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# HOW TO RECOGNIZE (DECODE) ANIMAL LANGUAGE

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## Abstract

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Combined electronic devices can make a graphic record of sounds, emitted by animals and birds for the purpose of communication, as well as visualize the modulated signal and its constituent parts. It is possible to record the amplitude and frequency, oscilloscopic shape and graphic registration of the signal, emitted by animals. The recordings we made showed that the signals were strictly modulated in the form of a code of sound vibrations, depending on the behavioral response of animals. Thus, sound vibrations provoked adequate electric impulses in the auditory nerve of the inner ear that reached the auditory zone of the cerebral cortex.

*Key words*: animal language, behavior, decoding

## Introduction

Animals communicate in different ways such as mimic reactions, postures and gestures, instrumental activity as well as vocal intercourse. Separate types of behavior such as feeding and sexual conduct, parental, aggressive, motherly and playful, etc., are accompanied by sounds of different power.

Unlike humans, animals are capable of using the whole range of sound oscillations – infrasonic (up to 16 Hz) for sensing earthquakes and tides as well as transmission of information by ground or water, low frequency oscillations (16 – 20000 Hz) and ultrasonic (40-80-120 kHz), used by dolphins, bats, sharks and some rodents, etc.

Audiogenic reproduction of animal sounds as well as multiple and diverse birdsongs is not good enough for the identification of their physical parameters. The graphic presentation of these sounds is a more reliable method. Payne et al., 1986 and McComb, 2000, presented a scale of the sounds of elephant within the low frequencies and their frequent characteristics.

The interest in animal language dates back to ancient times. Today, a number of authors study, describe and interpret the essence of animal language and its importance in interspecies and interspecies communication (D.Mac-Farlend.1988; Stishkovskaia, 1980; Tinbergen, 1978; Kostov and Alexandrova. 2004).

Our objective was to develop complex equipment for the recognition and decoding of animal and bird vocals by means of a graphic record.

## Material and Methods

We used complex equipment and recording apparatuses for animal language decoding that gave us the opportunity to decode sounds by amplitude, fre-

quencies parameters, coding and signal modulation. The records were registered on paper with band velocity 100 mm/s.

## Results and Discussion

Figure 1 shows sound recordings of nightingale, zebra and wolf. As you can see on line 1, the sound vibrations of the nightingale were meticulously packed, several of them per module or package, followed by increase of amplitude up to the next package of vibrations. This is a unique natural phenomenon.

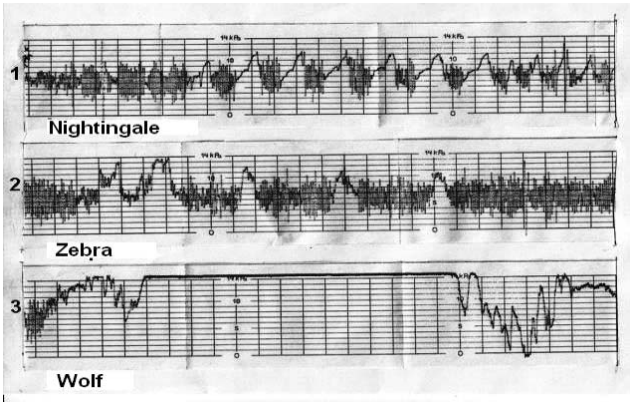


**Fig. 1. Soundgrams (spectrograms) of (1) nightingale, (2) zebra and (3) wolf**

Similar coded oscillations were also recorded in zebra (line 2) but with a bigger number of vibrations in one module.

The frequency of sound vibrations was about 5060 Hz. The recording of the wolf was different, the modulation came in a different order, and there was a transition of the signal from a succession of vibrations into higher frequency.

It is remarkable that animals use differently modulated signals that provide information on their behavior or emit signals with different messages.

