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# THE CONDUCT OF THE WAR AT SEA

An Essay by

Admiral Karl Doenitz

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DIVISION OF NAVAL INTELLIGENCE

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1. Admiral Doenitz' essay on the Conduct of the War at Sea is published by ONI for several reasons. It has historical significance as a review of the German Navy's participation in World War II. Also, from the standpoint of naval science, the opinions of an enemy naval officer of Doenitz' caliber merit study and consideration. Still more important is the forceful presentation of Hitler's fatal error in disregarding or underestimating the necessity of sea power as a prerequisite to a major political power engaging successfully in war of any magnitude—or, by the same token, defending successfully its own political and economic boundaries and rights.

2. In order to assist in the analysis of the essay, this publication includes a biographical sketch of the author (page IV), introductory remarks concerning the essay's background and contents (pages V and VI), and a list of subjects in the form of a table of contents (pages VII and VIII).

3. Doenitz was interrogated in order to amplify certain portions and theories of the essay, and his interrogation is also published herewith (pages 33-34). His reaction to such interrogation and to analyses made of the essay is set forth in the Introduction.

*Thos. B. Inglis*

THOS. B. INGLIS,  
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## Karl Doenitz

**K**ARL DOENITZ, the son of an engineer, was born September 16, 1891, at Gruenau, near Berlin. In 1910 he entered the Imperial Naval Academy as a cadet. In December 1916, at which time he was a lieutenant (j. g.), he was transferred at his own request to the U-boat service, and by 1918 had become commander of U-25, and later of U-68. In October 1918 he was captured at Malta by the British and taken to England for a year's imprisonment. Upon his return to Germany, he reentered the navy. In 1928 he was a lieutenant commander in charge of a torpedo boat; in 1934 commander of the cruiser *Emden*, and in 1935 captain of the *Emden*. In 1935 he was transferred from the *Emden* to the Weddingen U-boat Flotilla, Neustadt, and was ordered to rebuild the U-boat service. In 1939 he was advanced to the rank of rear admiral and appointed commander in chief of U-boats. In September 1940 he was made a vice admiral and in March 1942 admiral. In January 1943 he was named grand admiral and appointed to the supreme command of the German Navy, replacing Raeder. In May 1945 he took over Hitler's position as head of the government and as such sued for an armistice.

Doenitz is credited with having invented the "wolf pack" technique of submarine warfare, of having supervised all submarine construction, and of having founded and directed a research bureau for counteracting improved British methods of submarine detection. He has written extensively on naval warfare, naval articles and the books, *Die Fahrte des Breslau*, which describes his experiences aboard the cruiser *Breslau* in 1913 and 1914, and *Die U-Bootwaffe*, published about 1939.

Doenitz, classified by psychological tests as just below the genius class, is an independent thinker, clear and precise, and is an expert in his field. To the end he kept the navy free from all outside influences. He became interested in the Nazi Party in 1930, deciding that through the party Germany had a chance to regain her position in the world. He was on good terms with Hitler, but opposed Keitel and Goering. He is often referred to as "Der Loewe," his nickname among U-boat officers.

In October 1945 it was reported that two brothers of Doenitz, one a butcher and the other a postal clerk, were residing in Halle-on-Saale, and two other brothers, farmers, lived at Woermlitz and at Albersroda. Both sons of Admiral Doenitz served during the war on U-boats.

## Introduction

ADMIRAL DOENITZ' review of the German Navy's participation in World War II and opinions on the causes of defeat is a well-prepared exposition. Although at certain points the text is obviously the rationalizing of a naval officer of a defeated country and although international law is alternately argued and disregarded entirely as a matter of convenience, the essay certainly deserves careful consideration by students of naval strategy and history. It is both a historical record and a noteworthy professional treatise.

But of far greater significance is the force with which the essay presents irrefutable arguments of the importance of sea power in war—not only in the past, as evidenced by the light of history, but equally in the future when any conflict between even atomic-armed nations will again necessitate the most thorough consideration of great logistical problems. Doenitz admits with complete frankness a number of German naval weaknesses. For example, there was a gross lack of U-boats at the start of the war due to faulty political concepts of the Third Reich. Then the naval construction program was relegated to a role secondary to the development of the luftwaffe, resulting in failure of the German Navy ever to obtain any semblance of surface superiority; and this lack of naval strength was definitely one of the primary causes of "postponing" the invasion of England.

Success of wolf-pack tactics was dependent upon reconnaissance to locate convoys. Aircraft was the logical instrument for the accomplishment of this mission, but the navy was dependent on the luftwaffe for air support. Eventually sufficient pressure was exerted so that a squadron of FW 200's was placed at the disposal of the U-boat command. However, results proved to be painfully slow (from Doenitz' point of view), due to lack of cooperation and time consumed in arriving at mutual under-

standing and common terminology and mediums of communication and in training pilots in navigation over water, recognition, correct reporting of contacts, etc. In his opinion, the lack of an adequate naval air arm was a decisive disadvantage in the German conduct of the war at sea, and conversely that the outcome of the U-boat war in 1941 would have been quite different if the navy had had its own air arm.

Germany, with her victorious armies all powerful on land, did not have the sea power to stage the invasion of Britain. In building his war potential, Hitler failed to recognize the importance of the British fleet as a threat in being. In the final analysis it was Allied sea power which saved the situation.

World War II was a war of logistics, and VE-day came only after many weary months of supplying men and matériel to Europe. What greater successes might Germany have had in the Atlantic, what further destruction might have resulted to Allied convoys, had the German Navy possessed even the minimum sea power which should have been contemplated as necessary for global war?

The Doenitz paper, originally dictated to and typed by Colonel-General Jodl, is a translation from the German. It has been edited only to the extent of presenting a more readable English version. Particular care has been taken to avoid changing in any manner the professional opinions and observations of the author.

A summary of the essay was prepared by the British N. I. D. in an attempt to crystallize Admiral Doenitz' unexpressed conclusions. Although the admiral had previously given the impression that he neither spoke nor understood much English, he "read it through rapidly, smiled ruefully once or twice, appeared visibly shaken that his innermost thoughts \* \* \* had been so clearly understood, and agreed that the appreciation left nothing to be altered."

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# The Conduct of the War at Sea

An Essay

By

Admiral Doenitz

## SECTION I

*30 January 1933 to 1 September 1939*

WHEN Adolf Hitler assumed power on 30 January 1933, the German wehrmacht found itself in a position of impotency. The strength of the German Army was 100,000 men. There was no German Air Force. The navy had not yet attained even the strength allowed it in the Versailles Treaty, having only a total strength of 15,000 men. There were 6 new light cruisers, each of 6,000 tons, available. The torpedo boats had been brought up to the permitted number of 24 by the construction of 12 new ships. Of the pocket battleships of the *Deutschland* class, only one ship, the *Deutschland* itself, had been completed. Two more, the *Scheer* and the *Graf Spee*, were building; but the three other pocket battleships which could have been built under the treaty had not yet been ordered.

It was part of Hitler's policy to create again for the German people an adequate wehrmacht which would be in a position to represent the interests of the Reich. The central position of Germany in the heart of Europe compelled her to place the emphasis in rearmament first on weapons of land warfare, that is, on the army and the air force. Only these latter were in a position to secure the extended and unprotected land frontiers against the large number of hostile continental neighbors, thus creating the first prerequisite for domestic reconstruction. Con-

sequently the navy had, of necessity, to modify its armament demands.

This was all the more possible as Hitler was striving for a political agreement with England, having always regarded Bolshevik Russia as the arch enemy of Germany and Europe. None of the great naval powers, therefore, was considered to be among the future opponents of Germany.

This policy of Hitler found its consummation in 1935 with the conclusion of the naval agreement with England, which fixed the strength of the German Fleet at 35 percent of the English (U-boats at 50 percent). *This clearly showed that Germany did not reckon with a war against England, as she voluntarily renounced arming against English sea power.*

Apart from the fact that the composition of the projected German Fleet was already extensively fixed by the percentage figures of the treaty, the building of a fleet was based on the conception of creating a small, homogeneous, well-balanced navy, which would be able to counter successfully the fleets of continental neighbors (France, Russia) and which, moreover, would considerably improve Germany's ability to ally herself also with the great naval powers. This was also a reason why Germany, on the basis of experience gained in the First World War, did not at once proceed to build a large U-boat fleet, but on the other hand con-

structed a symmetrically balanced fleet of all types, conceding only a proportionately small part to the U-boat arm.

The naval intelligence service was also mainly directed against the European continental powers, less importance being attached to the collation of intelligence from England.

Internal reorganization of the navy went hand in hand with the construction of the ships. The navy of 15,000 men had provided a good nucleus of fully trained petty officers and seamen, who were of great value. The existing ships were used almost exclusively for training purposes so as to have crews ready for the new ships in good time. Difficulties did not arise to any great extent. Certain disadvantages, however, were caused in home training by the dispatch of strong units of the German Fleet to Spain to protect German interests there in the years 1935-39; but these were partly mitigated by the advantage of sea experience which a large part of the crews there were able to obtain and which was not available to the same extent in home waters.

After 1933, technical development, which before that time was retarded through lack of means, was extended and pushed forward energetically. The technical establishments of the navy believed they had produced superior weapons (of first-class performance) in the field of mines as well as torpedoes, in spite of the short time for development at their disposal. But this was only partly realized. The ground mines with simple magnetic fuzes proved very successful at the beginning of the war; but when the English brought into service an effective means of countering the magnetic mines, a substitute was not available. Further new developments were not yet concluded and were only very gradually becoming operational, some of them for the first time in 1944 (oyster mine and acoustic mine). The remote detonation of torpedoes, in which great hopes were placed, failed in practice and caused us serious reverses. The significance of short waves for locational purposes was recognized and their investigation and exploitation were pushed forward; but we did not succeed, as later experience was to show, in attaining the degree of development reached by our enemies in this sphere. This decisive disadvantage to us in our conducting of the war at sea we had failed to recognize before the war.

In all other spheres of naval war technique we in fact succeeded in making good to some extent the fateful effects of disarmament and military impotence existing before the outbreak of war. We were convinced that the German U-boat types especially represented the best of their kind in the world.

At the beginning of the war the German Fleet was still in its initial reconstruction stage. The numerical strength permitted by the London Naval Treaty had not yet been attained by a long way. We did not yet possess a single real battleship. *Bismarck* and *Tirpitz* were building. Since 1933 the following ships had been newly commissioned:

- The two transitional battleships *Scharnhorst* and *Gneisenau*;
- The pocket battleships *Scheer* and *Graf Spee*;
- The heavy cruiser *Hipper*;
- Twenty-two destroyers of the 1934 and 1936 classes;
- Some torpedo boats of the 1935 class;
- About 48 U-boats of classes II, VII, and IX.

At the outbreak of war the following were building:

- The battleships *Bismarck* and *Tirpitz*;
- The aircraft carriers *Graf Zeppelin* and "B";
- The heavy cruisers *Blucher*, *Prinz Eugen*, *Luetzow*, and *Seydlitz*;
- Eight destroyers;
- Some torpedo boats;
- Some U-boats.

The complete abolition of the air force under the Versailles Treaty and the consequent necessity of developing it from the beginning had lead, despite the navy's vigorous efforts to build up its own naval air force, to *Hitler's decision to form the flying units required for the navy within the framework of the luftwaffe*. In this way a closer concentration in the development of aircraft types and in all other aeronautical questions was to be attained. At the beginning of the war a number of naval aircraft groups existed. These, as was foreseen, were subordinated to the navy for tactical purposes at the outbreak of war, but otherwise remained integral parts of the luftwaffe. Apart from a few fighter groups they were exclusively equipped with seaplanes and flying boats. This proved, during the course of the war, to be a mistake. The high performances required could not be obtained from the seaplane types, *while on the other hand the exigencies of naval warfare were not sufficiently taken into account in the design of the available land types*.

## SECTION II

*September 1939 to April 1940*

The navy at the outbreak of war was in an extraordinarily poor position. Policy and navy had not reckoned with England as a possible opponent during the years of reconstruction and therefore the German Navy was in no way suited to fight England's sea power numerically. Nor was the composition of naval war material adapted to a war with England.

When the war came in September 1939, the following, therefore, obtained for the navy:

England was in every respect dependent on sea-borne supply for food and import of raw materials, as well as for development of every type of military power. The single task of the German Navy was, therefore, to interrupt or cut these sea communications. It was clear that this object could never be obtained by building a fleet to fight the English Fleet and in this way win the sea communications. The only remaining method was to attack sea communications quickly. For this purpose only the U-boat could be considered, as only this weapon could penetrate into the main areas of English sea communications in spite of English sea supremacy on the surface.

Therefore, when the war with England became an actuality in September 1939, the navy had to convert its armament. The former program for building a homogeneous fleet was altered. Only those ships which were nearly ready were completed. A considerably increased U-boat construction program was ordered. Whereas previously the monthly output was only about 2 to 4 U-boats, in the new U-boat construction program ordered in September 1939, it was intended to reach by stages 20 to 25 U-boats a month.

