Abstract
Persistence and uniqueness is an inherent quality of the papillary ridges and it applies to the ridges as a whole and its parts. In 1880, Sir Francis Galton had proved science of personal identification using ridge characteristics is based on these two primary factors. Later, Dr. Harris Hawthorne Wilder studying morphology of plantar and palmer surfaces, along with Bert Wentworth re-authenticated that friction ridges are formed on the hands of faetuses, from the fourth month of intrauterine life. Identification specialists continually encounter friction ridge impressions of varying degrees of clarity and difficulty, and when there are insufficient numbers of minutiae in relative position to prove positive identity, fingerprint examiners find great difficulty in extending their opinion in the Courts of Law. In such situations, third level details like edgeoscopy could prove a crucial tool of support.

Introduction
Authenticity of Fingerprint Evidence

Papillary ridges can help in identification even when the epidermis gets eroded or damaged due to burns or long-term submergence in water. A partially submerged body was discovered in March 2004 in Prince Rupert, British Colombia (BC) Canada. The cadaver was identified by impressions of dermal ridges by BC AFIS Department. Identification in such complicated cases certainly compliments the established science of fingerprint identification, which not only reassures the world about Sir Francis Galton’s theory based on twin factors, uniqueness and permanence. Traditionally, latent print examiners have presented identification testimony in courts with an explanation of identification or with a charted enlargement of matching and latent prints.2

Most often, the subjective nature of the opinion of individualization comes under attack by Lawyer in the Courts of Law. Fingerprint examiners do not possess uniform objective standards to guide them in their comparisons. To the contrary, there is complete

disagreement amongst the fingerprint examiners as how many points of comparisons are necessary to make an identification, and many examiners now take the position that there should be no objective standards at all. Perhaps, scientists have started suggesting for the incorporation of more than one aspect in fingerprint evidence, i.e., poroscopy, edgeoscopy, etc. Prior to 1973, different States (regions) of India had no uniformity on minimum number of identical points for giving opinion on fingerprints, it ranged from 5-17. In the year 1973, the first All India FP Conference held at Srinagar (Jammu & Kashmir) adopted the following resolution:

"The minimum number of points for establishing the identity beyond doubt in case of fingerprint examination has been fixed at eight. However, where there are six or more points of identity, a qualified opinion can be offered by the expert on his responsibility."

In 1970, the International Association of Identification had formed a Standardization Committee for the purpose of determining the minimum number of ridge characteristics for establishing positive identification. The resolution stated that no valid basis exists at this time for requiring that a predetermined minimum number of friction ridge characteristics must be present in two impressions in order to establish positive identity. The Ne'urim Declaration (Israel) in 1995 had stated that no specific basis exist for requiring that a predetermined number of friction ridge features must be present in two impressions in order to establish positive identification.

**Edgeoscopy & other Friction Ridge Evidence**

The scientific foundation of friction ridge identification originates with various doctors, scientists and progressive thinkers, many playing a distinctive role in formulating the foundation of the science without ever recognizing its potential. Both Nehemiah Grew, M.D. in his report (1684) for the Royal Society of London, and the Anatomist Govard Bidloo from Holland in his book on human anatomy in 1685, discussed and illustrated their recognition of the friction ridges and pores within these ridges. Over 200 years ago, JCA Mayer in 1788 stated that the "arrangements of skin ridges is never duplicated in two persons."

Mr. S.K. Chatterjee was influenced by the research of Harris H. Wilde published in 1918, in his book entitled 'Personal Identification', which was co-authored with Bert Wentworth, he promulgated that the friction ridges are formed by the fusion of rows of units, which fuse across with the adjacent unit on one side and form a fork. He further described that ridges are subjected to differential growth and, as a result, all areas of friction ridge are unique.

Dr. David R. Ashbaugh in his book Quantitative-Qualitative Friction Ridge Analysis states that to ignore sweat pores and edge shapes when they are present is to ignore part of the valid information in the total image. This is by no means to suggest that an expert should ignore the minutiae points and concentrate on the pores and edge shapes. It is simply to say that one must consider all of the information present in both the latent print (or mark) and the inked print. Traditional minutiae points are still the backbone of most comparisons.

**Discussion**

**Edgeoscopy as Third-Level Details**

Third-level details are small shapes on the ridges, the relative location of pores, and small details contained in accidental damage to friction ridges. The small intrinsic details of friction ridges have tremendous individualizing power. The relevancy of friction ridge clarity, third-level detail, and quantitative-qualitative analysis were not understood by the friction ridge identification discipline.

**Practical Difficulties in accepting Edgeoscopy for Individualization**

Lack of sufficient and systematic data about various aspects of edge details like as shape, position, and frequency, etc.

**Remedial Measure for Practical Problems**

Some suggestions have been made by pioneers like David R. Ashbaugh of RCMP Manitoba, Canada for studying third-level details:

- Powderfill: Careful cleaning of the developed fingerprint, and use of good quality powder with no moisture contaminates.
Shapes of Edges of the Ridges

- Use of pre-inked fingerprint strips increases the clarity of inked impressions; proper training and practice in inking the slab would improve results. Practice on correct pressure when fingerprinting will also be an asset.

- Knowledge of Edgeoscopy will allow us to add strength to low ridge count identifications, assist in evaluating ridge characteristics and, on occasion, make identifications on prints we previously considered unidentifiable. Therefore, that piece of fingerprint that is considered unidentifiable, due to lack of sufficient ridge characteristics, but displays ample pore structure, may be worth collecting anyway.

- Learning the basics of edgeoscopy is not at all time-consuming as the material required is minimal. Identification experts would not find it to learn edgeoscopy difficult at all.

REFERENCES


