

THE INFLUENCE OF MEDICAL PHOTOGRAPHY'S WESTMINSTER REPRODUCTION RATIOS ON STANDARDIZATION IN FORENSIC PHOTOGRAPHY – AN OPINION

Hoosain M Ebrahim

*Department of Medical Illustration
and Audio Visual Services*

University of Limpopo

South Africa



PHOTOGRAPHY

Forensic

Medical

Different aims
Different objectives

Legal purpose

FORENSIC PHOTOGRAPHY



Final photographic product
(may only be the beginning)



Photographer's involvement in a legal
system that might want to know



WHY, WHERE, HOW, WHEN and under
WHAT CONDITIONS the images were
taken

Forensic photographs must meet the following:

- Technical qualities
- Sharpness of detail
- Clarity of image
- Use of lighting
- Perspective
- Accuracy of reproduction of both colour and form

The medical photograph...

- provides a precise record
- is comparable with others taken over a period of time
- is obtained with the least inconvenience to the patient
- meets the intention of the request
- is in accord with current methods of presenting medical data

STANDARDIZATION FACTORS

- Film emulsion / Digital
- Lighting
- Backgrounds
- Viewpoint
- Scale
- Perspective
- Colour
- Processing
- Printing
- Presentation
- Orientation (forensic)
- Identification (forensic)

**STANDARDIZATION REQUIRES
WORKING TO PRE-DETERMINED
RULES**

WORKING TO SCALE

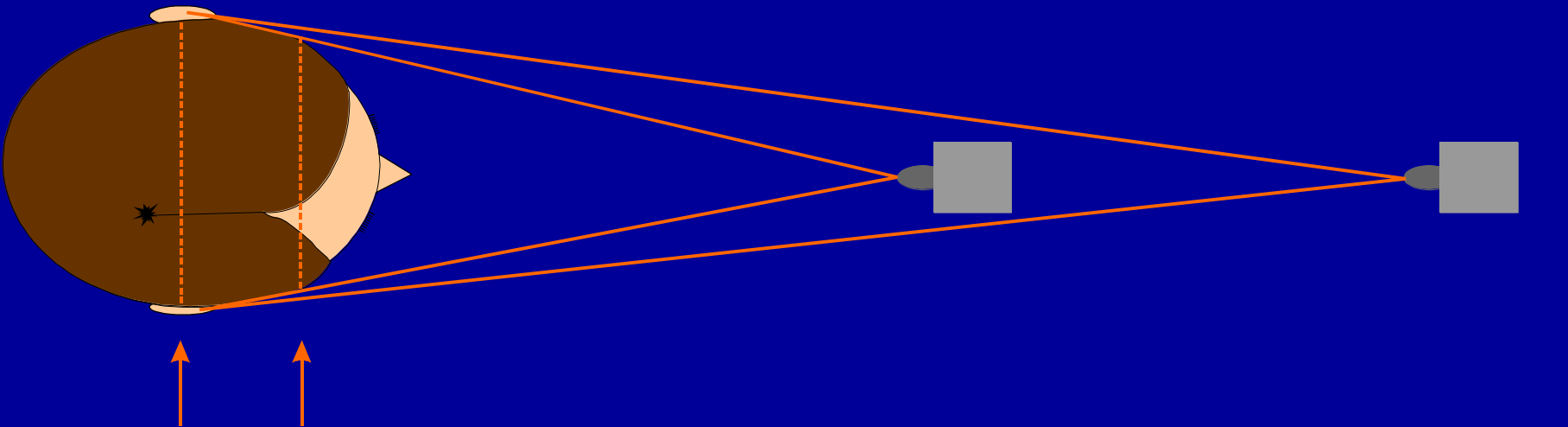
The scale of reproduction must be constant for any given area both at the recording and printing stage

**WESTMINSTER REPRODUCTION
RATIOS FOR STANDARD
ANATOMICAL REGIONS**

REPRODUCTION RATIOS

35mm format	55mm micro lens 105mm	
Full length	1:50	
Chest	1:15	1:15
Abdomen	1:15	1:15
Forearms	1:15	1:15
Both feet	1:10	1:10
Head and neck		1:10
Face		1:8
Both eyes		1:4
Genitalia		1:3
Teeth		1:2
Single eye		1:1





**level of
contour**

camera

camera

View from above. Diagram explaining why photographs taken from different distances show different contours of the head. Short-distance photographs do not show coronal contours and portions of the head.

