

FORENSIC IDENTITY

It is defined as the fixation, determination and establishment of the individuality of a person that may be living or dead." Identity may be.

1. Complete or Absolute identity

"This is the absolute fixation of the individuality."

2. Incomplete or incomplete identity

"This is the ascertainment of only some facts about the identity while others remain unknown." e.g.; age of a person, race of the person etc.

3. Legal identity

Here is exact fixation of the body is impossible, because he or she is unknown to the people around. Such cases are coded by a number of alphabetical letters or some other methods by the police, constitutes the legal identity.

Examples:

- A dead body, recovered at the central part of the city, being unknown is labeled and registered as body No. A.
- A second dead body recovered in some other part of the same city, if again unknown, for registering the case may be labeled as body no. B etc.

Note: Identity is essential to be established in all medico-legal and postmortem cases.

IDENTIFICATION OF A LIVING PERSON

Why forensic identity is required?

This is a police responsibility to identify the living person. Identification of a living person is required in following medicolegal cases.

A-Civil cases:

- 1- False impersonation for insurance, pension, passport etc.
- 2- School admission
- 3- Inheritance claims
- 4- Marriage
- 5- Disputed sex
- 6- Missing person
- 7- Identification of religion
- 8- Disputed paternity

B-Criminal cases: *مذہب*

- 1- Absconding soldiers and criminals.
- 2- Absconding person accused of assault, rape, murder etc.
- 3- Impersonation for financial benefit
- 4- Interchange of newborn babies in maternity hospital.
- 5- Road accident

- ... and defects ... marks, mole, harelip etc.
- tattoo marks, Occupational marks, Scar, Acquired malformation like kyphosis, multiunit fracture, Tricks of manner and habits.
- 13- Handwriting
 - 14- Clothing and laundry marks
 - 15- Ornaments and articles in pocket like dairy, visiting card etc and other personal effects, it may give social status.
 - 16- Speech, voice, accent and language
Voice may not be relied upon as it may be altered intentionally or by disease.
 - 17- Gait
 - 18- Wound on body
 - 19- Mental power, memory and education
 - 20- Dr. Siriniva's method: Based upon ECG and vector cardiogram
 - 21- Identification of previous X-rays
 - 22- Diverse information regarding presence of billiary or renal calculi, fibroid etc.
 - 23- Amount of illumination required for identification.

METHODS OF IDENTIFICATION *Imp*

Following methods may be applied to identify a person.

- ✓ Third party identification
- ✓ Subjective method
- ✓ Objective method

1. THIRD PARTY IDENTIFICATION

Third party identification is most common method of identification.

Two parties are medical examiner and the examinee. Third party may be the relatives or friend of examinee so third party is who brought the person to be examined. Third party verifies the findings on the examinee. In third party identification system following points about the relatives or friends (third party) is noted down.

- Name, address
- I.D Card no.
- Relationship with examinee

It is used in medicolegal certificate to establish identity of examinee. Also useful in autopsy work.

Police may be the 3rd party. In this case belt number \ paiti number of constable is noted.

2. SUBJECTIVE METHOD

When third party is not available this method is applied.

Morphological data of examinee is used for identification. It is a technical job done by medical practitioner. Characteristic having relation to personal identities should be recorded in fullest possible detail in medicolegal examination.

Basic information to be collected

- 1- Physical characteristic of body.
- 2- Belongings as described above.

PI parameters are divided into

- A- Body as a whole: It tells us information about, Age, sex, weight, stature etc.
- B- Various part of the body. e.g. Face, Hand etc.