Mainly U-boat Types VIIC and IXC were under construction. Type VIIC was a comparatively small and very handy boat of 517

tons with a high action radius for its size and a comparatively high number of torpedoes (12 to 14). In the opinion of the U-boat command it was the ideal combination of tactical usefulness in attacks (light and easy to handle, difficult to see at night, small turning circle) and possessed the necessary fighting strength, expressed in action radius and armament. As a second type of boat the Type IXC (about 740 tons) was ordered. Though less handy and more complicated to handle, it had a larger action radius and a higher number of torpedoes. Both types of boat were already available in the small U-boat arm and had proved themselves in peacetime operation.

A construction period of about 21 months was envisaged for the U-boats ordered in September 1939, so that they could not be counted on operationally for 2 years. It was clear, therefore, that the armament of the navy, only commenced at the beginning of the war with England, would be very late, if not too late, for a successful U-boat war. Despite the greater successes achieved in 1942 with mounting numbers of boats, the effectiveness of the individual boats was actually small compared with the year 1940. The proportion of the average tonnage sunk by each U-boat each day in 1942 was only about one-tenth of that in 1940.

When the construction program of the navy was changed in this way by the high command for the war with England, the U-boat command was faced at the front with the following position:

The U-boat arm possessed a small number of boats, Types II, VII, VIIC, and IX. The Type-II boats, by reason of their action radius, were limited to the operational areas of the North Sea, English east coast, and the Orkneys and Shetlands. With the Type VII boats (a forerunner of the Type VIIC with less fuel) the west

coast of England could be reached by a journey around the Shetlands. The Type VIIC enabled the war to be carried to the north coast of Spain and the Type IXC to Gibraltar. All these distances were reckoned with outward and inward passage north of England. This long journey consumed a considerable part of the action radius of the boat. So, in November 1939, the U-boat command attempted to send U-boats through the Channel on their way to the Atlantic. They failed in this, however. The losses, apparently through mines in the narrow Dover-Calais Strait, were too high; and this route had to be abandoned as too costly.

The orders of the operations division of the naval staff were authoritative for carrying out the U-boat war. Merchant ships were, in accordance with these orders, only to be attacked in accordance with international law. Over and above this, Hitler expressly and additionally forbade that any passenger ship and all or any ships of French nationality should be attacked or stopped. The reason for this was obvious. Hitler at that time hoped, in spite of England's and France's declaration of war, to limit the war to Poland; and he wished in this way above all to prevent an actual active participation by France in the war.

Only when England placed her ships outside the protection of international law, as laid down at the Hague Convention, by arming merchant ships and by orders to use these weapons for defense and attack against U-boats, was the U-boat command allowed to attack any merchant ship whose armament was officially recognized or whose armament was recognized with certainty. In the same way the U-boat arm was given permission to attack darkened merchant ships by night, as the recognition of these ships as merchant ships was made impossible by this English precaution. The declaration of an operational area around England and freedom of attack on all British merchant ships followed after England had publicly declared that all English merchant ships had been armed. Very soon after the beginning of the war the convoy system was instituted by England to an ever-increasing degree. By this, merchant ships lost the protection of all international rules, as under the protection of their own warships they had put themselves outside the prize law. The U-boats were then given freedom of attack on

all merchant ships escorted by enemy warships.

With the very small number of U-boats which were available, it was clear to the U-boat command that they could only inflict pinpricks on England's trade and conduct of the war at sea. The U-boats at sea in operational areas during the winter 1939-40 never exceeded 10 in number and at times fell as low as 2. It was clear to the U-boat command that they could achieve results only if they took the bull by the horns and attacked, as far as possible, the concentration point of traffic in or near harbors. Disposition was made in groups of 3 and boats were assigned areas by types as follows:

- (1) All small U-boats of Type II and Type VII off harbors and close in to the English coast.
- (2) The Type VIIC boats on the approaches of North Atlantic traffic to England as close to the coast as possible.
- (3) The very few Type IXC boats to more remote operations in areas as far away as Gibraltar.

Under group 1 belonged the operations in Scapa Flow, Moray Firth, the Firth of Forth, the Shetland passages, Loch Eue, Liverpool, and the British Channel. The operation against Scapa Flow, carried out by Kapitänleutnant Prien, necessitated a previous air reconnaissance so that the U-boat command could determine the possibilities of penetration. The successful penetration by the boat proved the correctness of the view that the boom could be passed here. I had expected very much more of the operation against Scapa Flow. Klt. Prien was denied further successes by torpedo failures. The operation against the Firth of Forth carried out by Klt. Frauenheim resulted in damage to the cruiser *Belfast* and the operation against Loch Eue in damage to the battleship *Nelson*. An operation planned against the Clyde had to be given up after two fruitless attempts.

Basically, these operations were carried out with a mixed outfit of mines and torpedoes. In this respect, the magnetic mine had proved itself an effective weapon in the first months of the war when it was actually laid in the narrows of harbor channels. In contrast to this, experiences with torpedoes during these months were both surprising and unpleasant. It appeared that the magnetic firing of torpedoes had not been mastered, as had been thought, in peacetime. The torpedoes usually exploded before reaching the target, or did not detonate at all. As magnetic firing had been relied on, in peace-

time, depth-keeping had been neglected and also was not fully understood. The same applied even to contact firing. These circumstances had a marked influence on the success of the U-boat arm in the first months of the war. For example, in November 1939, a German U-boat west of the Orkneys fired at the *Nelson* from very close range. The torpedoes hit but did not explode.

The losses of U-boats during this period were comparatively heavy, although English defense was still very weak. In addition to the general inexperience of the crews under war conditions, the reason lay in technical defects which could only become apparent in war, e. g., leaky exhaust valves in Type VII boats which, when the boats were submerged for long periods or when they were being chased, resulted in the gradual flooding of the boat aft, finally forcing it to surface where it was destroyed.

Planning the strategic use of surface forces was governed by the fact that they could not embark on a battle for sea supremacy because of their inferior numbers and strength compared with the overpowering sea power of England, further strengthened by the addition of units of the French Fleet. Even the French Fleet was far superior to the German Navy. The protection of German sea traffic and communication was, in view of the distribution of sea power, impossible and was abandoned. German overseas trade on anything approaching its peacetime scale, except across the Baltic and Skagerrak, had to be abandoned from the first. On the other hand a direct attack by enemy fleets in German home waters was not to be expected, because of our strength in the air and the forces available on the coast, so all sections of the German Fleet were free for offensive action. When the focus of the war at sea was turned to shipping, it was obvious that, as far as possible, the surface forces had to be devoted to this task as well. Here only was there a chance for the Navy to play an important, perhaps even decisive, part in the general conduct of the war.

The weakness of our surface forces had to be compensated for by boldness and by constant change of tactics. Where previous tactical views stood in the way of such an operation they had to be abandoned and replaced by the tactics of surprise. The greater our own weakness,

the more daring our operations had to be if the fate of the First World War was to be avoided. In that war, the fleet, though having suffered no decisive losses, was locked up in German waters and so was left without strategic value. It was obvious, and was taken into account, that in this type of operation great risks and the heaviest losses had to be incurred. Further, the change to the U-boat building program meant such a reduction in other construction that any possibility of replacing losses of battleships and cruisers was out of the question.

Under the new construction program work was continued on the nearly completed *Bismarck*, *Tirpitz*, *Blucher*, *Prinz Eugen*, the destroyers, torpedo boats, and small boats. The other new constructions, the aircraft carriers *Graf Zeppelin* and "B," and the cruisers *Lutzow* and *Seydlitz* were stopped. A newly planned program for surface ships envisaged merely construction of destroyers, torpedo boats, mine sweepers, R-boats, and E-boats, and these in limited numbers only.

The instructions issued by the operations division of the naval staff for the use of the fleet were in accordance with the above decisions. The destroyers were employed in numerous bold and very successful mine-laying operations in the mouth of the Thames and farther north. The battleships made sorties into the northern North Sea and through the Bergen-Shetlands Strait into northern waters. The pocket battleships *Deutschland* and *Graf Spee* carried on the war against merchant ships in the Atlantic, in the course of which the *Graf Spee* was lost as a result of the unfortunate decision, although approved by command, to run to Montevideo.

All these operations had even at this time, and primarily during the later stages of the war, the object of keeping the English Fleet busy and preventing it, by immobilizing parts of the fleet, from being able to concentrate on the formation of more vigorous U-boat defenses, as had been the case at the end of the last war.

The conversion of steamers into armed merchant cruisers was taken in hand at the beginning of the war. It took, however, a certain time as the operations division of the naval staff had decided, with regard to the effectiveness of air reconnaissance, to give up the old method of the rough-and-ready preparation of fast ships that could be recognized from afar,

and instead to convert and camouflage very carefully innocuous-looking freighters with the greatest possible speed, provide them with modern devices, and arm them strongly. Thus, the first A. M. C. only came into operation in spring 1940.

As it was impossible to protect effectively our own overseas shipping, on the day war broke out all merchant ships received orders to break through to home ports if possible. Otherwise they were to run for neutral harbors.

Apart from the offensive operations of the fleet there were a great many tasks for the navy in home waters. In order to protect the Heligoland Bight and the inward and outward passage of our own forces, extensive mine fields were laid in the North Sea from Holland up as far as the Skagerrak, and were later extended north-northwest up as far as Bergen.

The waters around the coast were guarded by many mine sweepers and patrol units, and the

coastal defense performed by the navy on all German coasts was extended and improved.

The Polish war made but slight demands on the navy. The modern Polish destroyers had, before the outbreak of war, broken out of the Baltic and gone to England. We were not able to prevent this as a state of war did not then exist. The other Polish surface craft did not put in an appearance. The Polish U-boats were actually at sea but had no success of any kind and later allowed themselves to be interned in neutral countries. Apart from the first days, when we operated strong forces of light craft off the Polish coast and laid an extensive mine barrage off the west Danzig Bay, the activities of the navy were confined to the operation of a few U-boats, coastal bombardments by the old battleships *Schleswig-Holstein* and *Schlesien*, and the support of the army at the final taking of the Hela Peninsula and the Westerplatte in front of Danzig by mine sweepers and other small craft.

### SECTION III

*April 1940 to October 1940*

The attitude of the navy regarding the policy to be adopted toward Norway was based on the conviction that Norway's neutrality would be the happiest solution, but only if Norwegian territorial waters were also respected by the enemy. The reason for this was that it was considered almost impossible to protect shipping in Norwegian coastal waters effectively with the limited means at the navy's disposal, as it would be easy for the English Navy from its nearby bases to interfere with this shipping at suitable points and at any time. On the other hand, all possible means would have to be employed to prevent Norway from becoming an English sphere of influence, as this would also lead to the blocking of the North Sea and constitute a threat to the entrance to the Baltic.

The attack on the German supply ship *Altmark* in spring 1940 by the British destroyer *Cossack*, in Norwegian territorial waters, contrary to international law, showed that England was not prepared to respect Norwegian neutrality in all circumstances. Various reports from Norway that England was planning to attack that country confirmed this impression. It, therefore, seemed advisable to make careful preparations for the occupation of Norway. These were ordered by Hitler, at the suggestion of Grand Admiral Raeder, and immediately put into action. All possible measures were taken to insure secrecy and these precautions were apparently successful.

When at the beginning of April 1940 reports of an imminent English expedition against Norway increased, our own preparations were complete so that April 9 could be fixed for the beginning of our operation. In view of the inferiority of the German Fleet, the undertaking was one of the boldest in naval history. However, every risk was justified by the enormous strategic importance of Norway as the cornerstone of

a blockade against Germany or alternatively as a jumping-off place for German surface forces, particularly U-boats. The decision to throw into the attack all the German Navy which could fight was made with the full realization of the implications.

Our own warships were not sufficient to transport the requisite weapons and equipment as well as troops necessary for the initial occupation of Norway's leading ports. For this reason it was unfortunately necessary to dispatch a number of merchant ships in advance, with suitable cargoes, so that they would be on the spot at the right time. They were loaded in Stettin without camouflage, and it was given out that they were transports for East Prussia. While passing the southwest coast of Norway, some of these ships were attacked and sunk on April 7 or 8 by English submarines. When it was announced on the Norwegian wireless that shipwrecked German soldiers from these ships had reached land, the whole expedition seemed in danger. No further effective counter-measures were taken by the English, but the Norwegian resistance encountered in several places (Oslo, Bergen, Kristiansand) may have been due to this alarm. The progress of the remaining transports was so very much delayed that they reached their ports of destination either very late or not at all, and consequently weapons and ammunition were in short supply at Narvik.

For the carrying out of the expedition, the fleet was divided into different forces made up somewhat as follows:

NARVIK.—10 destroyers, under the command of Commodore Bonte, senior officer, destroyers.

TRONDHEIM.—*Hipper*, 4 destroyers, under the command of Captain Heye, commanding officer, *Hipper*.

BERGEN.—*Koeln*, *Konigsberg*, training ship

*Brummer*, torpedo boats, under the command of Vice Admiral Schmundt.

KRISTIANSAND.—*Karlsruhe*, torpedo boats, under the command of the commanding officer of the cruiser.

OSLO.—*Blucher*, *Scheer*, *Emden*, torpedo boats, under the command of Rear Admiral Kummetz.

The greatest possible number of troops was embarked on these ships. To cover the expedition the two battleships *Scharnhorst* and *Gneisenau*, under the command of Rear Admiral Leutjens, were standing by west of the West Fjord.

In March 1940 the U-boats were withdrawn from the operational spheres mentioned in section II so that they would be available should the occupation of Norway become necessary. They took up positions off different fjords as a defensive measure against the penetration of English warships.

