

The importance of our work is that it is the first detection of a leucocyte-transforming agent, which must be considered potentially oncogenic for man, in human upper respiratory tract secretion. Further investigation into the nature of this transforming agent may clarify its relationship with (a) EBV, (b) transforming agents from various lymphoblastoid cell lines (from Burkitt's lymphoma<sup>6,8</sup>, acute leukaemia<sup>7</sup>, mononucleosis patients<sup>2</sup>, and healthy persons<sup>3</sup>) and (c) the filtrable agent which can convert lymphoid cells from negative to positive for EBV antigen<sup>9</sup>.

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## Salmon Nomenclature

Payne, Child and Forrest<sup>1</sup> have shown little regard for the rules of zoological nomenclature in proposing the subspecific names "europaes" and "americanus" for the Atlantic salmon, *Salmo salar*. First, the European stock, binominally named by Linnaeus, must become the nominate subspecies and, therefore, should bear the name *Salmo salar salar* Linnaeus, 1758<sup>2</sup> rather than *S. salar europaes*. Second, a cursory examination of the literature reveals a number of older and available names for the North American stock. These include *S. immaculatus* Storer 1950<sup>3</sup>, *S. sebago* Girard 1854<sup>4</sup>, *S. gloveri* Girard 1856<sup>5</sup> and *S. ouananiche* McCarthy 1894<sup>6</sup>, any of which must take precedence over *S. salar americanus*. Undoubtedly any British ichthyological systematist could advise the authors on correct choice of names for their subspecies. At the same time, they should consider that while designation of type-specimens in the species group is not mandatory, it is a protocol to which systematists almost invariably adhere<sup>7</sup>.

Although the authors are aware of "communal feeding grounds off Greenland" for both European and South American salmon stocks, they seem to be unaware that some salmon spawn in Greenland<sup>8</sup>. The transferrin type of this Greenland stock is apparently unknown, but could be intermediate between the European and American stocks. Furthermore, the small size of their North American sample (only seventy-eight specimens) from a geographically restricted area is hardly comparable with the large sample from the British Isles (4,414 specimens). Perhaps the authors would be advised to test their hypothesis on a larger sample from North America as well as

samples from Greenland and European localities other than the British Isles before they take the step of proposing corrected subspecific names for these salmon stocks.

Finally, however, they are only able to distinguish 57.7% (forty-five out of seventy-eight specimens) of their North American sample from their European sample. Few taxonomists would agree that such a low percentage discrimination deserves subspecific designation.

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Drs Payne, Child and Forrest write: Dr Gruchy's criticism of our proposed nomenclature is quite valid and we accept that the European subspecies of the Atlantic salmon should be called *Salmo salar salar* L. according to the International Code of Zoological Nomenclature. The choice of a correct name for the North American stock is more difficult in view of the complexity of earlier terminology and a detailed study of the literature is indicated.

Our thesis is that free gene exchange was possible through the amphi-Atlantic range of *S. salar* until the end of the Last Inter-Glacial when the expansion of the polar ice-cap caused a major discontinuity in the range. We believe that genetic contact has never been re-established as shown by the restriction of the transferrin variants Tf3, Tf4 to North America and Tf2 to Europe (one must assume that Tf1 was the "ancestral" gene at this locus and that Tf2, Tf3 and Tf4 have arisen by mutation at this locus since the establishment of a geographical barrier in the polar region of the North Atlantic). We do not conceive of these transferrin variants as definitive characters for the recognition of morphological subspecies but as indicators of the existence of a major discontinuity in the free exchange of genetic material through the species. However, we hope that absolute discriminants may be discovered from further work.

An analysis<sup>1</sup> of 1,623 Atlantic salmon sera collected over the area between Labrador and Maine showed that there is a widespread polymorphism in transferrin phenotype which is determined by three allelomorphous genes. It is highly probable that these alleles correspond with Tf1, Tf3 and Tf4 described in our paper. This work confirms that the transferrin polymorphism we describe in the salmon populations of the Gulf of St Lawrence is not a feature applicable only to this geographically restricted area.

We have not examined material from the very small native population in Greenland. However, an analysis of more than 1,000 sera samples from the drift-net fishery in the Davis Strait between West Greenland and Canada did not reveal any intermediate phenotypes (Tf2/Tf3, Tf2/Tf4). We have examined a small sample (100 specimens) from rivers in SW Iceland; all these fish had the Tf1 phenotype. While further work in this area is required, this must be taken as provisional evidence that the Tf3 and Tf4 alleles have not spread from North America into the European side of the North Atlantic via Greenland.

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