

# ALL HANDS

*Keating*

THE BUREAU OF NAVAL PERSONNEL INFORMATION BULLETIN

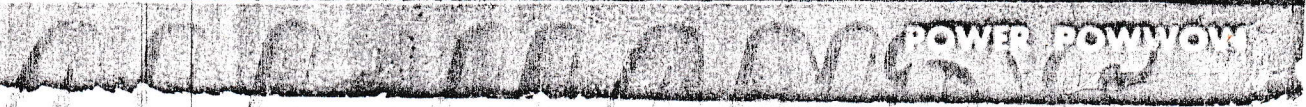
NAVPERS-O

JUNE 1946

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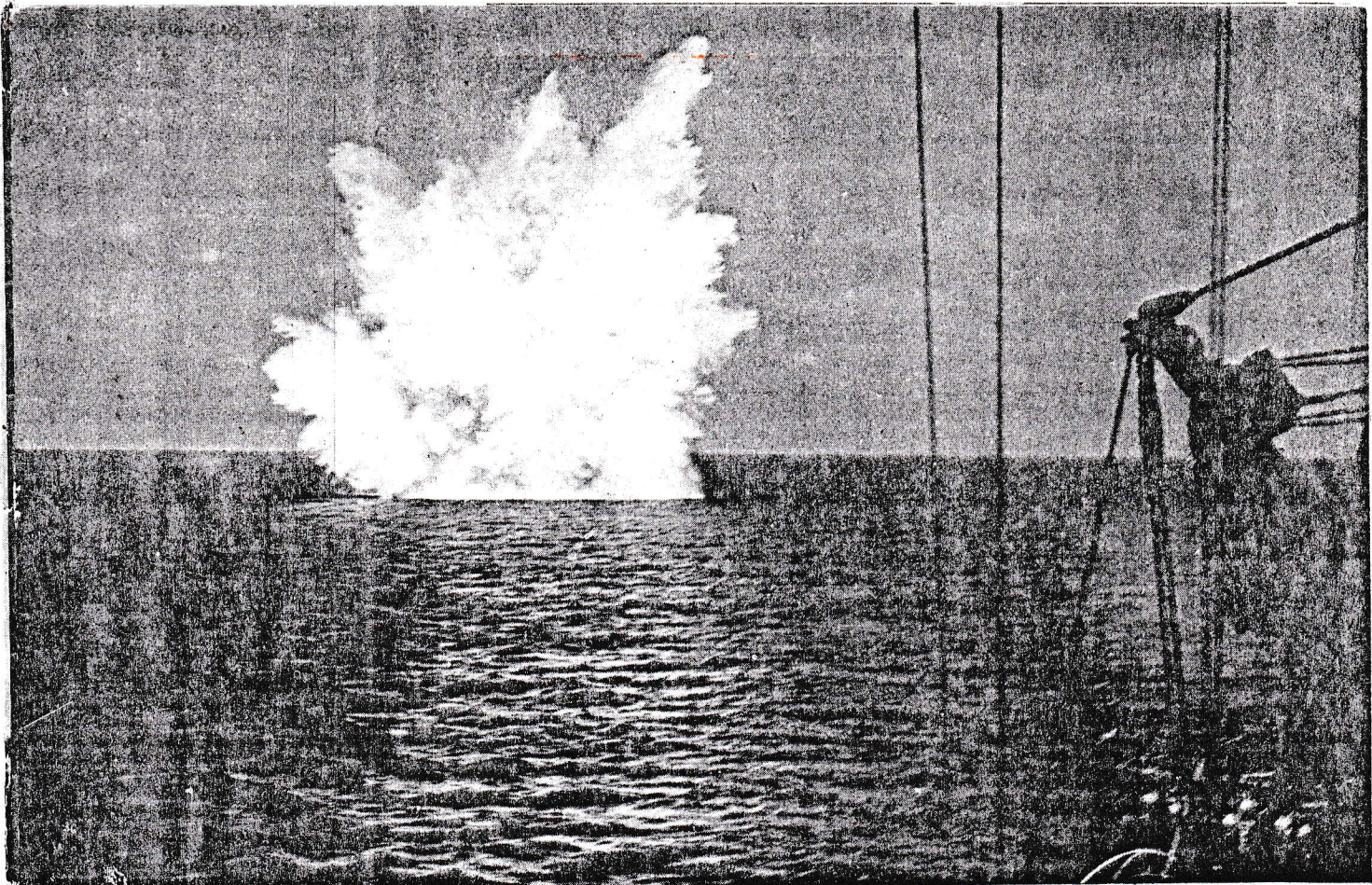


POWER POWWOW



*THE BUREAU OF NAVAL PERSONNEL INFORMATION BULLETIN*





Official U. S. Navy photograph

COMBINED aerial, surface and submarine minelaying sunk about 675,000 tons of Jap shipping in the Pacific.

## PACIFIC CINDERELLA

**T**HE MINE HAS EMERGED as the Cinderella of the Pacific war. Now that the full story can be told, the Navy's mine warfare experts can present a record of extraordinary accomplishment. It is a record which gives new meaning to the assertion by Fleet Admiral Chester W. Nimitz that "phenomenal results" were achieved.

The story of the offensive mining campaign in the Pacific is one of Army-Navy cooperation, and inter-allied coordination, which played a vital part in choking off the lifelines of maritime Japan right up to the Emperor's doorstep. It is a story of human ingenuity used to create deadly machines which could almost think, particularly the unsweepable pressure and subsonic mines. Above all, it is a story of results achieved with amazing economy of men and materials.

During the war, the mine became an offensive weapon of major importance. Aerial mining not only was born but came of age so quickly that the Navy's mine warfare experts have declared the airplane to be their most effective minelayer. This does not mean that submarine and surface minelayers did not play a vital role, particularly in the earlier days of the war.

