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THE PERCEPTION OF BINAURAL PHASE DIFFERENCE NOT CAUSED BY AN INTENSITY EFFECT

G. W. STEWART

ABSTRACT

It is becoming well known that it is possible to perceive a difference in phase at the ears by a displacement of the phantom image from the median plane. Attempts have been made to explain this effect by bone conduction and the effect of intensity, for it is also well known that a difference of intensity will also cause a displacement. But the only published explanation of this character has been shown to be not satisfactory. Yet, since a large group of psychologists believe that sensation depends entirely upon the mode of response of the end organ and not upon the character of the stimulus, it is difficult to secure convincing evidence that the character of the stimulus, i.e., phase, does produce an apparent displacement of the phantom source.

If, however, it can be demonstrated that intensity does not indirectly produce the effect of phase, there remains but one conclusion, i.e., that there is direct perception of phase difference.

Such a proof has been found provided one accepts an obvious proposition, e.g., that if, for a given frequency, the observer does not respond to a difference of intensity at the ears by a displacement of the phantom sound, then intensity cannot, by bone conduction and consequent variation of intensity at one ear by variation of phase externally, produce such a displacement of the phantom sound.

In the test of five individuals for the intensity effect and the phase effect, three of the five are found to have the phase clearly defined in the region of frequency when *the intensity effect does not exist at all*. Indeed, the phase effect is just as clearly defined at a frequency where the intensity effect exists as at a frequency where the intensity does not exist. This would seem to be convincing evidence that the phase effect cannot be explained by terms of intensity.

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