Comments on "The Nature of Electrosensing in the Fish"

Dear Sir:

After reading the valuable paper of Frey and Eichert (1) published in this *Journal* I agree with the authors in criticizing the literature and announcing that "little can be used in developing and understanding of sense mechanism and sensitivity . . . no matter how competent the investigator." For example, Hagiwara and Morita's paper (2) describes many new interesting facts, but neither coding nor its mechanism are described according to the exact meanings of these expressions. Further, Frey and Eichert (1) made a mistake themselves describing as coding when "electroreceptors respond to each discharge of the electric organ with a succession of short pulses." In contrast to that and in accordance with the information theory the *stimulus* (the change in the electric field) is coded by the receptor producing the receptor potential, which is further coded by the afferent nerve producing spikes of some frequency. Thus the latter can not be considered as coded signals of the electric organ.

As to the *mechanism* of coding, this is not explained, in its real meaning, by describing the temporal or frequency data of the discharges and spikes. In this connection I would mention my suggestion (3) that the famous Gunn effect (4, 5) describing frequency modulation in crystalline materials could serve as a proper model of *coding mechanism* in the nerve fiber.

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REFERENCES

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3. ERNST, E. 1968. *Acta Biochem. Biophys. Acad. Sci. Hung.* **3**:115.
4. GUNN, J. B. 1963. *Solid State Commun.* **1**:88.
5. GUNN, J. B. 1964. *IBM J. Res. Develop.* **8**:141.

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