For the most part, mine warfare

### Mine Became Vital Weapon Of Offense During Navy's Unrelenting Campaign to Choke Off Jap Lifelines In Enemy's 'Front Yard'

against the Japanese was strategic, but it also was used tactically on occasions, and with spectacular results. The Okinawa invasion is an outstanding example of the latter use of mines.

All told, the minelaying campaign against the Japanese sank or damaged more than 1,750,000 tons of enemy shipping—nearly one-fourth the pre-war strength of the Japanese merchant marine. This figure may go as high as 2,000,000 tons when all the returns are in. Enemy casualties caused by mines included 2 battleships, 2 escort carriers, 8 cruisers, 46 destroyers and destroyer escorts, 7 submarines and 81 other naval vessels.

Preliminary reports credit mines with the sinking of more than 675,000 tons of enemy shipping and the final total may go to 750,000 tons. Of more than 1,000,000 tons damaged by mines, an estimated 25 per cent might as well have been sunk as the

Japanese were concerned because their ship repair yards were so crowded that damaged vessels couldn't go to sea again for a long time. In fact, many of them were still out of service at the end of the war. The Japanese themselves have declared that a large ship damaged by mines required an average of 95 days for repairs and a small ship 70 days.

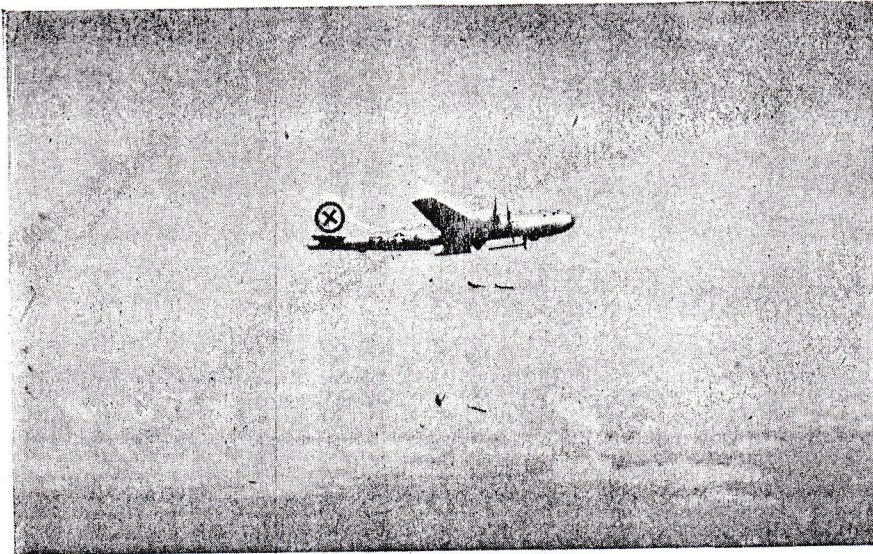
All this was accomplished with a total loss of 55 airplanes, 15 of them B-29s, in 4,760 sorties. No submarines or surface vessels were lost while minelaying. Nearly 25,000 mines were laid, 21,389 of them mines of aircraft types.

The mining offensive was divided into two principal phases:

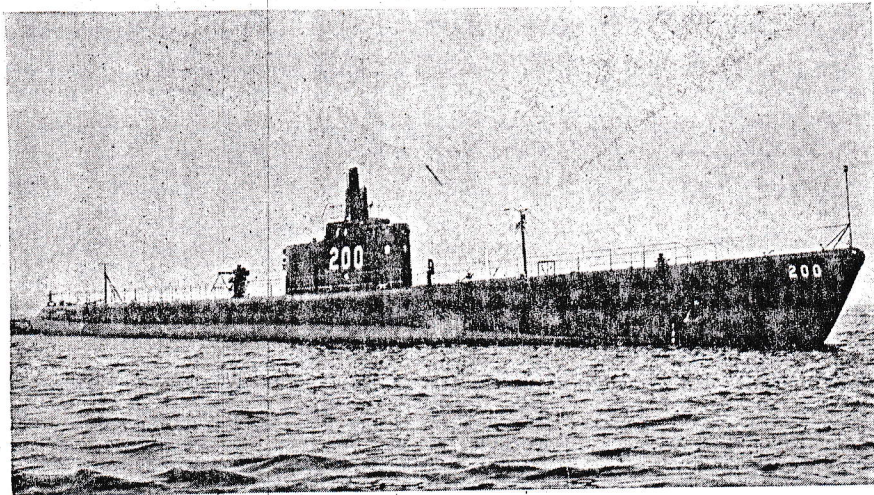
- The "outer zone" campaign, which began early in the war and lasted to the end, choked 150 enemy harbors and shipping channels with nearly 13,000 mines, more than 9,000 of them aircraft types. This campaign hampered the flow of enemy troop supplies, and of raw material shipments to the Japanese homeland. It helped to foul up the enemy's offensives; and frustrate his efforts at defense. And it sank 245,000 tons and damaged 460,000 tons of enemy shipping while causing many sailing delays of a day to a month.