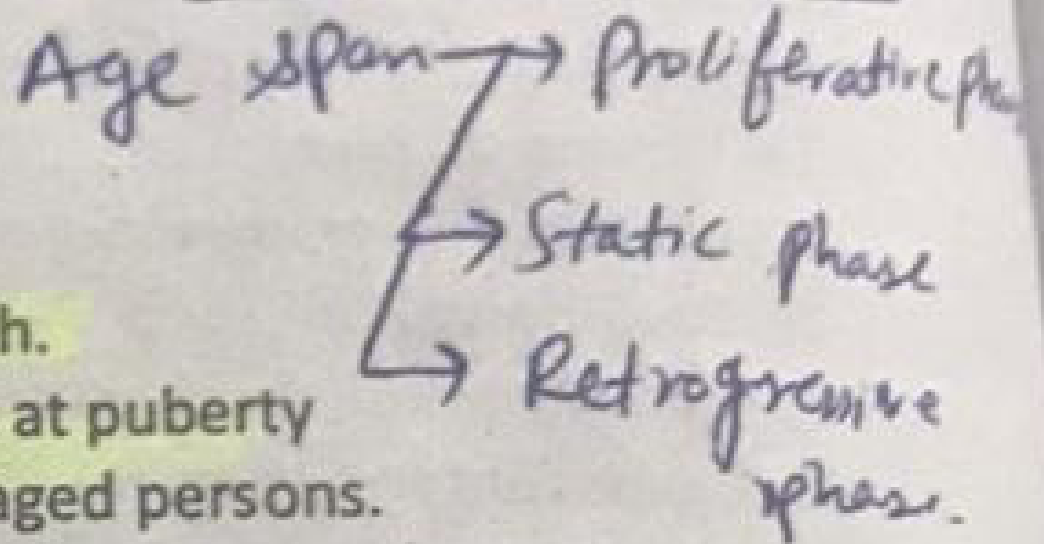
Also we can classify as

1-Anatomical Parameters

Note the followings

- (i) Shape of body.
- (ii) Primary characters at birth.
- (iii) Secondary Sex characters at puberty
- (iv) Degenerated changes in aged persons.

S) Individual Parameter.



2-Physiological Parameters

Note the

- | | | | |
|----------|-------------|-------------|-----------|
| (i) Gait | (ii) Speech | (iii) Voice | (iv) Tone |
|----------|-------------|-------------|-----------|

U) Hand writing.

3-Pathological parameters

- | | |
|--|----------------|
| (i) Scar of eczema and small pox | (ii) Landmarks |
| (iii) Calcified fibroid uterus in old female | |

4-Genetic parameters

- | | |
|-----------------|----------------|
| (i) Blood group | (ii) Barr body |
|-----------------|----------------|

3. OBJECTIVE METHOD

This is done by investigating agency.

Morphological and belonging data is utilized in this method. It is based on theory that a character having intimate association with a person in the body of a person or his belonging is sufficient to establish his identity.

e.g. Tallest boy of class, shortest boy of class, fattest boy of class

It is useful in living, dead, decomposed, and mutilated dead body.

This method is divided into,

1- Biological objective method

Hair nails & bones are examined in this method. Biological stains on the cloth are subjected to DNA analysis.

Epidermis under the nails of affected person can be tested as a clue for identity.

2- Non biological objective method

Clothes and belonging, style of dress, nametags of tailor can be examined. If a person is killed in the garden then the seeds and grass from the ground may

Classification

P.F

- Scars
- Fibroids
- Dental filling
- Nail plating

Q3

Hess's Rule:-

⇒ Squares of months of gestation gives length of fetus upto 5th months.

⇒ After this number of months are multiplied by five that gives length of fetus in (cm)

Q4 Describe Classification and Parameters of Personal Identification?

Classification of Parameters

- * Anatomical Parameters
- * Physiological Parameters
- * Pathological Parameters
- * Individual Parameters
- * Genetic parameters

a) Body as a whole

⇒ age

⇒ sex

⇒ stature

⇒ weight

b) Specific characters

⇒ Face

⇒ Nose

⇒ Lips

⇒ Cheeks.

