U.S. Department of Justice
Federal Bureau of Investigation

Fingerprint Training Manual

Criminal Justice Information Services Division
Identification Services Section

(REV. 12-93)

TABLE OF CONTENTS

CLASSIFICATION

1. CLASSIFICATION OF FINGERPRINTS PROVIDES FOR ORDERLY PLACING OF FINGERPRINT CARDS IN A FILE WITH SYSTEMATIC FILING OF AN ORIGINAL CARD. ANY SUBSEQUENT CARD OF THAT INDIVIDUAL FALLS IN THE SAME SECTION OF THE FILE AND A SEARCH OF THE SECTION QUICKLY YEILDS THE EARLIER RECORD.

2. THE CLASSIFICATION SYSTEM USED IN THE IDENTIFICATION SERVICES SECTION IS BASED ON THE HENRY SYSTEM. EXTENSIONS AND MODIFICATIONS WERE DEVELOPED BY THE BUREAU.

TYPES OF PATTERNS

ARCHES

PLAIN ARCH

TENTED ARCH

LOOPS

ULNAR
LOOP---RIDGES FLOW IN THE DIRECTION OF THE LITTLE FINGER.

RADIAL
LOOP---RIDGES FLOW IN THE DIRECTION OF THE THUMB.

ULNAR LOOP

ULNAR LOOP

RADIAL LOOP

RADIAL LOOP

ULNAR LOOP

RADIAL LOOP

THE ABOVE PATTERNS SHOW THE DIRECTION RIDGES FLOW IF LOCATED IN THE RIGHT HAND.

WHORLS

PLAIN WHORLS--

CENTRAL POCKET LOOP WHORLS--

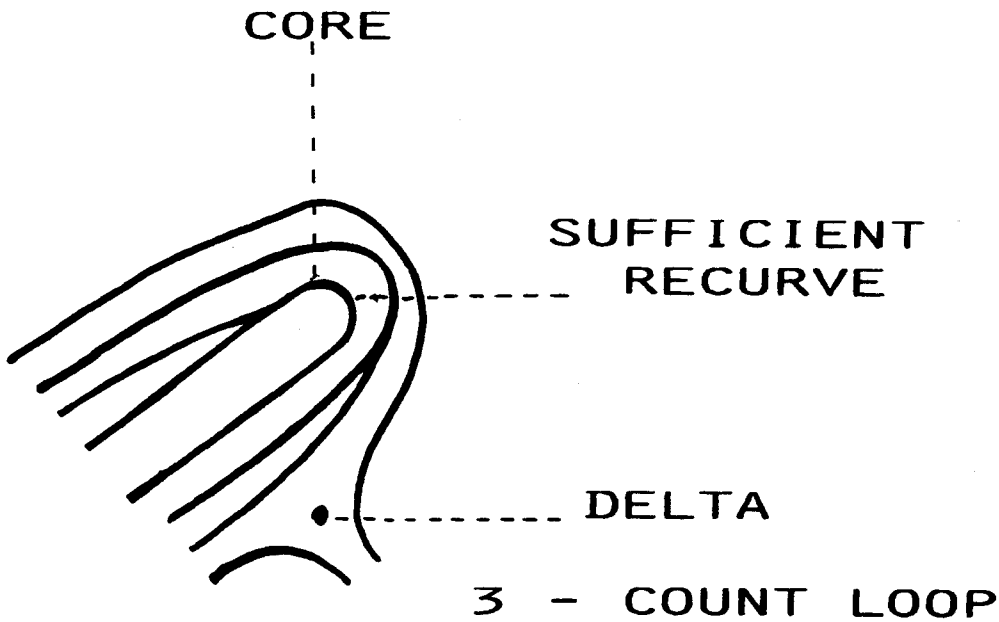
DOUBLE LOOP WHORLS--

ACCIDENTAL WHORLS--

LOOP: A LOOP IS THAT TYPE OF PATTERN IN WHICH ONE OR MORE RIDGES ENTER UPON EITHER SIDE, RECURVE, TOUCH OR PASS AN IMAGINARY LINE BETWEEN DELTA AND CORE AND PASS OUT OR TEND TO PASS OUT UPON THE SAME SIDE THE RIDGES ENTERED.

THREE BASIC REQUIREMENTS OF A LOOP:

