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**Sexual differentiation in the bread molds.**By **A. F. BLAKESLEE** (by invitation).

[*From the Laboratory of Experimental Evolution,  
Cold Spring Harbor, N. Y.*]

The Mucorales, represented by the bread molds, and their relatives, are characterized by a sharp sexual differentiation. Certain sexually primitive forms are hermaphroditic with equal gametes. From such forms as a possible starting point sexual differentiation seems to have proceeded in two directions—first toward a constant inequality in the size of the gametes seen in a few hermaphrodites; secondly toward a difference in the individual plants themselves. In these diecious forms, the interaction of two sexual races are necessary for the production of sexual spores.

Not only will the opposite sexes of a single species unite to form sexual spores but a reaction can also be induced between the opposite sexes of different species which shows itself as an "imperfect hybridization". An imperfect hybridization reaction between the sexual races of diecious species and heterogamic hermaphrodites leads one to believe that the (+) or vegetatively more active race is female and the (−) or less active race is male.

Tests of the sexual reaction of races of a large number of different species have been made and no race of the diecious forms has yet been found by the writer which reacts, if at all, other than as a male or a female. Variations, however, occur in the sexual vigor of different races and some are apparently neutral. Such a neutrality has been induced by environmental factors. Mutations have been observed in an hermaphroditic form producing hermaphroditic races with male, female and neutral tendencies.