The occupation of Denmark, which followed immediately afterward, was carried out by smaller units such as auxiliary and training ships.

The expedition was entirely successful, although at some places initial difficulties and serious losses were experienced, including the *Blucher* in the Droebak Straits south of Oslo, the *Karlsruhe* in the Skagerrak, and damage to the *Koenigsberg* while running into Bergen.

The naval staff and the U-boat command had expected great results from the use of U-boats. Because of the confined waters and the probable counter-action, it seemed likely that there would be frequent contact with the enemy; but the result of the U-boat activity was extraordinarily disappointing. The chief reason for this was torpedo failures. If a torpedo shortage had been evident in the early months of the war, it was now torpedo ineffectiveness in the Norwegian expedition which became disastrously apparent. As a result of being in contact with the enemy for extended periods, the U-boats were forced to remain submerged for a very long time. This caused pressure in the boat which penetrated the depth chamber of the torpedo and considerably increased its depth setting. For example, Klt. Prien was able to fire at close range at the big English transports near Harstad, but the torpedoes went too low. The reason for the increasing number of torpedo

misses was only understood by the German Navy at a very much later date when the individual technical faults of the torpedoes were ascertained by systematic testing. It was actually true that, despite numerous opportunities to fire, there were few, if any, successes. The effect on the crews was marked. They lost confidence in the weapon, and the personal influence of the U-boat commander in chief was necessary to restore their morale. At the same time everything possible was done to overcome torpedo faults.

On April 12 and 13 a crisis threatened the Norwegian expedition when various troop and supply ships were sunk or damaged in the Skagerrak by enemy submarines and aircraft. By putting into use all suitable means of defense, mastery of the situation was secured in a very short time. Thereafter English submarines were observed in the Skagerrak only to a decreasingly small extent or not at all. Losses by air attack were also very small up to the end of 1944.

After the repulse of the English attack made from Mamsos, the only serious situation resulting from the enemy landing at Harstad was at Narvik. The attack by the English Navy on Narvik cost the German Navy 10 of their latest destroyers, which were unable to repel the attackers' superior strength. The fighting power of these ships had been seriously reduced by an extreme shortage of fuel. On the other hand, the destroyers' survivors formed a welcome reinforcement to the land forces, and, according to Colonel-General Dietl, the holding of the Narvik area for so long a time thereafter would have been impossible without them.

Just as the growing English successes had caused the disappearance of any further hope that the German troops in Narvik would be able to hold out, there took place the entirely surprising withdrawal of the enemy from Norway, apparently as a result of their set-backs in Holland, Belgium, France, and particularly at Dunkirk.

German naval forces operating about this time in northern waters came upon the tail-end of the English retreat. After the commander in chief had released the cruiser *Hipper* and her escorting destroyers to Trondheim for fueling, the battleships *Scharnhorst* and *Gneisenau* came upon the carrier *Glorious* and her two escort-

ing destroyers. All three units were sunk, although one destroyer first succeeded in torpedoing the *Scharnhorst*.

In order to be able to protect sea traffic along the Norwegian coast, which was seriously threatened by English sea and air forces, but whose maintenance was indispensable for the holding of Norway, and also in order to be armed against English attempts at reconquest, the formation of a strong coastal defense system was immediately put in operation. As it was impossible to cover this extended coast line continuously, the defense was so arranged that fortified bases were created at intervals as short as possible, and merchant ships which had been warned of threatening danger could enter these refuges. The chief bases were equipped as fortresses and were provided with the necessary base equipment for U-boats and warships. These measures proved their value, for, in spite of the fears which existed initially, the extensive and very important Norwegian coastal shipping was continued with astonishing success throughout the entire war, though with increasing losses during the last months of the war.

For the protection of southern Norway and the entrances to the Baltic, a system of mine fields was established in the western part of the Skagerrak, and in the course of the war this was continually being extended.

The navy played only a small part in the campaign in the west, as its forces were essentially tied to Norway. The campaign developed with such astonishing rapidity that it was not possible to make available sufficient fighting forces to attack the English retreating from Dunkirk. The few E-boats which took part did not have much success.

By the conquest of Holland, Belgium, and France, Germany had gained a naval strategical position of first-class importance. All measures were immediately applied to build it up and profit by it as soon as possible.

Conditions were made particularly favorable for the U-boat war against shipping in the Atlantic, which was resumed at the conclusion of the Norwegian expedition. The possession of the Biscay ports eliminated the long journeys to and fro which had taken up almost the whole radius of action of the U-boats. The sea routes were now, so to speak, at the front door. The U-boat command took energetic steps to insure

that U-boats in the Atlantic were able, when their fighting resources were exhausted, to return to the Biscay ports for repairs and refitting as early as July 1940. The advantage of avoiding the long journey home was seen immediately in the doubling of the number of U-boats available in the actual operational area.

The shipping war was relatively successful until October 1940. English destroyers and escort vessels were either under repair as a result of the Norwegian campaign or else tied to the south coast of England by the threat of invasion. The protection of the shipping lanes in the summer of 1940 was consequently very limited. U-boats proceeding from the Biscay ports quickly contacted shipping, since they were able to operate close to the English approach channels, e. g., the North and Bristol channels. The U-boat losses were exceptionally small. Technical difficulties were recognized and overcome. Torpedoes fitted only with impact fuzes and of increased reliability were used. U-boats still operated singly, for up till then there was no difficulty in finding shipping near the coast.

The idea of sending also *Gneisenau* and *Hipper* via the Denmark Strait to the Biscay ports immediately after their capture came to nothing because *Gneisenau* was hit in Norwegian waters by a torpedo before sailing.

In the spring of 1940 the first auxiliary cruisers sailed on their successful expeditions to the Atlantic and Indian Oceans, and in the summer of 1940 another one proceeded to the Pacific by way of the northeast passage. The gaining of the Channel coast made it possible for German E-boats also to be used in the war against shipping by attacks on the sea routes off the English southeast coast.

The situation which had developed in the destruction of the English expeditionary force and the weakness of the English land defenses caused us to entertain the idea of deciding the war in our favor by a rapid invasion of England. On account of the circumstances previously described as existing before the war and the surprisingly rapid development of the situation in the west, no preparations of any sort had been made. Since an invasion could only succeed if it took place quickly, in any case before the coming autumn, it was necessary now (Hitler himself gave orders for its preparation) to attempt to create the necessary conditions,

both as regards material and training, with the greatest haste and with every means of improvisation. To produce new landing craft in great numbers and in time was, from the point of view of material and construction, no longer possible even though at this time the naval ferry barge (M. F. F.) had been designed and completed. It was, therefore, necessary to fall back in the greatest possible measure on available tugs, as well as barges of the coastal and inland water transport system. These were modified for landing purposes. Their greatest disadvantage lay in their very limited seaworthiness (up to sea 3); and, as most of them were not self-propelled, they required towing. Investigations were made into landing conditions on the south coast of England and current and weather conditions in the Channel. Training of the troops intended for the landing was extended as more of the necessary materials became available and all possible preparations of a tactical nature were made.

From the beginning it was clear to the leaders that the invasion could succeed only under certain particular conditions. The navy was certainly not in a position to protect the landing forces against the English Fleet, whose full weight would have to be reckoned with in such a situation. This task would have to be taken over by the air force. To this end it was necessary not only to wipe out completely the Royal Air Force but also to attack beforehand the ports near the landing area with such effect that

the English naval forces would have to withdraw to more distant bases. Otherwise the air force would not be able to prevent the enemy's naval forces from reaching the landing forces at night by short approach routes.

When in September 1940 the preparations for invasion were complete, it also became apparent that complete defeat of the English Air Force had by no means been achieved. Thus, one of the most important prerequisites for an invasion was lacking. There could be no question of a short postponement, for once October and the beginning of the autumn gales had set in, a longer period of good weather such as would be required for success could no longer be expected. Postponement to the spring of 1941 could only render the military conditions less favorable. With such limited prospects of success, the resolve to carry on with the invasion of England could not be justified unless it presented the only and final means of ending successfully the war against England. This was not the case, for the German leaders saw in the Mediterranean another possibility of striking a decisive blow against England. This was quite apart from the shipping war which, as U-boat numbers increased and with the yet-hoped-for forceful participation of the air force, should gradually produce some result.

Hitler, therefore, decided to abandon the invasion, although the apparent threat of it was to be maintained.

## SECTION IV

*October 1940 to December 1941*

From October 1940 the picture west of England began to change for the U-boat arm. For England the danger of invasion was over. The English defense vessels were apparently once more available for A/S defense. The Royal Air Force was being used on an increasing scale for guarding shipping routes and for A/S defense. The convoy system was apparently being most extensively used. In any case it was becoming more difficult for U-boats to operate close in to shore and convoys were located less frequently. The U-boats were often at sea for lengthy periods without meeting any traffic, and the great successes of the summer came to an end. The U-boat command decided, therefore, in October 1940, on the controlled operation of U-boats at sea against convoys located by systematic search. These so-called pack tactics were developed in the clear knowledge that location would be the main problem in the U-boat war. Because of the concentration of shipping in convoys, the empty spaces of the ocean would be extraordinarily increased. On the other hand, what mattered was to direct as many U-boats as possible to a convoy once found and thus set a concentration of U-boats against a concentration of shipping.

These tactics correspond to the principle held for thousands of years by every military command: that of being as strong as possible in the right place at the right time. Organization and control of U-boats was carried out by radio on long and short wave from the command post in Paris, and after November 1940 from Lorient.

The first convoy attacks at the end of October 1940 succeeded with very good results. In these engagements the U-boats quickly exhausted their torpedoes. This resulted in very short but successful operations. After the convoy battles there were no U-boats in the operational area. Because of the ever-present

shortage of boats there were no replacements ready for sea. Thus the operational area in November 1940 was empty and it was filled only at the beginning of December. This led immediately to another successful convoy battle. Tactically it was proved already with these first experiments that pack tactics had been developed correctly. It was necessary to keep strict control of the boats, having regard to their disposition for contacting the convoy, their keeping contact with a view to directing other boats to the scene and the issuing of the order to attack. In the attack itself, however, the boats must have complete freedom. It was, therefore, a control in a tactical sense but did not hamper the actual attack by the individual U-boat.

It was further proved that night was by far the most opportune time for attack, because the U-boats could get within firing range much quicker and more often. Therefore, the night was used basically for concentrated attacks by U-boats, and day attacks were undertaken only in favorable conditions. The comparatively small and maneuverable Type VIIC proved itself excellent for night attacks.

The great U-boat aces of that time, such as Kapitänleutnants Prien, Kretschmer, and Schepke, were all "VIIC drivers." They swore by this type of boat and, when changing boats, did not wish to take over any of the new, large ones. Never, in my opinion, have Germans in the front line been so convinced of the quality of their technical material and type of boat as the German U-boat men in this war.

The winter of 1940-41 showed even more that, with further concentration of English shipping into convoys and the forcing of the U-boat disposition into the open Atlantic, the main difficulty of the U-boat war would be the location of convoys. A more distant disposition

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of U-boats in the open sea was necessary for two reasons: Firstly, owing to growing English defense measures close in to land, U-boat operations which for the most part took place on the surface were no longer possible. Secondly, time was necessary for a successful attack on a convoy by several U-boats so that U-boats could reach the convoy from their various reconnaissance positions, which were, for the most part, in distant areas. It was, therefore, no longer any use locating a convoy about 24 hours before it ran in under the English coast, as there was not sufficient time to direct the other U-boats to the target and carry out the attack.

The problem of location urgently required better reconnaissance. The U-boat itself, with its extremely limited range of vision, was the worst possible medium of reconnaissance. The most vital and necessary complement to the U-boat, which was our main instrument of battle, was the aircraft. Here the flaw in the conduct of the war at sea was revealed with painful clarity. *Fundamentally, it was the fault of the direction of the armed forces who in peacetime had created a sea-air arm which in wartime was to be incorporated into the luftwaffe; but the construction of the luftwaffe to be employed in a purely land battle did not meet the demands of the navy.*

This resulted in the navy having to operate without air support. Pressure exerted by the German U-boat Command and representation by the Chief of the German General Staff and the commander in chief of U-boats to Hitler in September 1940 resulted in a squadron of aircraft with the greatest range (F. W. 200) being placed at their disposal and based at Bordeaux. Then there began very extensive experiments in air and sea cooperation between this squadron and the U-boat arm, which, however, produced at first completely negative results.

The lack of a corresponding cooperation carrying over from peacetime became painfully obvious. The primary essentials to be attained were: A common terminology, a common medium of communication, and, above all, experience of the pilots in flying over sea, navigation, recognition of types of ships and their clear and correct reporting, shadowing, directing U-boats by means of radiobeacons and other things. The lack of success was caused by one decisive factor: The U-boats being assembled in a wrong

position devoid of shipping through faulty navigation on the part of the reporting aircraft, or else being split into two groups owing to two aircraft through faulty navigation (up to 120 miles apart) having given two different positions for the same convoy. Gradually these teething troubles were overcome. This finally resulted in a profitable cooperation. Owing to the limited range of the aircraft it was only practicable to operate on the England-Gibraltar convoy routes. The main shipping routes in the North Atlantic had to be reconnoitered by the U-boats alone.

