"Experiments in Hybridisation, with Special Reference to the Effect of Conditions on Dominance." By L. DONCASTER, B.A., King's College, Cambridge. Communicated by Dr. S. F HARMER, F.R.S. Received March 19,—Read May 7, 1903.

(Abstract.)

The paper describes experiments made at Naples with hybrid Echinoid larvæ. The object of the experiments was to determine whether the dominance of a character is influenced by the condition of the genital cells at the time of fertilisation. It had been suggested by Vernon* that the "prepotency" of the sexual cells varies with their maturity, and experiments were made to test this conclusion, and also to discover whether "prepotency" could be influenced by other conditions acting on the eggs or spermatozoa before fertilisation.

It was found that adverse conditions acting on the eggs did give rise to differences in the larvæ, but evidence is given to show that these differences are not due to a change in the dominance of characters, but are the result of differences in the vigour of the larvæ. It is also shown that the seasonal changes observed by Vernon are probably due chiefly, if not entirely, to differences of temperature, and are not caused by a change of dominance accompanying difference of maturity.

It is also shown that if an individual, A, shows greater dominance than B when each is crossed with a specimen X of the other sex, then A will also show greater dominance than B when both are crossed with a specimen Y.

It is shown that the different characters of one parent are inherited separately by the hybrid offspring, so that there is no pronounced correlation in the offspring between characters derived from the same parent. Further, a given character may appear in very different degrees on the two sides of the body of a hybrid larva, so that the hybrids are very frequently asymmetrical, although in the characters considered the two sides of the pure-bred larvæ are similar.

Experiments are described dealing with the causes which hinder cross-fertilisation between separate species, and it is shown that treatment of the eggs which tends to reduce their vitality usually renders their fertilisation by sperm of another species more easy.

* 'Phil. Trans.,' B, 1898.