Norman Bel Geddes : war maneuver models created for Life magazine : January 26 to March 5, the Museum of Modern Art

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Geddes, Norman Bel, 1893-1958

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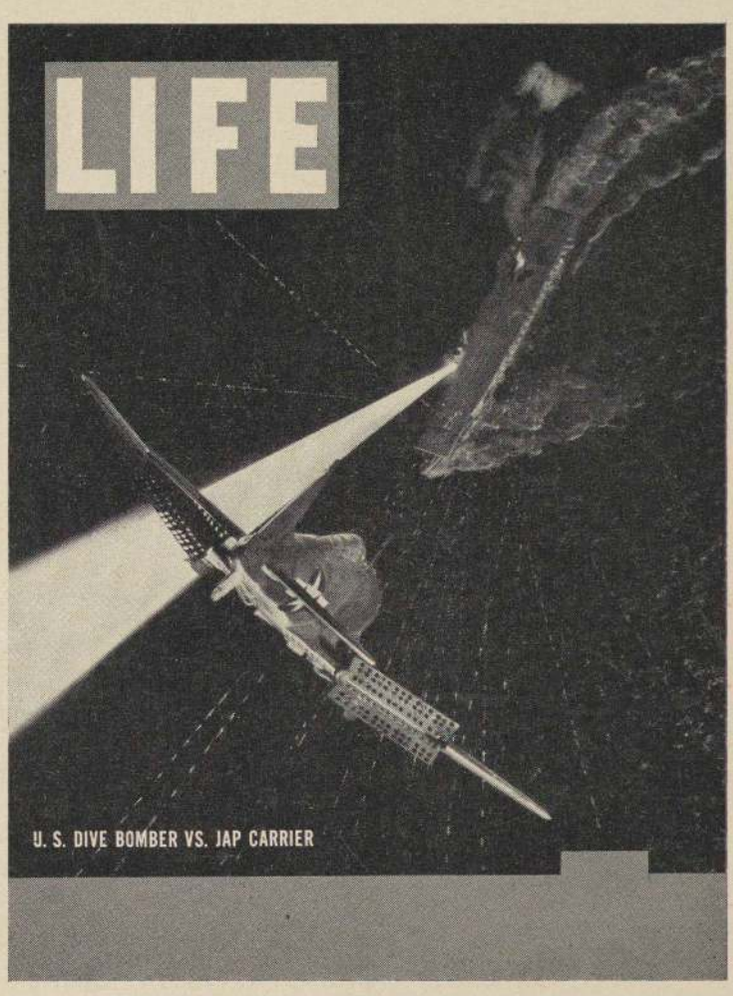


NORMAN BEL GEDDES

WAR MANEUVER MODELS

CREATED FOR LIFE MAGAZINE

JANUARY 26 TO MARCH 5

THE MUSEUM OF MODERN ART

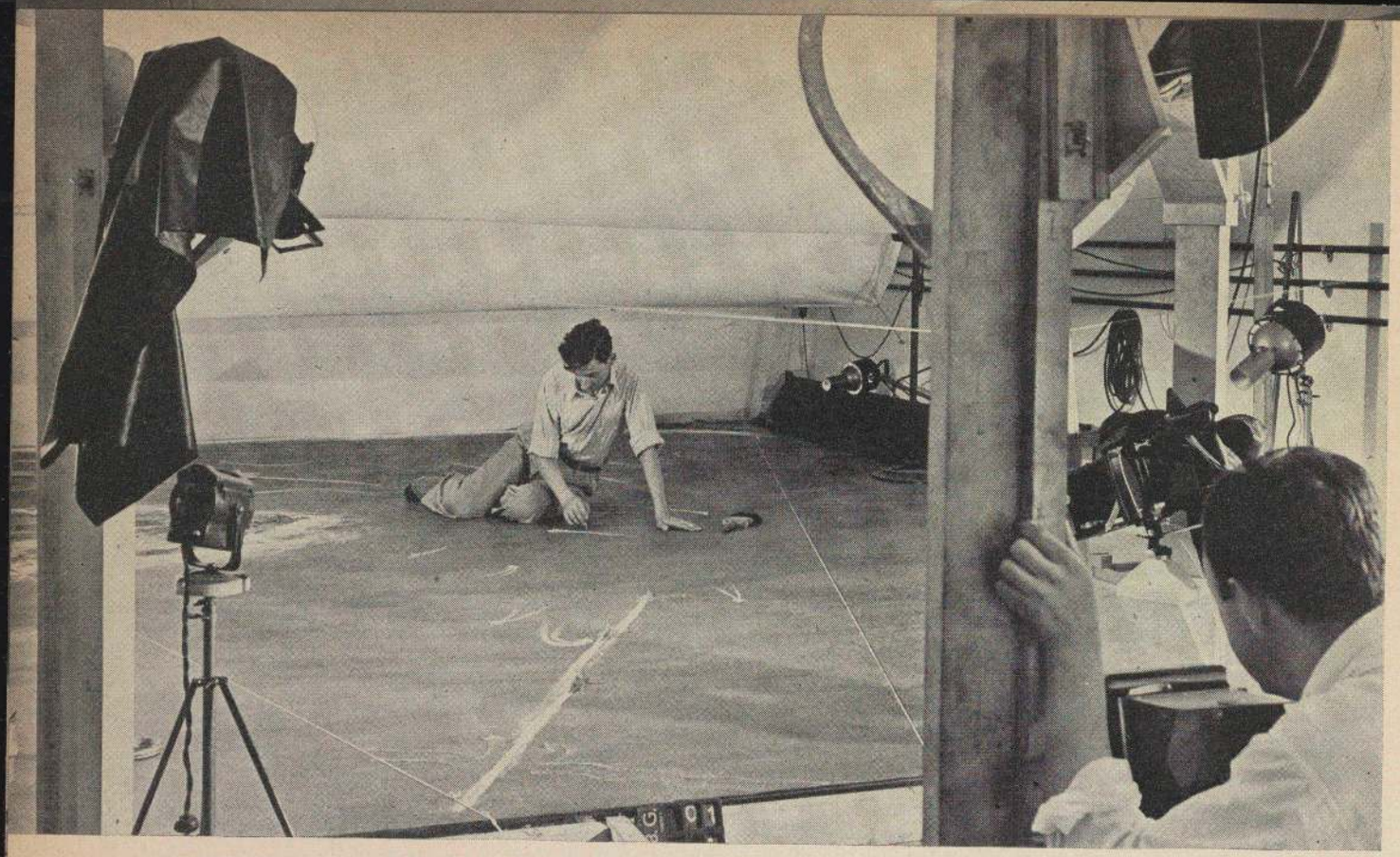
MODELS ARE A NEW FORM OF PICTURE JOURNALISM

Norman Bel Geddes' models have added an extra dimension to pictorial reporting. By recreating large or small parts of the sea and the earth's surface in miniature they have made it possible for the camera to take positions which would normally be highly unusual or impossible. By the use of models, the lens may hover safely over a seething battlefield, or it may picture the world from a detached point 10,000 miles in space.

Such perspective is made convincing only by injecting extreme realism in all the model construction. The realism of the Geddes models has no trade secret—it is simply built in. Because big models are made out of little ones, a constant check must be made on the accuracy of detail of model and all of its parts. Shown on the opposite page is a carpet armada of the tiny ships which appear in the Geddes naval models. Together with others they duplicate in miniature all of the fighting ships of the navies in the world, so that any model of a naval engagement may use exact duplicates of the ships that took part in the real battle. These models are made by a staff of jewelers in Geddes' office, and with jewel-like precision. For ease of working the fine detail, they are made out of sterling silver. This detail extends as far as miniature planes on the decks of model aircraft carriers, and gun turrets on warships which actually train. But despite this detail, the manufacture of the models has been so mastered that it now takes only about three days to finish a cruiser and five days to finish a battleship or an aircraft carrier.

The building of this fleet began shortly before the United States entered the war. A miniature shipbuilding race was begun in Geddes' shop to complete all of the models before the real navies met in battle. The Battle of the Coral Sea, which was the first Geddes-reported sea battle, almost caught this program in an embarrassing early stage, but it has since been completed. Today it includes even the expended models of the French battle fleet.

But not all of the Geddes models deal with naval engagements, and not all of their detail is ships. For the air war the same craftsmen have made model airplanes of all known types. And for the ground war, there are miniature tanks, guns, jeeps, trucks and men, all made to the same painstaking standard.



PREPARING A MODEL of naval task-force action (*see pages 18-19*), one of the model builders brushes a powdered wake behind a PT boat. String lines which appear to right and left of the model mark the outer limits of the camera field.

MAKING SHIP MODEL, workman fixes miniature airplane to deck of a model American aircraft carrier with loving care. Note detailed working drawing on clip-board at his elbow. Jewelers' and dentists' tools are preferred for this fine work.

COMPLETE FILE OF WARSHIPS of all the navies of the world is kept in the studio. Models must constantly be altered to keep up with refitting of real ships. Full-time clerk and elaborate card file are needed to keep rebuilding in progress.