- The "inner zone" campaign, a

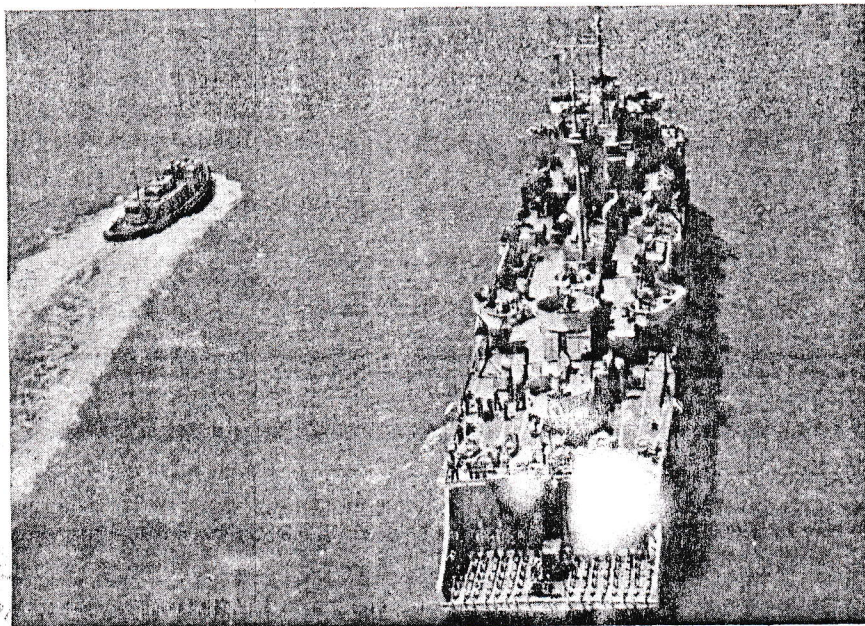




ARMY B-29's laid Navy mines which sank or damaged more enemy shipping during last months of war than any other Army or Navy offensive measure.



Official U. S. Navy photographs  
USS THRESHER, above, was one of submarines active in minelaying campaign. Surface vessels started minelaying in 1942. Below the USS Salem.



spectacular aerial mine warfare blitz, during the last five months of the war built a virtually impenetrable wall of 12,000 mines around the Japanese homeland, sinking or damaging more than 1,000,000 tons of enemy shipping. This drive, in which Army B-29s laid Navy mines, sank or damaged more shipping than the combined efforts of submarine and direct air attack by both the Army and Navy in the war's final months. The Japs even moved anti-aircraft guns from industrial centers to mining targets in an effort to stop the Superforts. Although the 21st Bomber Command devoted only 5.7 percent of its efforts to mining, Prince Konoye, a former Japanese premier, subsequently declared that the mines were as devastating in their effect as all the bombing and incendiary raids in the last few months of the war.

In the outer zone campaign, mines were laid by the Australians, the British and the U. S. Army and Navy. In the inner zone, the U. S. Army carried the brunt of the minelaying effort because it had the long-range better suited aircraft (B-29s).

The British supplied some mines for the outer zone campaign, but most of the mines were U. S. types supplied by the Navy, which was responsible for their design, development, production and servicing. The Navy also played a major part in planning the joint Army-Navy efforts.

Submarines, surface vessels and aircraft participated in the outer zone campaign. Operations were carried out from China, India, Australia, Ceylon and island bases in the south and central Pacific. Rangoon and Haiphong were rarely used by large ships after mining began. The presence of mines frequently closed Shanghai, Hong Kong, Takao in Formosa, Bangkok, Singapore, Balikpapan and Surabaya to enemy ships. Palau, Penang, and Kavieng were abandoned as key bases shortly after and largely because of mining.

Major General Claire L. Chennault has credited mining of the Yangtze River and ports of the China Coast with being one of the major factors responsible for failure of the Japanese offensive in South China in 1944.

"Aerial mining was primarily responsible for the long delay which amounted to a tactical defeat for the Japanese," he said.

Much of the failure of the Japanese to supply and reinforce their troops in Burma can be attributed to the persistent mining of ports in Burma, Siam, Malaya and Indo-China. In the Southwest Pacific, 49 areas were mined by air, greatly hamstringing Jap efforts to exploit the Netherlands East Indies and supply troops in that area. Rear Admiral Matsuzaki, chief of staff in the NEI area, estimates that 90 percent of the ships over 500 tons were lost to allied attack and 40 percent of these were due to mines.

The 33 submarine mine-laying missions in the Pacific laid 658 mines, sinking at least 24 enemy ships and damaging 20. The mines also forced enemy ships into deep water where they were better torpedo targets.

Fourteen surface-laid minefields in the vicinity of the Solomon Islands



sank four destroyers and interfered significantly with the support of Japanese troops in the closing months of the Solomons campaign. The aerial phase of the outer zone campaign required 3,231 sorties from which 40 aircraft failed to return.

The mining offensive began in October 1942. Seventh Fleet submarines, based in Australia, started it by taking extremely long cruises to the dangerously shallow waters of the Gulf of Thailand and the Gulf of Tonkin in the South China Sea and laying mines in enemy shipping channels.

Submarines from Pearl Harbor conducted similar operations off the coasts of Japan and China.

Surface vessels started minelaying early in 1943 and by the end of January, as the Guadalcanal campaign was drawing to a close, mined the channels around that island. On one night, the "Tokyo Express" made its usual effort to run supplies to the beleaguered Jap troops and an enemy destroyer was sunk by a mine. Three more destroyers were sunk in a similar field in Blackett Strait. Surface minelaying continued as U. S. forces penetrated deeper and deeper into the Solomons, doing such a thorough job that the Navy later had to sweep some of its own fields because the Japanese did not have enough gear to sweep the fields themselves.

### Vigorous Campaign

The first aerial minelaying in the Pacific occurred on the night of 22-23 Feb 1943 when the Tenth USAAF, India-based, sent ten B-24s loaded with British mines against Rangoon. Shipping there fell off immediately and from that time on few large ships ever attempted to use that port. This started a vigorous minelaying campaign from India and from then on neither Rangoon nor any other port within aircraft range was long free from mines.

The first dropping of U. S. mines from U. S. aircraft occurred on the nights of 20 and 21 Mar 1943 when 40 Navy and Marine Corps TBFs made two aerial mining strikes at Bougainville, then the center of enemy resistance to the Solomons campaign. This opened a campaign to close down enemy supply lines to Jap outposts in the Solomons in which aircraft and surface layers collaborated.

Ground mines, which sank to the bottom and laid there until a pre-selected size of ship came along to set them off, were laid by aircraft in the shallow waters, while the surface layers established fields of moored mines across the deep approach channels. As a result, at least six enemy warships were hit. Of these, two destroyers were sunk, two were so badly damaged that they became "sitting ducks" and were subsequently sunk by air attack and one light cruiser and one destroyer, as well as one or more cargo vessels, were damaged.