THE HEAD AND FACE

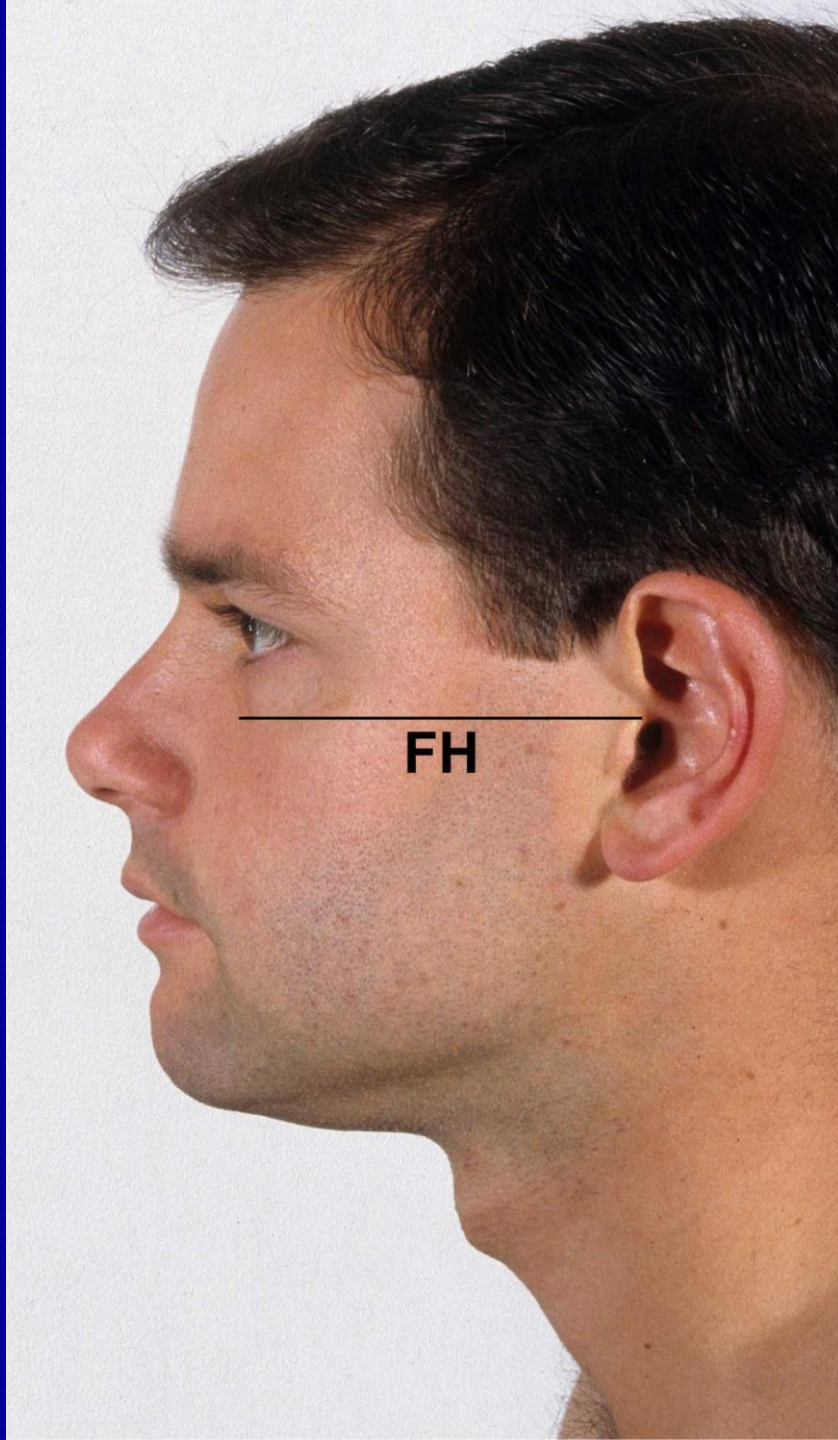
Views:

- Antero-posterior (AP)
- Postero-anterior (PA)
- Left and Right oblique (45° to median plane)
- Left and Right Lateral (90° to median plane)
- Inferior (Worm's-eye view)
- Superior (Bird's-eye view)

