

THE GEOGRAPHIC APPROACH TO OPHTHALMOLOGY

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At the inception of the Australian Ophthalmological Society thirty years ago means were discussed of lessening the amount of blindness in the continent. It was realised then that a thorough survey of the causes of blindness was a necessary preliminary. A start had been made (1) (Bruce Hamilton) with an investigation of hereditary eye disease in Tasmania and this has been followed up by exhaustive investigations in various areas of Australasia continuing till the present time (2). Anyone who undertakes such surveys in any part of the world is at once struck by the effect on the distribution of eye disease of climate, race, cultural habits and often of history. The ophthalmologist must be alert to the associations of his subject with geography and anthropology at least. Too often, immersed in the exigencies of day to day clinical practice in large centres, he becomes apt to consider the individual patient as a "case" (of a disease) without reference to what may actually be determining and causative factors in the background and environment. For instance, an Australian patient with a nordic surname and glaucoma simplex, may not always suggest an enquiry into family history and possibly an examination of near relatives, although it may be vaguely know'n that the incidence of glaucoma simplex is the highest in the world among persons of Scandinavian (especially Icelandic) ancestry (3). The location of such a family in Australia will also alert us to the blurring of the clear cut picture of geographical distribution of disease by ease of communication, rapidity of travel and the overrunning of one culture by another. This was emphasized ten years ago by the World Health Organisation. To quote their joint monograph (with UNESCO "Methods of Geographical Pathology 1959"): "Time is short if the most is to be made of present opportunities. Changes in the physical and cultural structure of society are taking place at a faster rate than ever before and industrialisation and the ease of communication are establishing a common

pattern... in areas which until recently provided striking contrasts in... ways of life". The urgency of the situation has again been stressed as recently as last year by Baker and Weiner (4) in their work on the biology of human adaptability. This, though not dealing with medical specialities, emphasizes the necessity of studying individual population groups in their context of reaction to environmental and genetic characteristics while such clear-cut groups are still available.

The effect of climate on pathology has long been recognised. Exhaustive works such as Manson-Bahr's *Tropical Diseases* have alerted us to this, but there remain many unexplored areas in the specialities which would repay research. A disentangling of genetic versus environmental causes can almost always be arrived at in such regional studies. For example, in Australia we are dealing with two still largely distinct populations, the European-descended and the Aboriginal, living often in an identical environment. Surveys on the eye diseases of the two groups show striking differences. The absence of glaucoma simplex and of convergent strabismus in the Aboriginal race and its high frequency in the European indicate of course a genetic difference, while the high incidence of pterygium in both groups (and its virtual absence in England) point strongly to an environmental cause. A study of cataract and its various types in different parts of the world along these lines might yield valuable information. Infections also are largely tinted with cultural and climatic patterns as can be seen in the distribution of trachoma in Australasia. We find a high incidence among Aborigines leading unhygienic lives without soap or washing water, while the disease is almost unknown in the large cities where the level of sanitation and education is high. The incidence of diseases such as trachoma is also partly dependent on history. Thus we find the highest incidence in the ports of Papua-New Guinea where foreign contact is centuries old, while in the Highlands of New Guinea (almost inaccessible less than 30 years ago) the incidence is low. The same pattern of trachoma distribution can be seen on the American continent. The Amerind tribes exposed to early contact with Europeans (themselves trachomatous at the time) are still infected while those to the north and south of the pioneering routes are comparatively free. Equally dependent on movement of peoples, often centuries ago, is the distribution of favism, a genetic biochemical fault (presenting sometimes ophthalmologically as retinal and vitreous haemorrhage) originating in Baghdad Jews in the second century B.C. and spreading by migration and deportation throughout the eastern end of the Mediterranean.

In the South American States also the distribution of trachoma is linked with immigration and the infection of the Amerinds was largely determined by their contacts with Mediterranean incomers. Indeed South America offers unique opportunities for research along the lines indicated above as it still possesses relatively clear-cut population groups together with every possible type of environment.

For instance, the ophthalmic characteristic of Ecuador are almost unknown yet this state presents extremes of climate, and many racial groups. A possible line of work would be a study of the different disease distribution in the African and the Araucanian populations, the environment being the same. A glaucoma survey might prove interesting. Again, Bolivia offers unrivalled opportunity for studying the effects of altitude on eye disease. Here glaucoma research could be conducted to contrast the populations living at 12,000 ft. with those in the jungles almost at sea level. Malnutrition and infection could probably be linked with geograhy here. The genetic nature of convergent strabismus has already been brought out by researchers in Bolivia (Urrets-Zavalia). (5), and Belfort Mattos (6) has noted tis absence in Amazonian tribes. Further work with these primitives of the Brazilian jungles might prove interesting as they are still isolated.

This is an age of synthesis and the overlapping and interdigitating of various disciplines. Ophthalmology must avoid too narrow a specialisation and we must remember that there are many opportunities for collaboration with anthropologists and geographers at least.

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