In late April 1943, Royal Australian Air Force Catalinas (PBY-5s) opened a campaign continuing into early June, during which they laid 60 mines in

the proposed Japanese fleet anchorage at the north end of New Ireland near Kavieng. The one entrance remaining, too deep for ground mines, was closed by a field of moored mines laid by a U. S. submarine. Late in June and July, the field was reinforced. Results: One survey ship and five cargo vessels sunk, several vessels—including two light cruisers and a destroyer—damaged and, finally and most important, the Japs abandoned the anchorage completely.

The RAAF carried out virtually all subsequent aircraft mining in SoWes-Pac. It was a strategic campaign against the principal harbors and shipping routes of the NEI.

By the end of 1943, U. S. offensive mining had taken its first steps in each of the major combat areas of the Pacific war.

In the next 12 months, about 400 U. S. and British mines were planted by the RAAF, operating from Australia, in 21 harbors of the NEI and Bismarck Archipelago, with a loss of only one plane in 200 sorties.

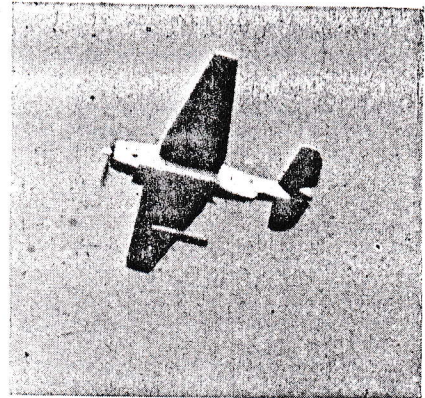
The first U. S. mines arrived in India in July 1943. They were later used in extending the mining attack from Rangoon to Bangkok and the railway ferry crossings between those places. After the early mining of Rangoon, the Japs attempted to bring their ships into Bangkok and transport supplies the rest of the way to Burma by rail. Minelaying combined with direct air attack on the rail lines made this route an unreliable one for the enemy and his supplies suffered.

The 14th USAAF, based in China, joined the minelaying offensive in October 1944. Two B-24 sorties against Haiphong sank a ship in the main channel, blocking a 10-ship convoy outside the harbor. After milling around several hours, the convoy headed for northern Hainan where the 14th's bombers caught it and sank six of the ten ships. The Japanese also suffered another ship casualty in the minefield and abandoned Haiphong as a port for anything larger than junks. The 14th subsequently mined from Tonkin Gulf on the south to the Yangtze on the north. Hong Kong and Takao became favorite targets. Both of them, especially Takao, were staging points for convoys between the Empire and the southern Japanese holdings.

Mines began to be used more extensively as tactical weapons early in 1944. The first mining done specifically in preparation for an amphibious attack was directed against the Marshall Islands late in December 1943 and early in January 1944.

Heavy bombers from Tarawa and Apamana placed mines in the entrances of four of those islands which were by-passed during the invasion of the Marshalls.

The first and only minelaying mission by U. S. carrier-based aircraft was directed against Palau on 30 and 31 Mar 1944. Task Force 58 was spotted by a Nip search plane at Woleai so the Japs had sufficient warning to get their warships out of danger before the task force was in striking position. Thirty-two enemy merchantmen and tankers, however,



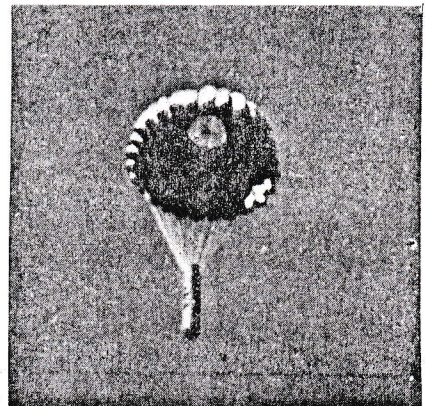
AERIAL MINE is dropped by a TBF.



PARACHUTE then begins to open.



AND MINE floats gently to water.





**PACIFIC CINDERELLA (Cont.)**

were bottled up in the harbor by mines which planes from the *Hornet*, *Lexington* and *Bunker Hill* laid in the long, tortuous passages leading into it. Bombers and torpedo planes of the task force then came along and wiped out all 32 ships.

This strike denied use of Palau to the enemy for at least 20 days and was one of the factors which led to its abandonment as a forward operating base for enemy naval ships and aircraft.

Truk and Woleai were mined in April 1944 to prevent temporarily their use by enemy fleet units which might endanger the Hollandia invasion and other movements then being carried on. Palau was mined again in June and July to insure its neutralization during the capture of the Marianas and the westward sweep toward the Philippines.

Attrition (strategic) mining also expanded rapidly. The Royal Air Force, based in India and Ceylon, and the 10th USAAF flew more than 200 sorties and laid almost 1,000 mines in 11 regions along the coasts of Burma, Thailand and the Malay peninsula.

The 14th USAAF's mining was done under more difficult conditions. All its planes and mines had to be flown over the Hump from India and Jap advances greatly curtailed air operations in late 1944. Nevertheless, several hundred mines were laid along the coast and in the rivers of China and around Formosa. In the first three months of 1945, the 14th laid over 300 mines in the upper Yangtze, including more than 100 floating mines dropped upstream from such places as Hangkow to float down on ship and barge traffic. Then India-based B-29s carried out two heavy mining attacks

in the mouth of the river near Shanghai in March.

In the SoWesPac area, meanwhile, the RAF, RAAF, 10th USAAF, 14th USAAF, 20th Bomber Command and the Fifth Fleet all contributed to mining 40 localities, hampering enemy development of important sources of raw materials.

Balikpapan, Borneo, site of the only high octane gasoline refinery nearer to Pacific bases than Palembang, Sumatra and principal storage place for bunker fuels in that area, became an important new target. RAAF Catalinas first mined it on 22 Feb 1944, and port closures and ship sinkings followed regularly thereafter. The first U. S. acoustic mine—a mine fired by the noise of a passing ship—was used there on 20 Apr 1944.

