

Ethel Browne and the Organizer

Although we discuss the hypostome in analogy to the amphibian organizer, the first demonstration of the organizer activity was in hydra, not amphibians. In 1909, graduate student Ethel Browne (later, Ethel Browne Harvey) demonstrated that transplanting the hypostome from one hydra into another hydra would induce a secondary axis in the host hydra. Howard Lenhoff (1991) has written that her experiments used essentially the procedures that were later used by Spemann and Mangold, that Browne recognized the significance of her studies, and that Spemann and Mangold knew of her work.

The formation of a secondary axis is different than producing a new bud. Whereas a bud drops off from the trunk of the parent hydra, a secondary axis actually splits the existing hydra in two. When Browne transplanted the hypostome into the trunk of a host hydra, she used differently pigmented hydra (marked with green algae in the gut) so that she could distinguish between (a) the transplant's ability to organize the secondary axis in the unpigmented host tissue from (b) the ability of the transplant's own cells to organize themselves into the secondary axis. Thus, Browne's experiments in 1909 were essentially the same as the Spemann and Mangold experiments published in 1924. Moreover, Browne realized the importance of her studies. She discussed the results in terms of whether or not the hypostome region "induced the formation of a new hydranth."

Indeed, this phrase was underlined in a copy of the paper sent by Browne to Hans Spemann. (It was the only underlining in Spemann's copy of the paper.) Moreover, in the 1920s, regeneration was much more a part of embryology than it was in later years, and Hilde Mangold's first thesis project (before she was assigned the "organizer" experiment) involved hydra development. According to Lenhoff, it is probable that Browne's paper was part of the background that gave rise to the Spemann and Mangold organizer experiment, and he argues that she should have shared in Spemann's Nobel Prize.

Later, Ethel Browne became one of the world's authorities on sea urchin development (indeed, the author of *The American Arbacia and Other Sea Urchins*), married physiologist E. Newton Harvey, and was active doing her research at Princeton University and at the Marine Biology Laboratory (MBL) at Woods Hole. One of her experiments was critical in demonstrating stored mRNA in the sea urchin egg.

Literature Cited

Harvey, E. B. 1940. A comparison of the development of nucleate and non-nucleate eggs of *Arbacia punctulata*. *Biol Bull* 79: 166–187.

Lenhoff, H. M. 1991. Ethel Browne, Hans Spemann, and the discovery of the organizer phenomenon. *Biol Bull* 181: 72–80.

[PubMed Link](#)

All the material on this website is protected by copyright. It may not be reproduced in any form without permission from the copyright holder.