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Electrical control of polarity in an egg.

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The egg of *Fucus inflatus* is normally shed into the water after low tide. The previous period of exposure to drying during low tide can be imitated by wrapping plants in paper and leaving for about twelve hours, then removing the tips of the plants, which bear the reproductive organs, and floating them in dishes of sea water¹.

The shedding of the eggs can then be allowed to take place upon thin cover glasses to which the eggs adhere securely in about six hours. One of the two cells of the first cleavage gives rise to the frond while the other gives rise to the holdfast. Therefore such a preparation fulfills ideally the necessary conditions for determining the orienting effect of a direct electric current of proper density, upon the longitudinal axis of symmetry in the future plant body.

The cover glasses holding the eggs were placed in the bottom of a special glass trough, through which flowed fresh sea water and an electric current of appropriate density. The threshold value of the fall of electrical potential through an egg, necessary for orientation of the first cleavage is definite and amounts to about .035 volt. Perfect orientation and normal growth only occurs within a relatively narrow range of electrical potential which lies around .025 volts. Higher potentials inhibit cleavage, stop growth or kill the egg. It seems permissible to conclude that the establishment of an electrochemical polarity in the egg is probably an associated condition for the development of morphological polarity, because the physiological mechanism which determines morphological polarity can be controlled and directed by an electric current of external origin. Direct evidence of the existence of such inherent potential differences along the axis in certain eggs² and tissues³ already exists.

¹ Hurd, A. M., *Bot. Gaz.*, 1920, lxx, 25.

² Hyde, I. H., *Am. Jour. Phys.*, 1904, xii, 241.

³ Lund, E. J., *Jour. Exp. Zool.*, 1921, xxxiv, 471.