B-29s entered the minelaying picture for the first time at Palembang



**THE BIG SQUEEZE**

**Mine Warfare Against Japan**

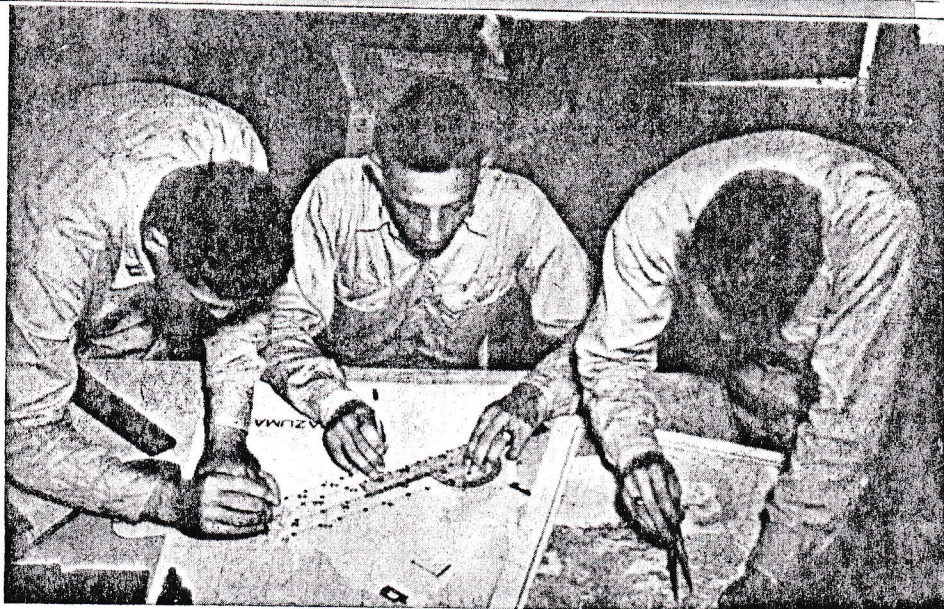
Aircraft laid minefields . . . ●

Submarine or surface laid minefields . . . ■



on 10 Aug 1944. It was also the first time the B-29 had been used for anything but high altitude bombing. While some Superforts bombed the target, eight B-29s flew low and dropped mines into the long river channels leading to the refinery—so low that one plane strafed an enemy tanker. The mining resulted in seven ship casualties and the river was closed to important enemy tanker traffic for nearly a month. It was the longest bombing and mining mission of the war.

\* In November and December 1944, B-24s of the 7th USAAF heavily mined the Bonins, which were being used as forwarding points for enemy supplies to the Volcanoes and other advance bases. This operation, which caused a marked decrease in enemy shipping in the mined areas, was in support of the invasion of Iwo Jima.



Official U. S. Navy photograph

**NAVY MINING EXPERTS** plot a raid in the blockade mining of Japan. During the last months of the war, almost 12,000 mines blockaded Jap homeland.

By early 1945, the Japanese were making desperate efforts to transport the most vital materials from their outer zone to the homeland for a last stand. It was at this point, on the night of 25-26 Jan 1945, that India-based B-29s engaged in their first large-scale mining effort, planting several hundred magnetic mines in the approaches to Singapore, Saigon and Camranh Bay, a serious blow to the major port and repair facilities left to the Japanese in southeast Asia and the southwest Pacific. In view of the operations already in progress in China, southeast Asia and the central and southwest Pacific, this operation served notice on the Japanese that no mineable waters short of those in North China, Korea and the Empire proper could be considered safe to shipping.

At the same time, during one week the RAF mined nearly every usable port along the Malay peninsula. The RAF kept up a continuous campaign against all targets within range of India and Ceylon, using all types of U. S. and British magnetic mines, as well as acoustic mines, for the first time in that theater.

While the Japanese offensive in South China forced the 14th Air Force to move so far west into China that it could no longer mine the China Coast, RAAF Catalinas, operating under Com7thFlt, took over the job as soon as Philippines bases were available.

By the end of March 1945, the Japanese were forced to withdraw most of the 2,000,000 tons of shipping they had left to the inner zone. There, in the comparatively shallow and well-protected East China Sea, Yellow Sea and Sea of Japan, the Nipponese vessels shuttled back and forth between the homeland and the Asiatic continent in comparative safety. Most of this shipping—and it was then adequate to Japan's needs in the inner zone—passed through Shimonoseki Straits to industrial ports on the Inland Sea of Japan.

