as are *fd* and *Ec*9, whereas *M*13 seems to differ considerably from both groups.

In general, the filamentous *I* phages bear a marked resemblance to those attacking *F*-like pili, which suggests a common origin. No isometric *I* phages have yet been isolated, although they should have been obtained by the present method of selection because we have used it to isolate isometric *F* phages. One *F*-related plasmid, F_0-*lac*, is known to determine *F*-like pili which adsorb filamentous but not isometric *F* phages[2]. It may be that the *fi*⁻ *R* factors so far used for the isolation of *I* phages are similarly unable to propagate isometric *I* phages.

We thank Dr R. Dettori and Dr H. Hoffmann-Berling for phages and antisera, and Dr H. Williams Smith for providing the material from which phage *If*1 was isolated.

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Received January 23, 1968.

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GENETICS

Unusual Distribution of Red Cell Acid Phosphatase among Aborigines of Australia

THE Australian Aborigines are an interesting population for the study of human variability due to inherited characteristics. The first study of their blood groups was published in 1922 (ref. 1) and many extensive surveys have since been undertaken. More recently discovered polymorphic characters, including the serum haptoglobins, transferrins, gamma globulins and group specific types, have also been investigated, and the results have been reviewed[2–4]. There is, however, no published information about the distribution of red cell acid phosphatase types among the aborigines and the study reported here was undertaken primarily to provide the information.

Blood samples were obtained from the subjects at Darwin and Alice Springs in the Northern Territory and at Cairns in Queensland by staff members of the Commonwealth Health Laboratories. Because of the interest which they have provided, many Australian aborigines have been subjected to venepunctures for research purposes. There is now some reluctance to approve the collection of blood for surveys of individual gene markers. The problem was overcome in this work by using blood samples which had been collected for clinical pathology investigations. Serum for the tests had been removed from all samples and the investigation described here was performed on the residual clots. There is no reason to suggest that this selection was in any way related to the genotypes of the subjects. Obviously, this material would not be suitable for an extensive survey of both red cell and serum gene markers, but it proved convenient for the test in this survey. The samples were kept in a refrigerator after collection, transported to Sydney by air and were tested within 10 days of collection.

The red cell acid phosphatase types were determined with minor modifications[5] by the starch gel electrophoresis and staining technique described by Hopkinson, Spencer and Harris[6]. The phenotypes were classified using the nomenclature published elsewhere[7]. Briefly, the enzyme types formerly called A, B, AB, and so on, have been designated PHs^A, PHs^B and PHs^{AB}, and so on, and the allelic genes *PHs*^{a}, *PHs*^{b}, and so on, where *P* stands for the gene locus in *Homo sapiens* (*Hs*).

The results are shown in Table 1. Only three phenotypes controlled by two alleles, *PHs*^{a} and *PHs*^{b}, were found. The frequency of the *PHs*^{b} is higher than has been observed in any other population. This gene is the commonest in all populations studied so far[8], but the highest frequency previously recorded was 0·805 in a group from the Tristan da Cunha Islands[9].

Table 1. RED CELL ACID PHOSPHATASE IN AUSTRALIAN ABORIGINES

Phenotype	Cairns No. observed	Cairns No. expected	Darwin No. observed	Darwin No. expected	Alice Springs No. observed	Alice Springs No. expected
PHs^A	0	0·2	0	0·1	0	0
PHs^{AB}	8	7·7	5	4·8	0	0
PHs^B	84	84·1	148	148·1	26	26·0
Total	92	92·0	153	153·0	26	26·0
Gene frequency						
PHs^a	0·044		0·016		—	
PHs^b	0·956		0·984		—	

The high frequency of *PHs*^{b} among the Australian aborigines could be the result of selection or of the founder principle. If selection has operated over the centuries or millennia the gene *PHs*^{b} must have been favoured to the extent that the genes, *PHs*^{a} and *PHs*^{c}, were at least partially eliminated. Alternatively, the Australian continent may have been populated by a group which by random chance had a high frequency of *PHs*^{b}. The recently restated trihybrid theory[10] involves three successive migratory waves from different parts of Asia with unequal mixing in different geographic areas of Australia. If this theory is correct, selection after arrival seems more likely than the possibility that all migrating groups had the same high gene frequency.

I thank the staff members of the Commonwealth Health Laboratories in Darwin, Northern Territory, and in Cairns, Queensland, for the blood samples.

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Received February 19, 1968.

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