- **STANDARD REPRESENTATIONAL VIEW**
- **IMAGINATIVE EVIDENTIAL AND TEACHING VIEW**

FRANKFURT HORIZONTAL / PLANE

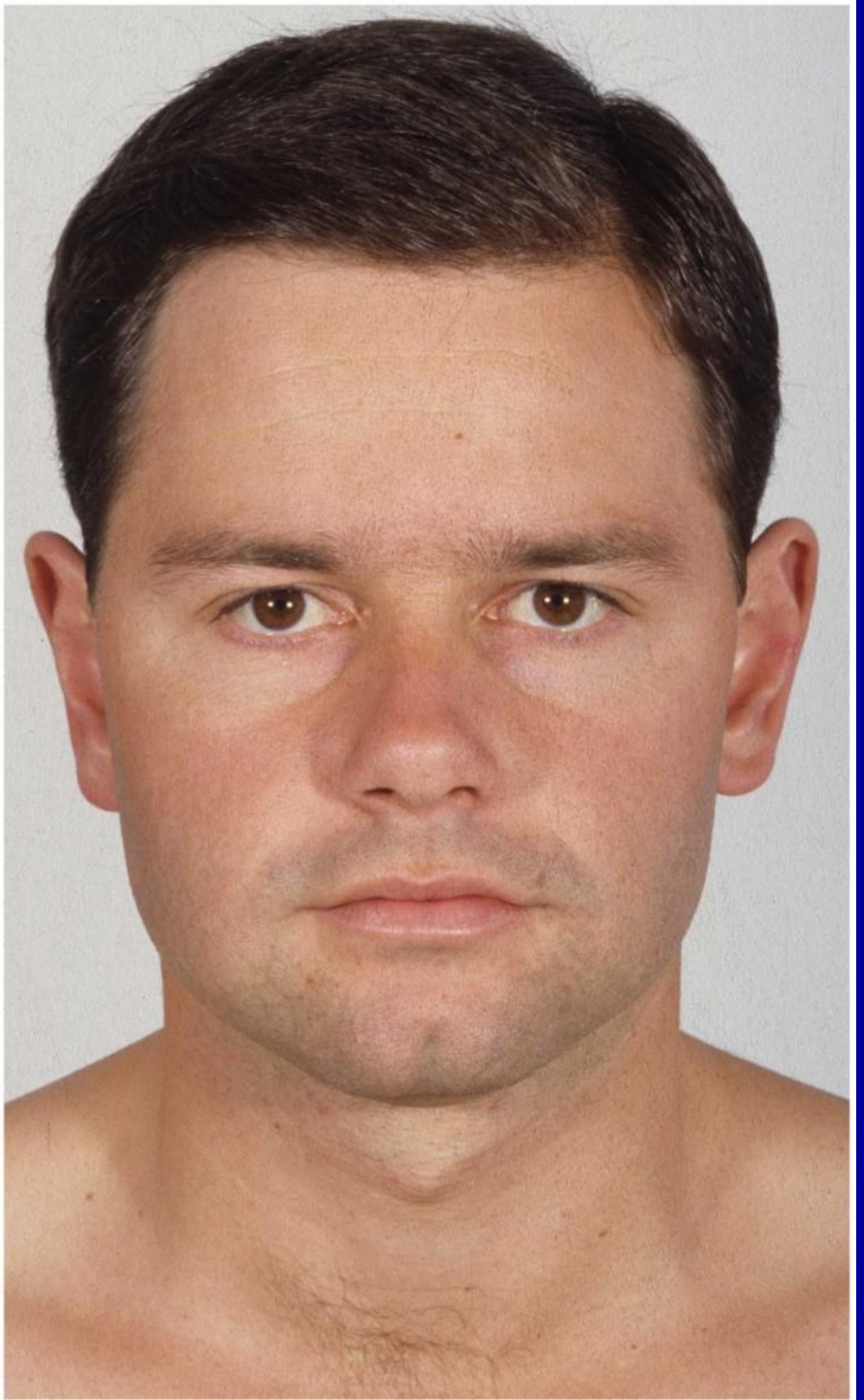
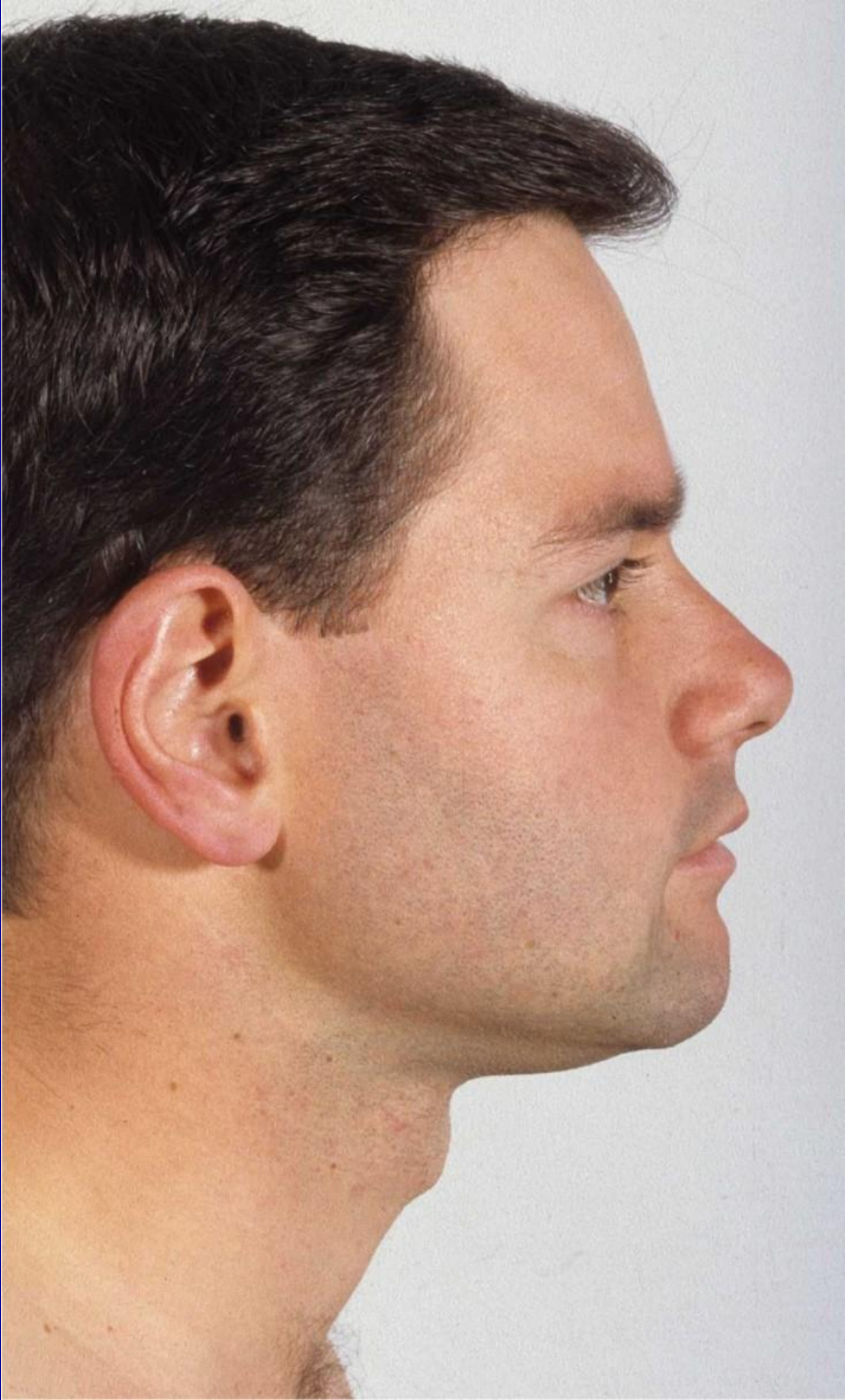
- A plane defined by three osteometric points, the right and left porion points and the left orbitale. These osteometric points are at the top of each external auditory meatus and the bottom of the orbital margin
- It is used to systematically orient the skull. (Convention held in Frankfurt in 1884)