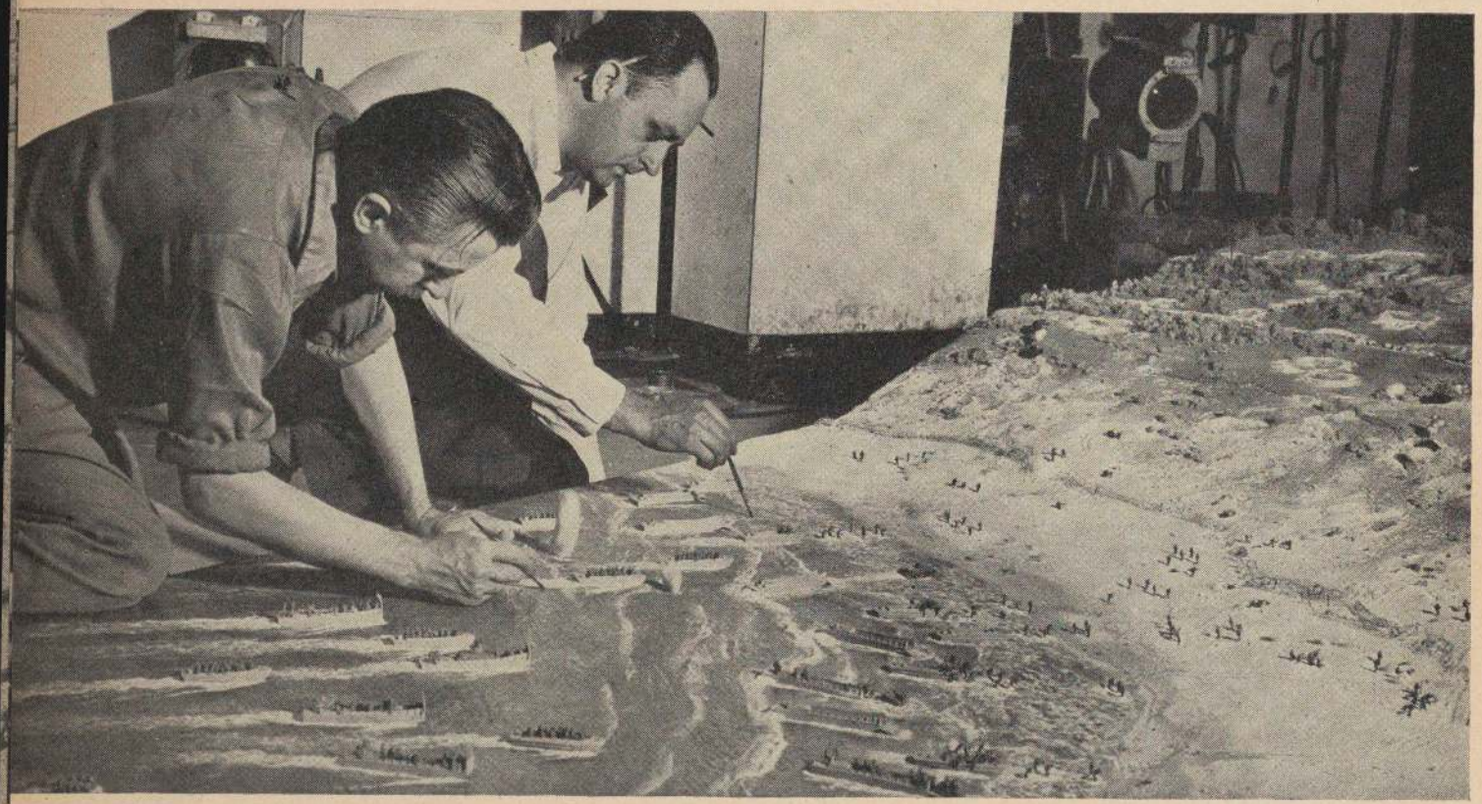
HOW THEY ARE MADE

ALL the Geddes models, with the exception of those in the Museum of Modern Art, are built on the same base. It is a low platform of plaster shaped in a triangle to conform to the fixed camera angle. Uncovered, this platform serves as a water surface; covered with a mixture of sand and powdered asbestos (for stiffer consistency), it becomes land. For contour modeling, layers of wallboard are built up before covering. Trees are made of fine, dyed moss hung on tiny armatures of wire. Low vegetation is simulated by sprinkling a woolly powder called floc. The model builders have even used Wheatena for certain rocky textures, and have been annoyed by rats which persisted in eating it.

In water models, ship wakes and breakers are made with carefully brushed table salt. The effect of distance is also heightened by coloring the model bright blue in the foreground and fading away to a dull gray. The effect of rain from a distance is created by a screen of slanting threads slightly out of focus. Clouds are mostly made by tricky studio lighting.

The development of an individual model begins with painstaking pictorial research, which indicates the correct natural detail for a given terrain. Detailed drawings are then made up to guide the modelmakers in the actual building. After a model is completed and photographed it is always broken up, its materials stored and the base used for the next model.

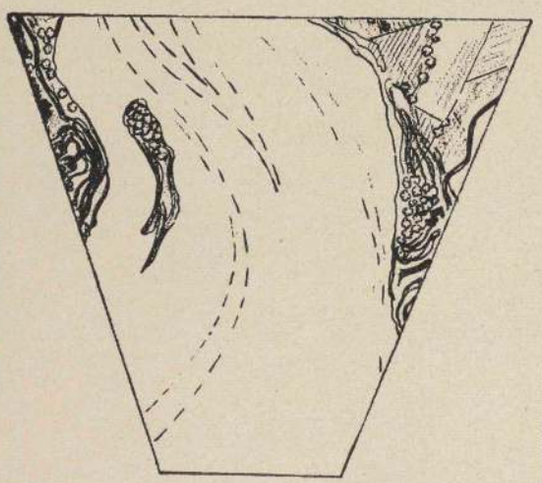
MODEL BUILDER RECLINES on board catwalk while setting single figure in place. This model shows advanced phase of an amphibious operation. Attackers have landed in force and are pressing forward to penetrate the echeloned enemy positions.



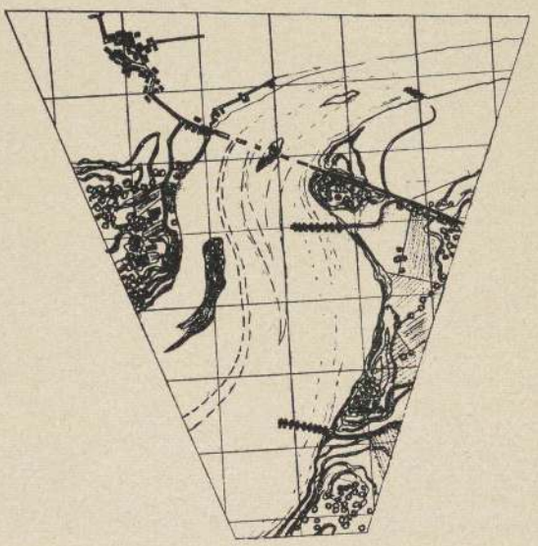
CRAFTSMEN RETOUCH EDGES of breakers for model of amphibious attack. Geddes originally used powdered sugar for white-capped waves and wakes of ships, had to stop because of wartime shortage. Now he uses table salt for same purpose.

PLACING A TREE on battlefield model, builder stands in purposely unfinished area. Geddes' shop has "library" of distinctive trees of almost every theater of the war. This model series is of a hypothetical enemy-occupied island in the South Pacific.

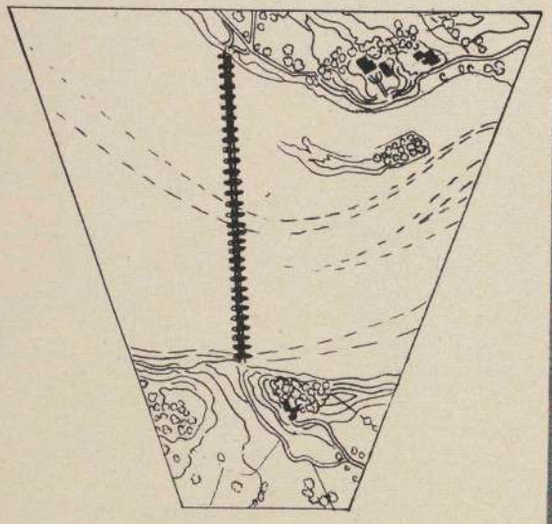
TOUCHING UP a complete model, a lady model builder adds color to a tree. Although models are photographed in black and white, they are built in full color, grading from bright tones in foreground to gray in background to emphasize perspective.



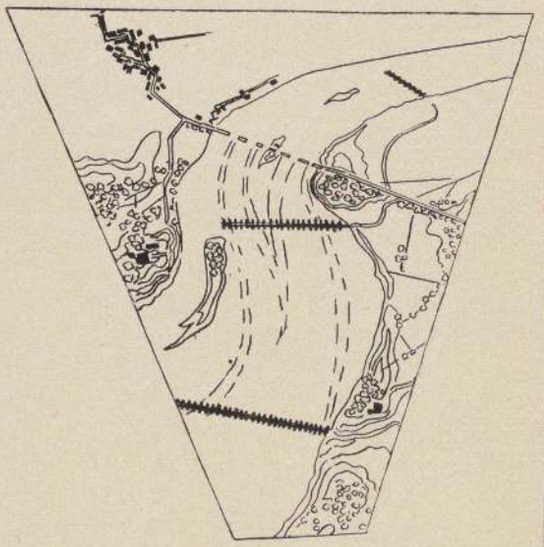
MODEL OF FIRST PHASE of river crossing shows positions of opposing forces, direction of thrust.