1) Anatomical Parameters :-

- Primary

- Secondary →

- Secondary sexual characters

- degenerative changes

2) Pathological Parameters :-

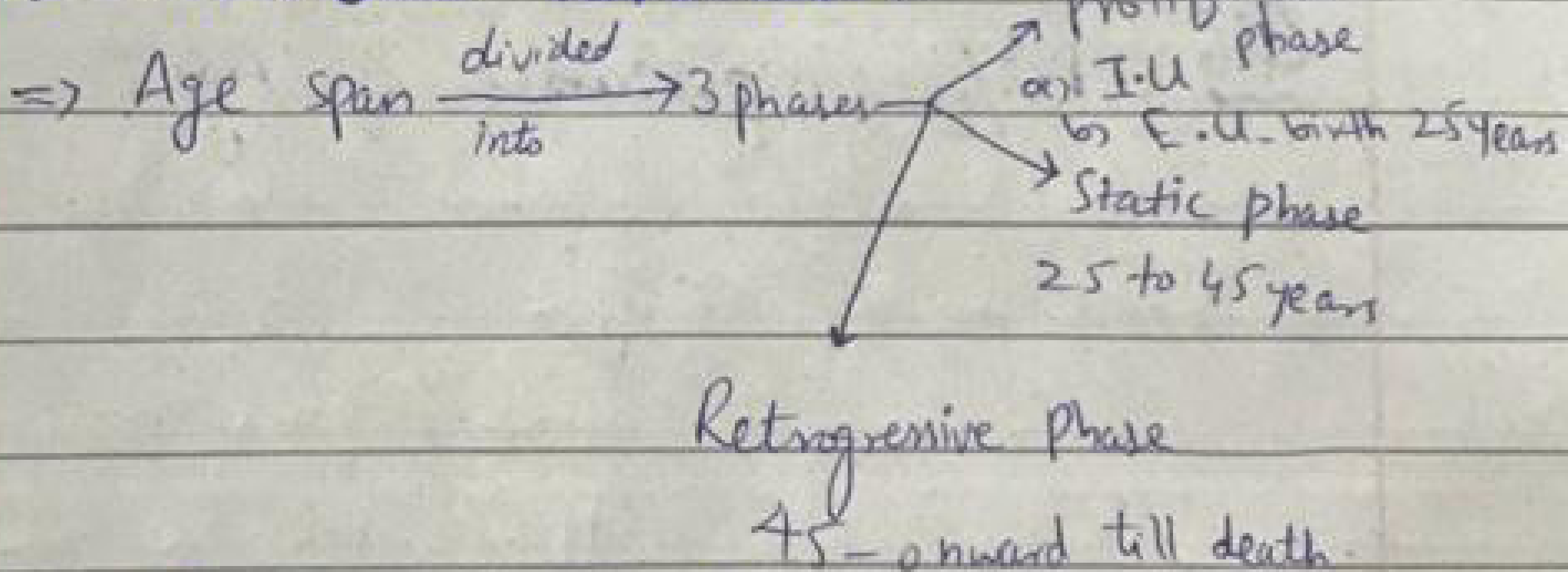
- Scars

- Nail Plating

- Dental filling

- Fibroids

3) Individual Parameter :-



4) Physiological Parameter

- Tone

- Voice

- Speech

- Hand writing

5) Genetic Parameters.

- Blood groups.

Write a short note on race? P.P.
Sense of identity and membership
in the group that shared common
language, cultural traits, religion habits

South Indian are black, European are fair colored.
Indian are brown. North Pathans of Pakistan are fair colored.

Indian have brown or dark. Europeans have blue or gray colour

thick and everted and those of European thin and inverted.

of hair

Indian have black and coarse hair and Chinese and Japanese

e.g.
Asian,
Negro,
European.

What is the importance of
Cephalic Index in Personal
Identification?
Cephalic index:-

$$\Rightarrow CI = \frac{\text{Maximum Transverse Breadth}}{\text{Maximum Anteroposterior length}} \times 100$$

MTB = one mastoid to other
mastoid

MAL = glabella to occipital protuberance.

How will you determine race from skull:-

DOLICO cephalic or Long headed \Rightarrow black
(70 - 74.5)

MESATI cephalic or Medium headed
 \downarrow
Chinese & European
(75 - 79.5)

BRACHY cephalic or Short headed \Rightarrow Mongoloid.
(80 and above)

Q NO-1: | It can will a determine |
Race from Skull

Race can be identified from skull by examining morphology or shape of skull.

e.g

Caucasian → Rounded skull

Mongolian → Square shaped skull

Negro → Narrow skull.

Principle: It depends upon the difference in female cells.

Methods of Nuclear Sexing

- a. Barr bodies
- b. Davidson's bodies
- c. Sex chromatin pattern

a. BARR BODIES

In 1955 Mr. Barr discovered sex specific nuclear bodies in all cells of Buccal mucosa, Skin, Cartilage, Suprarenal cortex, Amniotic fluid, Hair etc.

"These are the minute condensation of nuclear chromatin (nodules of chromatin) attached to inner surface of the nuclear membranes."

Its size is 1.2 micron and shape is signet ring. This can be made out up to 2-3 weeks after death depending upon the nature of the environment in which tissues decompose. Female: 40% or more are positive (show Barr body)
Male: 90% or more are negative (do not show Barr body).

b. DAVIDSON'S BODY

In 1954 Mr. Davidson Smith discovered this drumstick like body.

"It is a thin, stalked, drumstick like projection of polymorph nucleus of feminine trait of WBC's."

Importance: - Establishes interrelationship b/w sex
It is present in females & absent in males. Its diameter is 1.5 micrometer. It may be present in 5% of males. So 500 ploys should be looked before giving result.

c. SEX CHROMATIN

Importance

Essential to regulate amount of X-linked gene product being transcribed.

