

# German "Subs" Armored With Mirrors

*Military Engineering*

## Bouncing Grenades Also Among Wartime Devices

By Dr. Maxim Bing

PERISCOPES encased in mirrors to make them invisible, bomb-releasing gondolas hung thousands of feet beneath their parent Zeppelins, rifle grenades that bounced into the air before exploding, were among the military devices used by the Central Powers during the World War. The tale of these martial inventions has just been told in a lecture at Berlin by an Austrian engineer, Otto Gergacsevics, formerly captain in the Austrian technical forces and holder of over a hundred patents.

During the war it was a favorite "wisecrack" that the English could never see a submarine because the Germans painted a joke on it. As a result of Capt. Gergacsevics' disclosures, it is now known that the concealing device was even more transparent than this. The end of the periscope was sheathed in a 16-faced prism of mirrors. These reflected the waves, and provided the most perfect possible concealing camouflage.

But even with the periscope thus "armored" in invisibility-providing mirrors, it still betrayed its presence by the streak of broken water it caused even when the boat was cruising at low speed, and at full speed it would often throw a wave four feet high and some sixty feet long.

This was overcome by placing around the periscope shaft a sliding float of streamline shape, that permitted the water to close in evenly astern and thus do away with the long ripple. A deflecting plate on top of the float prevented the rising of a bow wave. Two common football bladders within the float became filled with water when the U-boat submerged, preventing the outside water pressure from collapsing the float.

So effective was this device in preventing the betraying white wave that it was possible for a submarine to approach within 125 yards of an enemy ship without being detected. Word went around among the Allies that the Germans had devised a means of using submarines without employing periscopes.

An equally effective device was used with the Zeppelins. From the great height the Zeppelins were obliged to keep, to avoid the shells of the defend-

ing guns, it was well nigh impossible to do any proper aiming. Thus the bombs dropped often hit private houses, while objects of military importance were missed.

This difficulty was finally overcome by an invention of Capt. Gergacsevics. On a cable 2,000 yards long auxiliary gondolas were suspended from the body of the airship. They were lowered when in action, so that they were only a hundred meters above the ground. Through the cable, electric current was supplied to the small gondola, which had a propeller of its own revolved by a noiseless electric motor.

The auxiliary gondola was able to travel around a circle of two kilometers diameter. The gondola was clad in chrome nickel plates, proof against rifle fire. Its exterior was so highly polished that it acted as a mirror, reflecting the clouds and the ground only as a narrow line, thus becoming well-nigh invisible.

Within the gondola an observer lay flat on his chest, directing the circular motion of his little craft by a small rudder, and dropping the bombs by a

catch working from the inside. The airship kept above the clouds. After the action, the gondola was hauled up again. The Zeppelin raids, were finally suppressed by the Allies, through the invention of an ignition bullet, fired from rifles and machine guns. Capt. Gergacsevics nevertheless believes that by filling the Zeppelins with helium and by operating the gondolas with radio waves, the giant airships can still be made formidable weapons.

Another invention of Capt. Gergacsevics was a bouncing rifle grenade. The ordinary rifle grenade, upon falling, would usually bury its head in the earth and explode mainly upward, with very little effect. The Austrian inventor developed a grenade which, upon striking the ground, was thrown back into the air by a small auxiliary charge. After one or more of such explosive bounces the main charge would be detonated, with much greater effect than it would have had if the explosion had been close to the ground. The inventor also provided a noiseless pneumatic gun for throwing this formidable weapon.

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## Trees Have Ancient Lineage

*Botany*

A plea for a "more general appreciation of the wonders of the past history and present beauty of trees" instead of the "attitude that regards our forests as so many potential board feet" was made by Edward W. Berry, dean of the College of Arts and Sciences of Johns Hopkins University, speaking in a Science Service radio talk over the Columbia Broadcasting System.

"We need not grow sentimental about 'woodman, spare that tree,'" declared Dean Berry, "but nevertheless fire and the lumberman have worked more havoc with the forests in a few hundred years than all of the natural vicissitudes of time. We might remember that a tree is no longer a tree when it is lumber."

"Some of us take great pride in our ancestry, and everyone in these days when evolution is so much discussed has heard at least something of the ancestry of man and of the lower animals," he said. "Few, however, even among lovers of flowers and

trees, have given much thought to the possibility of our favorite trees having had ancestors, or that the evolution of plants is quite as fascinating a field of study as is the field of animal evolution.

"The stage setting is the same for plants as for animals only the time involved is somewhat longer. Plants are essentially the gatherers and storers of energy while animals are essentially expenders of energy. Consequently animals must have plants for food. Hence plants were the first organisms.

"The latest fraction of earth history, which we call the Tertiary period, comprises—according to recent studies of the atomic disintegration of uranium and thorium minerals—something like 60,000,000 years. This period is commonly called the Age of Mammals since it is during this time that the mammals or warm blooded animals underwent their main evolution which culminated in the anthropoid apes and in man."

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