The year 1941 presented the U-boats with almost insoluble tasks as far as the finding of merchant shipping was concerned. The number of U-boats was still limited. The building program ordered at the beginning of the war had as yet no effect on the fighting group. There was no longer any question of attacks near the coast. The disposition of forces had to take place in the open sea. Yet the number of U-boats was too small for the complete surveillance of the open sea. Its disposition could only succeed through surprise, almost deprived of every accepted principle.

The enemy had recognized that the best protection for his convoys was in taking advantage of the wide spaces of the open sea by a continually varying routing. So, for example, the U-boat successes were small in the months of July and August 1941 because of the failure to find convoys in the North Atlantic. Already, to some extent, long-range English aircraft began to locate and attack the U-boat dispositions, so that, as far as possible, the U-boat patrols were detected by the enemy and then avoided by the convoys. After an unsuccessful search for convoys in July and August, at last in the beginning of September 1941, a convoy was detected near the coast of Greenland and attacked with good results. This shows how very greatly the wide ocean spaces favored the enemy, with the dispersal of his convoys from Greenland and Iceland down to the Azores and the resulting difficulty on the part of the U-boats to find anything.

Once contact was made with the convoy the attack succeeded every time. The difficulty lay in the finding and not in the attacking. The limited sinkings for many a month resulted from the searching and waiting, lasting for weeks.

With its own extensive, long-range air reconnaissance, the outcome of the U-boat war in the year 1941 would have been quite different. *The lack of an extensive naval air arm proved to be a decisive disadvantage for the German conduct of the war at sea.*

The attitude of the United States of America was a further stumbling block in the U-boat war. The United States had declared the Western Hemisphere to be their zone of protection and, although neutral, announced they would attack any German warships in this area. In fact, German U-boats were actually depth charged by American destroyers. In spite of this contravention of international law, the German U-boat officers had definite orders from the political leaders to avoid, under any circumstances, any incident with American warships and merchant ships. As a result, the U-boat officers had to prohibit, in this western area, any attack on English destroyers, since at night or through periscopes it was quite possible to confuse them with American destroyers.

A situation most unfortunate for the captains was the decision of the political leaders to forbid U-boats to proceed west of Newfoundland because they wanted to prevent any incident in this area. This was with a view to avoiding war with the United States of America. The U-boat officers were unable, therefore, to search out the convoys proceeding to England near their point of departure and in the areas of strong concentration (e. g., near Halifax), but had to remain in the open spaces of the Atlantic, where, after passing Cape Race, a very great dispersal of the convoys was possible. Also the operations division of the naval staff required a detachment of U-boats in the Mediterranean. So, of necessity, the number of Atlantic U-boats was reduced and the finding of merchant shipping was made more difficult. There was an even greater drop in the number of successes.

For all these reasons the successes of the year 1941 were moderate, the losses, at the same time, happily being low. The U-boat arm knew that they could fight and that their limited success lay only in the failure to make contact with the enemy. They further knew that this would improve as soon as greater numbers of boats were available for searching and so regarded future developments with confidence.

After the conquest of Norway and western

Europe there were no further tasks for the fighting units of the fleet in the waters of the North Sea and Arctic Ocean. The idea of maintaining it as a "fleet in being" was abandoned, for such a fleet with the ratio in strength would be as good as useless. And, in addition, there was the danger that they would, through the great range of modern weapons (bombs, airborne mines), be uselessly expended. At this time (1941) the limited number of U-boats demanded that the shipping war should be supported by all available means. The French Biscay ports, of which only Brest was suitable for battleships, were available as bases.

The decision was made to send the battleships and heavy cruisers, as well as the pocket battleships, into the Atlantic. Owing to their limited range it was not possible to send destroyers on the trip around the north of England, as well as on the later far-reaching attacks from western France, where, after their passage through the Channel, they could be used only in the Biscay area. This lack of any protection for the heavy units was felt to be a great disadvantage, yet it could not influence the decision which had been taken. In autumn 1940, the *Hipper*, as well as the *Scharnhorst* and the *Gneisenau*, went into the Atlantic and entered Brest, and from there made their several successful sorties into the North Atlantic. For the maintenance of ships at sea a big organization of supply and maintenance ships was set up in western France.

The occupation of Iceland by the Americans early in 1941 increased the difficulties of passage through the Icelandic waters. This occupation, numerous other measures (such as sale of destroyers to England, declaration on the Western Hemisphere, the notice to attack the German fighting units in the western Atlantic, propaganda on the threat to America), and various utterances of leading American personalities showed the efforts of the American leadership deliberately to accustom its preponderantly isolationist people to the idea of entry into the war, and to the preparation for this with all means.

The difficulty of the Icelandic passage did not prevent the battleship *Bismarck* and the cruiser *Prinz Eugen* from being sent into the Atlantic in May 1941 after the completion of their working up and according to the strategic dispositions already mentioned. After the sinking of

the battle cruiser *Hood*, which proved the outstanding fighting power of the new German battleship, the unit was able to shake off contact with the English once more, but on the next day she was contacted again by an enemy aircraft. In a hard struggle the *Bismarck* fell victim to the English battleships and formations of aircraft, assembled together from the whole of the North Atlantic. Our own aircraft sent out from western France could not, unfortunately, bring her any effective help because of the great distance. *Prinz Eugen* succeeded in escaping, and entered Brest in good condition.

The sinking of the *Bismarck* was a grave loss for the navy, even though the leaders, as already mentioned, in their bold and unusual methods of conducting the war, had reckoned with such reverses. In this operation it seems that radio location from ships played a decisive part for the first time. It afterwards became more and more apparent that the enemy had a definite superiority over us in this direction. This superiority was one of the reasons which caused the units of the German Fleet and later the armed merchant cruisers to succumb outside home waters. On the other hand, the strong reaction of English naval forces proved that the strategic object had succeeded—that of keeping the English Fleet busy, added to the direct success attained by sinkings. At this time the English convoys were guarded partly by single battleships, partly by groups of battleships.

The intention of the leaders to continue the Atlantic operations with the remaining ships was interrupted by the great threat to the Biscay ports from the air. While the U-boats could be protected against it by the building of strong pens, there was no such possibility for ships. In spite of the strongest air defense measures in Brest, the enemy succeeded in getting various bomb hits on the ships, which prevented them from further operations in the Atlantic.

The activity of the armed merchant cruisers was particularly successful in this period of the war. Their number was continually being increased. Operational areas in the South Atlantic, Indian Ocean, and at times also in the Pacific, were allocated to them. They were maintained by auxiliary ships, for the most part, sent out from the homeland, and later

from Japan. In the use of armed merchant cruisers lay the strategic idea of preventing a concentration of all enemy forces in European and North Atlantic areas. In addition they accomplished a considerable number of successful sinkings, thereby tying down as great a number of enemy ships and arms in distant waters as possible. Their direction was, therefore, as elastic and many-sided as possible. Worthy of special mention are the mining operations in South African and Australian waters, three successful fights against enemy A. M. C.'s in the South Atlantic, the capture of a whaling fleet in the Atlantic, the sinking of the cruiser *Sydney*, and the capture of several hundred thousand tons of enemy merchant shipping, with a number of ships entering ports under German control with cargoes intact. This activity was supplemented by a successful operation of the pocket battleship *Scheer* in the Atlantic and Indian Oceans.

After the conquest of France and the entry of Italy into the war in June 1940, the Mediterranean, too, became a sphere of interest to our war leaders, and with it North Africa came into the area covered by our own strategic deliberations. From an appreciation of the Italian fighting forces at that time, which were not indeed equal to the English or German, but were still valued too highly, a favorable opportunity seemed to be offered to strike a decisive blow at English interests and to compensate for the failure to invade England. Soon after, the French ports were set working, because of the great danger from the air, the navy wanted Atlantic ports farther to the south near French Morocco and Dakar. The strategic aim of control of the Mediterranean Sea, which at times even raised hopes of the conquest of the Near East and creation of a sea link with Japan through the Red Sea, was not reached for the most varied reasons, though at times we came near to it. The already planned attack on Gibraltar was not carried out because there was no political success in drawing Spain into the war. The winning and using of French North Africa was only possible with the voluntary support of the French, which was not attained. When the situation at sea in the Mediterranean took an unexpectedly favorable turn for us after the sinking of the battleship *Barham* by a German U-boat and the damaging of two other bat-

tieships by Italian midget craft in Alexandria, the Italian Fleet, in spite of continual German proposals, failed to make adequate use of it. The beating down of Malta by the German and Italian Air Forces to a state of helplessness (winter 1941-42) did not lead to its conquest, for the Italian forces were insufficient; and German support, considering the commitments in Russia and North Africa, was not available. Moreover, the successful offensive of Field Marshal Rommel in North Africa was prevented from being a strategic victory by lack of adequate land support to bring up supplies, lack of material, bad leadership of the Italians, and lack of reinforcements. On the Italian side, the navy suffered from lack of training, inferior technical equipment, and, to some extent, a lack of offensive spirit. This is not to belittle many incidents of bravery in operations involving the Italian Navy and merchant fleet. On the German side, the final failure of the North African campaign was due to the fact that large forces were tied down in Russia, which prevented any large-scale operations by land and sea forces in the Mediterranean. The German Navy played only a very small role in the Mediterranean campaign and, apart from U-boat support, could only use light forces and improvised auxiliaries. For this reason we had to leave the direction of sea warfare in this area largely in the hands of the Italian Fleet, over whose operations only limited influence could be exerted. At the end of January, the supreme commander of the navy was acquainted for the first time with Hitler's opinion that a campaign against Russia was unavoidable and that plans for this must be formed. Although at the beginning she abided loyally by the terms of the Russo-German Treaty, Russia subsequently changed her tactics and exploited the position into which Germany had been forced, by withholding more and more of her supplies of wheat and oil to Germany and also by flagrantly violating various conditions laid down in the treaty (Baltic States, Rumania). In addition, intelligence had been received that Russian armament, which on the face of things could only be used against Germany, had been placed on a war footing and that violent anti-German propaganda was being carried on in the Russian Army. Reliable intelligence was later received

about the deployment of Russian troops on her western frontier.

In order that Germany should not risk the danger of being overrun by Russia while the bulk of her own forces were tied down elsewhere, it was decided to carry out a "preventive war" against Russia as being vital to Germany's existence. For the naval command, whose strategic interests had been turned entirely to the war against England and her sea communications, this new development was particularly painful, though they supported Hitler in his opinion that war with Russia was an urgent necessity and unavoidable. It was hoped, however, to bring the war with Russia to a successful conclusion within a few months, thereby releasing manpower and materials for the Mediterranean front. But we seriously underestimated the Russian war potential.

Before the Russian campaign began, the changed situation in the Balkans made it necessary for Germany to attack in this area.

Italy, who already in October 1940 had attacked Greece through Albania without the previous knowledge of the German high command, was now being hard-pressed there. Another danger spot which needed clearing up without delay was the situation caused by the revolution in Yugoslavia in March 1941. The Balkan campaign began early in April and was brought to a conclusion in May by the successful offensive operations against Crete and the Aegean Islands. Apart from the attack on the islands, the navy, by its very nature, did not take part in the campaign. The acquisition of further sea and coastal areas brought the navy numerous additional problems.

While leaving the Adriatic under Italian command, the German Navy took over command in the Aegean. Under the greatest difficulties and by the use of every possible expedient, the safety of the sea lanes, the protection of the island reinforcements, and the defense of the coast were assured.

At the beginning of the Russian campaign, the navy took part only in the Baltic. It saw that its task from the very beginning consisted of preventing, by energetic measures, the Russian Fleet from taking any action, and of bottling it up even tighter in the Gulf of Finland with the advance of the land operations. As the initiative of the Russian Fleet and its ability

were estimated as slight, the strength of our forces placed in readiness for this purpose was kept within modest limits. A cruiser squadron, the so-called Baltic Fleet, was, for a time, held in readiness in the waters of the Aaland Islands. It participated by coastal bombardment in the conquest of the Baltic Islands and provided security against the possible breaking out of Russian surface forces. The conduct of the naval war in the Gulf of Finland was left to our own light forces, from torpedo boats downwards, in collaboration with the allied Finnish Navy. On the night the war began mine barrages were begun in the central and western Gulf of Finland, which in course of time were developed into strong mine fields pushed out as far as possible to the east. As it was, unfortunately, not possible to take Leningrad and Kronstadt, and so to eliminate the Russian Baltic Fleet once and for all, the mines had to be maintained until the end of the war. In the first days of our own advance, especially at the time of the evacuation of Tallinn and Hangoe, they inflicted heavy losses on the Russians and prevented any Russian surface craft from breaking out of the Gulf of Finland until the loss of Estonia in 1944. A few submarines which broke out in the first year caused only slight damage.

In northern waters the objective demanded by the navy, the conquest of Murmansk, Pogliarno, and the Ribachi Peninsular, was never attained as a result, in particular, of insurmountable difficulties of terrain. Consequently, there developed in this sphere a protracted struggle for sea communications in which we succeeded in maintaining permanently and without serious encroachment the important maritime traffic with Petsamo and Kirkenes.