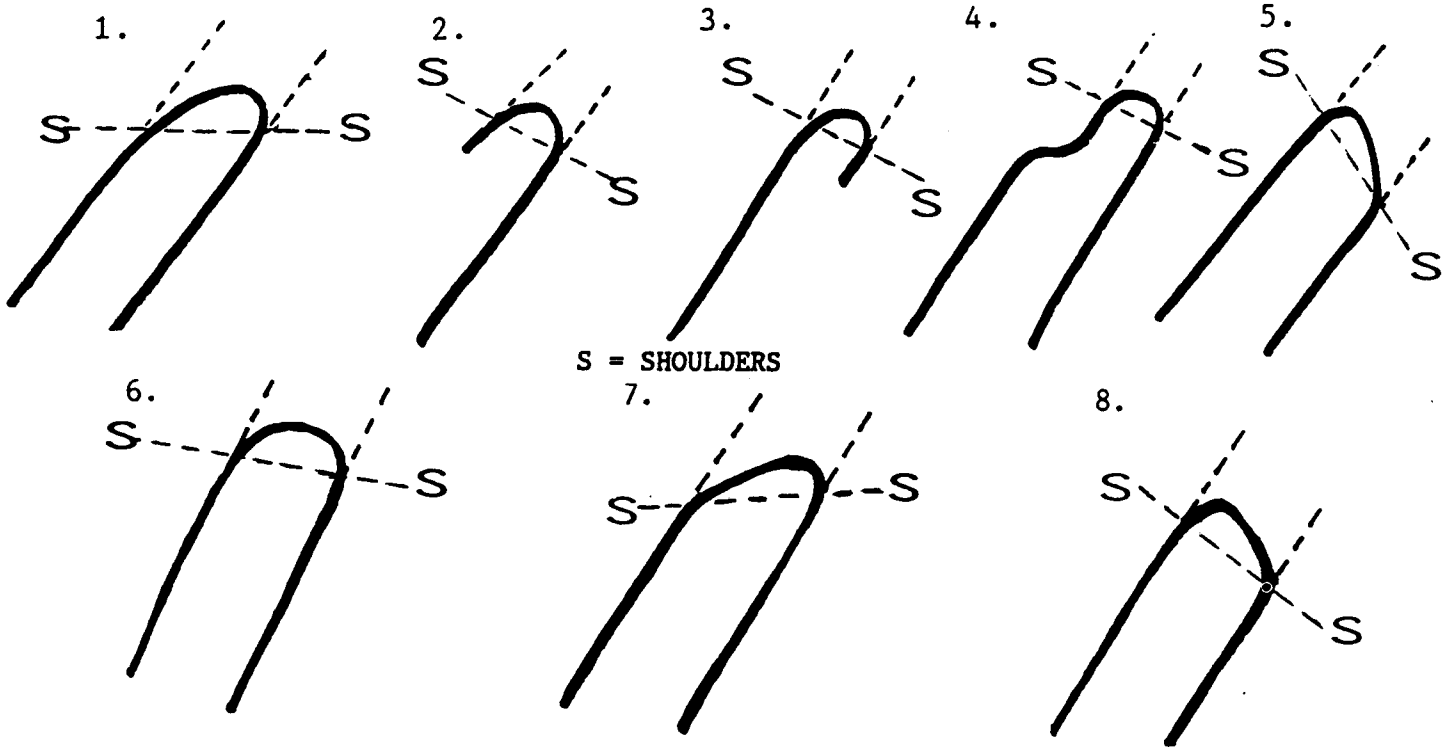
1. SUFFICIENT RECURVE
2. DELTA
3. RIDGE COUNT - ACROSS A LOOPING RIDGE



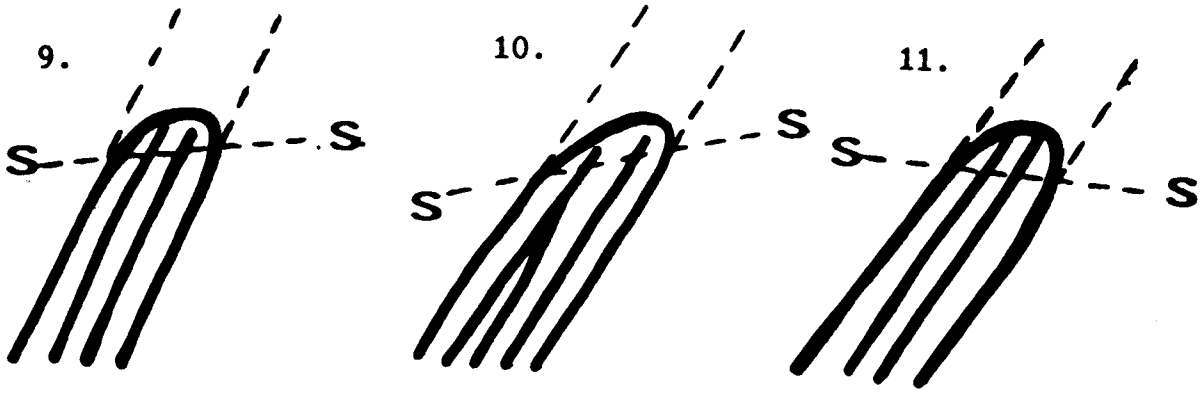
3 - COUNT LOOP

SUFFICIENT RECURVE

A SUFFICIENT RECURVE CONSISTS OF THE SPACE BETWEEN THE SHOULDERS OF A LOOP FREE OF ANY APPENDAGES WHICH ABUT UPON IT AT A RIGHT ANGLE ON THE OUTSIDE OF THE RECURVE.



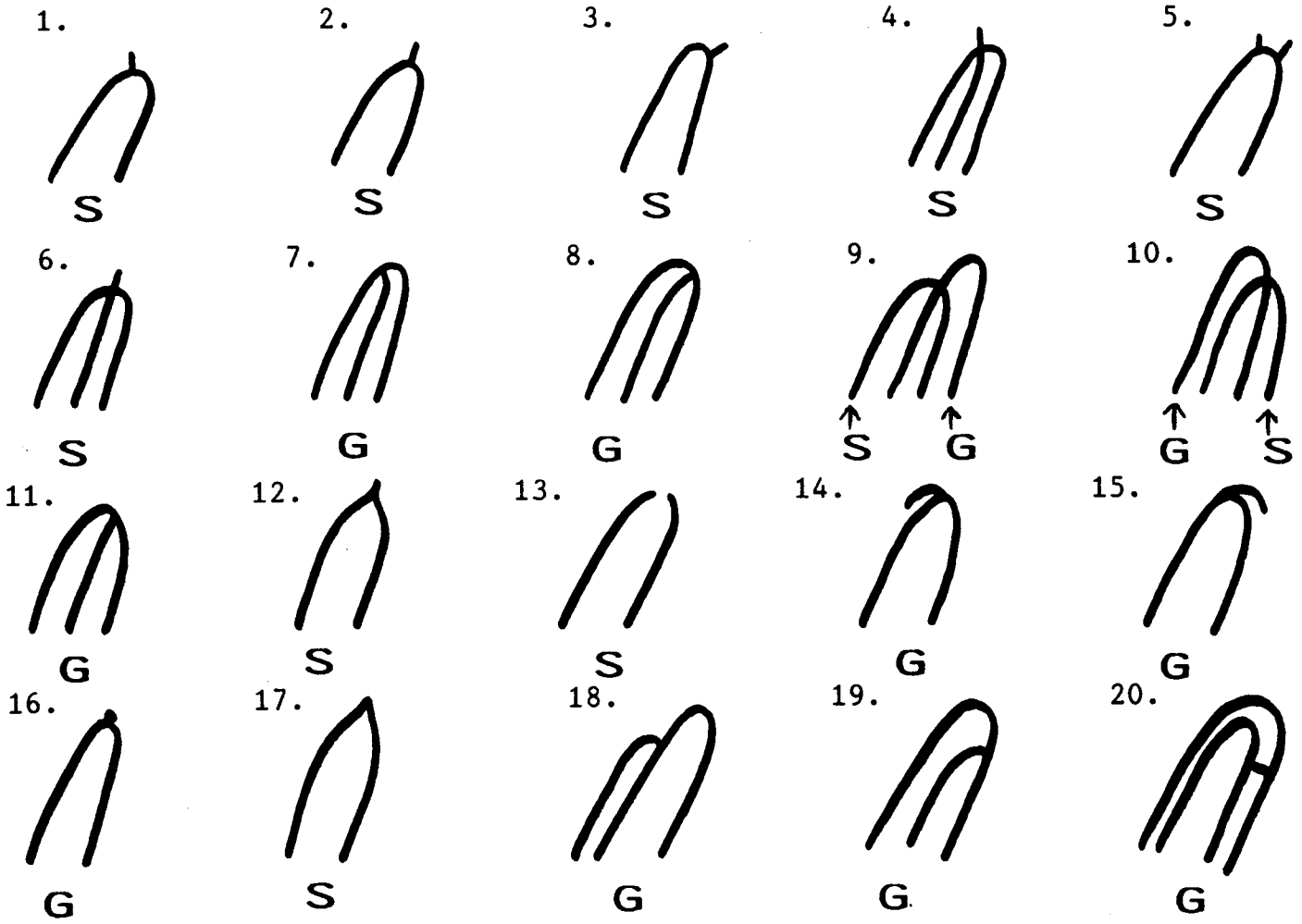
1. THE SHOULDERS OF A LOOP ARE THE POINTS AT WHICH THE RECURVING RIDGE DEFINITELY TURNS INWARD OR CURVES.