SECOND PHASE, calibrated for scale, shows shelling of enemy positions, beginning of pontoon bridges.



THIRD PHASE shows the first pontoon bridge completed, looks at operation from a different angle.



FOURTH PHASE: Second bridge nearing completion, early investment of enemy positions by attacker.

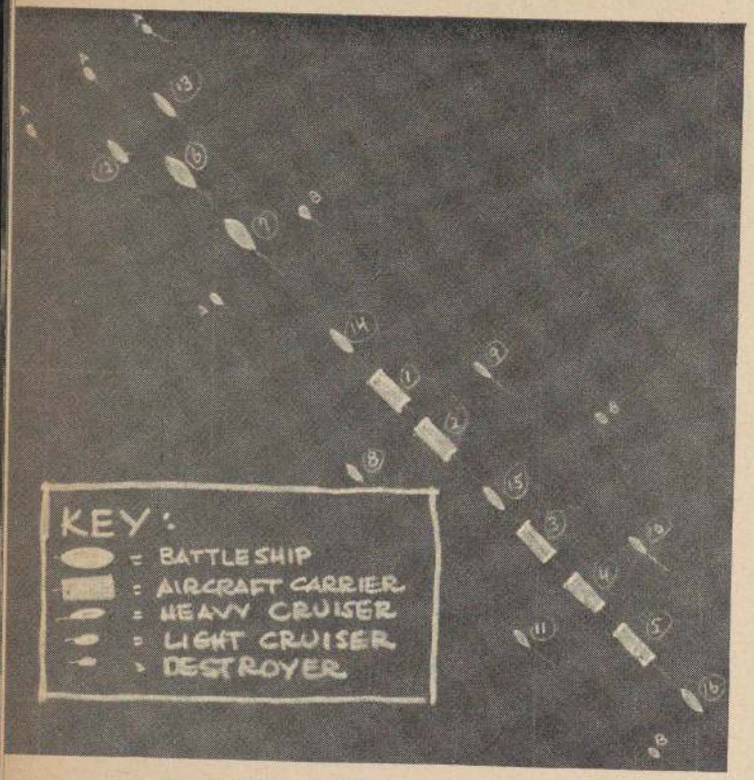
PICTORIAL RESEARCH for River Crossing went into river terrain, river boats, special weapons, landing boats, motor transport and pontoon bridges. LIFE pictures previously taken of Army training in amphibious operations were main source.

RIVER CROSSING

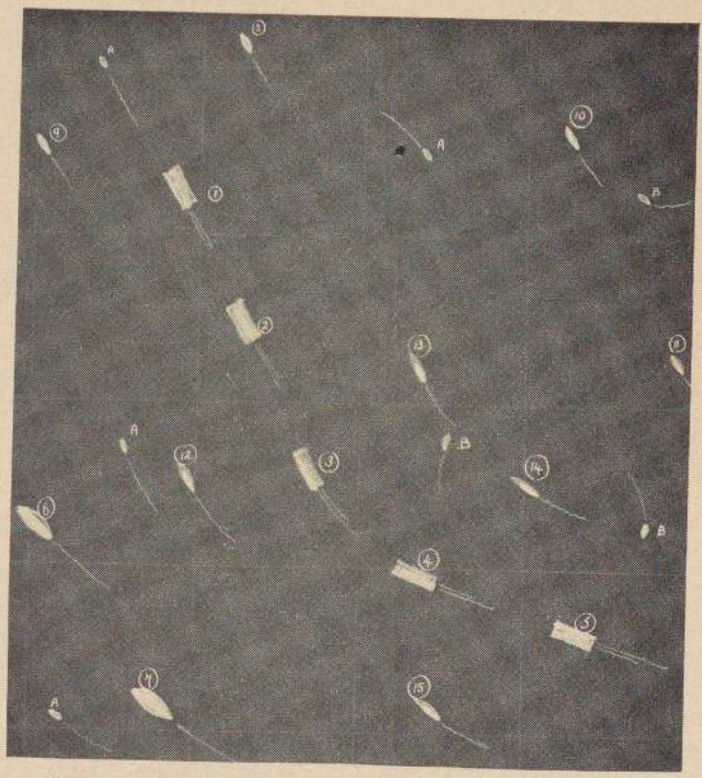
The four rough maps on the opposite page show four separate Phases of a River Crossing model that is being built and photographed for LIFE at this exhibition. This action is similar to the great Russian amphibious crossing at Kremenchug. Shown above is a brief survey of the great mass of pictorial research which must precede the building of every model of this kind.

Because amphibious operations must develop gradually in order to succeed, they make fine subjects for models. The positions of the opposing forces are clearly drawn and the movement of troops almost stylized. And always, a tremendous break-through must follow the climax of the crossing.

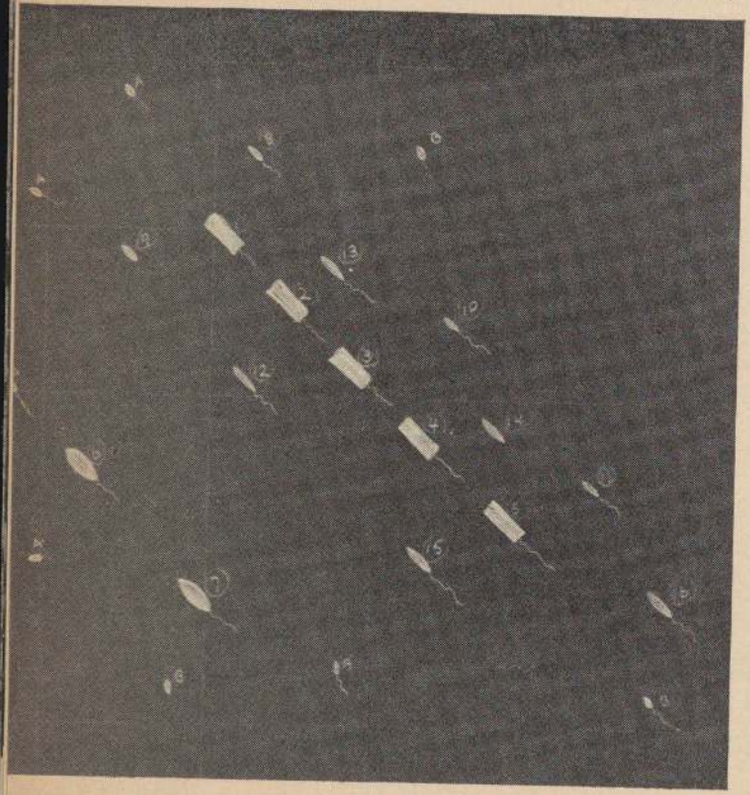
In the first of the four Phases, shown in the first map at the left, the two forces have taken up positions on opposite sides of the river and begun an artillery duel. In the second, the attackers have begun to throw two pontoon bridges across the river under cover of shellfire and heavy smoke. In the third, one bridge has been completed and close action begun against the enemy. And in the fourth, the second bridge is completed to allow large force of attackers to bite deeper into the defenses and effect a break-through.