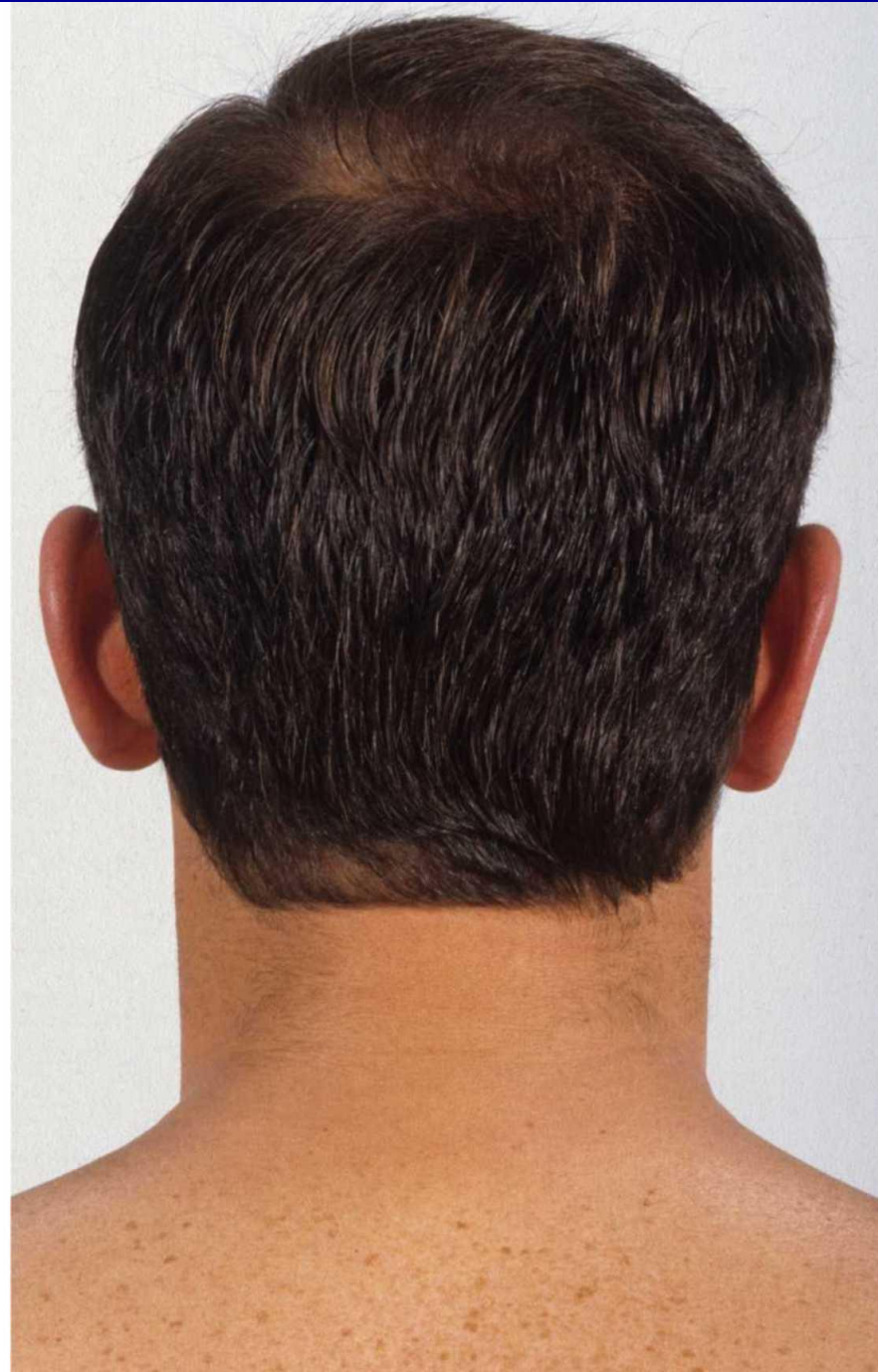


FH

MEASURING LINEAR PROJECTIVE DISTANCES

The Head and Face should be photographed in the standard antero-posterior and lateral positions. The position of the head should be standard (in Frankfurt Horizontal).





COMPARISONS BETWEEN FACES MAY BE MADE TO:

- identify offenders
- identify missing persons
- confirm or refute claims of identity
- study the relationship between the skull and the overlying soft tissue
- develop diagnostic methods for facial syndromes

FACIAL LANDMARKS

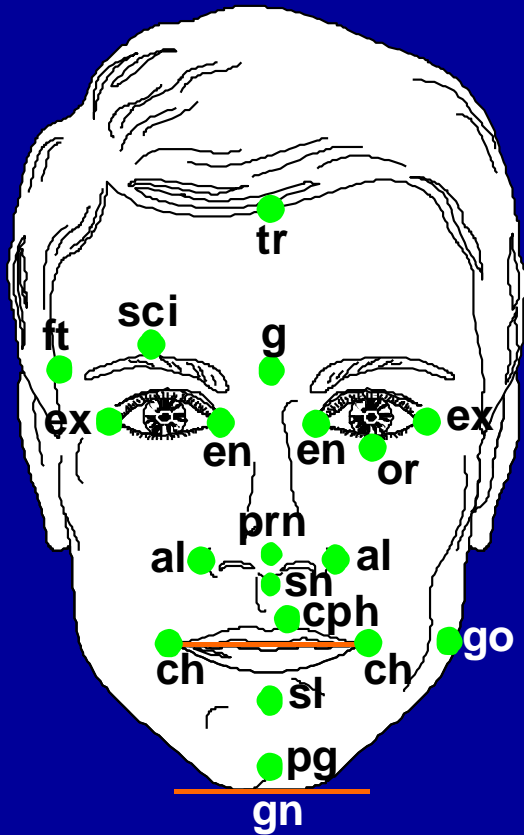
Can be used:

