

Champlain Sea was decreasing. In one location near Ottawa a salty marine clay remnant appears to be flanked by such deposits. A similarity which is characteristic of all the deposits is the flocculated structure, but it is known that rather small concentrations of electrolyte during sedimentation are required to bring this about. If, in fact, these are essentially fresh-water deposits, the existing theory for sensitivity based on the salt-leaching is not satisfactory. Some progress is being made in exploring sensitivity on a new basis.

The main intent of the present communication is to show the trend in the measured relationship between electro-kinetic potential and sensitivity. Details of the apparatus and technique and more complete results are to be published shortly.

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GENETICS

'Selfers' and High Mutation Rate during Meiosis in *Ascobolus immersus*

DEMERE¹⁻³ applied the term 'selfers' to "auxotrophic mutants of bacteria in which transduction with homologous phage gives rise to significantly larger numbers of wild-type variants than occur by spontaneous reversion in uninfected control bacteria". Lissouba *et al.*⁴ found that some mutants affecting ascospore pigmentation in *Ascobolus immersus* produce wild-type 'recombinants' in homo-allelic crosses, whereas numerous other whitespore mutants when selfed never give wild-type revertants. However, this phenomenon has not been investigated in detail. We have examined one such mutant, '186', more precisely, because it produced the 'recombinants' in relatively high frequency. Homo-allelic crosses of this mutant were carried out and tetrad analysis applied. It was characteristic that wild-type spores were found mainly in asci with 6:2 segregation, namely, 6 spores '186' and 2 wild. In the case of normal back mutation before meiosis, asci with 4 mutant and 4 wild spores should be obtained. Among 127,964 tetrads examined, 38 of the 6:2 and 3 of the 4:4 asci were found (frequencies 0.000297 and 0.000023, respectively). Asci with segregation 4:4 in homologous cross may represent the normal rate of spontaneous back-mutations that correspond to Demerec's control experiments, because only one set of genes is present during mitosis. In turn, the 6:2 tetrads can originate only during meiosis. In meiosis two sets of genes are present in the nucleus, so that the situation is analogous to the transduction experiments with 'homologous phage'. Assuming that the 4:4 asci result from back-mutations in mitosis and the 6:2 asci from back mutations in meiosis, it is obvious that the frequency of this phenomenon is about 10-fold higher in meiosis than in mitosis. Presumably this difference is even greater if we take into account the clonal effect which works only on back-mutations in mitosis, increasing the number of wild-type nuclei that could enter meiosis.

There are at least three possible explanations of the 'selfers' phenomenon: (a) unequal crossing-over; (b) copy-choice (non-reciprocal exchange) connected with illegitimate conjugation of similar components of structures involved in recombination; and (c) stimulation of mutability of the locus by its homologue. Demerec excluded the first and second possibility in his experiments. The third, however, gives actually no information of the mechanisms involved. We crossed all six white

spores from one 6:2 ascus obtained in the cross '186' × '186' with the mutant '186' to see if there would be any difference in the frequency of the 6:2 asci in these crosses, because one could expect that two spores—the second product of unequal crossing-over—would behave differently from the other mutant spores. No difference was found between these crosses and the initial one as to the frequency of the 6:2 and 4:4 asci, which makes the hypothesis of unequal crossing-over rather improbable in this case. It is impossible to check the second hypothesis because we have no deletion mutant covering the site examined (as in Demerec's case).

In this situation we cannot distinguish between the second and the third hypotheses, which assume an increase of the mutation rate in meiosis. Whatever the mechanism of origin of the asci described, it is evident that in the site examined the mutation rate (if it is really mutation) in meiosis is higher than in mitosis. This is in agreement with the results obtained by Magni and von Borstel⁵ with a number of genes in *Saccharomyces*. Magni⁶ found later that there is no preferential mutation rate in either of the two chromosomes involved. We crossed double mutant '231' × '186' ('231' is located about 1.3 crossing-over units away from '186' and has the same phenotypic expression as '186') with the mutant '186'. In this situation we expected the frequency of the 6:2 asci to equal a half of that found in the cross '186' × '186', if the reversion occurs at random in all of the four strands. Among 95,972 asci examined, 15 of the 6:2 and 1 of the 4:4 tetrads were found (frequencies 0.00015 and 0.00001, respectively), which was in agreement with our assumption and also with Magni's results. On the other hand, Magni found that reversion was highly correlated with the exchange of the outside markers, suggesting that the phenomenon in question was due to the unequal crossing-over.

The analogy between our results and those obtained by Demerec and by Magni is striking. Possibly it may be a more general phenomenon that intimate contact of the two homologous fragments of genetic material can stimulate reversions. The molecular basis of this phenomenon is still unknown.

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PSYCHOLOGY

Androgen-induced Reversal of Parental Behaviour in the Female Rabbit

DURING the course of recent experiments designed to investigate endocrine influence on the developing nervous system androgens have been given to pregnant guinea-pigs^{1,2} and rats³ without apparently disturbing parental behaviour at, or after, parturition. The effect of such treatment on the pregnant rabbit does not seem to have been previously reported. This has now been examined by injecting six rabbits during pregnancy with testosterone propionate in arachis oil. Three ('Chinchillas') received five injections of 5 mg beginning on the 10th day of pregnancy and on each 4th day afterwards; the other three animals ('New Zealand Whites') were all injected daily with 5 mg from the 17th until 21st day, 2.5 mg from the 22nd until 25th day and 1.0 mg from the 27th until