2. AN APPENDAGE IS AN ATTACHMENT OR CONNECTION.

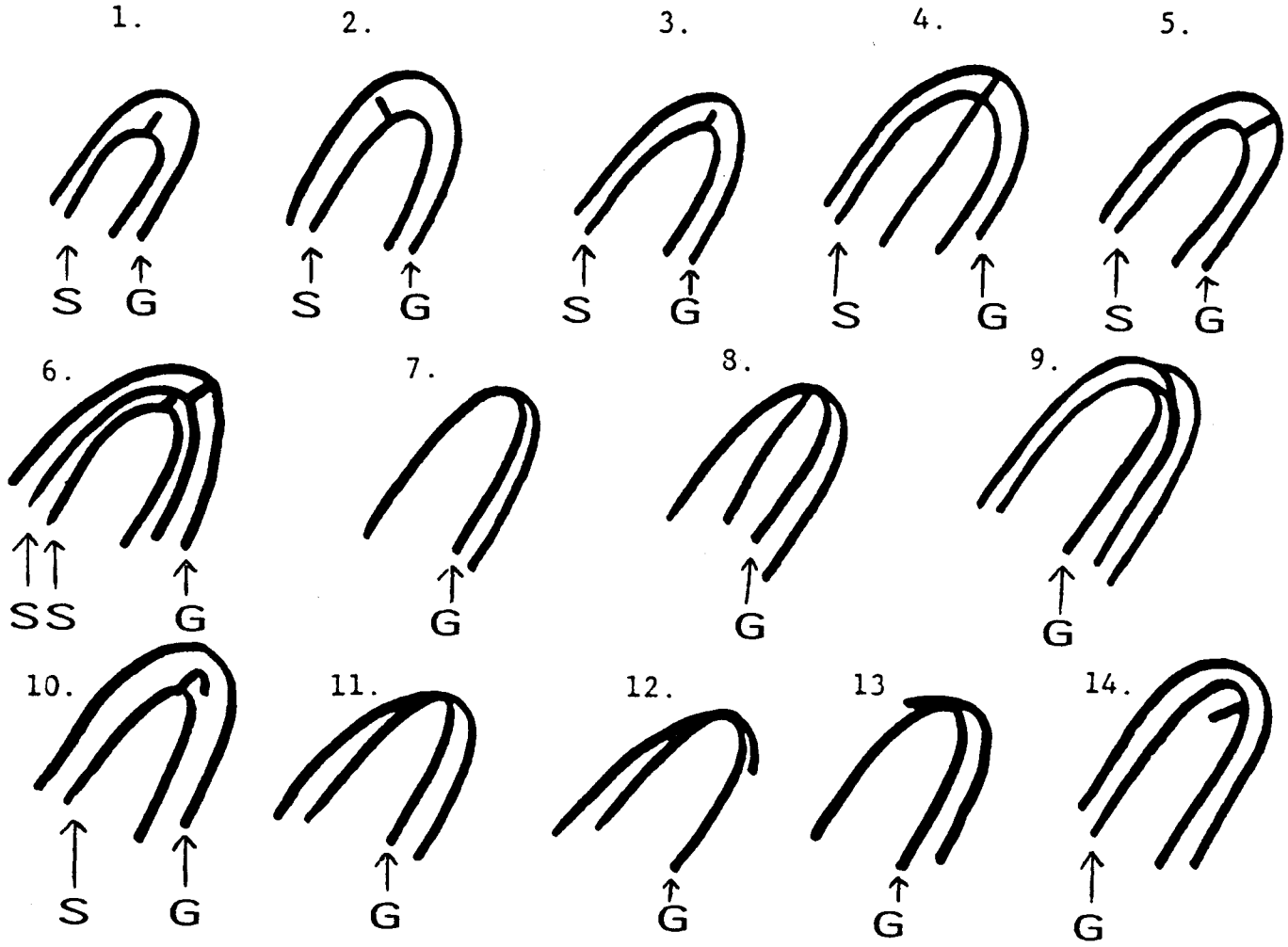
3. AN APPENDAGE STRIKING THE OUTSIDE OF THE RECURVE AT A RIGHT ANGLE WILL SPOIL THAT RECURVE.

S-SPOILED G-GOOD



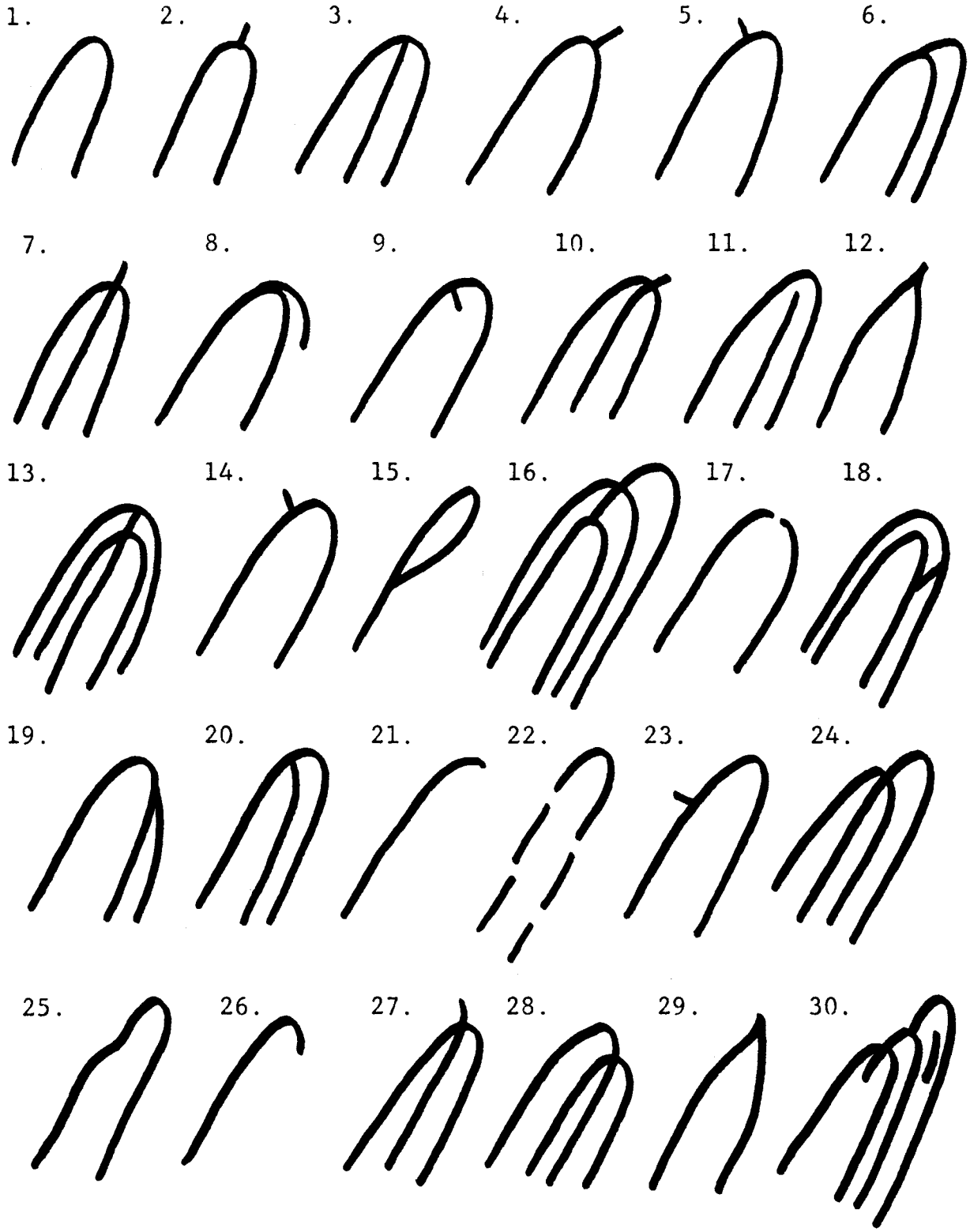
4. TEST FOR APPENDAGE. IF YOU CAN TRACE AROUND THE RECURVE, AND THE APPENDAGE FLOWS OFF SMOOTHLY, IT DOES NOT SPOIL THE RECURVE, WHEN A RECURVE IS SPOILED, USE THE NEXT RECURVE OUTSIDE OF IT, IF IT IS FREE OF APPENDAGES.

