Diversity in ultrasonics

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I recently had the opportunity to read about research on ecological surveys involving wild animals such as penguins, seals and whales. A technique called “bio-logging” involves the attaching of small positioning devices to the bodies of animals to better understand what they do and where.

It is relatively well known that bats, dolphins, whales, and some other animals use echolocation to recognize positioning information. Bio-logging is different in that it does not use sound emitted from the animals, but uses signals sent from transmitters attached to the animals.

Argos, a system using satellites, is the most common wildlife tracking system used for bio-logging. Here, the Doppler curve, for which the frequency shifts from positive to negative due to the Doppler effect, corresponds to each animal location. This curve is used to compute animal positions.

Recently devices equipped with GPS functions that can even use virtual ultrasonics have been developed. There are expectations for advances in bio-logging based on new survey systems that combine such devices with the Argos system.

Apparently recorders can be attached to whales using suction discs as whale epidermis is rather sleek. Records

taken using Argos indicate that whales dive to depths of between 1,000 and 2,000 m depending on the species. I wonder if whales at such sea depths could be located using echolocation functions.

Diversity associated with the development and progress of engineering research and engineering technology is important. Originality often comes from such diversity. Recently in the field of science and technology, there have been books and papers focusing on such topics as the “essence of engineering.” The Japan Society of Ultrasonics in Medicine was created through a natural fusion of engineering research and technologies from various fields, along with research in medical science fields.

There is no doubt that the utilization of close ties between engineering and medical science, a strength of this academic society, can help improve the quality of this journal and make direct and indirect contributions to both medical circles and society. Contributions to this journal from various countries overseas are trending higher with a striking increase in the number of original papers and case reports contributed to the English version of this society’s journal.

In the midst of such progress, I am grateful to be involved with this academic journal as an area editor.

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