Just before the invasion of Okinawa

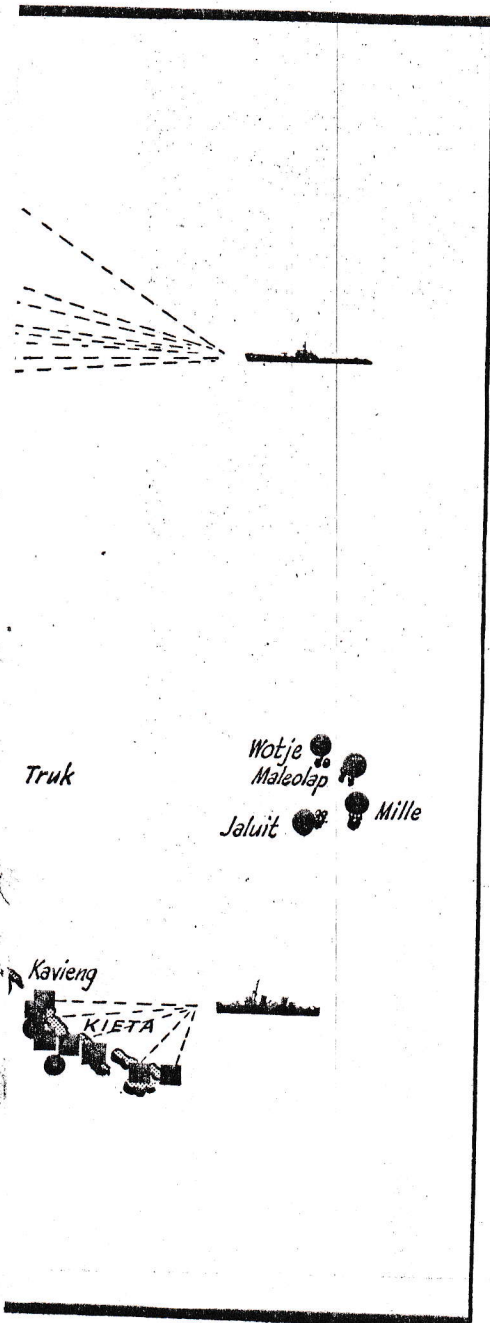
began, Superforts of the 21st Bomber Command (313th Very Heavy Bombardment Wing) carried nearly 1,000 magnetic and acoustic mines from Tinian to Shimonoseki Straits and the Inland Sea. This attack opened the inner zone campaign by denying the enemy the use of sea lanes on which they depended heavily to rush reinforcements to the Ryukyus and to bolster their homeland for the threatened invasion.

The inner zone campaign was divided into five phases:

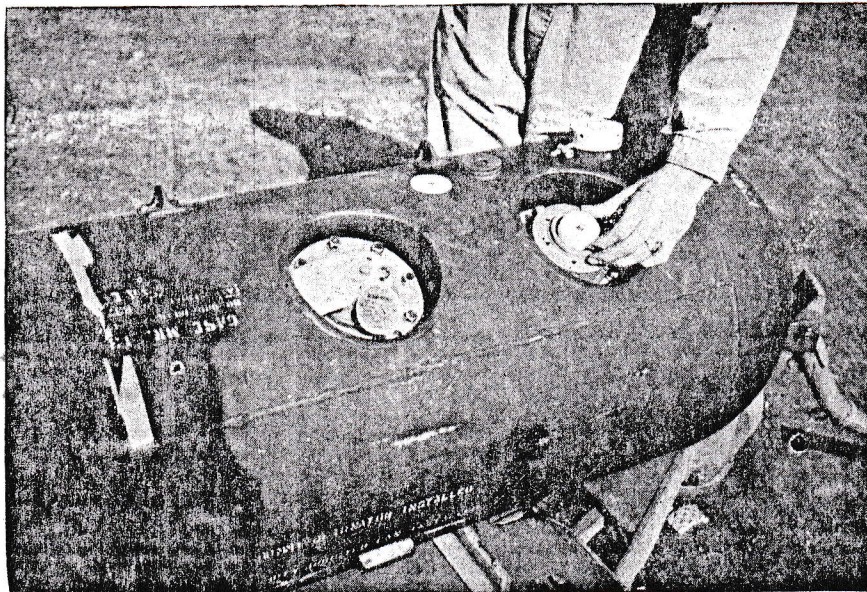
- First phase, 27 Mar-2 May, Okinawa support: Shimonoseki Straits, the naval bases of Kure and Sasebo and the military port of embarkation at Hiroshima were mined to endanger Japanese naval movements, particularly by a sortie of the fleet through Shimonoseki to Okinawa under cover of western Kyushu. As a result, the only task force which did sortie attempted to slip out of the Inland Sea via Bungo Suida, east of Kyushu, where U. S. units lay in wait and sank the BB *Yamato*, pride of what was left of the Japanese fleet.

- Second phase, 3-12 May, industrial center blockade: Purpose of this attack was to destroy seaborne communications between industrial zones of Japan by maintaining the blockade of Shimonoseki and mining the ports of Tokyo, Nagoya, Kobe, Osaka, and the main shipping lanes of the Inland Sea. It was here that the unsweepable pressure mine was introduced, after being made available by the Navy. This attack used 1,422 mines of all types, and shipping at all ports began to fall rapidly while ship sinkings rose. Much shipping from Korea and Manchuria, which formerly passed through the Straits to industrial ports on the Inland Sea, was diverted to northwest Honshu ports and

- Third phase, 13 May to Northwest Honshu-Kyushu blockade: The purpose here was to blockade the bulk of enemy shipping from the Asiatic mainland to Japan by continuing to block Shimonoseki Straits and by mining all the major harbors







SOLUBLE WASHER is adjusted in a mine case. When water pressure reaches a predetermined density, the washer dissolves, thereby arming the mine.

of northwest Honshu and Kyushu. The Superforts laid pressure, magnetic and acoustic mines in this phase and the low-frequency or subsonic acoustic mine also was introduced. As shipping fell off in Shimonoseki Straits and the industrial ports, there was a slight increase in shipping in the northwest Honshu and Kyushu ports, but the newly laid mines resulted in many ship casualties.

• Fourth phase, 7 June to 8 July, intensified northwest Honshu-Kyushu blockade: Secondary and tertiary harbors were added to the list of targets and saturation of Shimonoseki and the primary ports of northwest Honshu and Kyushu continued. The important port system of Kobe-Osaka was mined repeatedly. Ship losses accumulated rapidly, shipping began to drop off in the northwest ports and

Shimonoseki and the industrial ports were almost completely blockaded.

In conjunction with the fourth phase, Navy PB4Y-2 (Privateer) aircraft based on Okinawa conducted an attrition mining attack against shipping from the Yellow Sea skirting the southern coast of Korea.

• Fifth phase, 9 July to 15 August, total blockade: The purpose of this phase was to mine all the ports of Korea while maintaining the blockade of Shimonoseki and all of northwest Honshu-Kyushu. This attack resulted in continued shipping losses and falling off of traffic in all ports. In the closing days of the war, Japan was ringed with ports polluted by aerial mines. None of the shipping lanes was being cleared efficiently, but the Japs preferred to take abnormally high losses rather than stop shipping

completely. Ships were using the diversionary ports on northwest Honshu and Kyushu only as a desperate measure to get supplies to the mainland, but limited inland transportation prevented final delivery of the necessary food and materials to the industrial sections on the Inland Sea.