5. AN APPENDAGE MAY FORM A NEW LOOP.



TWO FOCAL POINTS OF A LOOP ARE THE DELTA AND CORE.

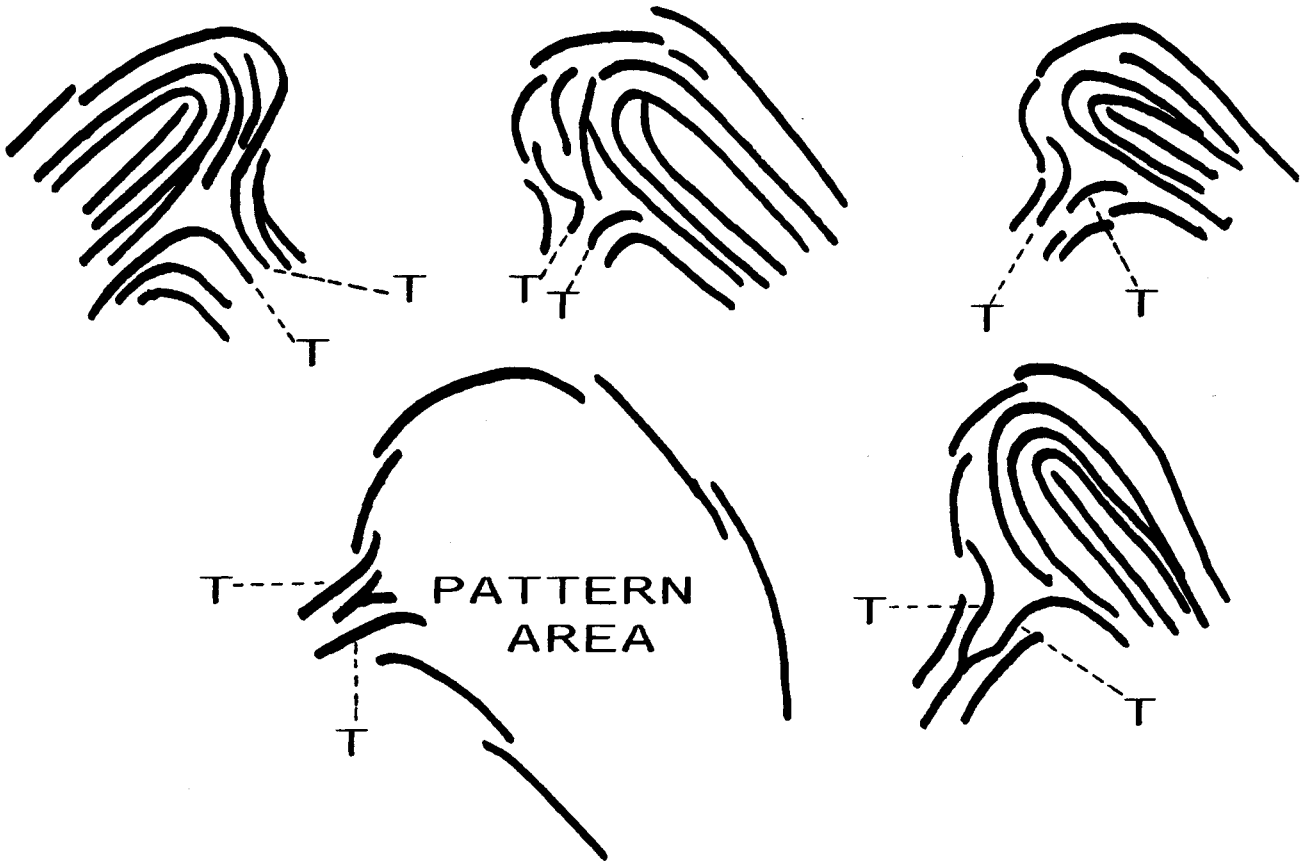
S-SPOILED G-GOOD



SUFFICIENT RECURVE QUIZ

TYPELINES

TYPELINES ARE THE TWO INNERMOST RIDGES WHICH START OR GO PARALLEL, DIVERGE, AND SURROUND OR TEND TO SURROUND THE PATTERN AREA.



PATTERN AREA INCLUDES CORE, DELTA AND RIDGES WHICH ARE USED IN THE CLASSIFICATION OF A LOOP.

1. TYPELINES ARE NOT ALWAYS TWO CONTINUOUS RIDGES, BUT ARE OFTEN BROKEN. WHEN THERE IS A DEFINITE BREAK IN A TYPELINE, THE RIDGE IMMEDIATELY OUTSIDE OF IT IS CONSIDERED AS ITS CONTINUATION.

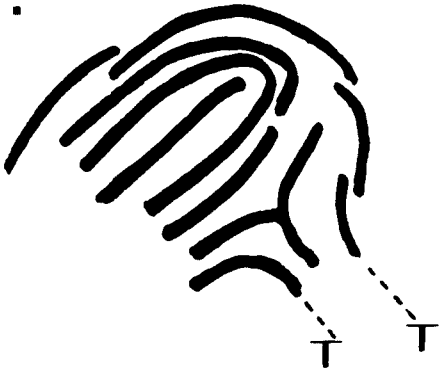
2. WHEN LOCATING TYPELINES, IT IS NECESSARY TO KEEP IN MIND THE DIFFERENCE BETWEEN A DIVERGENCE AND A BIFURCATION.

   A. A <u>DIVERGENCE</u> IS A <u>SPREADING APART</u> OF TWO LINES WHICH HAVE BEEN RUNNING PARALLEL OR NEARLY PARALLEL.

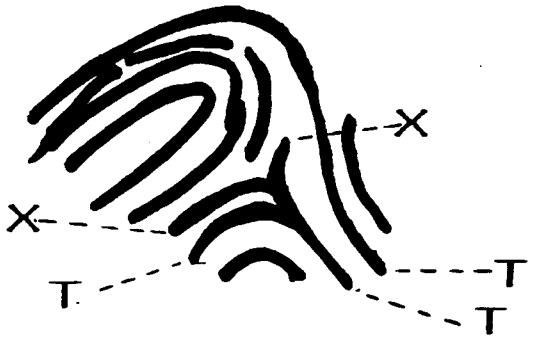
   B. A <u>BIFURCATION</u> IS THE <u>FORKING OR DIVIDING</u>, OF ONE LINE, INTO TWO OR MORE LINES.

