

Sub Finder Not Yet "Sure Fire"

Physics

Rumors that the United States and other powers are willing to abandon submarines because a sure means has been perfected for locating them under water, even when "sleeping" on the bottom, seem to be without solid foundation. Information available indicates that the various types of supersonic listening gear, while moderately effective, are of too short range to be reckoned as generally effective from a military viewpoint. If, therefore, submarine construction is abandoned or restricted in the immediate future it will be a deliberate move in a peace program rather than the abandonment of an arm because it has lost its fighting value.

Statements have gained circulation lately that the British Admiralty has perfected a device for locating submarines at a distance. Such a device, if perfected, would, without doubt, mean the end of undersea fighting craft, for such boats are easy to destroy once they are located. But the range of the listening gear used in all navies of the world so far as known is to be measured in mere hundreds of yards rather than in miles, so that unless the sea were literally peppered with scout boats many submarines would be bound to escape detection.

Most of the locators of "silent" submarines known to military students depend on the propagation through the water of beams of sound-waves so short as to be inaudible to human ears—the so-called supersonic or ultrasonic waves. These can be produced from electrically excited crystals of quartz, somewhat similar to those used in radio broadcast stations for frequency control, but larger. These waves differ from ordinary sound waves in that they can be directed in a comparatively narrow beam, like the rays of a searchlight. They reflect as echoes from solid objects, and parts of these echoes are picked up by the listening gear on scout ships, amplified, and interpreted by observers. Similar devices, using audible sound waves, have been used for a long time in the well-known sonic depth-finding apparatus.

Work on supersonic submarine locators began during the World War, and has been carried on ever since, particularly by France, Great Britain and the United States. During the war their information was more or less pooled, but since then the researches have continued independently in each country. It is believed that progress in this country has been about equal to that abroad, although

necessarily most of the information about the technical details of the apparatus is kept confidential.

From time to time wild stories get into circulation crediting supersonics with destructive power verging on the supernatural. These seem to be based on the experimental work on extremely short-length supersonic waves carried on by Prof. E. W. Wood of the Johns Hopkins University and Alfred L. Loomis, in the latter's private laboratory at Tuxedo Park, N. Y. This work, following observations made by Prof. Wood in the laboratory of P. Langevin at Toulon during the war, has shown that it is possible to kill small animals and microscopic plants with "rays" of supersonic waves in water. But they do not kill anything bigger than a tadpole or a goldfish, and they are never used in more than half a pint or so of water. So that using them to sink a submarine in the ocean, or to kill her crew at the distance of a mile, is quite out of the question. The significance of the supersonic researches of Prof. Wood and Mr. Loomis is not military, but purely scientific.

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Modern "David" Treats Ills with Music—Continued

experiences and sorrows into the drama. All the energies that had been monopolized by his resistance toward a difficult world were liberated, and he set them to work in the appealing and social undertaking of the fairy tale play."

The presentation of such a play is less important than the rehearsals, Dr. Van de Wall has said, and yet the evening of the performance brings more acute sensations and emotions to both the performers and to the patients who act as audience. Music's stimulus to the ear causes other senses to function in an increased way, he explains. And the music hall caters to most of the senses. There is color and light and the softness of velvet chairs and traces of perfumes. And on the stage there is the drama of love, conflict, and victory with the music intensifying the whole emotional tone of the events.

Music is the most powerful of the arts to evoke emotion, but even

music gains when it is thus allied to poetry, dance, and drama, the musician explains. The old Greeks made Apollo, god of music, also god of medicine. His son Aesculapius gained even greater fame in healing, and his daughters the Muses, linked poetry, drama, music, and the dance into one sisterhood. The whole family, in fact, resembled a family of mental therapists, and they are still indispensable to every mental hospital.

There has been a good deal of experimentation to see whether different rhythms would bring about specific changes in heart action or blood pressure or nervous energy. In time, it has been hoped, a science of musical therapy might be founded.

Dr. Van de Wall uses a wide variety of types of music in his informal concerts. A piece of music may have a different effect on different listeners, or even a different effect on the same listener at various times.

"The value of a musical composition as medicine," he states, "depends on

the influence it has on a certain individual or patient at a certain time in his particular life or state of disease. What kind of music will stimulate a patient, his energetic impulses, his physical and mental powers, feelings, thoughts and actions, depends, to a great extent, on his history and personality make-up. In the case of the patient, the physician, using the gauge of his experience, is the judge to decide about the curative value. The business of the musician is to cooperate with the physician in what could be called the musical prescription and application.

"The music serves as a stimulant of physical, mental, and moral energy and it is an essential medicine in the treatment and care of the physically, mentally, and morally weak, whether they are in an institution or not."

And creating harmonies and melodies is stronger medicine than listening, this musician to the sick has found.

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