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publishes a bullet in within which one can request professional contacts with others who may be doing similar research...

-John B. Gregg, M.D.

BRIEF COMMUNICATION

A Comment: How Is Epidermal Ridge Configuration Determined? -W. Babler

A primary factor in interpreting differences in epidermal ridge configuration is the nature of pattern determination. Generally, the interpretation of ridge configurations can be grouped into two categories. The first considers ridge configurations or patterns to be "primary foci of evolution"[1] and therefore directly determined by genetic factors. The 'second interpretat ion proposed by Cummins in 1926 considers ridge configuration as a product of epigenetic processes involving response to growth forces. By "epigenetic" I refer to the system of causal relationships by which the genotype becomes realized as the phenotype, This second interpretation suggests that ridge configuration is. not directly determined by genes but rather is indirectly determined by adjacent tissues with which the developing glandular folds of the basal epidcrmal layer interact, These adjacent , interactive tissues may include the volar skin itself, the soft tissue of the dermis, bone, and/or other epidermal appendages (eg. fingernails).

While there is no doubt that there is a strong genetic component to ridge configuration, the question of how epidermal rid&e configuration may be determined st ill remains. In my opinion, we do not know when during development, nor by what developmental process, ridge configuration is determined. Most studies on the development of epidermal ridges involve the time of appearance of ridges and their growth. Such studies do not tell us much about the initiation of rid&e formation. Indeed, ridge pattern probably is already determined prior to the formation of the first glandular fold around the 10th week of development. This is suggested indirectly by those who hypothesize that volar pad size and/or shape are determinants of pattern [2-4] or that peripheral nerve and/or vascular patterns determine ridge configuration [5-7].

Volar pad topography at the time of ridge Eormation is difficult to document. Similarly, there is conflicting evidence as to whether vascular end/or neural "patterning" may play a key role in ridge configuration. I have attempted to give a general idea of some factors which may play a role in determining ridge pattern. Yet, while, ridge configuration is determined prenatally, one should not rule out possible postnatal evidence for rid&e pattern determination.

One easy approach might be adopted to investigate pattern determination postnatally. There is significant evidence that growth of the glandular folds, in particular the spacing between folds and their depth of penetration into the dermis, is correlated with growth of the underlying distal phalanx. Similarly, there is some evidence to suggest that this type of digital pattern is correlated with the relative depth of penetration of glandular folds into the dermis. This suggests a possible association between distal and phalangeal morphology and pattern type, The high frequency of archs associated with brachydactly and distal phalangeal hypoplasia is consistent with this suggestion. However, is it true for the normal hand? With the advent of metacsrpophalangeal (MCP) length standards and MCP pattern profiling [8,9], we may wish to address this question anew. Furthermore, the possible association with bone marrow shaft should not be

overlooked.

I have really made only two basic points in this comment. (1) To understand variation in dermatoglyphic traits we need to study epidermal ridges both during their development and in postnatal life. (2) The explanation for ridge configuration is to be found as much in the tissue(s) with which the glandular folds interact during its development as in the ridge itself.

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4. Mulvihill, J.J. and Smith, D.W. 1969 The genesis of dermatoglyphics. J. Pediatr., 75:519-589.

5. Bonnevie, K. 1929 Die ersten Entwicklungsstadien der Papillarmuster der menschlichen Fingerballen. Congres Intern. Exp. Zool. Budapest 1927. Pt 1. pp. 726-733.

6. Blechschmidt, E. 1963 Die embryonalen Gestatlungsfunktionen der menschilichen Oberhaut. II. Mitteileng Die Entstehung des Papillarkorpers inden proximalen and distalen Abschmitten der Fingerbeere. Zeit. Morph. Anthrop., 54:163-172.

7. Hirsch, W. and Schweichel, J.U. 1973 Morphological evidence concerning the problem of skin ridge formation. J. Ment. Defic. Res., 17.58-72.

8. Garn, S.M. et al. 1972 Metacarpophalangeal length in the evaluation of skeletal malformation. Radiol., 105:375-381.

9. Poznanski, A.K. et al. 1972 Metacarpophalangeal pattern profiles in the evaluation of skeletal malformations. Radiol., 104:1-11.

DERMATOGLYPHIC ABSTRACTS FROM THE 1983 AAPA MEETINGS

Frank Johnston, President of the American Association of Physical Anthropologists, and Alan R. Liss, Inc. have graciously allowed us to reproduce the abstracts of dermatoglyphic papers presented at the 1983 AAPA meetings in Indianapolis, IN [published in the Am. J. Phys. Anthrop. 60(2):169-273, 1983]. We are doing this as a service to those of our ADA members who are not also members of the AAPA.