3. THE ARMS OF A BIFURCATION ON WHICH THE DELTA IS LOCATED CAN NEVER BE USED FOR TYPELINES. (NOTE FIGURE B: X REPRESENTS ARMS OF BIFURCATION; THEREFORE, CAN NOT BE USED AS TYPELINES.)

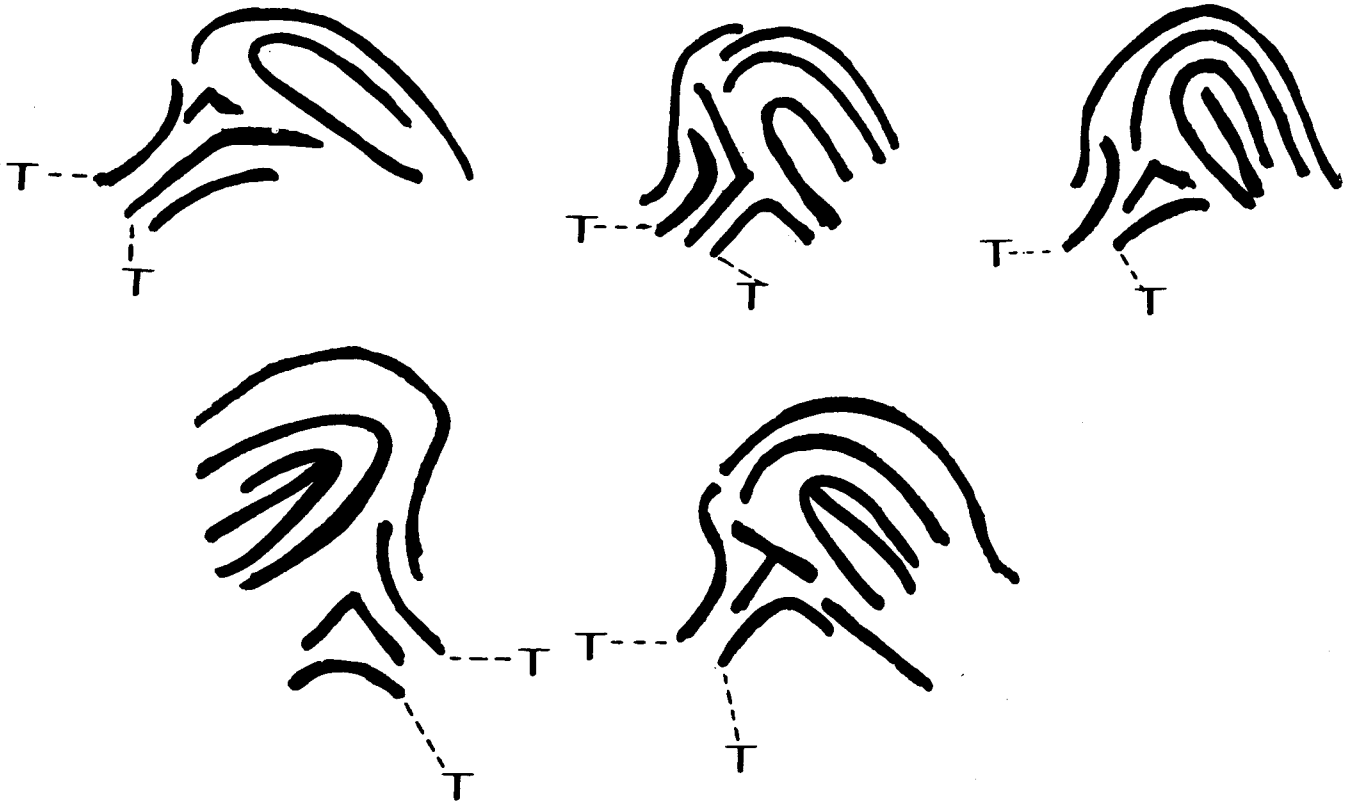
A.

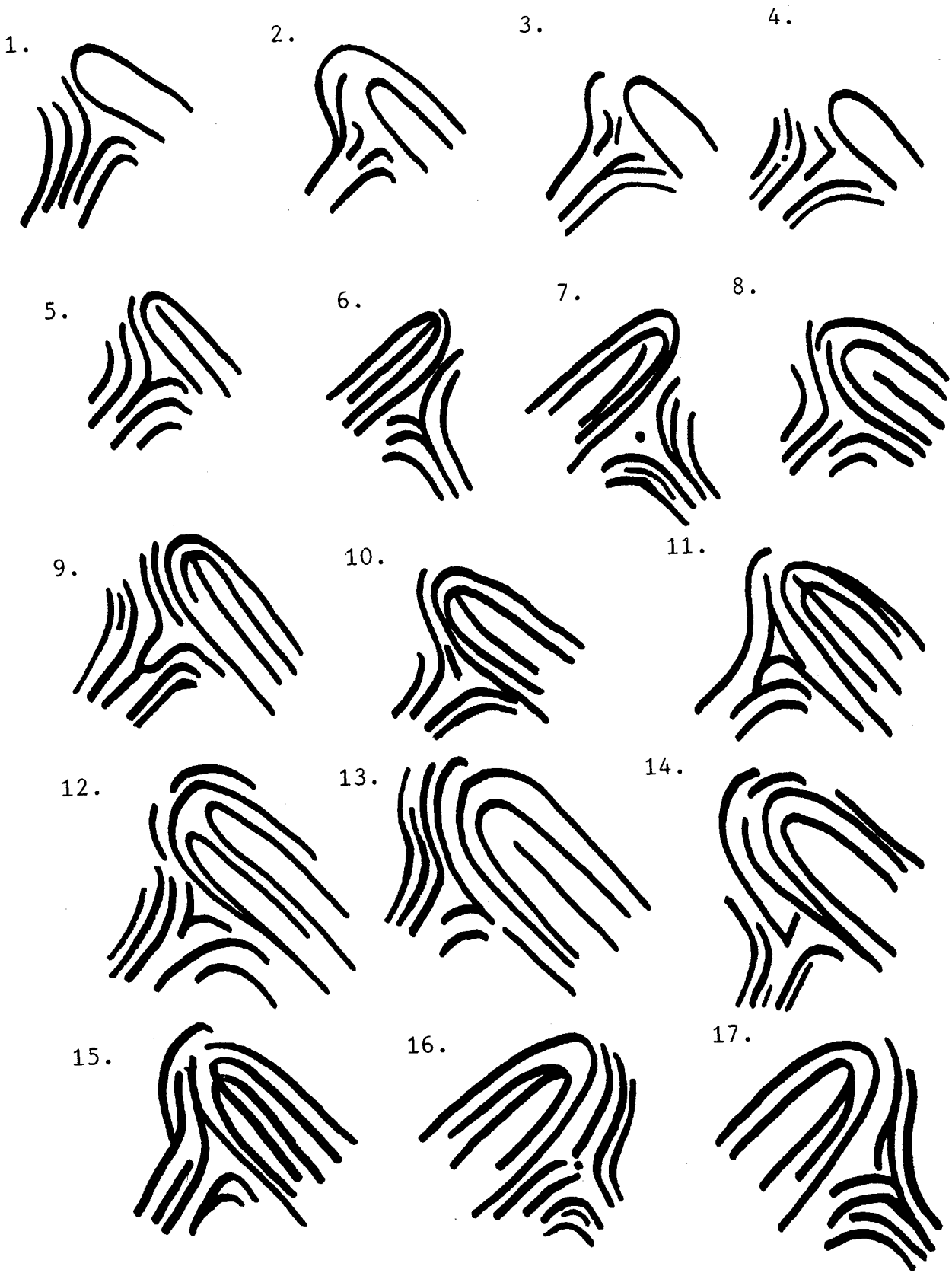


B.