In the third naval theater of war against Russia, the Black Sea, the Russian Black Sea Fleet possessed an overwhelming superiority over the few units of the Rumanian Navy, which were badly trained and without sea experience. These were strengthened by six Type-II German U-boats and an E-boat flotilla transported to the Black Sea via the Elbe, Reichsautobahn, and Danube, and by a number of landing craft, armed trawlers, and auxiliary vessels which were fitted out there. The Russian superiority, however, was, as a result of the almost incomprehensible inactivity of their Black Sea Fleet, but with the exception of the later landings in Eupatoria and Feodosia, ineffective, so that we were in a very much better position to carry out the tasks which had fallen to the lot of the navy in the Black Sea than could be expected with such a strength ratio.

## SECTION V

*December 1941 to April 1943*

The Japanese attack on Pearl Harbor on December 7, 1941, was a complete surprise to Germany's political and military leaders. It also resulted in a state of war between the United States of America and Germany. Conditions for U-boat warfare in the North Atlantic were once again clarified. Limiting factors vis-a-vis North America ceased to operate. The bar against German U-boats entering American waters was raised by the political leaders and in December the U-boat command equipped the first six U-boats which were to operate in American waters as near to the coast as possible. Additional U-boats were, unfortunately, not available because we did not have advance warning of the Japanese attack. The total number of U-boats ready for service was still small, and a larger monthly rate of increase could be expected only in the spring of 1942.

The success of the first six boats in American waters was, as expected, very considerable. The American defense was inexperienced; on the other hand, the U-boat commanders were exceptionally experienced. It was possible to operate very near to the coast and on the surface. Traffic was heavy here; consequently, the results were great. The U-boat command, therefore, sent every boat available for operations in American waters to this area in order to profit by the favorable situation, but a reduction in these great successes was expected to set in after a few months. Such, however, was not the case. Until the end of September 1942 such operations were worth while despite the very long inoperative passage out and back. The area of operations was, moreover, so extensive that it was still worth while to operate in the Mona Passage or off Aruba or Trinidad when, as a result of strong defenses, operations off Cape Hatteras became too difficult.

Compared with 1941, each U-boat was eco-

nomically valuable, even if, as already stated, its value had diminished, despite the great successes, to one-tenth of the 1940 figure. The large U-boat program ordered at the outbreak of war was in 1942 implemented only to the extent of 10 percent of the expected figure. Had the political leaders before the war recognized England as a probable opponent, and had they in 1937 prepared for a war with England and constructed a large U-boat fleet, the number of U-boats available in 1942 would have been available in 1940 but with 10 times greater results. The political desire of Germany's leaders not to make war against England and the corresponding armament policy of the navy led to our not having the requisite U-boats available at the right time or in the right numbers.

In order to increase sinkings wherever possible, the U-boat command used the long approach route and sailed in a group the boats which were to operate in North American waters. They followed roughly on a great circle course in a wide rake-like formation. In this way convoy traffic was often unexpectedly encountered. Apparently, the English convoy command had had to abandon the dispersal procedure used in 1941. This great circle procedure continued throughout the whole summer and autumn of 1942, convoys being attacked again and again and dispersed by U-boat packs lying in wait. The 1939 building program developed in such a way that, by late autumn, 42 boats were available for American waters, for operations against Cape Town, for three convoy-attacking groups in northern waters, in the North and Central Atlantic, and often an additional group to attack the Gibraltar-England traffic.

Losses by antisubmarine warfare were small. The main enemy, particularly in relation to the tactical maneuverability of the U-boat on the

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surface, was the aircraft. As these had, however, apparently not yet been fitted with long-range location devices, they were only available to spot U-boats close at hand. In a rough sea, and particularly at night, aircraft were not dangerous. Depth-charge attacks by destroyers against U-boats were not much feared. They were dangerous only when the U-boat was not protected by a sufficient depth of water. In general, depth charges dropped by sight over the diving position were more accurate than the patterns dropped later on the basis of Asdic bearings.

A U-boat which lay low and left no oil traces generally was lost by its pursuer after a certain time and could surface under cover of night and escape. The U-boat crews had in the meantime gained excellent experience in repairing failures and leaks. Damage and failures which, in the early war years, would have forced the boat to surface and led to its destruction were now overcome under water; and consequently the boat was saved. Proof was also given of the excellent construction of the boats, which was extraordinarily elastic by reason of the pressure hull sections having been welded, in contradistinction to the usual riveting process in the First World War. Thus, when depth-charged, the boat shook but did not break. Provided the valves held, nothing could happen to the boat unless a depth charge exploded close by and caused the pressure hull to burst.

Generally speaking, therefore, the U-boat attack in 1942 was superior to the defense. The finding of convoys was facilitated by the large number of boats. The U-boat's greatest possession, the element of surprise, was still effective. The U-boats, when on the surface, were not spotted soon enough for the enemy to be able to avoid them; and, when attacking, they could not be detected early enough by surface or underwater means of detection.

The surprise Anglo-American landings in North Africa called for a concentration of U-boats on both sides of Gibraltar. Every U-boat that could reach these waters within 10 days was mustered. This resulted in a considerable reduction of tonnage sunk that was not made up by sinkings off Gibraltar. Defense in these African waters was very effective, particularly in the air, and U-boat losses were correspondingly high. Through this withdrawal of forces

to the Mediterranean the Atlantic command suffered during the following months from a shortage of boats. This led to a reduction in the number of convoys sighted and consequently in the number of sinkings. Other grounds existed, however, for the renewed decrease in the number of convoys sighted during the winter of 1942-43.

In 1942, the German Cypher Office was fortunate enough to read various convoy ciphers. The German U-boat command thus had at its disposal the place and time of convoy meetings and also gathering points for convoy stragglers. This valuable assistance to attacking U-boats ceased in the early months of 1943. It was, of course, possible, given sufficiently large number of W/T messages, to break down the code, but advantage could no longer be derived from this, as the enemy was now changing the code at shorter intervals, so that the wearying labor of breaking it down had to be re-commenced each time.

The secondary reason for this reduction in the tracking of convoys during the winter of 1942-43 may have been that, at this time, the enemy grasped the U-boat reconnaissance and patrol tactics and took avoiding action. If mobile operations employing the so-called wolf-pack system of a number of submarines operating together on the surface were to be given up, it would be impossible to achieve the desired concentration on one convoy. In this respect, the same conditions apply to sea warfare as for land warfare. Here, also, no decisive results can be obtained by static trench warfare, but only by mobile operations.

The U-boat command, therefore, had to concentrate before the war on what means the enemy might employ to hinder U-boat movement on the surface and what could be done by us against his A/S measures. The enemy air force was at that time the greatest problem for the U-boat command and it was therefore surprising that it was only later that the enemy recognized and used this weapon as being the most effective means against the U-boat. The second anxiety at that time was the possibility of the development of surface detection. Possible available counters were: Protection for U-boats on the surface against radar beams; i. e., the absorption of such beams so that the transmitter, receiving no echoes, was unable to

obtain a bearing; the development of a search receiver for enemy radar beams of all wave lengths, with a view to warning the U-boat in good time; and the development of our own detecting apparatus. The U-boat command expected only small advantages from the latter, since the low altitude of the apparatus on the bridge would allow only a restricted range. The important point about this group of possibilities was that the U-boat was enabled, as it were, to assume a cloak of invisibility. During the following years the most varied experiments were carried out in this direction. They led to a clear recognition that, at the most, reduced but not total absorption of radar beams could be achieved. Another possibility to counter the development of surface detection was a complete change of tactics, i. e., to abandon surface tactics and to submerge the U-boats. This required, however, a high underwater speed and a great underwater radius of action. Without these properties the U-boat would have sunk in underwater warfare to a purely static instrument, and this would have meant a renunciation of the great results achieved by concentrating forces at the right place at the right time. However, in the years just before the war the development of a fast underwater U-boat was achieved. Very high underwater speeds were reached by means of the hydrogen-peroxide drive. Even before the war the U-boat command demanded the most energetic development of such a propulsion and such boats, but, unfortunately, it was found that much time was required and many set-backs were experienced. In the most successful months of the U-boat warfare in 1942, the U-boat command continually called for a speed-up of this development and for the building of faster U-boats. They had many meetings with the technicians to try to achieve this.

Although less convoys were encountered in January and February 1943, due not only to the weather but also to the aforesaid causes, nevertheless, the danger that the surface warfare against convoys might come to an end did not appear to be immediate. On the contrary, new, well-equipped U-boats were coming out from home and their numbers were rising monthly. The number of boats in the Atlantic rose continuously in spite of continued deliveries to the Mediterranean and to northern waters to attack

Russian-bound convoys. In March 1943, conditions on the main battleground, the North Atlantic, were again very favorable. Many convoys were met and attacked with very great success. The most successful convoy battles and also the attacks on the convoys by the commanding officers reached their peak.

It had now been proved unmistakably by years of war experience that the directing of the U-boats from another boat away at sea or in the neighborhood of the convoy was impossible. The whole direction had to be conducted by a U-boat commander ashore and often a thousand miles away. An understanding gradually developed between the commander ashore and the U-boat commanding officers at sea under his orders as to general conditions at convoy positions, air protection, close and remote screening, and the state of the weather. This understanding was so effective that the commander ashore could conduct operations and control successfully the tactical direction of distant actions; and it was felt by those at sea under his orders that the plan was correct and practical. In this, the higher command made unrestricted use of wireless and obtained the necessary information from the boats concerning conditions at the convoy position. If radio communications were inadequate, the commander of the U-boats communicated by R/T from his command post with the most experienced U-boat commander at the convoy position. No case is known to me in which agreement was not established by this method between the higher command and these veteran fighters. The battle at the convoy position itself was waged by the U-boats in tactical cooperation and with a high standard of individual performance in attack. With regard to reconnaissance, shadowing in spite of air and sea escort, clear reporting procedure, diving at the correct time to escape aircraft and destroyers, surfacing again as soon as possible, and pressing home the attack, breaking through the escort to attack, and carrying out the attack itself, the conduct of the U-boat commanders was excellent. They were men who, through years of seafaring in wartime, felt at home in the Atlantic in both summer and winter, and were a group of bold seamen of outstanding fighting ability. Consequently, there were convoy battles in which more than half, and in some cases over two-thirds, of the convoy was wiped out.

Looking back over this period, it can be said that U-boat successes were at their peak. The number of the U-boats was continually increasing, losses were slight; and the reinforcement by boats from home, considerable. The radius of action of all the boats was considerably extended by the use of supply U-boats, from each of which, about 10 U-boats could each draw 40 tons of oil and additional provisions, thus obviating the unnecessary voyage to and from even the Biscay ports, which, according to German conceptions, were not far distant. The U-boats also fueled by surface tankers when such were available. These could also supply torpedoes. Operations in the South American area, in the area around Cape Town, and in the Indian Ocean were thus made possible.

Through the construction, under timely orders from Hitler, of the U-boat shelters in the Biscay ports, the repairing and fitting out of the boats could be fully maintained without losses due to bombing attacks.

The torpedo branch had gained an extraordinary amount of technical experience from its failures at the beginning of the war and had reached a high stage of development. In the acoustic torpedo, now ready for action, the U-boat possessed at last a weapon against depth-charge-throwing escort vessels. By means of various kinds of looping torpedoes, and due to the concentration of targets in a convoy, the probability of scoring hits was considerably increased. Even though anxiety over the development of enemy air support over the Atlantic and the improvement of surface detection had a depressing influence on the U-boat war, the advantages mentioned above could be set against such anxiety. Consequently, the U-boat arm hoped to be able to meet even a strengthened A/S defense with an increase in the number of U-boats and thus maintain its successes at the same high standard.

Because of the great distance separating the European and the Far Eastern theaters of war, cooperation between the German Naval Staff and the Japanese Admiralty, which was carried out by the formation of naval liaison staffs, was limited mainly to the mutual reporting of events, the exchange of experiences, and the dealing with general strategic questions. With the rapid and successful advance of the Japanese to the edge of the Indian Ocean, the possi-

bility of a limited measure of direct cooperation presented itself. In order to avoid interference with one another's naval operations, longitude 70° E. was fixed as the limit of operational areas. It was incumbent upon each to obtain the other partner's approval before crossing the line, this approval being granted in principle, and to conform to his wishes regarding the waters navigated and the sea routes used.

After Penang had been established as a U-boat base, the German leaders were able to meet the demands of the Japanese regarding the operation of German U-boats in the Indian Ocean to an ever-growing degree, since the long passage was now compensated for by a greatly increased measure of cooperation.

German armed merchant cruisers, too, could henceforth run into Japanese bases for repair and to replenish supplies. This often happened and was the more valuable as the passage through the North Atlantic and Bay of Biscay became steadily more dangerous owing to strengthened enemy reconnaissance and warship patrol. A break-through via the narrows of Iceland could only succeed in especially favorable and rare cases. Nevertheless, the raider war was continued successfully. For the purpose of exchanging important military and commercial goods (rubber, metals, fuel oils) a blockade-runner traffic using fast German merchant ships was instituted between western France and Japan. This blockade running worked very well to begin with and provided us with an important quantity of supplies.

The operation of naval forces in the North Atlantic was no longer possible in 1942 because of the serious danger of air attack at the Biscay ports and the increasing enemy watchfulness in the North Atlantic. When this was fully recognized, a decision had to be made whether to leave the *Scharnhorst*, *Gneisenau*, and *Prinz Eugen* where they were, in Brest, or to bring them back to Germany via the Icelandic route or through the Channel. Taking into consideration the well-equipped detection installations on the English coast, the far superior British Fleet, and the very strong British Air Forces in this area, this operation represented an unusually hazardous venture which could succeed only by its surprise element. All three ships got back home, though the *Scharnhorst* and *Gneisenau* suffered damage from mines, necessitating

fairly long periods for repairs. Henceforward in the Bay of Biscay, along with the coastal auxiliary units, only destroyers and torpedo boats operated. Their principal duty was to escort armed merchant cruisers, blockade runners and, in special cases, U-boats.