- to establish points of reference
- to identify features defining the cranial-facial geometry of humans
- to perform reconstructive or corrective surgery
- by forensic artists to identify the remains of individuals, or when they compose age-adjusted photographs of missing children

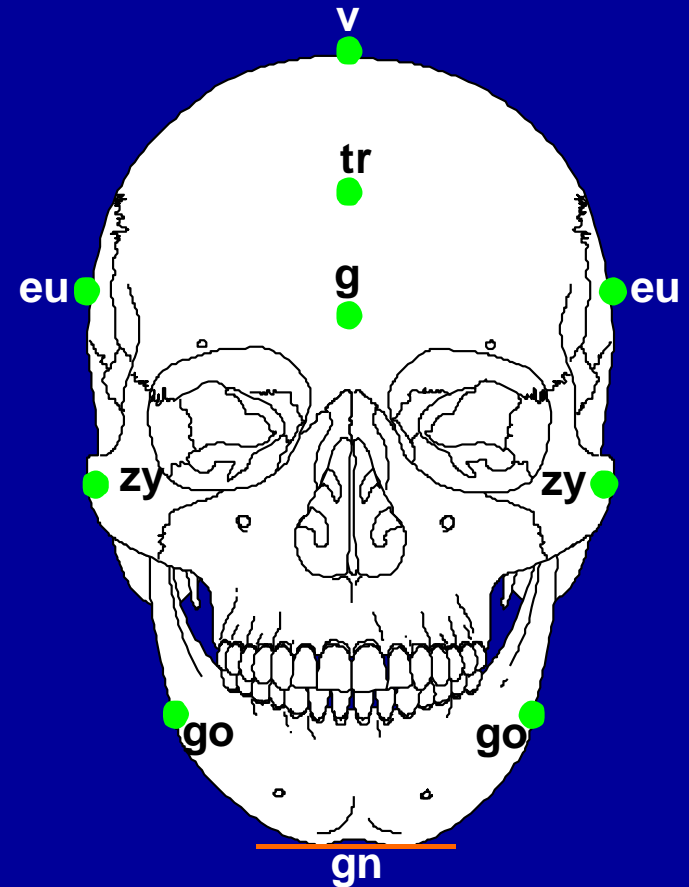
LANDMARKS

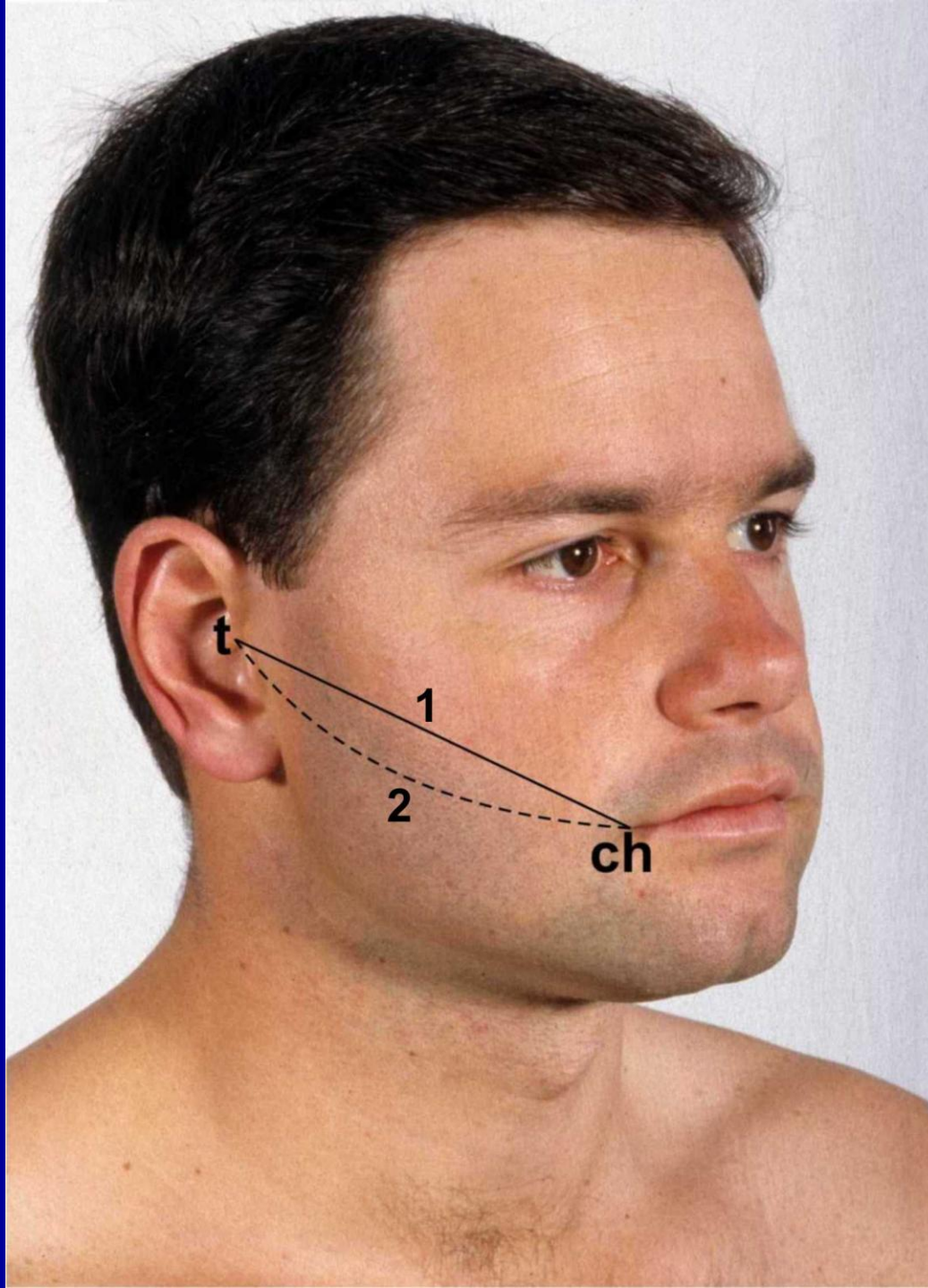
- Glabella (g)** the most prominent midline point between the eyebrows and is identical to the bony glabella on the frontal bone
- Trichion (tr)** the point on the hairline in the midline of the forehead.
- Eurion (eu)** the most prominent lateral point on each side of the skull in the area of the parietal and temporal bones