4. ANGLES CAN NEVER BE USED FOR TYPE-LINES. ANGLES ARE FORMED BY THE ABUTTING OF ONE RIDGE AGAINST ANOTHER, NOT BY A SINGLE RIDGE.

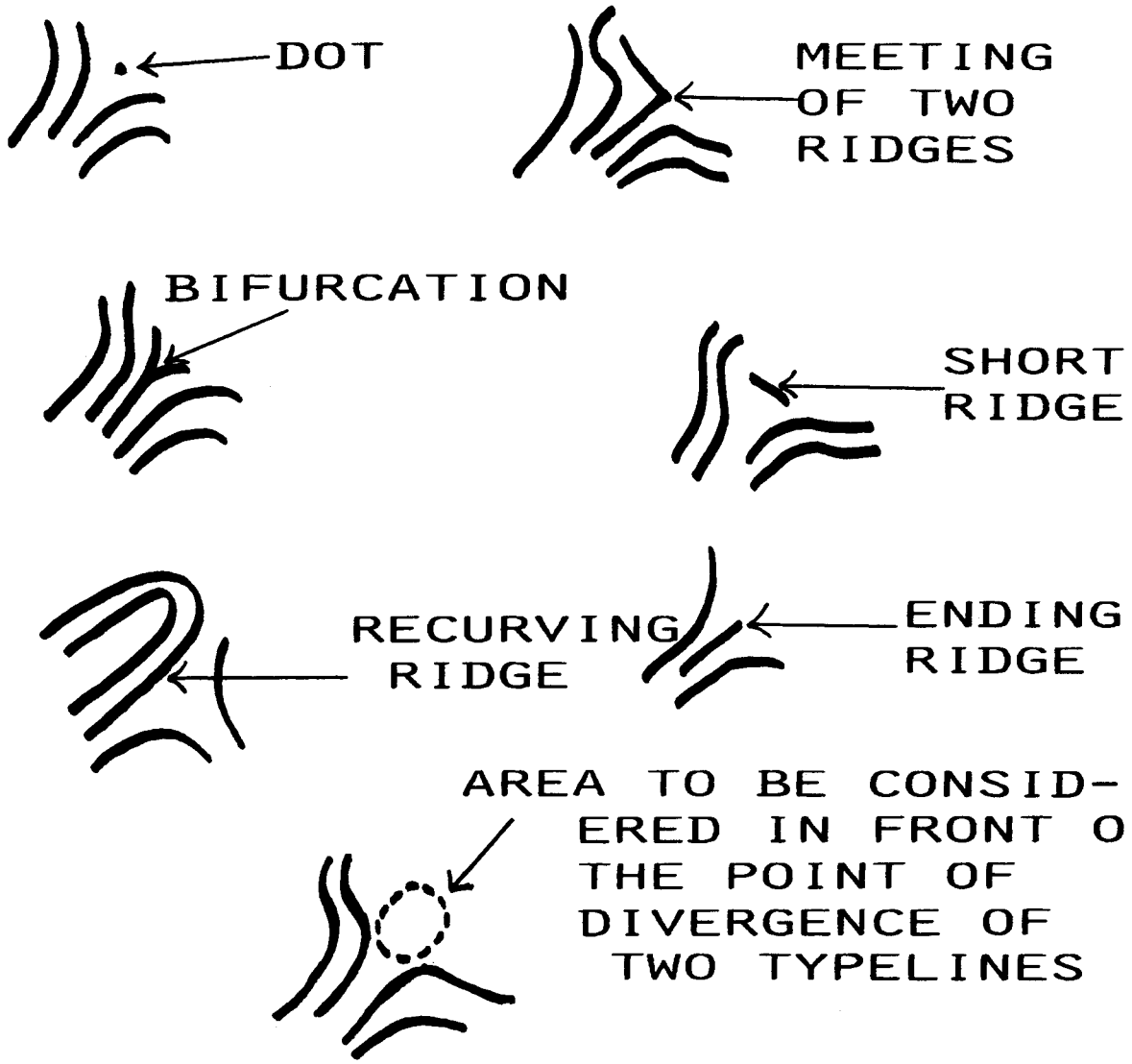




TYPELINE QUIZ

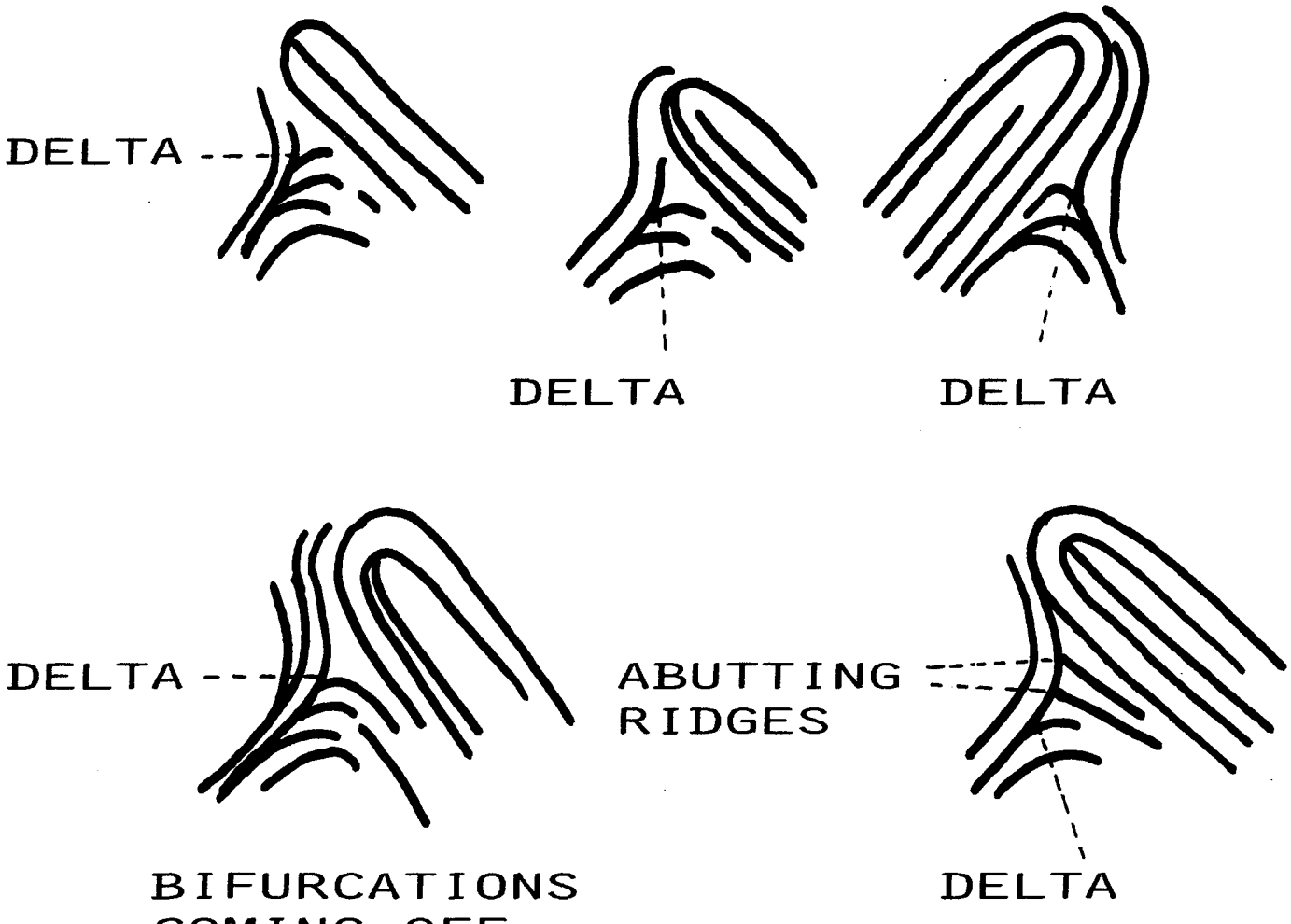
DELTA

THE DELTA IS THAT POINT ON A RIDGE AT OR NEAREST TO THE POINT OF DIVERGENCE OF TWO TYPELINES, AND LOCATED AT OR DIRECTLY IN FRONT OF THE POINT OF DIVERGENCE.



