

The Eugenics Review

NOTES OF THE QUARTER

IMMIGRANTS AND THE SOCIAL SERVICES

THE NATIONAL INSTITUTE of Economic and Social Research is undertaking a study on the economic aspects of immigration, which it is hoped to publish as an Occasional Paper by the end of 1968. The project is clearly an interesting and valuable exercise. A first instalment has been issued in the form of a contribution by Mrs. K. Jones, published in the August, 1967, issue of the National Institute's *Economic Review*.

The cost of the social services may be sub-divided into two elements, namely the age of the recipients and the extent to which the services are used. The author estimates the cost per head of the health and welfare services in England and Wales in 1961-62 as being about £20 for young people (under age fifteen), £14 for those of working age and £39 for the old (65 and over). She finds that young immigrants cost rather more, but old immigrants less, per head than these averages. Thus the intensity of use does not greatly differ as between immigrants and the population at large. As, however, relatively few immigrants are old, and the cost is highest for the aged, the average for immigrants of all ages (about £17) is below that for the home population (£18). It seems likely to remain relatively low for many years to come.

Other important aspects of the social services are (i) education and child care, and (ii) national insurance and assistance benefits. In respect of the first of these, the cost of immigrants is slightly above the average; in respect of the second, because of their young age distribution, the immigrants are relatively inexpensive and will probably remain so.

On balance, therefore, the immigrant population—defined for this purpose as those coming from the British Caribbean, India and Pakistan, Africa, Cyprus and Malta—costs materially less than the native population so far as the social services are concerned. The extent of the saving is of the order of twenty per cent. In view of the suspicion in many peoples' minds that coloured people in Britain put a strain on the social services, it is good that the facts have been so carefully elicited and balanced together to present a clear conclusion to the contrary.

THE INCIDENCE OF GAMMA-CHAIN VARIANTS OF FOETAL HAEMOGLOBIN

HAEMOGLOBIN PROVIDES a convenient subject for the study of the incidence of mutations in polypeptide chains, since the amino acid sequence of the polypeptide chains of haemoglobin are known and the usual type of mutation is expressed as a single amino acid substitution which may be chemically identified. Many such variants of adult haemoglobin (which contains alpha and beta chains) are known. Foetal haemoglobin contains alpha and gamma chains. Until recently the chemical identification of gamma-chain variants had only been carried as far as the finding that Haemoglobin F Texas has a substitution of lysine for glutamic acid (glu→lys) at either the fifth or sixth position in the gamma chain.¹

There are 146 amino acid residues in the gamma chain and variants were previously thought to be "probably rare".² Numerous hospitals in Great Britain are at present collaborating on a survey of umbilical cord blood specimens to determine the incidence

of electrophoretically abnormal gamma chain variants. Five have been found in the first 13,000 specimens. So far three have been chemically characterized. They are: Haemoglobin F Hull (γ 121 glu \rightarrow lys)³, Haemoglobin F Texas I (γ 5 glu \rightarrow lys)⁴, and Haemoglobin F Texas II (γ 6 glu \rightarrow lys).⁵ The incidence of electrophoretically abnormal gamma-chain variants is therefore about one in 2,000–3,000. This is certainly a low estimate for the incidence of mutants; from work on the genetic code⁶ it appears likely that in addition about twice this number of variants occur when the amino acid substitution does not involve a change in charge such as is found, for example, in glu \rightarrow lys mutations. Such mutations would not be detected by electrophoresis. Electrophoresis detects only those variants in which the substitution involves a charged amino acid, and most amino acids are neutral.

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“UNSTABLE” HAEMOGLOBINS REPRESENTING A NEW TYPE OF GENETICALLY DETERMINED PROTEIN DYSFUNCTION

THE DETECTION and isolation of haemoglobin variants usually depends on the electrophoretic difference between the variant and normal haemoglobin. This has virtually confined the identified abnormal haemoglobins to those in which the change in amino acid sequence involves the substitution of an amino acid by another whose side chain bears a different charge. If there is no change in charge one would not expect electrophoresis to discover the altered amino acid content. That this has so far been found to be true for the identified haemoglobins associated with disease such as sickle-cell haemoglobin, Haemoglobin C, E etc., was not unexpected as it seemed that this type of replacement would be most likely to cause dysfunction of the molecule.

Surprisingly, in view of this, there is now a report from the Medical Research Council Abnormal Haemoglobin Research Unit in Cambridge that in certain instances replacements causing haemoglobin dysfunction may be virtually confined to those involving only uncharged or non-polar amino acids. These will result in little or no change in the electrophoretic mobility of the protein. Carrell *et al.* (*Nature* 1967, **215**, 626)* review the findings of the investigation of nine abnormal “unstable” haemoglobins. These are haemoglobins which precipitate inside the red cells *in vivo* and cause a haemolytic anaemia. Carrell *et al.* find that none of these haemoglobins have an inherent change in charge and have confirmed this by identifying the amino acid replacement in three of them. They conclude that the major factor in producing the instability of these haemoglobins is that the amino acids that are replaced are non-polar residues inside the molecule whose hydrophobic bonding is the most important factor in determining the shape and stability of the molecule.

* Carrell, R. W., Lehmann, H., Lorkin, P. A., Raik, E. and Hunter, E. 1967. Haemoglobin Sydney: β 67 (E11) Valine \rightarrow Alanine: an emerging pattern of unstable haemoglobins.

NOTES OF THE QUARTER

Replacement of one of these residues by a charged residue would almost certainly result in a completely non-viable molecule whereas replacement with another uncharged residue of different dimensions will result in dysfunction, but is not incompatible with survival of the molecule.

It is likely that these unstable haemoglobins are a prototype for other proteins showing dysfunction and causing disease.

THE ANTI-FERTILITY ANTIDOTE

IN THE JUNE 1967 number of the REVIEW we reported Dr. G. I. M. Swyer's Oliver Bird Lecture (59, 76) in which he said that the most rational form of fertility control would require the participants to "exercise their desire to multiply by a *simple act of free will*"—that is by taking the antidote to the anti-fertility agent (whatever it might be) which *everyone* would be having.

It would have been apposite to have then reprinted a letter which Dr. P. D. H. Chapman contributed to THE EUGENICS REVIEW in January 1956 (47, 267). Dr. Chapman wrote:

Everyone will recognize the importance of a reliable oral method of birth control in the struggle against over population. That such a drug could be an equally potent weapon in furthering eugenic progress is not perhaps so obvious.

Let us suppose that drug X is an effective oral contraceptive and that drug Y is an equally effective antidote to drug X.

Let a government add drug X to the staple food of its people and let it sell drug Y, the antidote, at a price fixed at its discretion. By varying the price of drug Y, the size of the population could be controlled, and at the same time the genetic quality would improve, for only the philoprogenitive and reasonably successful would be willing to pay for drug Y. The irresponsible and the feckless would automatically be sterilized.

Naturally, I would not expect a democratic government to have the foresight or the courage to adopt such a scheme until famine was upon them, but it seems likely that famine may not be far off.

Whether or not all would agree on the eugenic potential of such a measure, it would certainly put an end to the problem of the deprived and unwanted child.