- Vertex (v)** the highest point of the head when the head is oriented in the FH

CRANIOFACIAL SURFACE / SKELETON LANDMARKS



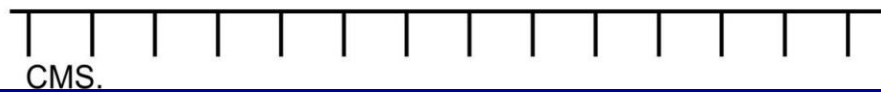
v	vertex
tr	trichion
eu	eurion
g	glabella
zy	zygion
go	gonion
gn	gnathion
pg	pogonion
sl	sublabiale
ch	cheilion
cph	crista philtri
sn	subnasale
al	alare
prn	pronasale
or	orbitale
ex	ectocanthion
en	endocanthion
ft	frontotemporale
sci	superciliare





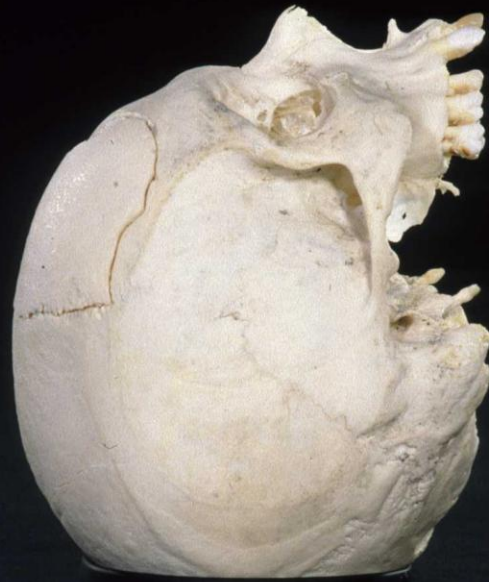
ORIENTATION

- Different angles can cause unnecessary confusion
- Consider:
 - (a) camera to the subject
 - (b) area of interest on the body
 - (c) orientation of individual body parts
 - (d) standardization rules



