Let $F(x_1, x_2)$ be a normal distribution with means m_1, m_2, variances σ_1^2, σ_2^2 and correlation coefficient ρ. The transformation can then be written as

$$F_1(x_1) = \Phi\left(\frac{x_1 - m_1}{\sigma_1}\right),$$

$$F_2(x_2 \mid x_1) = \Phi\left(\frac{x_2 - m_2 + \frac{\rho\sigma_1}{\sigma_2}(x_1 - m_1)}{\sigma_2\sqrt{1 - \rho^2}}\right).$$

REFERENCES

[1] P. Lévy, *Théorie de l'Addition des Variables Aléatoires*, Gauthier-Villars, Paris, 1937, pp. 71–73, 121–123.

[2] Paul B. Simpson, "Note on the estimation of a bivariate distribution function," *Annals of Math. Stat.*, Vol. 22 (1951), pp. 476–478.

ABSTRACTS OF PAPERS

(*Abstracts of papers presented at the Eugene meeting of the Institute, June 19–21, 1952*)

1. **The Auditory Cortex—A Probability Model.** Archie R. Tunturi, University of Oregon Medical School.

The role played by the brain in communication is well known, but in what manner the brain handles information is not understood. Some progress has been made in this direction by studying the anatomy and physiology of the auditory cortex in the anesthetized dog with controlled acoustic signals. Communication may be thought of as making a representation in a space of a representation in another space. In three of the four auditory areas (on one side of the brain), the entire frequency spectrum from 100 to 12800 cps is represented literally spacewise by groups of cells that respond only to a narrow range of frequencies. A special method increases the signal to noise ratio, by augmenting the electrical response of the cells, thereby permitting exact measurements of the characteristic frequency and intensity for each group of cells. This is similar to a narrow band filter, and does not reveal the effect of other frequencies on the information. The information capacity of the system can be inferred if it can be assumed that occurrence of the augmented response for the group of cells follows some probability function. These probabilities for all groups of cells can be assembled into a model representing the behavior of the system as a communication device. If there are 70 groups of cells between 100 and 12800 cps, the probability of any particular combination would be $1/2^{70}$, if the selections were equally probable. The effect of noise on this system will be considered. (Research sponsored in part by the Office of Naval Research.)

2. **Testing Message Diffusion: The Utilization of Mathematical Models.** Stuart C. Dodd, Richard J. Hill, and Susan Huffaker, University of Washington.

In connection with the study of interpersonal verbal communication, the Washington Public Opinion Laboratory designed an experimental procedure which yielded data on the temporal diffusion of thirty-three different messages in a population of 184 individuals. Data (including the recipient of each message, the initiator of communication, and the time of communication) were obtained on 5,522 separate instances of communication. The