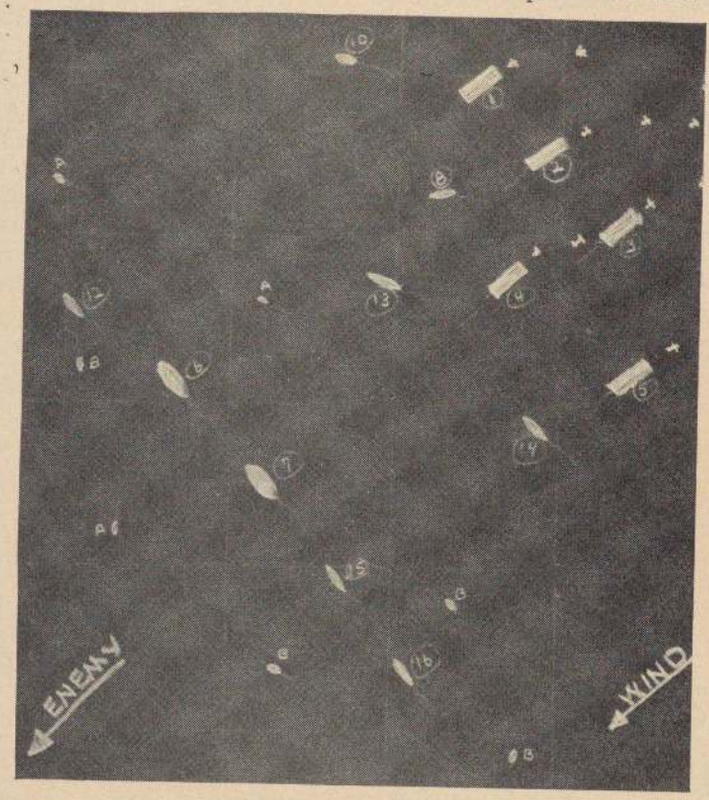


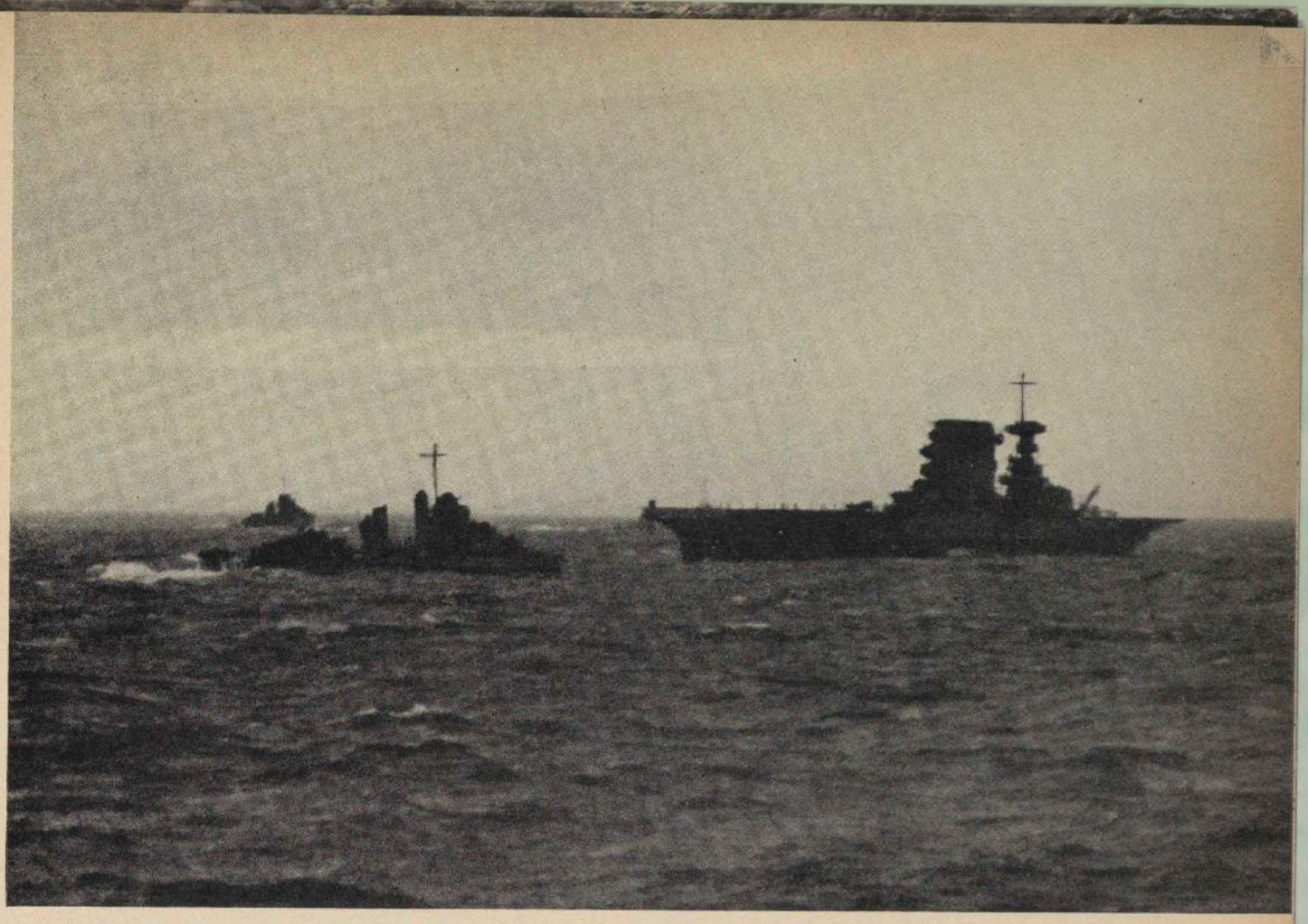
WORKING PLANS for formations of naval task force show cruising stations (*above*) and first contact (*below*).



EXECUTING TURN, battleships interpose themselves between carriers and enemy. Below, carriers launch planes into wind.







ACTUAL PHOTOGRAPHS of carrier task forces never show any more than picture above. At best only two or three ships are within field of one picture. Drawings or models are necessary to show complete formations such as those on opposite page.

TASK FORCE FORMATION

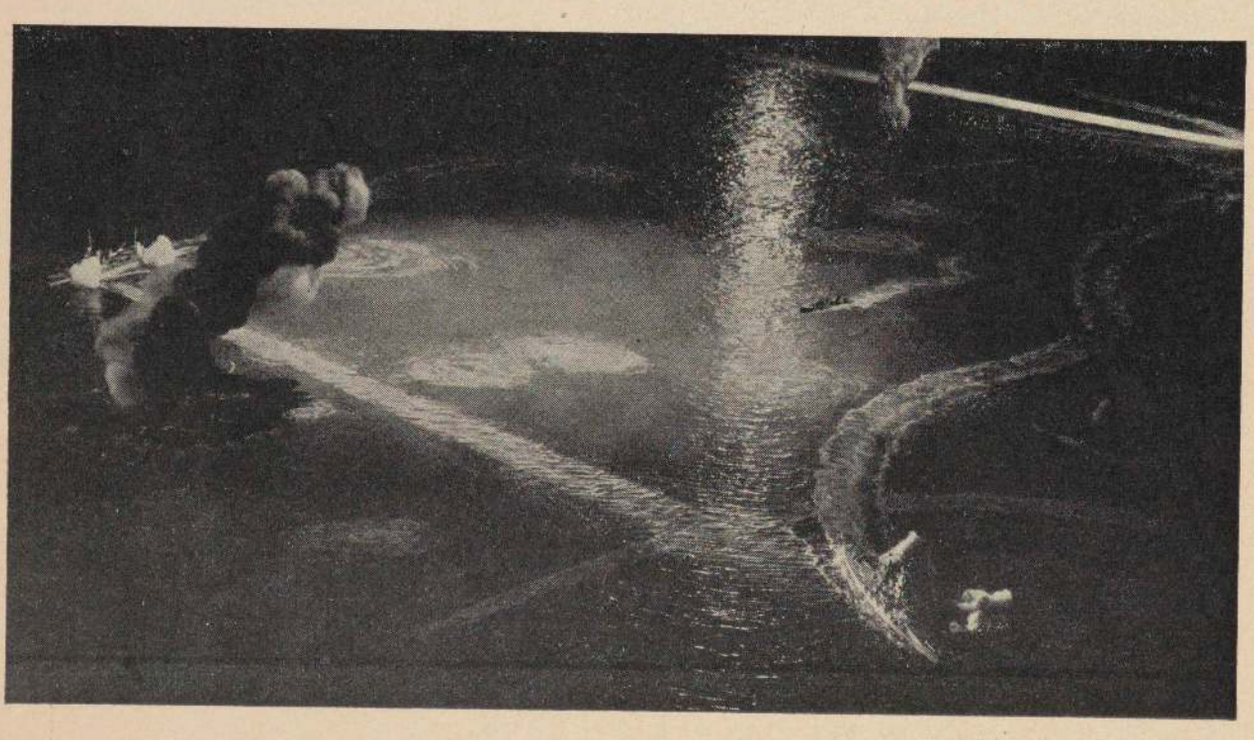
The sea model in the Museum of Modern Art exhibit represents a powerful task force composed of five carriers, two new battleships, their accompanying heavy and light cruiser screen and escorting destroyers. This force is about to strike brutally from the air at a target 250 miles away with 350 carrier-borne planes. The carriers of this air striking force are protected by the heavy 16-inch guns of the accompanying fast battleships as well as 8-inch and 6-inch and secondary batteries and the salvos of torpedos of their escort ships. No photographs have ever been published of a task force like this in operation, showing its full composition or the complexities of its tactics. In Geddes' models it is possible to present such a scene. Where necessary, the vast sea distances that separate each of the groups of ships can be compressed so that the entire force can be included in one photograph. When he views it from the walkway in the museum, the observer of this model should see it about as a reconnaissance-plane observer sees his enemy on a very bright, sunshiny day. His plane would be cruising at its ceiling, perhaps 35,000 feet, and as he catches this glimpse he shoots his picture, turns and high-tails it for home.

MODEL OF NEW BRITAIN AREA IS MADE FROM THIS BRITISH WAR MAP

Good maps are a prime necessity for good models. This one, which was made by the British War Office, is the best available topographical map of this all-important South Pacific battle area. This map was used to establish shorelines and contour of the geographical model seen at the Modern Museum exhibit. Observer on catwalk straddling this area is seeing it as though he were flying at the fantastic height of 300 miles above sea level.

In this model there has been no surface exaggeration of distances—each land mass and sea area is in the proper distance relationship to all of the others. The usual 10 times vertical exaggeration has been incorporated to point out the difficulties of the terrain.

U.S.-JAP NIGHT SEA BATTLE



EUROPE FROM THE SOUTHWEST

From a plane about 900 miles above the equator, the continent of Europe would appear as it does in the model shown above. The Spanish Peninsula would bulk large in the foreground but anything farther north than the southern tip of Norway would be lost beyond the curvature of the earth. This view has the natural distortion of the eye's perspective rather than the unnatural distortion found in most maps. Map on left shows area the model encompasses and direction in which observer looks (black arrow).