The main sphere of activity of the remaining heavy units of the fleet had now moved to northern Norway where new tasks awaited them. From the general strategic point of view our main interest lay in further immobilizing as large a part of the English Fleet as possible in English home waters, thereby relieving both the Mediterranean and the Far Eastern theaters of war. The Anglo-American convoys to Murmansk and Archangel, which had, meanwhile, come into operation, represented an objective of equal strategic importance, which was attacked by our naval forces at different times with varying success, while U-boats and aircraft operating jointly, frequently achieved considerable successes.

Our own activity in northern waters extended to various offensive sweeps carried out by cruisers, and especially by U-boats, into the Kara Sea, mining of the channels connecting the Barents Sea with the Kara Sea, mining of the Gorrow Straits and numerous coastal approach points, principally by U-boats, and constant U-boat operations and various destroyer sweeps against the Russian coastal traffic north of the Kola Peninsula. A system of partly manned, partly mechanically operating meteorological stations in the area from Greenland to Franz Josef Land, which was supplemented by weather reports from U-boats in the North Atlantic and meteorological aircraft, was created and maintained until 1944.

The German major offensive in southern Russia toward the lower Volga, the Caspian Sea, and the Caucasus began on July 5, 1942, and its first successful phases raised the hope that the reverses suffered in Russia during the previous winter would be made up for and the Russian campaign brought to a successful conclusion. Strategic objectives of the first order could be attained here: The total control of the Black Sea, the Caucasus oil, and the threat to British positions in the Near East, which, together with the ensuing favorable development of the situation in the Mediterranean (the break-through of Rommel's army toward Egypt), gave promise

of influencing this sphere too. The conquest of the Crimea and Sevastopol and the advance of the German armies as far as the western Caucasus, along with the capture of Novorossiisk, gave the weak German naval forces in the Black Sea numerous opportunities for operations and forced the Russian Fleet into the extreme southeast corner of the Black Sea. The German advance to the Caspian had already led to preparations for setting up auxiliary formations of small craft there for coastal defense and for the struggle against the weak Russian naval forces in this sea.

The successful Russian counteroffensive on the Don, with the encirclement of Stalingrad in November 1942, the retreat of our own Caucasus armies to the Kuban bridgehead which this compelled, and finally the defeat at Stalingrad on the third of February 1943, brought about a fundamental reversal of the situation. In the Black Sea a stubborn static war between naval forces developed in the vicinity of the military fronts, in which the supply of the Kuban bridgehead across the Kerch Strait played a special role. In these engagements the Russians did not succeed in taking decisive advantage of the overwhelming superiority of their larger units. Only the Russian submarines east of the Bosphorus were successful here and there in their attacks on the German supply traffic coming from the Black Sea to the Aegean.

Simultaneously with the change in the situation in southern Russia a turn of events to our disadvantage occurred also in the Mediterranean. While Field Marshal Rommel was compelled on November 2, 1942, to begin his retreat from the El Alamein position, on November 8, 1942, American forces made a surprise landing on the west and north coasts of French North Africa after overcoming the valiant resistance of the French Navy. The operation of large numbers of U-boats west and east of the Straits of Gibraltar and in the central Mediterranean, in addition to strong German formations from Sicily and Sardinia, which could not, however, reach the American disembarkation ports, were unable to bring sufficient relief to the German troops in North Africa. At the end of this phase of the war in April 1943, they were pressed back to Tunisia where the struggle for the last German bridgehead in North Africa took place.

The incursion into North Africa of the Anglo-Americans left no alternative but the occupation of southern France by German troops.

In spite of the loyalty of the French Navy in North Africa it was unfortunately impossible, on account of the secrecy of the whole operation, to come to any agreement beforehand with the French Admiralty regarding the fate of the Toulon Fleet, with the result that when the surprise German invasion took place, orders were issued to scuttle all warships. In spite of this the German Government abided by the German-French armistice agreement by which the Toulon Fleet remained in French hands even in respect to undamaged or only slightly damaged units. Only a few torpedo boats and auxiliaries, which did not come under the armistice terms, were taken over for coastal defense. The defense of the French Mediterranean coast west of the mouth of the Rhone was taken over by the German forces with the navy taking its appropriate share. The defense of the eastern coastal sector was left to the Italians. In the meantime the defenses of the Biscay and Channel coasts were developed on a large scale. The commando raid against St. Nazaire in April 1942, was, by its surprise tactics, a local success for the British. As opposed to this, the Cana-

dian attack on Dieppe in August of the same year was an evident failure for the enemy, which revealed the power of our defenses but also indicated many lines on which they could be improved. It was regarded as a large-scale reconnaissance to gain invasion experience.

The Allied air-borne mine offensive was becoming more and more in evidence in the coastal waters of the Bay of Biscay, the Channel, and the North Sea and particularly in the shallow waters of the western Baltic and the Baltic approaches.

By the utmost exertion the German mine defense was, generally speaking, able to master the situation in a very short time so that our losses were kept within reasonable bounds. Only in the case of surprisingly extensive use of new fuses or other devices (e. g., first appearance of the acoustic mine) did sweeping take a few days longer with a temporary increase of losses. The mine offensive resulted in the reorganization to the smallest detail of routing and in the increase of protective equipment on naval and merchant ships. These countermeasures proved their worth. Not until the winter of 1944-45 did the mine offensive begin to cause us really serious difficulties.

## SECTION VI

*April 1943 to September 1944*

After the winter of 1942 had produced changes in the situation in Russia and in the Mediterranean unfavorable to us, there appeared in the spring of 1943 a similar change in the U-boat warfare which was, however, quite independent of the former and due to completely different causes.

Although in March the major attacks on convoys could still be carried out, by May it was quite clear that the enemy's air strength in the Atlantic, consisting of long-range planes and of carrier-borne aircraft, had increased enormously. Of even greater consequence, however, was the fact that the U-boats could be located at a great distance by the enemy's radar, apparently on short wave, without previous warning on their own receivers. They were then heavily attacked by destroyers and aircraft carriers without even seeing the convoy, which had been diverted. If, however, in spite of this a convoy was contacted, it was discovered that the problem of finding it was no longer the only difficulty in that U-boats could not now attack the convoy because its fire power forced them to submerge.

From this new situation it was evident that the enemy's aircraft and destroyers must now be fitted with new radar. The U-boat losses, which previously had been 13 percent of all the boats at sea, rose rapidly to 30 to 50 percent. In 1943 alone, 43 U-boats were lost. These losses were suffered not only in convoy attacks, but everywhere at sea. There was no part of the Atlantic where the boats were safe from being located day and night by aircraft. All the U-boat entrance and exit channels in the Bay of Biscay were, in particular, most carefully watched. Losses here were especially high.

Under these circumstances, the previous surface war on convoys could not be continued because, in the meantime, the favorable conditions in the American sphere of activity had also

changed and U-boat successes had diminished considerably in that theater. The enemy air force with its modern methods of searching had produced this change in U-boat warfare. As countermeasures, the ideas already started had to be followed up with all speed. These were:

Firstly, to produce as quickly as possible a new U-boat with as much maneuverability when submerged as U-boats had, up till now, possessed on the surface.

Secondly, until production of these new boats, to make all possible alterations to the existing U-boats so that, in spite of the enemy's radar and superior air power, they might be as effective as possible.

On January 30, 1943, the commander in chief, U-boats, was appointed supreme commander of the navy. He was, therefore, in a position to deal personally and energetically with these important problems of naval warfare. Prior to this, all German industry had been united under Armaments Minister Speer. He was, therefore, given the order to produce the new U-boat. The well-known Electro-U-boat Types XXI and XXIII were worked out with great speed and put into production. By means of very large batteries and an external design specially constructed for under-water cruising, they attained a high speed when submerged and could remain below the surface a greater length of time. The development of the Walter boats with hydrogen-peroxide propulsion was also greatly hastened.

In the meanwhile, the defensive armament of the available old type U-boats was improved by an increase in the number of AA guns. This succeeded in reducing the number of losses as compared with the month of May 1943. The fundamental determination that the final solution was to be found in the U-boat did not, however, change.

In September 1943, another surface attack on convoys in the old manner was tried out in the

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North Atlantic with these more heavily armed boats. The boats were ordered to remain on the surface when attacked by aircraft and to cooperate in fighting off the attack. They were then to attack and break up the destroyer screen with acoustic torpedoes and, in the third phase of the battle, attack the convoy now deprived of its protection. It was a bold attempt which demanded a great deal of pluck and a high standard of capability from the U-boat. The vulnerable U-boats had to combat the enemy's overpowering defenses in the air and on the water before they could fulfill their main task of sinking the ships. This succeeded insofar as they managed to remain on the surface in spite of aerial attacks, and in the second phase of the battle to sink a number of destroyers. The third phase of the battle, the sinking of the ships, was, however, not so successful, because a smoke screen was laid in which the ships were not visible. In this action the U-boat losses were small. The success of the experiment encouraged repetition. However, it appeared that in the first attempt the smoke had also impeded the enemy's air activities. In further attempts the air force was so powerful that had the U-boats remained on the surface they would in all probability have been completely destroyed.

It was, therefore, finally clear that surface warfare for U-boats had come to an end. It was now a matter of filling in time until the new type could be made ready for action. At the same time the Schnorckel was being developed for all types to enable the boats to recharge under water. The Schnorckel was not yet ready as its use necessitated alterations to the Diesel, and extensive trials had to be made in order that its use at sea should not endanger the crew.

In these difficult months of 1943-44, when the U-boat warfare was achieving only minor successes with high losses, the tough fighting spirit of the U-boat crews showed itself as never before. It was plain that the U-boats must continue to operate. Through the mere presence of the U-boats the enemy was forced to sail in convoy, and this tied up a large part of his tonnage most uneconomically. The presence of the U-boats also forced the enemy to maintain constant reconnaissance in the air and on the sea, which tied up a large number of men, as well as large amounts of materials and indus-

trial and dockyard capacity. The U-boats survived this difficult period.

During the summer the Schnorckel experiments were finished and a start was made toward installing the gear. The boats fitted with Schnorckel did not need to surface at all and the losses dropped suddenly by more than half. Losses while on passage became nearly nonexistent. By means of this, the old type boats also became totally submarine. They could now explore areas close to the coast which U-boats without Schnorckel had not been able to penetrate even in the years 1939-40 when the defenses were at their weakest. The first U-boats fitted with Schnorckel were ready at the beginning of the invasion of the continent and were used between the Isle of Wight and the mouth of the Seine. They operated here under very difficult conditions in shallow waters with strong currents, and against powerful fighter and radar defenses on the sea and in the air. In spite of this, the boats fitted with Schnorckel were able to operate and the losses were bearable. The U-boats returned from this area after approximately 3 weeks sea time without surfacing during which three to five ships had been sunk, a result which would have been good even at the peak of the U-boat warfare in 1940.

As already shown in the previous section, the result of the increased air and sea reconnaissance resulted in a sudden deterioration in the situation for German surface craft in the Bay of Biscay, the North Atlantic, and all other seas from spring 1943 onward, due to the superior enemy radar previously mentioned. Raiders, supply ships, and blockade runners were lost in such large numbers that mercantile warfare and surface shipping in foreign waters had to cease. The most vital traffic of personnel and goods to and from Japan was reduced to a minimum, and was carried out from that time onward by U-boats, including a number of Italian submarines.

In the European theaters of war the German Army was forced into defensive positions everywhere. The whole situation had developed into a war to defend the "Fortress Europe." The defensive duties of the navy now rose in importance to a similar degree, even though the offensive U-boat warfare was still its foremost task. To facilitate this, in spring 1943, the supreme commander of the navy had a new plan

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of shipbuilding drawn up and put into operation. This envisaged, by strict concentration on the more important types, a considerable increase in the building of E-boats, mine layers and mine sweepers, as it was expected that the need for these coastal forces would increase enormously with the enemy's approach to the German frontiers. For the same reasons the supreme commander of the navy ordered the construction of midget craft, the building of which in large numbers started as soon as the most useful types had been designed. The types concerned were one-man torpedoes, long-range torpedoes, the smallest type of E-boats, and particularly midget submarines with two torpedoes and a two-man crew. In this class were the so-called Sea Fighters (Meereskämpfer) equipped with special swimming suits, whose duty was to take floating explosives to suitable targets. They were to be used chiefly in narrow coastal waters and rivers. The personnel for these duties were drawn entirely from volunteers who were forthcoming in large numbers from all parts of the navy as well as from other branches of the armed forces. This keenness to volunteer for jobs known to be dangerous and lonely was a magnificent proof of the spirit, idealism, and love for action of the fighting forces.

The carrying out of the shipbuilding plan and midget-craft program, as in the case of the U-boat building, was entrusted to the minister for armament and war production who, because of his responsibility for all raw materials and also the armament program of the other branches of the armed forces, was in a better position than the navy itself to obtain what was necessary for the extensive new plans and by careful adjustment to eliminate all interruption. This measure entirely justified itself.