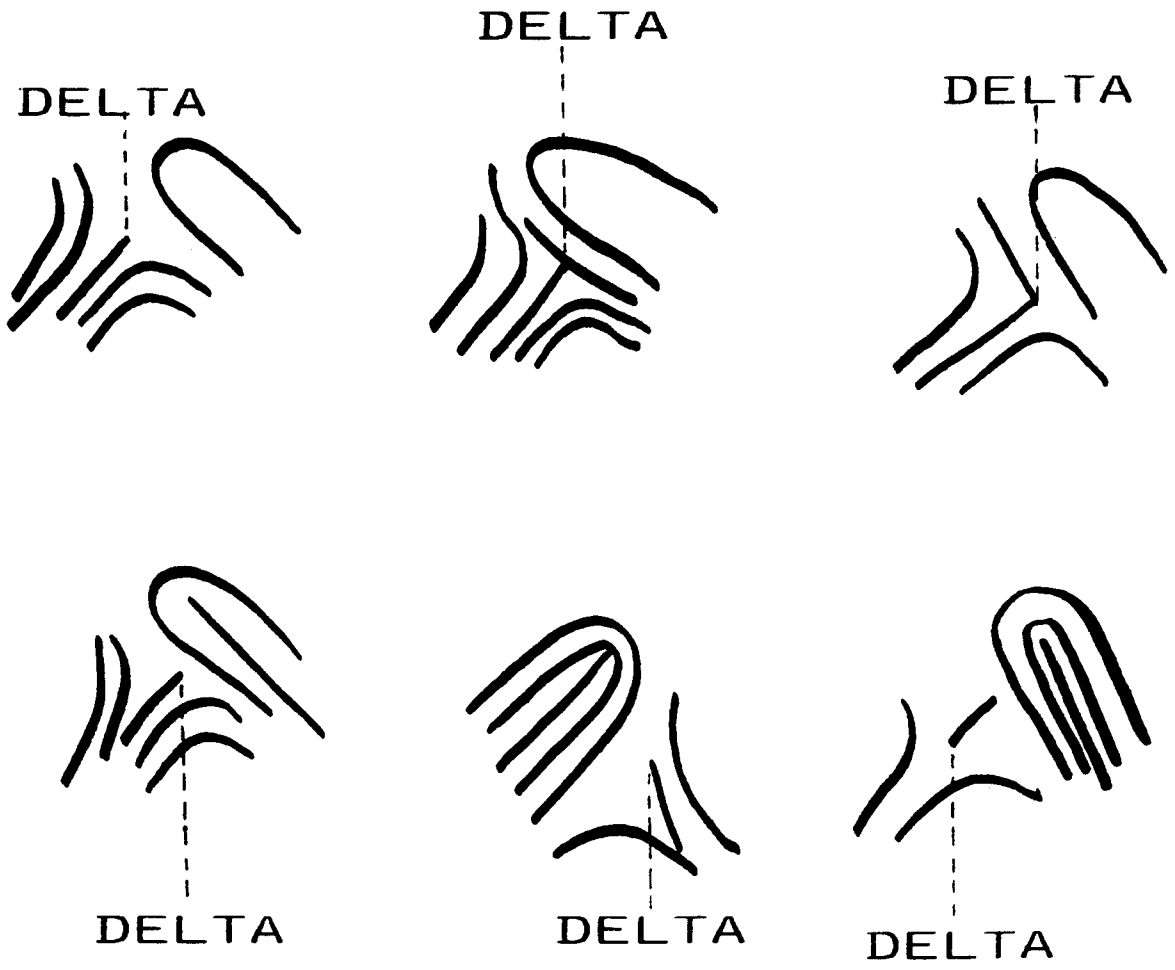
DELTA RULES

1. WHEN THERE ARE TWO OR MORE POSSIBLE BIFURCATION DELTAS WHICH CONFORM TO THE DEFINITION, THE ONE NEAREST THE CORE SHOULD BE CHOSEN.



DELTA RULES

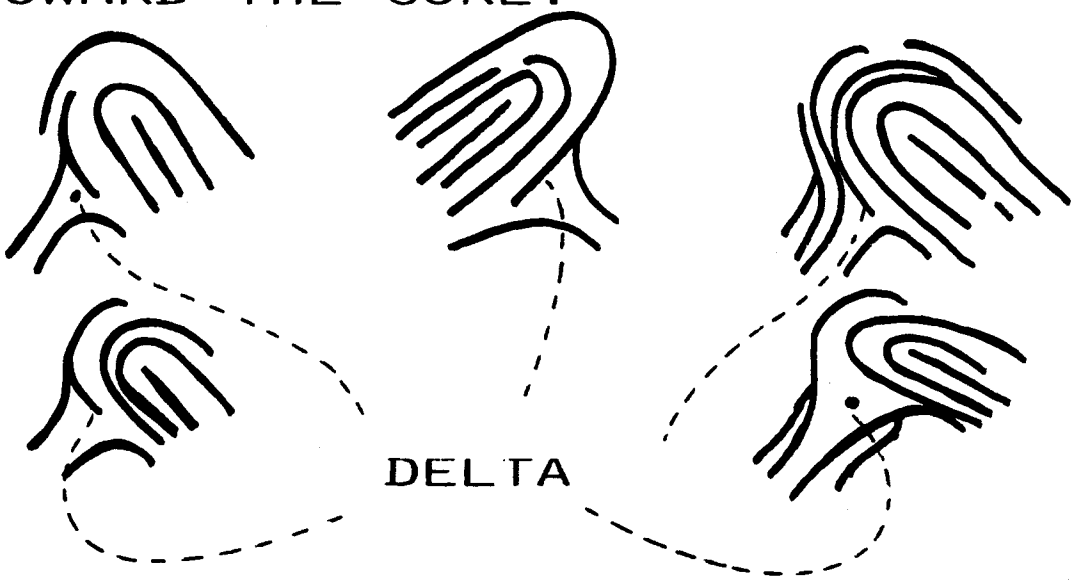
2. THE DELTA MAY NOT BE LOCATED IN THE MIDDLE OF A RIDGE RUNNING BETWEEN THE TYPELINES TOWARD THE CORE, BUT AT THE END NEAREST TO THE CORE.



