strategies and relative abundance. We have undertaken further studies on both genetic and ecological variables of population dynamics and regulation on several pairs of related species occurring in the California grassland community in order to analyse comparatively their genetic systems and evolutionary strategies.

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New Genetic Variant of 6-Phosphogluconate Dehydrogenase in Australian Aborigines

SINCE the original discovery of genetic variation in human 6-phosphogluconate dehydrogenase (E.C.1.1.1.44) by Fildes and Parr in 1963[1], several new variants showing either electrophoretic differences in starch gel or quantitative variation have been demonstrated[2]. The variants segregate in families in accordance with expectations based on control by autosomal codominant alleles, but with the exception of the "common" variant their frequency is very low. The "common" variant of 6-phosphogluconate dehydrogenase (6-PGD) represents the heterozygous genotype PGD^{A}/PGD^{C} and the frequency of the PGD^{C} allele is significantly different in populations in various parts of the world[3], ranging from zero in one small group of Central American Indians to 0·152 for Bantu in South Africa. Surveys of Caucasians in Europe, North America and South Africa give values of the PGD^{C} allele ranging from 0·021 to 0·039.

In a survey of 6-PGD electrophoretic phenotypes among Australian aborigines we have recently detected a new phenotype. This phenotype is present in many of the aboriginal populations sampled in the Northern Territory of Australia and the trivial name "Elcho" is proposed after the Island locality in which it was first encountered. Family studies suggest that the "Elcho" variant has the heterozygote PGD^{A}/PGD^{Elcho} genetic constitution.

Haemolysates were prepared from washed cells by adding 1 volume of distilled water, and the haemolysates were stored at −20° C until used. Electrophoresis was performed in 11 per cent gels of hydrolysed starch (Connaught Medical Research Laboratories). Electrode vessels contained 0·2 M disodium hydrogen phosphate adjusted to *p*H 7·0 with citric acid, a 1:20 dilution of this solution being used for preparation of the gels. A potential difference of 3 V/cm was applied for 18 h, the gels being held between metal cooling plates in which water at about 15° C was circulated. The 6-PGD pattern was visualized on the horizontally sliced gels using the reaction mixture of Fildes and Parr[1].

Fig. 1 shows the "Elcho" phenotypes compared with a sample of the "Richmond" variant kindly supplied by Dr R. G. Davidson, Buffalo, New York. The "Elcho" heterozygote has also been compared with another presumed "Richmond" variant by Dr C. W. Parr, London,

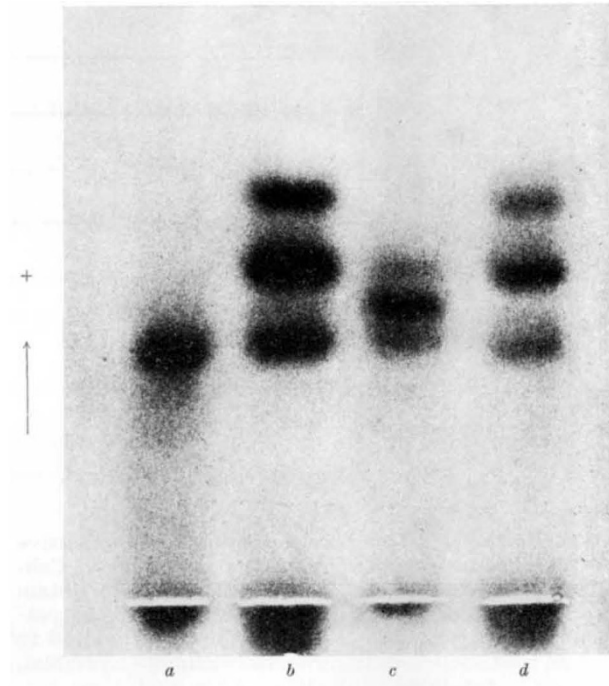

Fig. 1. Starch gel electrophoretic pattern of 6-PGD phenotypes. *a*, AA; *b*, "Elcho"; *c*, "Richmond"—Buffalo, NY; *d*, "Elcho".

who has confirmed the distinctiveness of the "Elcho" phenotype.

More than 1,700 samples have been screened from localities in the Northern Territory of Australia. Table 1 gives the 6-PGD phenotype distribution and indicates that in addition to the PGD^{A} and PGD^{C} alleles, which are present in all the populations studied, PGD^{Elcho} is widespread among populations in the northern part of the Territory, but has not been detected so far among aborigines from the more arid areas of central Australia. Further studies on the distribution of the *PGD* alleles in Australia and other parts of south and south-east Asia and the Pacific are in progress.

Table 1. 6 PGD PHENOTYPES IN AUSTRALIAN ABORIGINES

Locality	No. tested	Phenotypes (No.) AA	AC	CC	Elcho	Gene frequencies PGD^{A}	PGD^{C}	PGD^{Elcho}
Arnhem Land								
(*a*) Elcho Island	621	552*	47	1	21	0·944	0·039	0·017
(*b*) Other places	627	541*	65	3	18	0·929	0·057	0·014
Central Australia	532	490†	40	2	0	0·959	0·041	0

* Includes three phenotypes not typed.
† Includes one phenotype not typed.

The present investigation is part of the human adaptability project of the Australian contribution to IBP. We thank the director of health in the Northern Territory, Dr W. A. Langsford, for making blood samples available to us.

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