POSITIONING OF SKULL

- Skull holding jig
- Pan-and-tilt device
- Camera mount
- Supporting rails



PM 1778/89



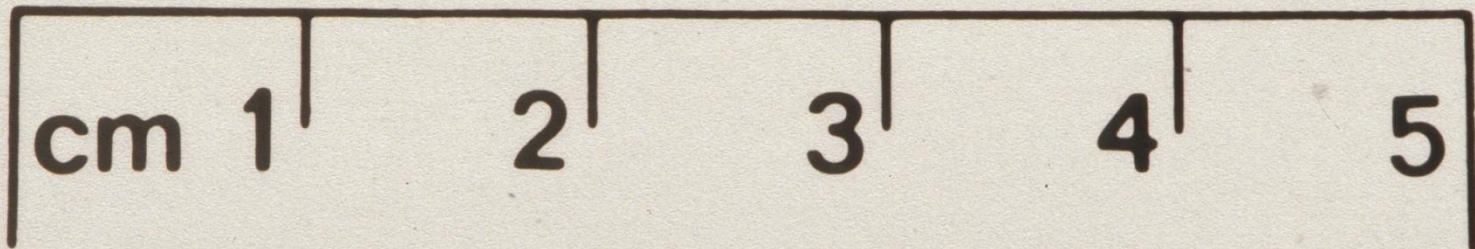
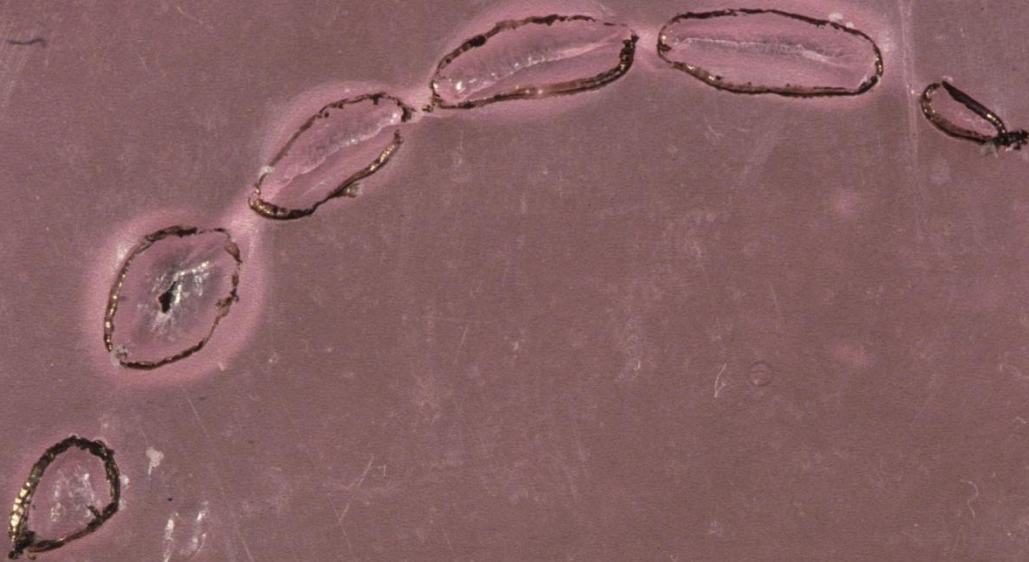
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STANDARDIZATION OF SKULL PHOTOGRAPHS IN PERSONAL IDENTIFICATIONS BY PHOTOGRAPHIC SUPERIMPOSITION

- Relationship between the image of the unidentified subject and the original photographic portrait
- Central projection (distance between camera and the head or skull that resembles the distance of the original photograph)
- Posture
- Magnification
- Perspective

BITEMARK EVIDENCE

- Standardized photography
- Scale of reference
- Teeth models and wax base
- Overlays
- Fluorescent image analysis
- Changes in the dermal and epidermal tissues
- Toneline bitemark photography
- Use of videotape
- Use of alternative light source – 450nm



**COMPARISON PHOTOGRAPHY
BASED ON STANDARDIZATION IS
CRITICAL IN FORENSIC SCENE
RECONSTRUCTION**

- **ACCURATE MEASUREMENTS**
- **COMPARISON PURPOSES**

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