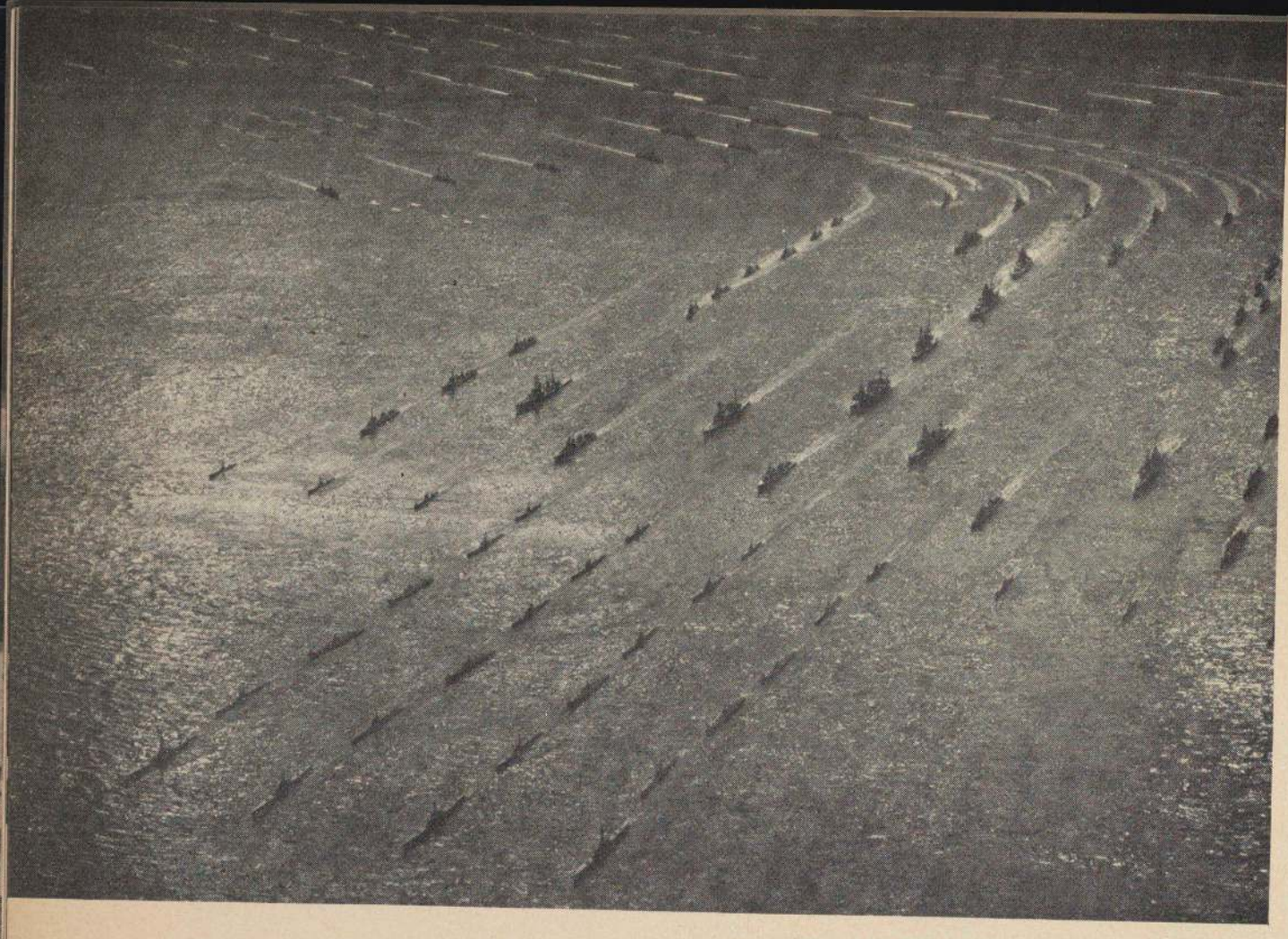
On the opposite page is shown one of the toughest technical problems of the model builders: the recreation of a sea battle at night. The main obstacle was solved by painting white streaks on the surface of the model for searchlight beams to accent real lights. In the picture at the top of the page, a Japanese battleship sinks off Guadalcanal during the night battle of Nov. 12-13, 1942; in the picture below the cruiser U.S.S. *San Francisco* engages another Jap battle ship.

LANDING ON THE NORTH SEA COAST

This model of a possible Allied landing on the continent, along a stretch of sandy, low-lying coast, with offshore islands, shows just about everything that Geddes' models are capable of showing in the way of the detail of warfare. It contains the full concert of a modern amphibious attack, with coordinated operations of land,

sea and air forces. In the foreground is the second wave of an invasion, shown by LCT's and LCI's landing men and equipment unmolested by the defenders. In the background is the first wave, indicated by landing boats heading toward mainland under cover of smokescreen laid by Allied aircraft and shells from offshore ships.

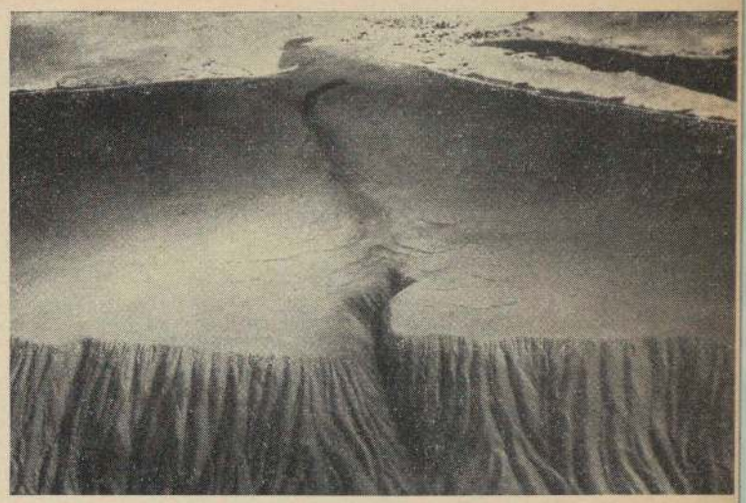
This model was also one of the most difficult to build. It contains authentic reproductions of buildings which alone took two weeks to make. There are also such backbreaking details as the long smoke trails of the planes in the background. These were constructed of cotton batting built up on a special frame of wire.



MODELS SHOW BIG THINGS

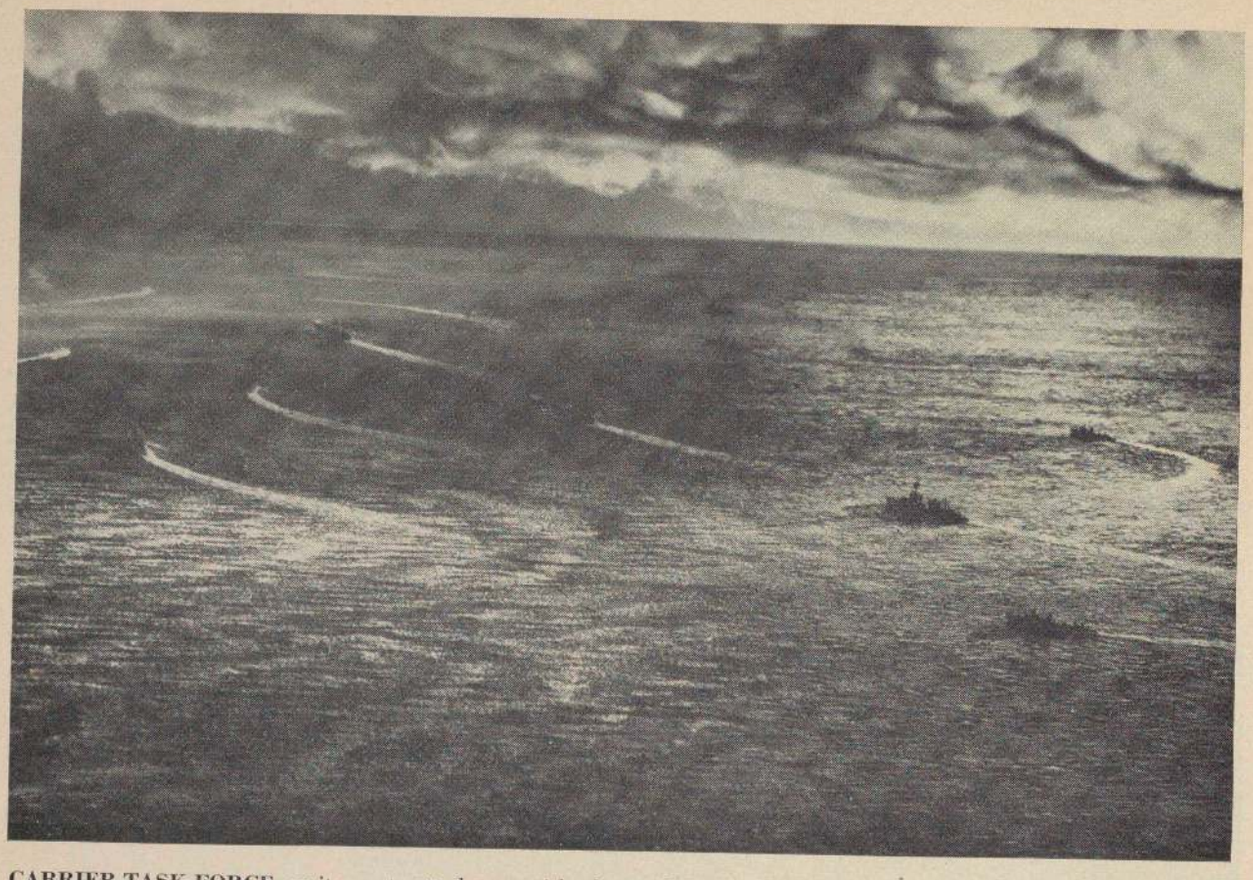
The models are at their best when they depict big things like an entire fleet or a huge mountain. Minute detail becomes unnecessary, for the scale is so great that detail would not be apparent to the eye even if it were there. Above is a model of the entire French fleet as it might have appeared before the war, shown with a clarity which a photograph could not excel even if it could be made. At the upper left on the opposite page is a model of the great volcano of Mauna Loa, in the Hawaiian Islands, which is the highest mountain in the world if it is measured from the ocean's floor. In a model which reconstructs Mauna Loa without filling in the ocean this fact may be clearly shown. At the upper right is the great Hudson River Canyon, which is cut in the Atlantic shelf 165 miles from New York City (*in rear*). The scale of this may be judged by the height of the shelf, which is 8,000 feet. Vertical exaggerations of heights is almost always necessary in geographical model work. Otherwise the relief would be so flat that it would not be apparent. Below is a model of the great Japanese base of Ponape, in the Pacific. Ships are visible only by their white wakes. The coral reef shown here, which surrounds this and most other Pacific islands, is probably the most effective barrier known to an amphibious attack.