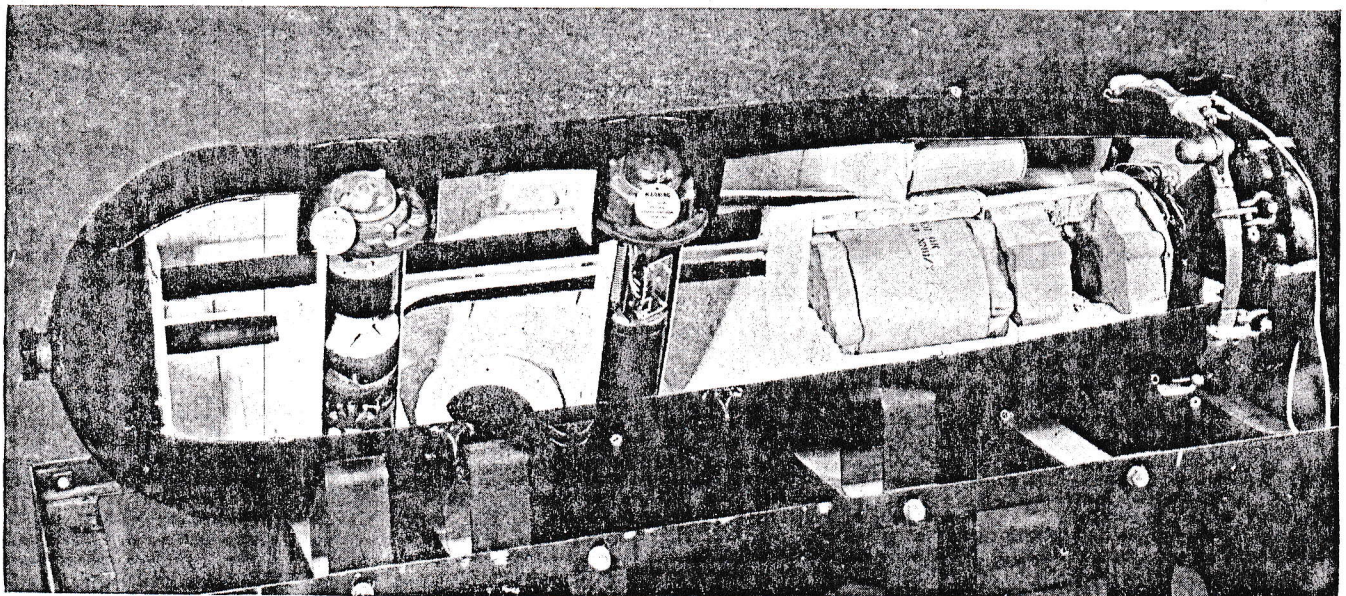
Accumulated results of the mining offensive were shortages of coal, oil, salt and food which contributed to such a complete paralyzation of industry that shortly before the surrender leading industrialists indirectly informed the militarists that industry could not continue. Seven million Japanese would have starved to death if the war had continued another year, they estimated. Appropriately enough, this mining attack on the inner zone was called "Operation Starvation."

Such is the outline of the war's mining operations. But it is more than a story of operations. It is also a story of machines—of the mines themselves—and of the race between allied and enemy scientists to bring them to a new and even more baffling perfection of intricacy.

The nazis started the race early in the war, while the U. S. was still at peace, by dropping new magnetic mines from airplanes into British shipping lanes. These mines lay on the bottom and were set off by the magnetic fields of passing ships. It was the "secret weapon" of which Hitler had been boasting in those days and the British were justifiably alarmed. Their alarm spread to the U. S. Navy.

British and American scientists joined in developing degaussing methods for neutralizing the magnetic fields of ships and in 1940 the Naval Ordnance Laboratory in Washington, D. C. began building magnetic scale model ships in an effort to predict degaussing systems for ships still under construction. This method worked and by war's end degaussing had protected 12,500 ships and millions of American lives from magnetic mines.