We had registered similar signals in rooster, where the recording had one configuration for a time message (Figure 2, Line 1) and a completely different one when crowing along with a hen cackling after having laid an egg, etc. (Figure 2, Line 2). Line 3 of the figure shows a recording of a hen cackle after having laid an

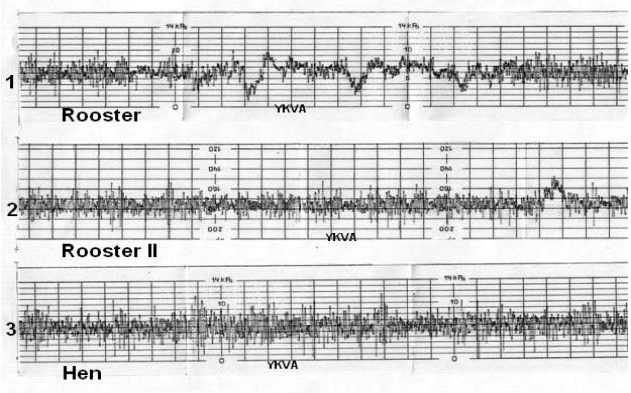


**Fig. 2. Soundgrams (spectrograms) of rooster (1) time message and (2) accompanying hen cackling; (3) recording of a hen**

egg.

The role of sounds in the life of dolphins and other aquatic creatures is difficult to re-evaluate today. However, these animal species are capable of using the complete range of known sound vibrations for interspecies and interspecies communication. By using ultrasonic and other types of sensor systems, they locate food sources (fish) as a fish passage or hidden in the sands at the bottom of the sea and river, etc. The sounds of whale (Line 1) and dolphin (Line 2),

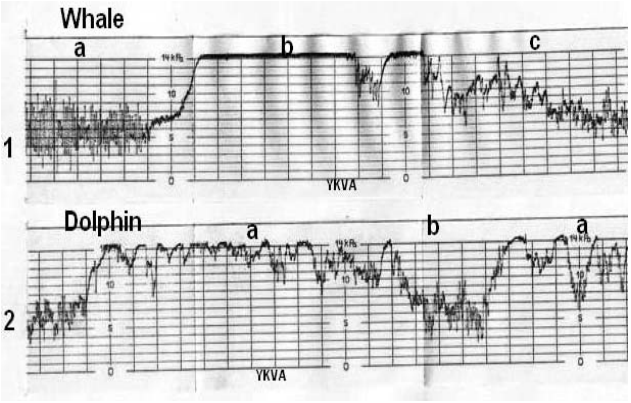


**Fig. 3. Soundgrams (spectrograms) of (1) whale and (2) dolphin**

registered as sound grams (spectrograms), are shown on Figure 3. The whale sound gram (spectrogram) showed that it was strictly coded and modulated and comprised of three types of modules or sound vibration packages.

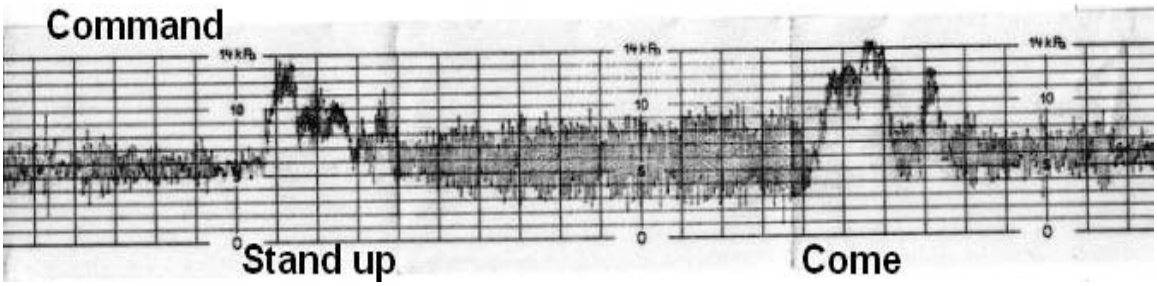


**Fig. 4. Human commands used in dog training**

The first one (a) consisted of sound oscillations of biphase shape, high amplitude and frequency and repeated after 2.5 seconds (not shown on the figure), the second package (b) started with low amplitude of oscillations and a different frequencies characteristics, followed by gradual passing over to the third module (c), where their amplitude was low as well but they were packed on a varying frequency band.

Signal coding in dolphin was similar (Line 2) but it was basically modulated in two types of modules – one prolonged (a) and one shorter (b).

Figure 4 shows a recording of different commands used in the training of house pets and other animals, combined with a conditioning reward. Animals do not understand the meaning of commands, they perceive them via the hearing apparatus as modulated signals of specific characteristics that are processed by the central nervous system and they react as trained according to the conditional reflex.

The recordings we show are similar to those published by Taylor (2008).

In conclusion, we think that animals have their own communication language that is strictly coded and modulated depending on their physiological condition and environmental effects.

Different species have a certain set of sounds for communication that is inherited and acquired during the ontogenetic development of the specimen.

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