MAUNA LOA, which actually is the entire Hawaiian island of Oahu is from ocean floor to peak higher than India's Mount Everest.



HUDSON RIVER CANYON, heretofore seen only in oceanographic charts, as it would appear without the ocean.

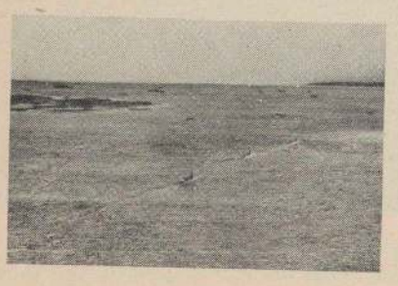
PONAPE, Japanese stronghold in the Central Pacific, is in the Caroline Islands group. It is the main outpost base for the great naval base at Truk. Rugged terrain like this is built up with a core of wooden blocks before it is covered with sand.



CARRIER TASK FORCE, on its way to attack enemy island purposely enters storm to avoid detection by enemy planes. Cruisers and carriers hold formation in single file while destroyers patrol flanks to detect marauding submarines.

CARRIER TASK FORCE

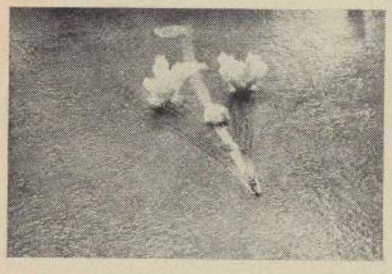
The progress of a carrier task force attack is shown in these models. In the first (*bottom, left*), cruisers, carriers and destroyers depart through their base's submarine net to assemble in the open sea. Heading into enemy waters they seek cover in a storm (*above*). Timing their arrival, they come within striking distance of objective precisely at dawn and launch planes for the attack (*bottom, center*). As plumes of smoke on the horizon (*bottom, right*) indicate successful attack, enemy planes strike at the carriers. Naval models are easy to build because detail is in pre-fabricated ships.

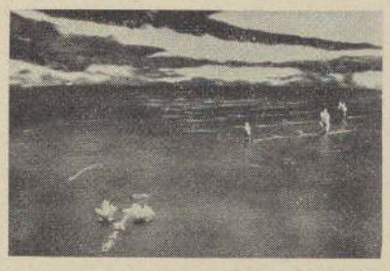


TWO ATLANTIC CONVOYS one by Geddes (*above*) and a real one for comparison by the United Nations. Photograph below was made on a crystal-clear day. In Geddes studio, where weather is clear or cloudy as desired, such pictures are easy.

ATLANTIC CONVOY

There are 68 tiny ships in the convoy model shown at the top of this page. In succeeding models below they have been maneuvered one by one to show the reaction of each of them to a submarine wolfpack attack. As the attack begins (*bottom, center*), a patrolling cutter is feinted away from the convoy by a submarine which has surfaced briefly and submerged. Shown in detail at lower left is the pattern of depth charges the cutter lays down with racks and Y guns. In the final picture (*bottom, right*), the convoy has turned away from the attack, leaving its sinking or damaged ships behind.





OPENING OF ATTACK on Gibraltar at dawn shows British fleet running to safety of open sea. Twisting wakes are made by PT boats churning the water to hide the sound of heavier propellers from sonic detectors of prowling submarines.

ROCK IS BLANKETED with smoke as shelling and aerial bombing reaches a crescendo. Airfield has been knocked out.

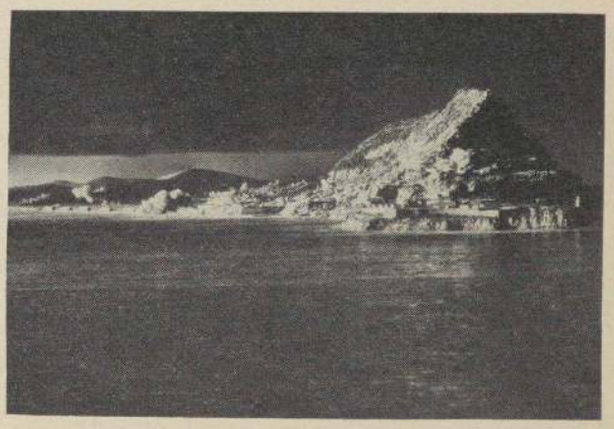
ATTACK ON

A year and a half ago, before the Allied landing in North Africa and just before Rommel was stopped at El Alamein, a German attack on Gibraltar through Spain seemed a logical military possibility. The sequence of such an attack, if it had happened, is shown in these models that were built and photographed at that time in preparation for such a news break. Looking across the bay at the Rock from the Spanish

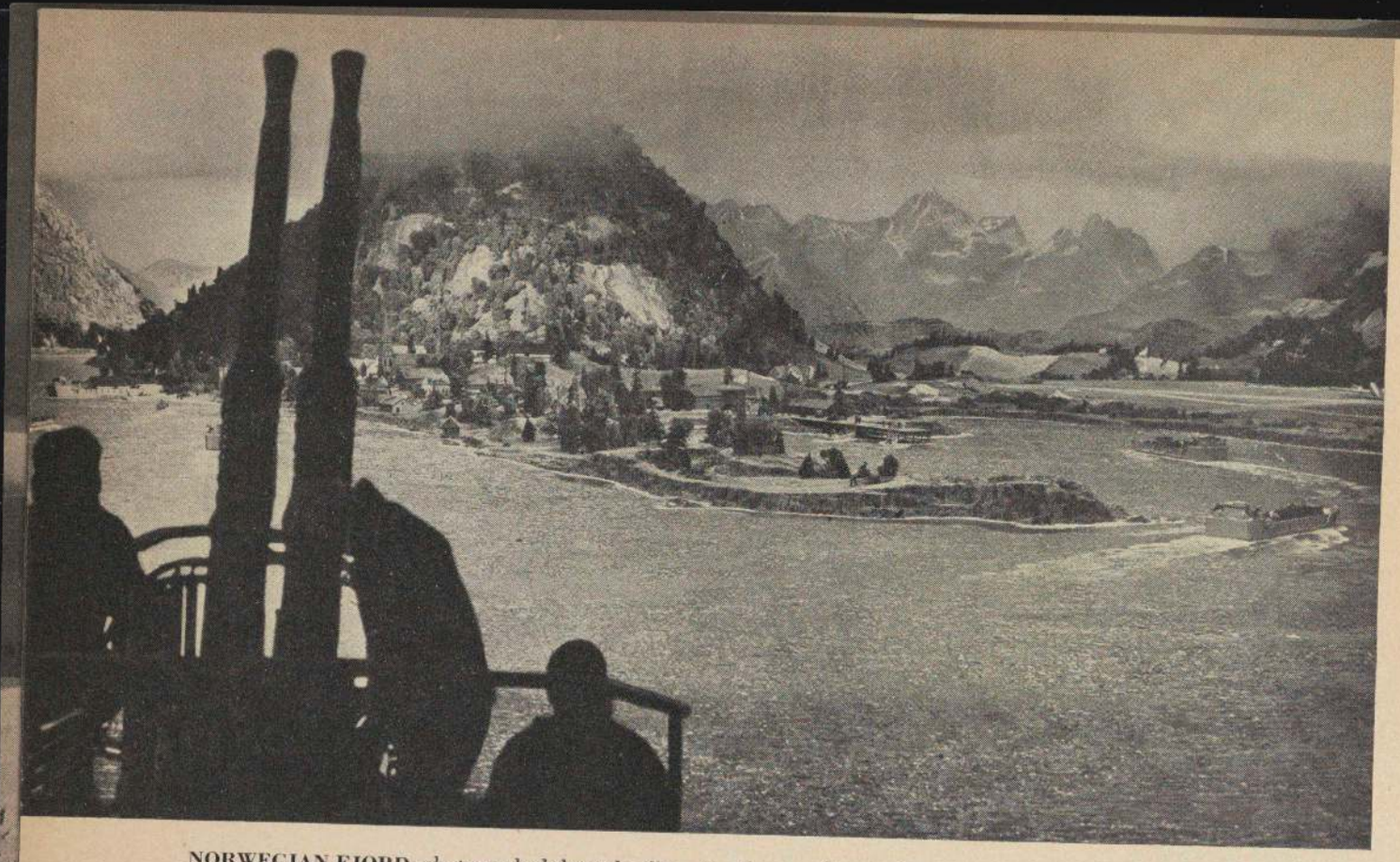
Over the Rock, the sky is dotted with bursts of defending antiaircraft fire as enemy reconnaissance planes take final photographs. Small white bursts are from antiaircraft positions, large puffs at the right are from first enemy smoke shells.