The German mining activities not



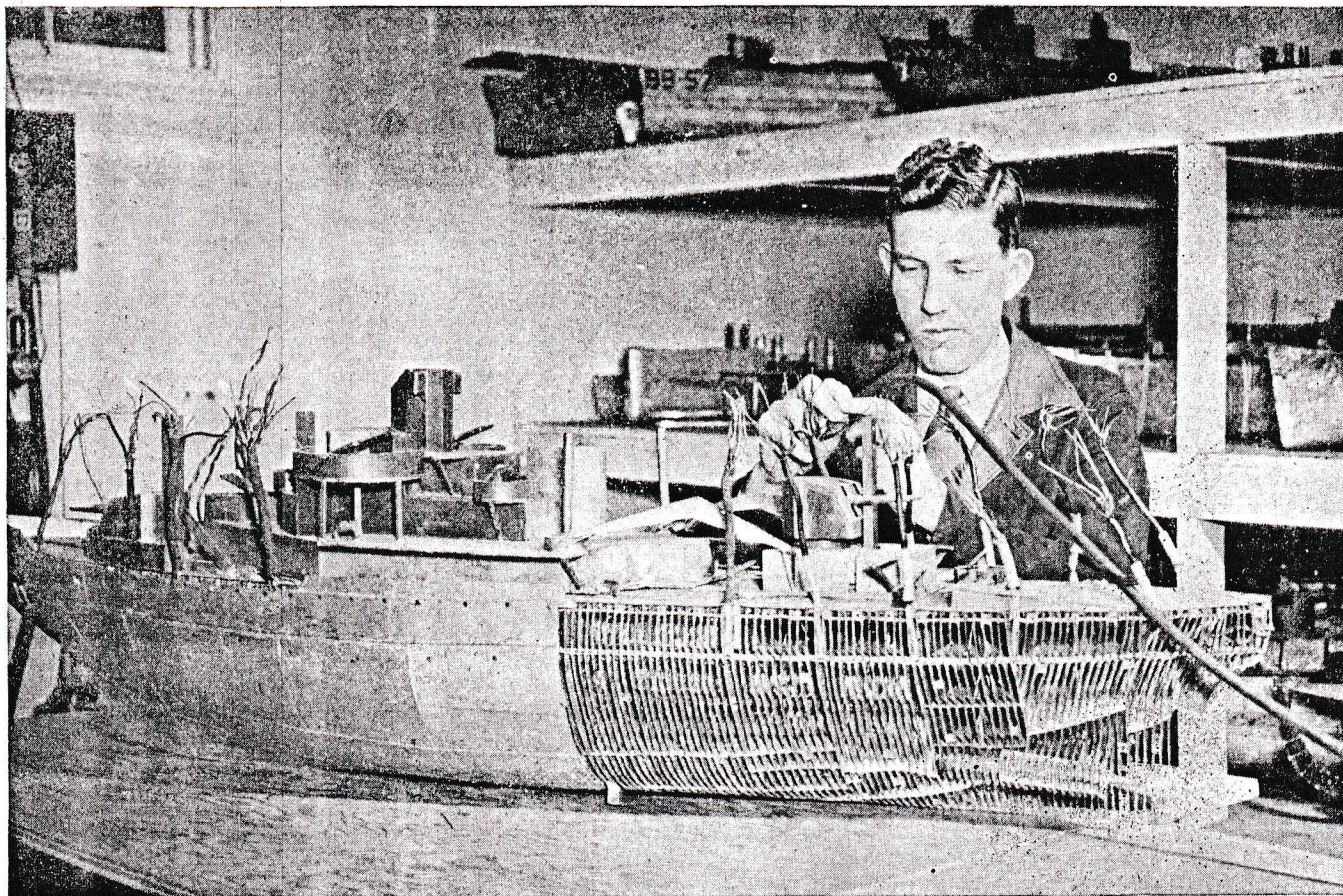
CUT AWAY VIEW of the Mark 26 shows delayed arming device, ship counter and sterilizer in first vertical incision.

Official U.S. Navy photographs

ALL HANDS

completely. Ships were using the diversionary ports on northwest Honshu and Kyushu only as a desperate measure to get supplies to the mainland, but limited inland transportation prevented final delivery of the necessary food and materials to the industrial sections on the Inland Sea.





Official U. S. Navy photograph

**DEGAUSSING COILS** are experimented with on scale models to determine formulas to be built into actual ships.

only forced the Allies to take defensive measures, but spurred them to take offensive steps in mine warfare. As a result, the U. S. Navy developed magnetic mines of its own, and went on to produce other types as well.

After the Pearl Harbor attack plunged us into war, mines designed and produced by BuOrd during 1941 and 1942 were sent to mine depots throughout the Pacific, Australia, India and China, staffed largely by personnel trained at the Mine Warfare School, Yorktown, Va., and at NOL, Washington, D. C. Several Navy officers stationed at the Admiralty in London also accumulated experience from the war on shipping between Great Britain and Germany.

As the race of the scientists developed, the Navy produced an audio-frequency acoustic mine which, lying on the bottom, would be fired by the audible sounds of a ship passing overhead. By sheer luck, the Japanese discovered they could sweep this mine with underwater noisemakers which they had been using for training of their sonar operators. The enemy also developed magnetic sweeps for the magnetic mines.

It was then that the Navy came up with its two "unsweepables"—the subsonic acoustic mine, and the pressure mine. The subsonic mine was fired by ship sounds so low in frequency that they could not be heard by the human ear. The pressure mine was fired by the changes in water pressure caused by a passing ship.

But the various types were only part of the story. The mines could be equipped with counters which would literally count the number of ships passing overhead and then go off when a pre-selected number had passed to hit an important target in mid-convoy.

### Lacked Equipment

Actually, the Navy's experts report, the Japanese never were able to cope adequately with the Allied mining offensive, for lack of sufficient equipment and for lack of sufficient ingenuity to keep pace with our scientists. For that matter, the Navy itself never discovered a sure method of sweeping the pressure mine, other than that of simply running ships over the areas in which they were planted. Although these mines were equipped with sterilizers to render them harmless after a given period of time, "guinea pig" ships—three ancient, battered merchantmen with specially protected volunteer crews and no one below decks—cruised up and down Japanese home waters after the war in a deliberate effort to blow up any mines which might still be alive. Fortunately, all the sterilizers had worked.

Aerial mine warfare required an entirely new type of mine. In general appearance they resembled heavy bombs, but were equipped with small parachutes to slow their descent. Most air mining was carried out at night, particularly when the sky was heavily overcast, and drops were made by

radar or visually from very low altitudes.

Problems of training ground and air crews in an entirely new type of warfare, problems of logistic support, problems of production were met and conquered. Mine details, consisting of specialized personnel and equipment for servicing intricate mine mechanisms under all sorts of advanced base conditions, were formed and sent to all areas in the Pacific theater. The speed and efficiency with which these details worked are illustrated by the fact that B-29's often took off from Tinian with fully-serviced mines, the components for which had been unloaded on the beach the day before. On the production front, freight cars were on occasion hooked to fast passenger trains to speed needed materials to the many manufacturers of mines.

Yet offensive mining had a slow start. Comparatively little had been done about developing mines between World Wars I and II, so far as the U. S. was concerned. Mines suffer from the handicap that their results cannot be seen immediately and often never are definitely known. Minelaying is not a competitor of more direct forms of attack on enemy shipping, but it is a valuable supplement. The record of the Pacific war has shown that it was the most economical, in terms of results achieved measured against effort and men and equipment expended, of all the forms of attacks on shipping. That record will not soon be forgotten.