



folding or thrusting in the visible part of the crust. The dykes occupying the tension fractures are of basaltic composition indicating that basic magma and not acid was then available. The change from a crustal layer, capable of being thickened or thinned by flow, to an overlying layer which remained unaffected is likely to have taken place where there was a sharp change of composition. For these reasons it seems likely that during the epeirogenic movement in East Greenland an intermediate layer of basaltic composition was changed in thickness, while the overlying sial layer remained unaffected (see accompanying illustration). The migration of material may have been effected by the drag of convection currents in a lower layer; several indirect lines of evidence, recently summarized by Gutenberg⁵, now suggest the existence of such currents.

The process described above is capable of producing by direct sinking an ocean basin such as the North Atlantic, and yet it is not at variance with the theory that the earth's crust is in isostatic equilibrium. New evidence for the hypothesis that the North Atlantic has been formed in part by direct sinking is provided by the recent work on submarine geology and topography summarized by Field⁶.

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¹ Daly, R. A., "Physics of the Earth VII", 58 (New York and London 1939).

² Wager, L. R., and Deer, W. A., *Geol. Mag.*, **75**, 39 (1939).

³ du Toit, A. L., *Geol. Mag.*, **75**, 189 (1939).

⁴ Wager, L. R., and Deer, W. A., *Geol. Mag.*, **75**, 46 and Fig. 3 (1939).

⁵ Gutenberg, B., "Physics of the Earth VII", 184 (New York and London, 1939).

⁶ Field, R. M., *Trans. Amer. Geophys. Union*, Part 1, 20 (1936).

Surnames, Intelligence and Fertility

IN a recent communication¹, Prof. R. A. Fisher and Dr. Janet Vaughan showed that a significant racial difference in blood-group frequencies could be detected in a sample of Liverpool donors by comparing with the whole group those possessing characteristically Welsh family names. This has prompted me to make a similar comparison for intelligence, as estimated by a mental test, in the case of a practically complete sample of school-children living in the city of Bath. The results may be of interest in view of the scarcity of observations made under conditions likely to ensure a fair comparison of racial groups. Furthermore, it has sometimes been suggested that Welsh immigrants in English cities tend to be of lower average intelligence and greater fertility than the native populations; in this connexion see, for example, Cattell².

The sample of Bath school-children consists of those whose dates of birth fell between September 1, 1921, and August 31, 1925, inclusive, and who were living within the city boundaries on July 27, 1934. Extremely few children escaped the ascertainment and mental testing; full details have been published³. The scale used was the Advanced Otis and the results are expressed in terms of an 'Index of Bright-

ness', or *I.B.*, which is simply a device for adjusting scores so as to allow for varying age at test. The norms were established on the group itself. The number of children is 3,361.

For the selection of Welsh family names I am much indebted to Mr. B. S. Bramwell, of the Society of Genealogists. In a paper⁴ in which he made certain interesting racial comparisons he used family names for differentiating groups. He gave a list of 33 characteristically Welsh names. Of these, 24 are represented in the index of Bath children: Davies, Edwards, Evans, Francis, Harris, Hughes, James, Jenkins, Jones, Lewis, Lloyd, Morgan, Morris, Owen, Parry, Phillips, Powell, Price, Pritchard, Richards, Roberts, Thomas, Williams and Willis. To increase the numbers I submitted to Mr. Bramwell a further list of names taken from the Bath index. Of these he selected ten: Griffiths, Howell, Howells, Humphries, John, Owens, Probert, Pugh, Rice and Vaughan. The number of children bearing these family names is 213, 6.3 per cent of the whole group.

COMPARISON WITH THE REMAINDER OF CHILDREN BEARING WELSH FAMILY NAMES.

	No.	Mean Otis <i>I.B.</i>	Standard deviation	Standard error of mean
Welsh family names	213	102.9	36.4	2.5
Remainder	3148	99.8	34.7	0.6

The difference in mean performance, 3.1, is not significant, being only 1.2 times its standard error. The difference between the standard deviations is not significant either, being less than its standard error. The frequency curve for the children with Welsh names is closely similar to that for the remainder, and does not depart significantly from the normal form.

In regard to fertility, taking as a measure the number of living full brothers and sisters (at the time the information was obtained), the Welsh children have an average of 2.46 sibs, while the remainder have 2.59. The difference is not significant. (Full data have recently been published⁵ on the fertility of Welsh migrants in the city of Oxford.)

It can safely be concluded that whatever racial characteristics distinguish the Bath citizens who are of Welsh origin, a lower average level of general intelligence and a higher fertility are not among them.

J. A. FRASER ROBERTS.

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¹ NATURE, **144**, 1047 (1939).

² Cattell, "Psychology and Social Progress", pp. 53, 96, 99, 102, 125-26 (1933).

³ Roberts, Norman and Griffiths, *Ann. Eugenics*, **8** (1938).

⁴ Bramwell, *Eugenics Rev.*, **15** (1923-24).

⁵ Daniel, *Sociol. Rev.*, **31** (1939).