GIBRALTAR

mainland, the first model (*above*) shows antiaircraft defenses trying to down last-minute enemy reconnaissance planes. The first enemy smoke shells fall as the ships put to sea. In the second stage (*left*) the Rock is blanketed by smoke and under full attack. At the upper left a plane lays a festoon of smoke. In last model (*right*), seen from Spanish Morocco, fire dies down at nightfall. The issue remains undecided.



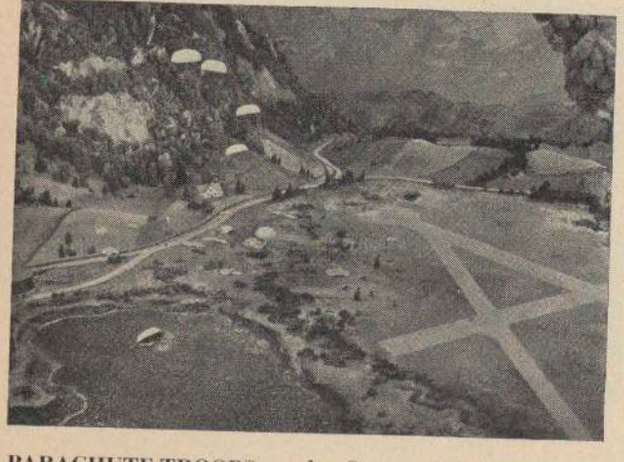
AT TWILIGHT smoke has cleared and shell fire has abated. Enemy would continue fire for days to soften defenses.



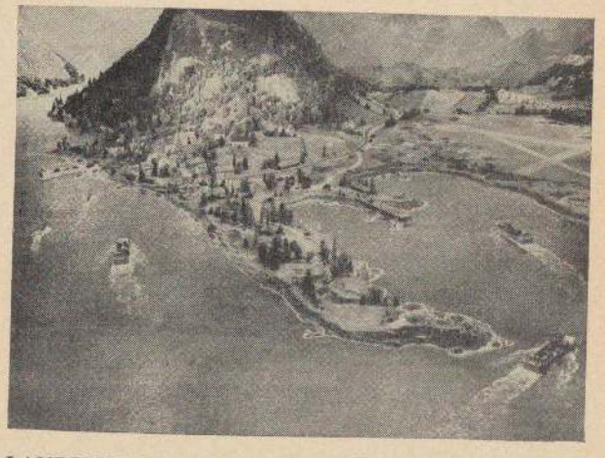
NORWEGIAN FJORD, photographed through silhouette of a warship's twin Bofors gun, would look like this to invading forces. In the center the little fishing town lies under a fog, with important German airfield in flat at the right.

NORWAY AND NORTH AFRICA

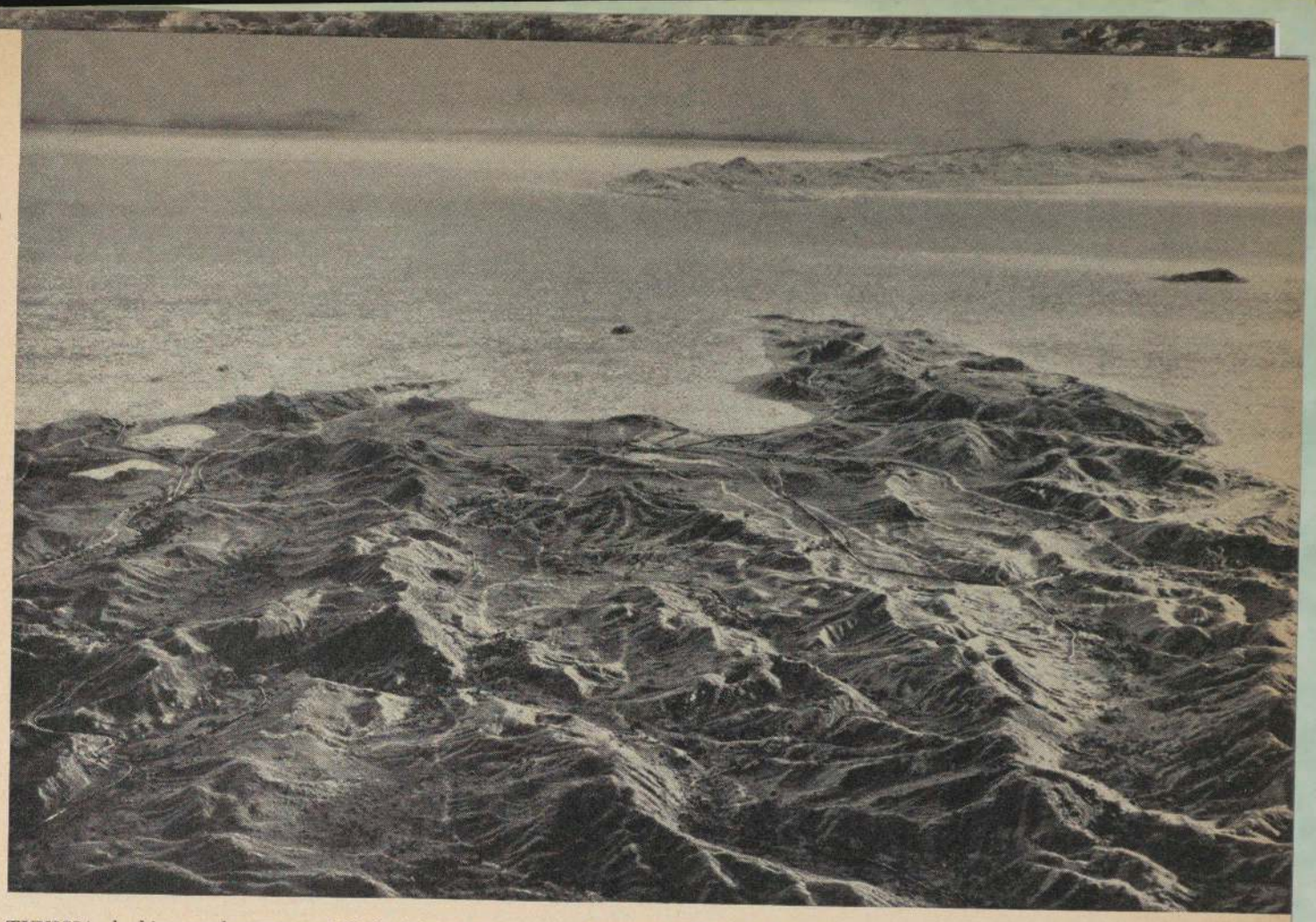
On this page are three models of an invasion of Norway, which may be undertaken by Allied forces in the near future. On the opposite page are two views of North Africa and Sicily, where successful invasions have been completed. These two projects show the main purposes of Geddes' models. The first has reduced military operation to a simple story that is available for an immediate news break. The second has recreated a part of the earth as it would appear from a point hundreds of miles in the air, where no man has been.



PARACHUTE TROOPS envelop German airfield (*at right of town*) to neutralize the enemy air strength before the landing.