The enemy attack on the "Fortress Europe" which we were awaiting started step by step on all fronts. The situation in the Mediterranean became worse. The loss of the Tunis bridgehead was due chiefly to the fact that the enemy, because of his superior naval forces and, more especially, because of his use of strong air formations, succeeded in crippling our sea supply routes. Also the morale and fighting spirit of the Italians diminished considerably. The capitulation without serious resistance of the Italian island fortress of Pantelleria was an undeniable symptom of this. The swift success

of the Anglo-Saxon landing on strongly occupied Sicily was due entirely to the fact that right from the first the Italians put up no resistance at vital points on the island. The evacuation of Sicily and later of Sardinia and Corsica, which were carried out almost without loss, was a splendid feat in which the German Navy played a decisive part.

The betrayal by the King of Italy and his forces in September 1943, which had been anticipated by the Germans for some time, was adequately made up for in a surprisingly short time as the feared landing in northern Italy, which would have unhinged the whole German position in Italy, did not take place, but was substituted by the less dangerous landing at Salerno. Unfortunately, it was not possible to seize the Italian Fleet, as it had, for the most part, previously withdrawn and was out of reach. The greater part of Italy remained in German hands and the important economic and industrial sources in the north Italian plain could be used for our own war effort until the end of the war. The defense of the coasts of southern France, Italy, Yugoslavia, and Greece had now to be taken over by the German Navy with only a very small and improvised force. In the Aegean, the Dodecanese were occupied with very little Italian resistance and taken over as our own defenses.

The German midget craft were used for the first time to combat the English landing at Nettuno in Italy. On account of their small number and the unfavorable conditions, they achieved but little success. In the heavy fighting in Italy, units of the navy were used to protect the seaward flank and to support the army, particularly with regard to supplies. Conditions were extremely difficult for the weak naval forces in the eastern Adriatic, where the enemy was very active in supporting and supplying Tito's forces. In the Aegean an equally inadequate number of ships succeeded in continuing to supply the islands with comparatively little interference until the evacuation of Greece.

The immediate effect on the naval war of the continued retreat in Russia was first felt in the evacuation of the Kuban bridgehead in October 1943 through the Kerch Straits where, by making use of all available means, its operation was carried out practically without loss. When in February and March 1944, land communica-

tions with the Crimea were cut by the Russian advance in the Ukraine, the navy had the task of supplying the Crimea from the sea. This was carried out successfully to the end. Even here the activity of the Russian Black Sea Fleet was, in comparison with its size, remarkably small. In the evacuation of the Crimea in June, which was necessitated by the Russian breakthrough on our land front in the Perekop Isthmus and the unsuccessful defense of Sevastopol against the advancing Russian troops, the Russian naval forces again appeared only in small numbers. Serious losses were, however, caused by the Russian air force and artillery fire on the advancing land front. With the fall of Rumania in July 1944, the German Army's front in this area collapsed, and after the consequent occupation of Bulgaria, the last portion of the Black Sea coast was lost.

The loss of the Rumanian oil country reduced the already small fuel supply of the German forces and forced the navy to a strict reduction in consumption. The fuel necessary for the U-boat war remained, however, unreduced.

In the Baltic, the retreat of the northern army group from Leningrad to the Narva position in January 1944 made the blockade of the inner Gulf of Finland more difficult, but it was continued without reduction till autumn 1944. The western enemy's aerial torpedo offensive in the Baltic became increasingly heavy during 1944, but, on the whole, the position as regards mines could be kept in check in spite of increasing difficulties.

During the summer, in northern waters, the German naval forces had few opportunities for action as the Russian convoys only sailed during the six winter months. Meanwhile, there was evidence that the bays of Spitzbergen were being frequented by enemy ships. As it seemed desirable to give the German naval forces an opportunity to keep in training, in autumn 1943, the Spitzbergen operation was carried out by the battleships *Tirpitz* and *Scharnhorst* escorted by a number of destroyers. This achieved the desired purpose and passed off without any particular incident.

Attacks on the Russian convoys were continued during the winter of 1943-44 by U-boats, surface craft, and aircraft with varying success. The battleship *Tirpitz* was damaged in November 1943 in an attack by English midget sub-

marines in Altafjord and was out of action for a considerable time. An operation by the battleship *Scharnhorst* with a destroyer group in December, after a successfully concealed start, seemed to have good prospects of success in view of enemy dispositions and weather conditions. It proved a failure, apparently through a misjudgment of the local situation, and the *Scharnhorst* was lost. In these actions the superiority of enemy radar once more became very apparent. The only battleship now left was the *Tirpitz*, as the *Gneisenau* had been so heavily damaged by bomb hits during her refitting in Kiel that under the circumstances further attempts to repair her were not justified.

The decisive event of this period of the war was the invasion of France by our western enemies. In view of the general development of the war situation, it was expected during the spring or summer of 1944. Exact information regarding the intended date of the attack was not available. From April onward aerial reconnaissance over the south coast of England confirmed the fact that increasing preparations for the assault were taking place in the areas of Portsmouth-Southampton-Isle of Wight and Plymouth-Dartmouth-Torquay. In the ports of southeast England, including the region of the Thames, nothing unusual was observed.

The naval command considered the area eastward of the Cotentin Peninsula as far as Boulogne to be the most probable place for a landing. The coast of the Pas de Calais was regarded as the second possibility owing to its short distance from the English coast, but prospects of success for the enemy appeared possible in this area only if he succeeded in obtaining an effective port in his first assault. Other possible invasion points were also considered. Most of the reports received, which predicted possible invasion points on nearly all the coasts of Europe in turn, were attributed to systematic enemy attempts to mislead.

No detailed information was available regarding the nature of the invasion preparations. The experience at Dieppe, Salerno, and Nettuno, however, permitted a number of inferences. The very efficient types of enemy landing craft were well known. Aerial reconnaissance had identified a large number of square pontoons in the southern English ports. They were thought to be sections of landing stages.

We did not anticipate the production of prefabricated harbors.

Above all, the coastal defenses on the land were further developed and improved in order to meet the imminent invasion. New types of beach and in-shore obstacles were laid in large numbers. The view was held that it was of paramount importance to repel the invasion on the beaches themselves. Appropriate battle orders were issued.

Offensive measures by naval forces against the invasion preparations were precluded owing to lack of suitable means. The precautionary laying of mines, apart from those already laid, was rejected in order not to paralyze prematurely our own freedom of movement in the narrow coastal waters which were still unmined and to prevent the limited number of mines fitted with new fusing devices being laid in wrong positions. The laying of mines equipped with old type fuses, which could be easily swept by the enemy, seemed to serve no further useful purpose. The new type fuses were used in the oyster and acoustic mines, which are considered unsweepable. They had hitherto been brought into operation in isolated cases only with the greatest precaution in order to prevent their falling into the hands of the enemy in the shallow waters of the Baltic. Such an event would have had a catastrophic effect. Torpedo boats and E-boats in the Channel were strengthened as far as possible, midget craft held in readiness, and U-boat operations in the Channel prepared.

When the enemy succeeded on June 6, in spite of failures at various points, in establishing a few bridgeheads and extending and uniting these immediately, the situation was regarded as extraordinarily grave by the naval high command. All forces were summoned to put difficulties in the enemy's way by disrupting his supplies. The operations of the U-boats, already described in the U-boat war, the torpedo boats, and E-boats with torpedoes and mines, long-range torpedoes, and especially, one-man torpedoes in conjunction with powerful luftwaffe operations achieved to our knowledge considerable success. They were, nevertheless, unable to bring about a change in the situation.

In an air attack on Le Havre in the middle of June, in which the AA defenses did not come into action owing to a mistake on the part of the

local luftwaffe command, 3 torpedo boats, 10 E-boats, and a considerable number of other vessels were sunk. In addition, the base installations were destroyed, as a result of which operations were no longer possible from Le Havre.

When the enemy, in the land fighting, had pressed on to the mouth of the Seine, long-range torpedoes could no longer be used and the one-man torpedoes could reach the Seine Bay only with difficulty. Thus, the possibilities of attack on the enemy's supply traffic dwindled gradually.

The premature surrender of Cherbourg by the local army command was considered a grave error by the naval command as well as by the supreme command. After the city and its fortifications had fallen, the heroic stand of the naval officer in charge on the outer mole could only delay for a short time the final loss of the port. Consequently, the first effective port fell prematurely into the enemy's hands. The damage to the harbor installations could still hold up the full working of the port for a limited time, but could not prevent its use over an extended period.

When in August 1944 the American troops succeeded in breaking through at Avranches, France was lost to Germany. The garrisons of the harbor fortresses on the western and southern coasts of France were strengthened, their defense being ordered to deny the enemy the use of these harbors as long as possible. This was successful in the case of the western ports and the Channel islands until the end of the war, with the exception of the fortifications at the mouth of the Gironde. On the other hand, the ports in southern France, where meanwhile a second successful landing in the region of the Maritime Alps had been made, were lost at an early date. The U-boats were withdrawn from the French ports, the remaining naval vessels being left there to help in their defense. The personnel not needed for defense were brought back overland as part of the retreating army and the majority reached German soil only after taking part in much hard land fighting.

After it proved impossible to form a defensive line on the Seine, out of the retreat, the rapid advance of the enemy continued as far as the edge of the Vosges and the German frontier. The loss of Antwerp with its undamaged port installations, through the surprise thrust of the

enemy to the north, was regarded as a strategic set-back of grave consequence. Thus, after the clearing of the Scheldt mine fields, which naturally could delay operations only for a short time, the enemy had at his disposal near the front line an effective port which was to be most useful to him for further operations.

The loss of France was a set-back of utmost gravity for the conduct of the war at sea. All the strategic advantages arising from the possession of the Biscay ports were lost with one blow.

The U-boats had to fall back on the Norwegian and home bases. The long passage swallowed up a disproportionately great part of the

boats' endurance and, as previously mentioned, had to be made submerged.

Besides the set-backs already dealt with in all theaters, the weight of the increased enemy air offensive in this sector was more and more noticeable. Destruction of industrial installations caused frequent interruptions in the production of armaments. Damage to communications caused wide-spread traffic hold-ups, which hindered the transportation of supplies to the front. By confining ourselves rigidly to the program of vital points, and thanks to the thoroughgoing measures of dispersal undertaken by the minister of armaments, it was still possible to keep production and transport going and to meet all vital demands.

## SECTION VII

*September 1944 to May 1945*

By the autumn of 1944 the war situation in all theaters and on all fronts had an extremely grave appearance. After losing the greatest part of the territories previously occupied by us in the west, south, and east, the "Fortress Europe" had become reduced to the "Fortress Germany" with the exception of Norway, Denmark, and Holland, which were still firmly held by us.

In the east and the west the enemy armies stood on the frontiers of the Reich or had in places actually crossed them. The ever-increasing air offensive of the western forces on the German homeland had already seriously reduced the industrial and economic resources, both by direct destruction and by the annihilation of means of communication. The German Air Force had failed with the available types of aircraft to bring it to a standstill. Thus the prospect for Germany of a successful conclusion of the war appeared very slender. All thought of an earlier end to the war was, however, destroyed by our enemies. Leading figures of the opposing side repeatedly declared that only an unconditional surrender by Germany was acceptable. Enemy propaganda painted a gloomy picture of the intended treatment of Germany after defeat. For this reason, therefore, our leaders had no alternative but to maintain resistance as long as in any way possible, in order to exploit any possible opportunity of saving the German people the fate painted in such fearful colors by the enemy press. The German people themselves, because of the continual air attacks and the numerous restrictions on their daily life, had become, here and there, somewhat weary; but, for the most part, they stuck to their task faithfully and with admirable determination. The terror raids on open towns with no military or even industrial significance brought horror and misery to all. This produced in the defense-

less population of women, children, and old people on the spot, rather a stiffening of the inner will to resist than the contrary. Men and women carried on grimly and obstinately with their work, bringing unbelievable energy to the rebuilding of their places of work so that they remained in production.

Serious as the situation was, there were still grounds which encouraged the hope of a last-minute turn of the tide. The fighter program with its new types of "beam fighters" (Strahljäger) and jet-propelled fighters promised the possibility of checking or even putting an end to the enemy's uncontrolled air supremacy over the whole German area. The new types of U-boats lead to expectation of a powerful impetus to U-boat warfare. Therefore, the leaders' task was to hold out and concentrate all forces in the most important tasks until the new weapons could be brought into operation.

The navy, too, was operated in this sense. All new construction, reconstruction, repairs, and developments which could not be made ready for front-line operation in the shortest time were abandoned. The authorities and staffs concerned were then reduced or dissolved and the personnel turned over to operational duties. The manpower of the navy was continually and more carefully than ever supervised so that personnel rendered superfluous by the shrinking of theaters of war could be transferred immediately to the army. To maintain naval tradition, to which there was great devotion, naval infantry divisions from among those superfluous ratings were brought into being and were destined purely and simply for land warfare. Just as with earlier naval formations which took part as required in land operations, for example during the retreats from the west, from Leningrad, and from the Balkans, the traditional naval fighting spirit was preserved in these new divi-

sions. To compensate as far as possible for the lack of land-fighting experience, these new divisions were provided with the greatest possible number of battle-trying army officers and N. C. O.'s. As a result of the short period of training permitted by this development, losses were relatively high.

