The probable deviation of a point from the mean line is about ± 200 kgm., while the probable error of f is only ± 0·02.

The observations were examined statistically for systematic effects due to varying ages of the specimens, or to changes of the tensile resistance Z due to compressive ring stresses at right angles to the main axis, or to variation of the superimposed load N. No effects of this nature were found.

The porosity of some specimens was determined by weighing and drying, and was always less than 20 per cent. The fraction of the area of cross-section over which the internal pressure acts can therefore have nothing to do with ordinary porosity, and the results of the experiments tend to support Prof. Terzaghi's views. They may lead to changes in the methods of allowing for uplift in the design of dams.

Further work is going on, and it is intended later to publish a full account of the work in an Egyptian Government publication.

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[1] *Mitt. a. d. mech.-techn. Lab. d. k. Techn. Hochsch. München*, **27**, 1 (1900).

[2] Rudeloff and Panzerbieter, "Versuche über den Porendruck des Wassers im Mauerwerk" (Berlin, 1912).

[3] Fillunger, "Versuche über die Zugfestigkeit bei allseitigem Wasserdruck", *Oesterr. Woch. f. d. öff. Baudienst*, **29** (1915).

[4] Hoffman, "Permeazioni d'aqua e loro effeti nei muri di ritenuta" (Milan, 1928).

[5] Terzaghi, "Die wirksame Flächenporosität des Betons", *Z. öst. I. und A. Vereines*, Heft 3/4, p. 1, Heft 5/6, p. 30, Heft 7/8, p. 45 (1934).

[6] Fillunger, "Nochmals der Auftrieb in Talsperren" and "Die wirksame Flächenporosität Prof. Terzaghi's", *Z. öst. I. und. A. Vereines*, 5/6, 28, and 7/8, 44 (1934).

[7] Terzaghi, "Simple Tests Determine Hydrostatic Uplift", *Eng. News-Record*, p. 872 (June 18, 1936).

Surnames and Blood Groups, with a Note on a Probable Remarkable Difference between North and South Wales

Two years ago[1] Prof. R. A. Fisher and Dr. Janet Vaughan suggested that recent population movements in Great Britain can lead to significant association between surnames and blood groups. They found that out of 11,377 donors resident in the Slough area 591 bearing Welsh family names were significantly lower than the remainder in the frequency of A. Counts of blood groups donors now in progress have yielded striking proof of the value of this simple technique; and incidentally have revealed a startling and (to me) unexpected difference between North and South Wales.

Taylor, Race and Fisher[2] have given figures which illustrate the great variability in the frequency of A in the British Isles: Southern England, $O = 45$ per cent, $A = 43$ per cent; Northern England, $O = 48$, $A = 40$; Scotland, $O = 52$, $A = 34$. Haldane[3] gives the following figures for an Irish sample: $O = 56$, $A = 30$. These figures will serve as a standard of comparison for those given in the present communication.

A sample of 2,550 Welsh donors, drawn from Caernarvonshire, Denbighshire and Flintshire, gives: $O = 48$ per cent, $A = 40$ per cent. When, however, the sample is divided into 1,132 donors with Welsh family names and 1,418 donors with non-Welsh family names, the Welsh donors give $O = 51$, $A = 36$: the non-Welsh donors give $O = 45$, $A = 43$. The difference is highly significant. (The high proportion of non-Welsh names in the sample is largely due to the North Welsh coastal area being strongly represented.) Here, then, the family name technique has unmasked the diluting effect of recent migration and has revealed an important difference in blood groups between two partially isolated populations inhabiting the same area.

Another positive result was found when donors with Highland Scottish and Irish names living in the Bristol area were compared with the remainder. 40,740 donors in this area have given $O = 44$, $A = 44$. 778 donors with characteristically Highland or Irish names have given $O = 49$, $A = 38$, again a highly significant difference.

During the course of this work it became apparent that North and South Wales were strangely different. The first piece of evidence was that 3,242 donors with Welsh names drawn from the Bristol sample were as high in A as the remainder. Yet much of this immigration must be very recent, for the proportion of men was considerably higher among the Welsh donors. As Welsh names in Bristol must be overwhelmingly of South Welsh origin, the North Welsh material was re-examined, the Welsh names being classified according to their relative frequencies in North and South. I relied on Guppy's "The Homes of Family Names"[4] in making the selection. It was found that donors with names more characteristic of South Wales were significantly higher in A. Prof. Fisher has very kindly provided some figures relating to South Wales. 1,765 Cardiff donors give $O = 45$, $A = 43$; 537 Swansea donors give $O = 45$, $A = 40$.

Further work is in progress, but even on the evidence now available it seems probable that while the North Welsh are, as regards blood groups, kin to the Highland Scots and the Irish, the Southern Welsh are almost indistinguishable from the Southern English. Surnames came into common use in Wales during Tudor times, so it appears likely that the peoples of the North and South who at that time adopted the same family names were already very different; after all, perhaps, not such a surprising result in view of the different influences known to have affected the two parts of the country and the great difficulties of communication between them.

Fisher and Vaughan[1] have undoubtedly directed attention to a simple and valuable technique, and it is much to be hoped that blood group investigators will avail themselves of it in connexion with appropriate material. The additional clarification thus made possible may often be considerable. The usefulness of the method is not, of course, confined to blood group studies.

When these investigations are complete it is intended to report them fully in the *Annals of Eugenics*. I will then take the opportunity of expressing my great indebtedness to all those who have so kindly provided the facilities which have made the work possible.

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[1] NATURE, **144**, 1047 (1939).
[2] *Brit. Med. J.*, **1**, 315 (1941).
[3] *Human Biology*, **12**, 457 (1940).
[4] London, Harrison and Son (1890).