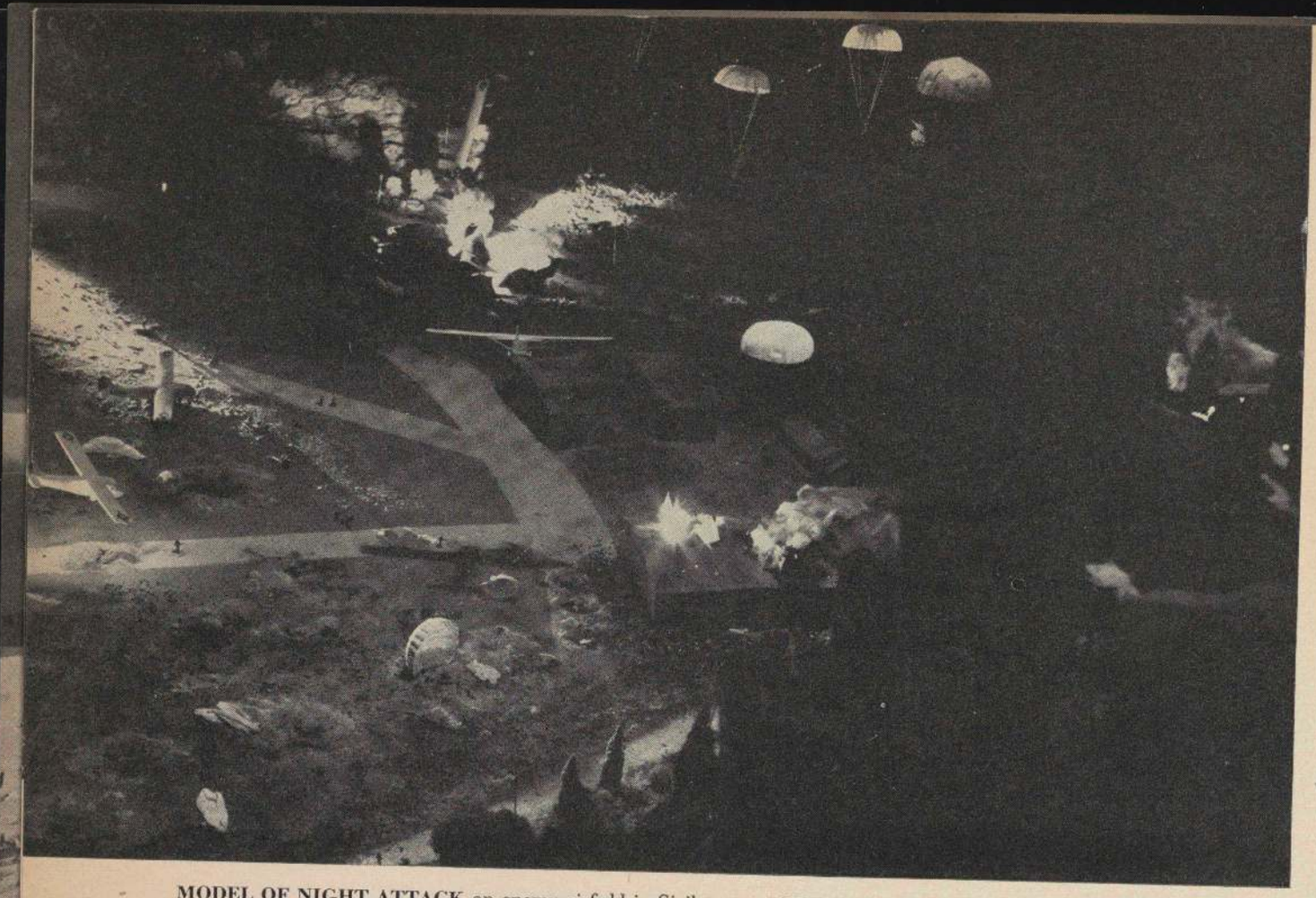


LANDINGS PROCEED at several points after airfield has been taken and shore batteries have been reduced by shellfire.



TUNISIA, looking northeast toward Sicily (*above*), shows the rugged terrain which slowed down Americans and British.

NORTH AFRICAN SHORELINE (*below*), with Cap Bon in foreground, shows area of Rommel's retreat from El Alamein.

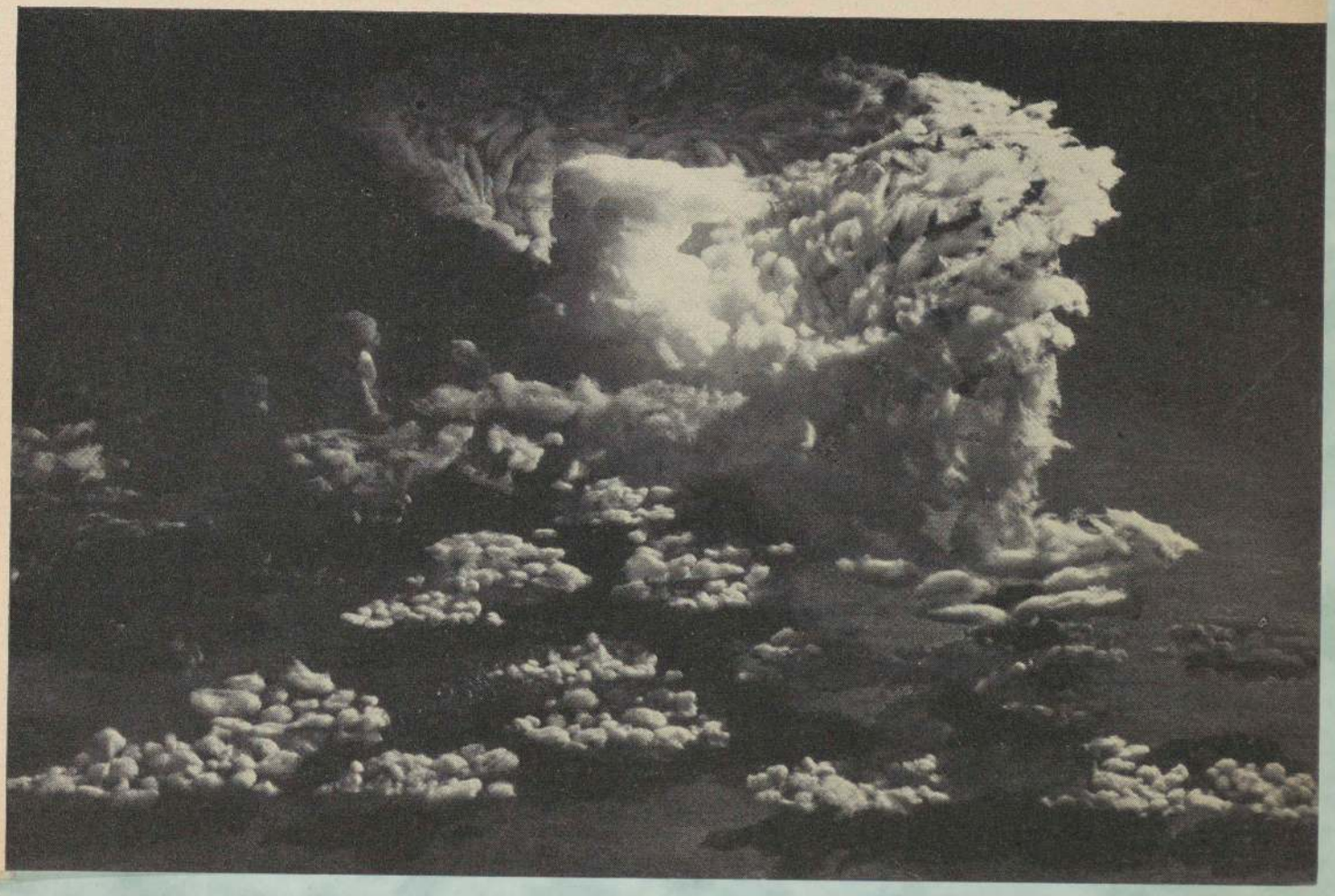


MODEL OF NIGHT ATTACK on enemy airfield in Sicily (*above*) shows troop gliders landing as paratroopers drift in.

SAME BATTERED AIRFIELD (*below*) is used as a base for transport planes bringing supplies to the landing forces.

ATLANTIC SHELF and Hudson Canyon from another view (*see p. 19*). Height of shoreline is dwarfed in comparison.

AERIAL MODEL of a storm shows its intricate cloud composition. Vertical scale is exaggerated here for dramatic effect.



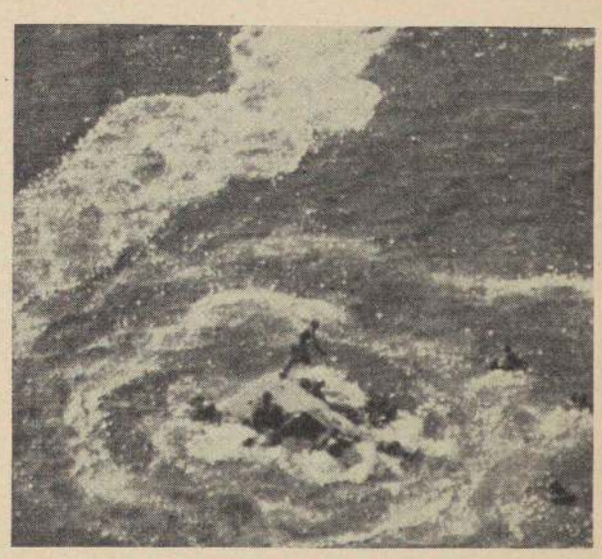
INITIAL STAGE of a landing operation (*above*) shows warships shelling shore positions while screening troopships column at right. Scale of distance between ships is reduced.

LANDING CRAFT line beach to bring in men and equipment. Two sets of tracks indicate that tanks have already gone ashore and are engaging enemy forward positions.

ESTABLISHING A BEACHHEAD

The same model is frequently used several times, with alterations to indicate progressive changes. Different editorial points in the same model may also be pointed out by photographing from different angles. On these two pages one model (*upper left*) is used to show the opening stages of securing a beachhead on an enemy-held shore; after that another model is used to show several successive stages in the actual landing.

The first model depicts the classic formation of an attacking fleet in an amphibious operation. The warships file by the enemy positions while the troopships steam parallel behind them, waiting for shore defenses to be knocked out. The other models show the progress of the landing itself, how the troops get ashore and how they break into enemy positions. The staggering detail of these models may be gathered from the picture at right, which is a tiny part of the larger model above.



DETAIL from larger model shows troops struggling in the water after rubber landing boat has been hit by enemy fire.