Chromatin
&
inactive
X-
Chromosome

- FORENSIC IDENTITY
2. Gonadal dysgenesis
 3. True hermaphrodite
 4. Pseudo hermaphrodite

1. Gonadal Agenesis

In this condition

- Testes and ovaries never develop.
- It is detected in early fetal life.
- Nuclear sexing is chromatin negative (-ve).

2. Gonadal Dysgenesis

In this condition:

- External sexual structures are present
- Testes and ovaries fail to develop at puberty.

It is of two types:

- Klinefelter's syndrome
- Turner's syndrome

A. Klinefelter's Syndrome:

This is a condition of male in which boy grows and develops normally till puberty but then one or more of following features appear:

- Testicles remain small and firm in consistency.
- Gynaecomastia may be present
- Signs of eunuchoidism may present.
- Aspermia
- Chromatin positive
- Sex chromatin pattern is XXY or XXXY.

B. Turner's Syndrome:

It is the condition in females. They remain female till puberty, after then following symptoms appear:

- Sex infantilism
- Short stature body
- Congenital anomaly
- Amenorrhea-Sterility
- Lack of development of breast
- Scanty pubic hair
- There is no ovarian follicle
- Sex chromosome XO
- Naturally sterile

3. True Hermaphrodite or Bisexuality

In this type genitalia of the two sexes, both external and internal are present in the same individual.

Handwritten: $XXXY$ - double sex

Handwritten: Endist

Handwritten: Gonadal Dysgenesis

Handwritten: P.P

Handwritten: Menstrual

species. Surgical inference is often needed for their social rehabilitation with a particular sex.

Example: Catherine Hohman is a remarkable case; she had the sexual instincts both of a male and a female. She menstruated periodically and had seminal emissions containing spermatozoa.

4. Pseudo-Hermaphrodites

Abnormalities are confined to external organs; here one set of external genitalia is more developed than the other, which is rudimentary.

They are of two types.

- Male pseudo or Andro-gynoid

It is also called womanly man.

In these cases: -

- External appearance is of male with beard moustaches & penis and testicles are fairly developed.
- They are chromatin negative

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from the dentures; the idea about the status of the individual can be gathered.

6. Teeth as a victim of assault and weapon of offence

PP →

Tooth or teeth fracture or dislocation or even breaking of enamel is designated grievous hurt. Other injuries to the surrounding tissues are considered as simple injuries, if the tooth is intact.

Injuries produced by the teeth are abrasions or lacerations.

II. AGE DETERMINATION

- This System requires delicate instruments and well-trained operators.

3. FINGERPRINTS (Galton System or Dactylography)

Write a note on fingerprinting.

This refers to method of identification by means of digital or palmer prints. It is good and easy method for detection of crime and criminals and has superseded the Bertillon system.

History:

First used in 8th century in China by emperors as a stamp. Afterwards used by British and French. *The system was discovered by Sir Williams J Herschel in 1877.* In 1958 Churchill collector of Bengal introduced it in India. In 1892 1st case of murder was solved in Argentina through this method. Dr. Fauld has classified and recommended for crimes. Galton developed it on modern lines. In 1895 Sir Richard I.G of Calcutta started finger-printing Bureau in India. It is the most important branch of criminal investigation for detection of crime and identification of criminals.

3 Principles

- ① is an individual characteristic, no 2 individuals have been observed
- ② Remain unchanged throughout life
- ③ 12 to 16 weeks of I-U-L & complete

principle:

"It is the surest method based on principle that skin of balls of fingers, thumb, palm and foot are covered with characteristic ridges and grooves. The pattern of which makes absolute identification possible."

Characteristics of Ridges

- These are Present on epidermis and dermis since birth
- Remain permanent and constant for whole life
- Fingerprints of two different individuals do not resemble and chances of resemblance are 1:64000 millions.



