrast, was designed from the beginning as an operation with a specific target date, to go in against full enemy opposition. Such conditions as were laid down concerning maximum enemy resistance were conditions to be brought about by the Allies during the period of preparation. They were tactical rather than strategic conditions-that is, they affected only the limitation of the number of German troops that could be committed against the lodgment area; they did not include any general undermining of Germany's military or political potential. The possibility of such general deterioration, however, remained and, since OVERLORD was being prepared entirely without regard for it, it became necessary to make separate plans to take advantage of collapse when and if it occurred.

General Morgan was instructed by the Combined Chiefs that his organization should provide for "the need to re-enter the Continent with all available forces at

the shortest possible notice in the event of a sudden and unexpected collapse of German resistance. The aim would be to seize critical political and military centers in Germany in the shortest possible time." Soon after the COSSAC staff was established General Morgan asked the British Chiefs of Staff for a clarification of this directive, because, he said, his main object was given him as "the defeat of the German fighting forces in North- West Europe," whereas the directive to prepare for German collapse presupposed that the enemy had been defeated. He wanted specifically a restatement of his major object, a closer definition of the phrase "German disintegration," and more detail on the "critical political and military objectives."

The reply of the British Chiefs of Staff was not delivered until 21 June. In the meantime General Morgan changed his mind about the need for definition. In a directive to his staff on 22 May, he said: "Little is to be gained by seeking to define the phrase 'German disintegration'. Quot homines tot sententiae." Instead he suggested a flexible plan capable of variation between the extremes of an invasion of the Continent to break through a screen of resistance, and a landing against no opposition at all. The first plan prepared should suppose no resistance, since the state of Allied resources would not immediately permit undertaking an opposed landing. He recognized the difficulty of getting hold of a planning hypothesis. Since the time of the return could not be predicted, no precise estimate was possible of conditions on either side of the Channel. But, he pointed out, "Nebulous though the setting may be, there can be nothing nebulous in the event, which must be characterized by the utmost speed and precision of movement." The problem was basically similar to mobilization in peacetime. The solution consisted, first, in providing machinery to anticipate the event as far ahead as possible and, second, in phasing preparations so that they will "gain or lose momentum as the critical moment is judged to be approaching or receding."

The solution at last selected was to break up the concept of enemy collapse into three definite degrees of collapse and provide three corresponding courses of action for the Allies. The three conditions were case A, which supposed a substantial weakening of organized resistance in France and the Low Countries, case B, which assumed German withdrawal from the occupied countries, and case C, unconditional surrender and cessation of organized resistance in northwest Europe.

If the deterioration of German military power in the west was not accompanied by surrender or withdrawal, Allied action would depend on the relative strength of German and Anglo-American forces at any given date. Before January 1944, it was thought that no assault against organized resistance, however weakened, would be possible. In January and February a substantial weakening of the German forces might make possible a limited bridgehead operation. Since this date would find preparations for OVERLORD far advanced, the only feasible operation would be one that made use of these preparations. The RANKIN plan

thus indicated a modification of OVERLORD to secure the Cotentin Peninsula if it became desirable to set the date forward to January or February. After 1 March a drastic reduction in German strength would permit a modified OVERLORD assault with substantially OVERLORD'S objectives.

Case A thus involved no special planning difficulty. The problem of following up a German withdrawal from France was more complicated. If such withdrawal was made, it would be done presumably with the idea of strengthening the German position. It could therefore be expected that the maximum obstacles would be put in the way of Allied occupation. If withdrawal was begun in the winter, Allied landing would have to wait for the evacuation of a major port, since beach maintenance in winter weather was impossible on the Channel coasts. The Germans seeking to establish a defensive position at the West Wall (the Siegfried Line)-the only position that would permit the necessary economy of troops-would start pulling out from the south and southwest. The first port to be vacated would be Bordeaux. But this was too far from where the Allies could be deployed against the Germans to be useful as a port of entry. The landing of substantial military forces could be begun only when Cherbourg was freed. The problem was to get as far east as possible in order to get as near as possible to the final German defense line and insure fighter protection from United Kingdom bases. At the same time landings could not be made so far east that they would be under attack by German mobile forces operating in advance of their main line of defense. Le Havre and Rouen were ruled out as initial ports of entry because the Germans were expected to make a preliminary stand at the Seine to protect and organize the retreat. Landing at Cherbourg, forces would be built up in the Cotentin. But this was likely to be a slow process in view of anticipated demolition of the port. "There can . . . be no thought of forcing the SEINE at an early stage, nor indeed can any major effort be contemplated at any time to speed the enemy's withdrawal other than by air action." It was pointed out further that a grave disadvantage of landing as far west as Cherbourg was "the immense bridging liabilities which the enemy's legacy of large scale demolitions" was likely to cause. The store of Allied bridging equipment in the United Kingdom was not likely to prove adequate for such an undertaking before 1 January 1944.

Advance beyond the initial bridgehead would depend on the rate of enemy withdrawal. It could be retarded by delay in the build-up but could not be accelerated. When the enemy reached his final defensive position, "There must of necessity be a considerable pause while we build up sufficient forces for an advance Eastwards.

The plan throughout was conservative in estimating the time needed to build up strength before joining the final battle. The conclusion was that German collapse as envisaged under cases A and B might permit the Allies to return to the Continent before May 1944 but that such collapse would not materially advance the time for decisive action. In short, the RANKIN A and B plans offered little

military advantages and the grounds for considering them were chiefly that politically it might be necessary to press into the occupied countries as soon as the Nazi grip on them relaxed.

As preparations for OVERLORD proceeded, the only RANKIN operation seriously considered was that under case C-total collapse accompanied by unconditional surrender. The plan here involved no purely military considerations, being a scheme for rapid occupation.

Although no RANKIN plan was ever put into effect, detailed consideration has been given to the planning because it reveals that the Allied timetable for the war in western Europe was actually much more dependent on Allied preparations than on the state of the enemy.

The RANKIN project was kept before the planners and periodically re-examined, but its importance as a plan steadily dwindled as the OVERLORD target date approached and the proliferation of OVERLORD plans and preparations focused attention more and more on the big invasion.