The U-boat and small-craft construction program was maintained as long as possible. But here, too, the increasing destruction of industry and means of communication, together with the loss of building yards and production units, compelled a gradual decrease. Finally, shortly before the capitulation, new construction was given up entirely. Only boats already completed were available to supply the front.

By the end of 1944 practically all available old type U-boats on operational work had been fitted with Schnorckel. They were operated on the English east and northwest coasts, off the North Channel, off the Bristol Channel, in the invasion area, and in the Irish Sea. The results were good and the losses acceptable.

The loss of the Bay of Biscay ports as operational bases was of enormous disadvantage to the U-boat war. The land communication to these ports had been severed by the advancing Anglo-American Armies in France, and thereby all possibility of further supply of fuel and torpedoes was removed. In spite of the favorable opportunities for attack close to the English coast, there was only a moderate increase in total sinkings. The reasons were obvious. The number of boats present and able to operate was very small and never exceeded 13. The great majority were on the long trip to or from Germany or Norway. The entirely submerged passage at very low speed reduced the economy of the U-boat warfare considerably by comparison with earlier times. This would have been true even if each boat in the operational area had reached the same daily average of sinkings as in the best days of 1942, and there had been an equal number of boats at sea.

That even the old boats fitted with Schnorckel could again operate close to the enemy coast with its powerful defenses, was proof that we were on the right lines with our new U-boat types. With these, by virtue of their high speed submerged, the dead cruising time would be halved. Over and above this, their length of stay in the operational area was expected to be

shorter, since, with this high speed they would be able to attack more quickly and more often. Therefore, it was expected that the economy of U-boat warfare would once more become extremely favorable.

In the meantime the construction of U-boat Types XXI and XXIII was pressed with all vigor. After completion of all construction plans the boats were put into construction as follows: The construction of the engines and accessories was given over to industry spread over the whole German area for production in the most widely diverse factories; the hulls of the boats themselves were manufactured in sections inland and then transported to the building yards; here, all the parts belonging to the single sections were installed and the completed sections were then welded into U-boats in the assembly yards. In this manner, in spite of the heavy air attacks on German industry, necessitating a continual diversion and transference of manufacture, the production figures as planned were, on the whole, maintained up to the end of 1944. Only then, as the result of intensified air attack and the destruction of lines of communication, did a considerable reduction take place. For all that, at the beginning of 1945, there were considerable numbers of both of the new types of boat in commission.

In March 1945 several Type XXIII boats were for the first time sent to operate on the English east coast. This operation confirmed the hopes entertained. Out of seven trips five were successful. All boats returned to base in spite of the strongest opposition. By virtue of their high speed submerged, the boats came easily to the attack and thereafter withdrew from enemy countermeasures by making off at high speed. After withdrawing some miles they observed from safe range the concentrated and extensive depth-charging of the attack area without their being located. The personnel had great confidence in the new type. This applied equally to Type XXI. The first boat, commanded by Korvettenkapitan Schnee, an experienced U-boat officer, had been placed on operations in April. Increasing numbers of both types were to be operated against the enemy in the coming months.

We were entitled to assume that the U-boat war would enter a new phase. Considerable successes had already been achieved by old type

boats fitted with Schnorckel on operations of long duration without a single surfacing being necessary. The strain on crews, who remained submerged as long as 70 days, was surprisingly light. Thanks to the Schnorckel the atmosphere remained fresh during under-water cruising and considerably better than in former circumstances. But the most important easing of strain came from the removal of the continual nervous tension in U-boat crews caused by surprise attack by aircraft.

Type XXI, with its great range of 22,000 miles, was capable of scouring all waters of importance for the U-boat war without having to surface. It was obvious that this would bring about a turn in the naval war. Control of the sea by great sea powers was exercised through surface craft supported by aircraft. A warship whose primary operational sphere lies beneath the surface immediately renders the greater part of this control of the sea impossible. If, in addition, this warship has a high top speed under water which makes possible an easy approach to the enemy, it is obviously a very valuable instrument of war.

This new effectiveness of the German U-boat war was cut short by the German capitulation which had become inevitable through the occupation by the enemy of the whole German area.

The battle of the U-boats had come to an end. Self-sacrificing and courageous, unstained and honorable had been the conduct of the crews in battle. Of an approximate strength of 38,000 men in the U-boat arm, around 30,000 had fallen. On the other hand, their successes were unique. According to enemy figures, more than 2,000 ships of at least 14 million tons, including numerous escort vessels, destroyers, and cruisers, 2 aircraft carriers, and 2 battleships were sunk. Many other naval and merchant vessels were damaged.

In northern Norway during 1944 the battleship *Tirpitz* was, on many occasions, the object of attack by enemy aircraft, armed with giant bombs (5½ tons) and manned by crews especially trained for this particular type of task. In September 1944, the enemy succeeded in scoring a heavy hit on the forward part of the battleship. It seemed hardly feasible to bring the ship back home for repairs, while to employ her as a mobile floating battery in the Norwegian fjords appeared of some use. The supreme com-

mander of the navy, therefore, ordered her to be moved to another anchorage, which, in contrast to the former berth in Altafjord, had such shallow water that, if further bomb hits were sustained, it would be less possible for the ship to capsize and become a total loss. A further reason for the shift was the withdrawing of the German front line in northern Norway back to Lyngenstellung, which had already begun as the result of the Finnish cease fire. A suitable location was found in the neighborhood of Tromso. Shortly after the shift, a new English air attack was made. Two direct hits and four near misses assisted by the soft nature of ground caused the ship to capsize. The last battleship of the German Navy was gone.

The sending of cruisers to northern Norway was also stopped as there was now a great variety of operational tasks in the Baltic for these ships which previously had been largely employed for the training of new personnel. One destroyer flotilla remained in northern waters. It had the task in conjunction with the coastal forces, to cover the seaward flank of the retreating northern Norwegian armies.

In the North Sea the small craft, together with U-boats and E-boats, bore the burden of our operational activity. The most important target was the enemy supply traffic to the Scheldt. Meanwhile, the latest type of midget submarine, the so-called *Seehund*, had become operational. These boats had an endurance of up to 5 days at sea, a noteworthy performance considering the enormous strain on the crews. A series of satisfying successes were achieved against the Scheldt traffic.

In the Mediterranean, naval activity was restricted to the defense of the coastal sector still remaining in our hands and the current supply activity. The occupation of Bulgaria by Russia in September 1944, and the over-all development on the eastern front made the evacuation of Greece essential. It was then no longer possible with the limited resources of this area and in face of enemy naval assaults to evacuate the occupation forces of the islands without disastrous losses. It was, therefore, decided to continue to hold a part of Crete and the islands of Melos, Rhodes, and Leros and a number of smaller islands between the latter two. German withdrawal from Yugoslavia in March 1945, and the collapse of the Apennine front in Italy

during the first half of April brought the activity of the navy in the Mediterranean to an end. A further source of supply of foodstuffs was lost when Hungary fell, but even then the German food supply situation was not seriously threatened. Throughout the whole war the intensive labor of German producers and the extraordinarily prudent and strict management of supplies had enabled the armed forces and the civil population to be fed on a notably high level.

(NOTE.—Several paragraphs are missing from the original manuscript at this point of the essay.)

The entry into unconditional surrender in northern Germany at 0800 on May 5, 1945, and the total capitulation of the German armed forces which followed on May 9, 1945, brought the war to a close.

The German Navy had fought honorably and courageously, afloat and ashore, on all the seven seas and in all European theaters of war. The fighting spirit and high idealism which inspired both officers and men remained unbroken to the bitter end. No stain sullied the German Ensign when it was hauled down, with honor, after a lost war.

## FINAL OBSERVATIONS

The foregoing treatise on the development of the German Navy and its wartime activities has been written from memory and without any kind of documentary support. Allowance must, therefore, be made for possible inaccuracies.

Since, during my period of service as cruiser captain and subsequently from 1935 to January 30, 1943, as senior officer, U-boats, I had no part

in the general direction of the navy, my observations covering this period are based on my general knowledge as an executive officer and cannot be regarded as the authentic observations of the naval commander in chief. They are, however, confirmed in all details by Rear Admiral Wagner, who belonged to the operations division of the naval staff throughout the whole war.

## APPENDIX

### INTERROGATION OF ADMIRAL DOENITZ

The purpose of this interrogation was to question Doenitz further in the light of his essay on the reasons why Germany lost the war, and in particular, to clarify his views on the effect of Allied bombing, a subject which he passed over in relative silence in his paper.

This was the first time that Doenitz had been interrogated by British officers since he had been named as a possible war criminal, and he at once launched into a passionate tirade on the iniquity of his being considered a war criminal since he had never, throughout the war, done more than his duty as a naval officer and considered that the German Navy, at any rate, had fought a clean war. More important still, in his own eyes, is perhaps his argument that the Western Allies should be grateful to him for having surrendered to them and not to the Russians; that he could have ordered the fleet to Kronstadt; and that instead he handed it over complete to the Anglo-Saxons, having gained time to withdraw as much material and as many persons as possible from the east. He states that he intends to take this line at his trial, but is possibly unaware that Russians will be sitting in the court.

Having got this off his chest, he calmed down and became quite affable, asking what we wished to know.

#### Allied Bombing

The war was in one sense lost before it began, because, as is set out at length in his essay, Germany was never prepared for a naval war against England. The possibility of having England as an antagonist was not envisaged until 1938, because the government was ill-advised politically. Hitler had never been abroad. A realistic policy would have given Germany a thousand U-boats at the beginning of the war. As soon as war started, shipbuilding policy was completely changed; but even on September 1, 1939, Hitler had stated that England would not come into the war. Doenitz himself got a terrible shock when he heard that England was an enemy, and it took him 24 hours to pull himself together.

In another sense the war still had a chance to be won because, for a long time, things seemed favorable to Germany. It was expected that the new type U-boats would radically alter the course of the war; and a complete new fleet of Types XXI and XXIII U-boats would have been ready by the autumn of 1944, but for the delay in production caused by bombing. To this extent, the

bombing offensive, in Doenitz' opinion, can be said to have won the war for the Allies. From the winter of 1944 until the end of the war more U-boats already in commission in German waters were being lost by bombing than were lost at sea.

#### New U-boat Types

Doenitz was asked what remarks he had to make to the charge sometimes made against him that his lack of foresight in not pressing for newer types than the 500-tonner at an earlier date was to some extent responsible for Germany's loss of the war. He stated that before the war ever started he had known of the Walter principle, and from 1938 onward had pressed for the matter to be taken up as one of urgency. It was not, however, until 1942 that he had been informed by the designers that the Type XXI hull-form with increased battery space, thereby giving the necessary under-water speed, was a feasible proposition.

The production of Walter and XXI types (later) was held up by the priority given to army and air force demands on productive capacity. It was not until Doenitz became commander in chief in 1943 that he had the authority himself to get the necessary priorities for the navy. He is, however, of the opinion that an enlightened policy would have struck a proper balance between the demands of the services much earlier. Had Speer been put in control of production 2 or 3 years earlier, the picture would have been very different, because he proved capable of organizing production in such a way that the output of industry was much higher than ever before in 1943. It could have reached the same point much earlier and at the same time distributed effort more evenly to insure the demands of all services being met concurrently.

#### Invasion of England

The German Navy was not a match for the Royal Navy, which would be presumably thrown in to the last man and the last vessel to counter a landing. It, therefore, became the responsibility of the German Air Force (a) to hold the R. A. F., (b) to hold the Royal Navy from attacking a landing force. The G. A. F. was incapable of either of these tasks. If it had succeeded in

defeating the R. A. F. in the Battle of Britain, it would still have been incapable of keeping the Royal Navy off a sea-borne landing force because it had not the necessary weapons. The bombs in use at that time were of far too small a caliber to have been able effectually to prevent main units from coming to grips with the landing force. The German main units were totally inadequate for this task. Granted that the G. A. F. could have carried out its two tasks, the German Navy would have had no difficulty in transporting the landing force in the vessels then available.

#### The Development of the K. d. K. (Small Battle Units)

Doenitz was wont to say to his chief of staff that he wanted Heye to be his Mountbatten. The K. d. K. was conceived as an offensive command. Circumstances forced it to be defensive. Doenitz himself wrote a paper on the potentialities of Small Battle Units in 1923 with the text "Cunning is the Strength of the Weak." It did not appeal to orthodox opinion.

It was expected that the K. d. K. would be ready for action in time to be an offensive weapon. Two factors made this impossible: Firstly, the delay in production was due to bombing; and secondly, given that this delay had occurred, the coming of the Allied landings sooner

than they were expected made it impossible to have the K. d. K. ready, nevertheless. U-boat building naturally took priority, and the delays in U-boat building consequently delayed the K. d. K., but as commander in chief, Doenitz took pains to give priority to the K. d. K. immediately after the U-boats.

#### Radar

Doenitz claims to have foreseen before the war that U-boat warfare was bound to develop into a strictly submarine war, and, therefore, as stated above, he pressed for the development of Walter propulsion. One of his reasons for coming to this conclusion was that he foresaw the development of radar, and himself before the war pressed for radar development to be taken up as a priority by the state instead of being left in the hands of various private individuals who were experimenting with it. He was, at the time, only a captain, and his words fell on deaf ears.

#### Russia

Doenitz emphatically denied that he had ever been to Russia, as is sometimes suggested, in order to continue U-boat development and training either before or after the Nazis came to power.