Arch (A) Tented Arch (T) Whorl (W) Loop (U or R)

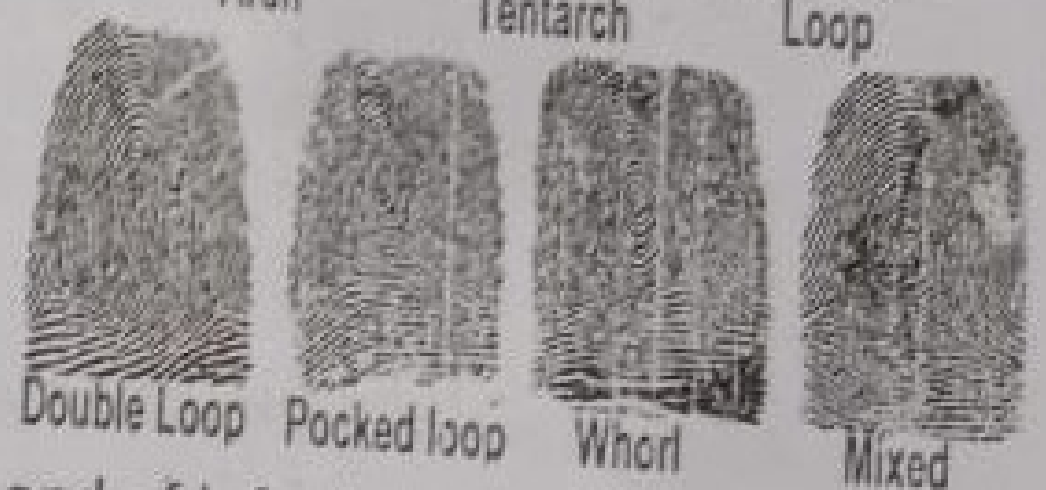
Classification of Finger Print Pattern

L W A C

- 1. Arch:** Present in 6-7 % of population. In this type ridges run from one side of the print to the other in an arch like fashion. It has no delta and no core.
- 2. Loop:** Present in 67%, most common type. Ridges in the center appear in the form of a hairpin, the ends of which point more or less in a downward slanting direction. It has one delta and one core.
- 3. Whorl:** In 25%. Circular design of ridge grouping is conspicuous. Ridges may take clockwise or anti clockwise turn, it has two deltas and one core.
- 4. Composite:** In 1-2%. Consists of two or more of the above patterns.



Arch Tented Arch Loop



Double Loop Pocked loop Whorl Mixed

Recording & Preservation of Finger Prints

- Clean finger with spirit, olive oil.
- Apply ink to make uniform film on pulp.
- Finger-prints of all ten fingers should be taken. (Preferably impression of right thumb for female and of left thumb for male)

recorded whenever

Types of F.P

- ① Visible prints :- Blood, ink
- ② Plastic prints :- soaps, waxes
- ③ Latent prints :- Naked,
visible
on polished
& smooth
surface.

Q6 M/L importance of Age? 18

(i) Criminal responsibility:-

under 7 years no offence because mind

is not guilty:-

(ii) Consent :-

under 12 years ---- no valid consent

(iii) Judicial punishment :-

Boys below 16 years

Girls below 18 years

Juvenile Court.

(iv) Marriage :-

Girls 18 years

Boys 21 years

~~Importance~~

M/L importance of age:-

* Employment:-

15 years in factory

* Criminal abortion:-

* Retirement :-

60 years

* Candidate for President :-

40 years.

Q16 Race determination from teeth:-

In blacks, A star shaped configuration is seen on occlusal surface of molars & 3rd molar is bigger than first two molars.

Q17 M/L importance of finger printing:-

- * Identification of unknown deceased person.
- * Maintenance of identity records
- * Identification of person suffering from amnesia.
- * Identification of criminals whose finger prints are found on scene of crime.
- * Detection of bank forgeries.

Q18

Types of finger printing:-

- * Visible prints

2. Plastic Prints

3. Latent Prints

Q14

M/L importance of Scar:- FD

- * Help in identity
- * Shape of scar tell type of causative weapon
- * Age of scar tell time of crime

Q15 Forensic Anatomy:-

Application of standard specific techniques of physical anthropology to the solution of matters of public concern.

Objectives:-

- * Age
- * Sex
- * Race
- * Stature
- * Poisoning
- * Time since death

Forensic

Personal Identification: P.P

Q1 Neonatal lines:-

The process of calcification has phases of activity and rest, both enamel and dentine are formed by rhythmic alternate periods of formation and rest represented in the teeth a series of fine lines in thin section when seen under microscope

Q2 Gustafson's criteria:- P.P

Age estimation from dental data over 25 years of age

- * Degree of attrition
- * Amount of secondary dentine
- * Translucency of root
- * Cementum deposits around the root
- * Periodontosis (Loosening of teeth in socket).

(11) Signs of eunuchoidism

Q12

Profiling

DNA

~~Profiling~~

- * Biological material
- * Isolate nuclei
- * Isolate DNA
- * Digest DNA with restriction endonuclease
- * Sorting of fragments
- * Separation of DNA fragments by gel electrophoresis
- * Transfer to nylon membrane.
- * Radioactive DNA probe is prepared
- * Wash
- * Autoradiography
- * Visual analysis

1. Tattoo marks
2. Scars
3. Occupational marks
4. Acquired malformations
5. Other miscellaneous features

1. TATTOO MARKS

These are designs made by multiple small puncture wounds made through skin with needle dipped in dye. Describe their design or pattern and situation color. Permanency of tattoo marks depends on type of dye and depth of penetration of body part.

Define P.P

Elimination of tattoo marks: It is done by:

1. Dermabrasion
2. Electrolysis
3. Laser (best method)
4. Surgery
5. Application of caustic soda or CO₂.
6. Eczema, small pox

Description of a tattoo

Anatomical situation, sizes, color, design and photographs.

Medicolegal importance

1. Helps in identification: Special designs, girl friend's name, birth-date, husband's name may help in revealing the identity of the individual.
2. Personal events of life: Date of marriage, service date.
3. Indicates race: Extensive tattoos on chest and limbs in Japanese and Hindus.
4. Profession/occupation: Criminals and coal miners have specific tattoos.
5. Erotic tattoos: blue bird indicates homosexuality.
6. Social status: lower society.
7. It indicates behavior and characteristics.

2. SCAR

"It is a cicatricial mark resulting from healing of an injury".

If the injury is superficial and involves only the epidermis no scar results. If the dermis is involved then scar is produced. It is fibrous tissue covered by epithelium formed as a result of healing process of a wound or injury when there has been breach of continuity in tissues.

It is devoid of hair, hair follicles, sweat glands and pigment but is slightly vascular owing to presence of few capillaries. Elastic tissue is absent in a scar. Present in linea albicantes (scar of the dermis due to skin stretching). Scar is permanent, may be removed surgically.

Time required for scar formation

It depends upon

1. Size of wound
2. Nature of wound
3. Method of treatment

Areas routinely x-rayed

- 1 • To determine age
- 2 • Children
wrist and hand
- 3 • In adults
elbow shoulder pelvis and knee
- 4 • In old
skull, vertebrae and sternum

It is a technique where a post mortem record is placed over a comparable anti mortem record for comparison.

Superimposition Photography

Photograph of the front and side view of the head of the deceased taken while he was alive are enlarged to the size as that of X-rays, photo of the skull of the deceased (recovered from fragmentary remains) all surfaces, contours, orifices are

- a. Help to identify body.
- b. Provide the actual pictures of scene of crime.
- c. Help in refreshes the memory about the findings.
- d. Help the court to understand the testimony in proper perspective.
- e. Enhances the credibility of evidence especially in reference to these observations & interpretations which are supported by them e.g. tailing of an incised wound which indicates its direction.

PARTICULAR	MALE	FEMALE
GENERAL		
Skeleton	It is comparatively bigger & stouter.	It is comparatively smaller & slender.
Muscular Ridges	It is more prominent	Less prominent
Shaft Of Long Bones	Relatively rough	Relatively smooth
Articular Surfaces & Ends	Larger	Smaller
PELVIS	<i>Male & female pelvis P.P</i>	
Bony Frame Work	Massive ✓	Less massive ✓
Shape	Deep and narrow	Shallow & wide
Ilium	Less expanded	More expanded
Ant. Superior Iliac Spine	Not widely separated	Widely separated
Pubic Arch	> 70, Narrow	=90, Wide
Ischial Tuberosities	Inverted	Everted
Obturator Foramen	Ovoid	Triangular
Greater Sciatic Notch	<90, Narrow	> 90, Wide
Pre- Auricular Sulcus	Narrow, shallow, without marked ridges	Broad & deep in parous woman
Acetabula	Wider and deeper	Narrower and shallower
Sacrum	Long and narrow. Well marked. Equal over entire length. Extends to 2.5 - 3 vertebral bodies.	Wide & short. Less marked. First 3 segments are straight, after 3 segments it is curved. Extends to 2 - 2.5 vertebral bodies.
i. Promontory ii. Curve iii. Articular Surface		
<i>Helps in identification of person</i> <i>Age determination</i> <i>sex determination</i>		
FEMUR		
Head	Larger forming 2/3 of a sphere.	Smaller
Neck Shaft Angle	Obtuse (more than 90)	Right angled
SKULL		
General	Bigger, heavier, more	Smaller, lighter, less

SCIP

P.P
m/c of Pelvis