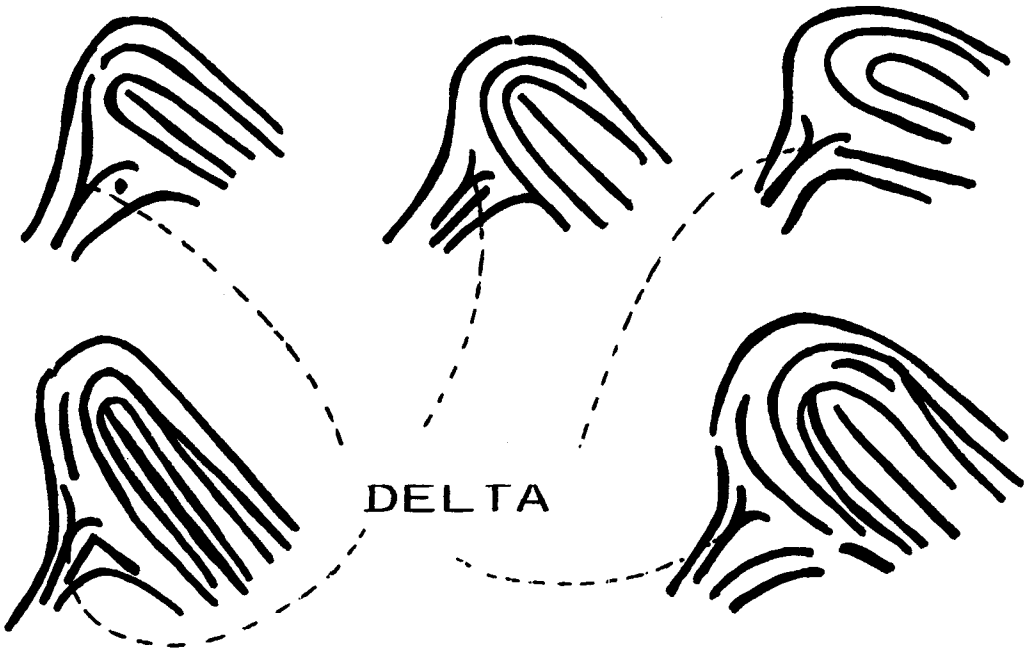
A <u>DOT</u> MAY BE USED AS A DELTA. A DOT HAS NO DIRECTION.

DELTA RULES

3. THE DELTA MAY NOT BE LOCATED AT A BIFURCATION WHICH DOES NOT OPEN TOWARD THE CORE.



4. WHERE THERE IS A CHOICE BETWEEN A BIFURCATION AND ANOTHER TYPE OF DELTA, THE BIFURCATION IS SELECTED.



1.

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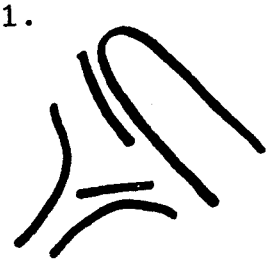
11.



12.

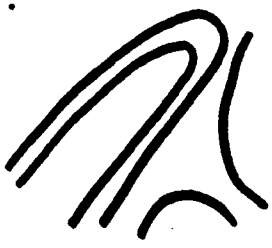
13.

14.

15.

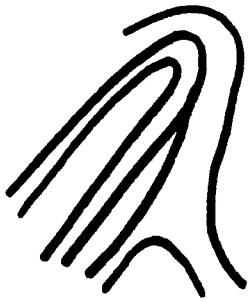
16.

17.



18.

19.



20.

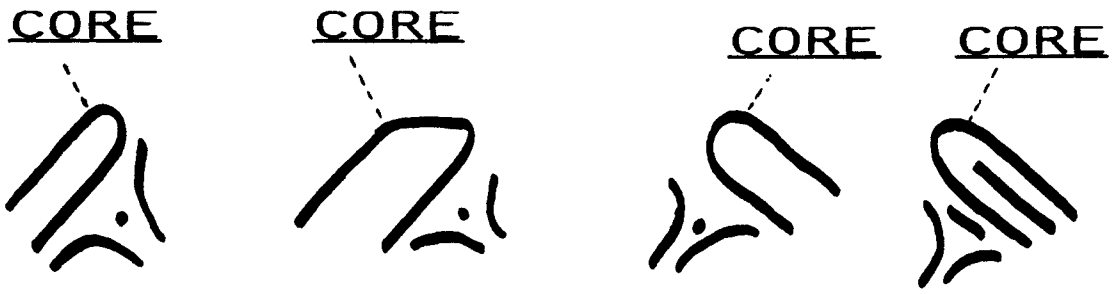
DELTA QUIZ

CORE

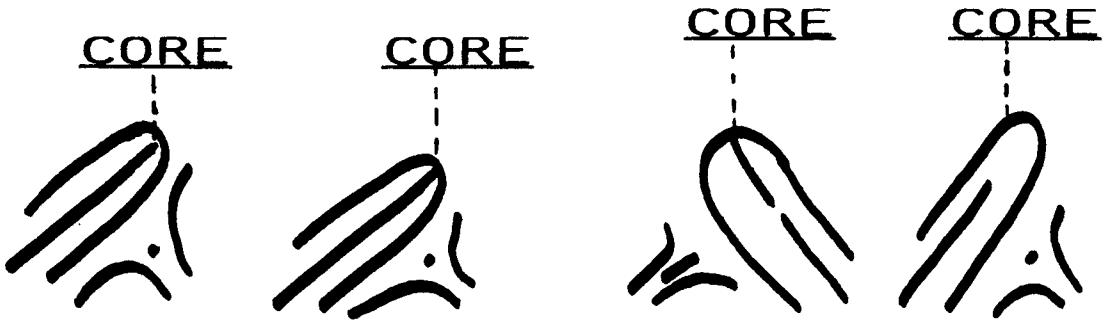
THE CORE, AS THE NAME IMPLIES, IS THE APPROXIMATE CENTER OF THE PATTERN.

THE CORE IS PLACED UPON OR WITHIN THE INNERMOST SUFFICIENT RECURVE.

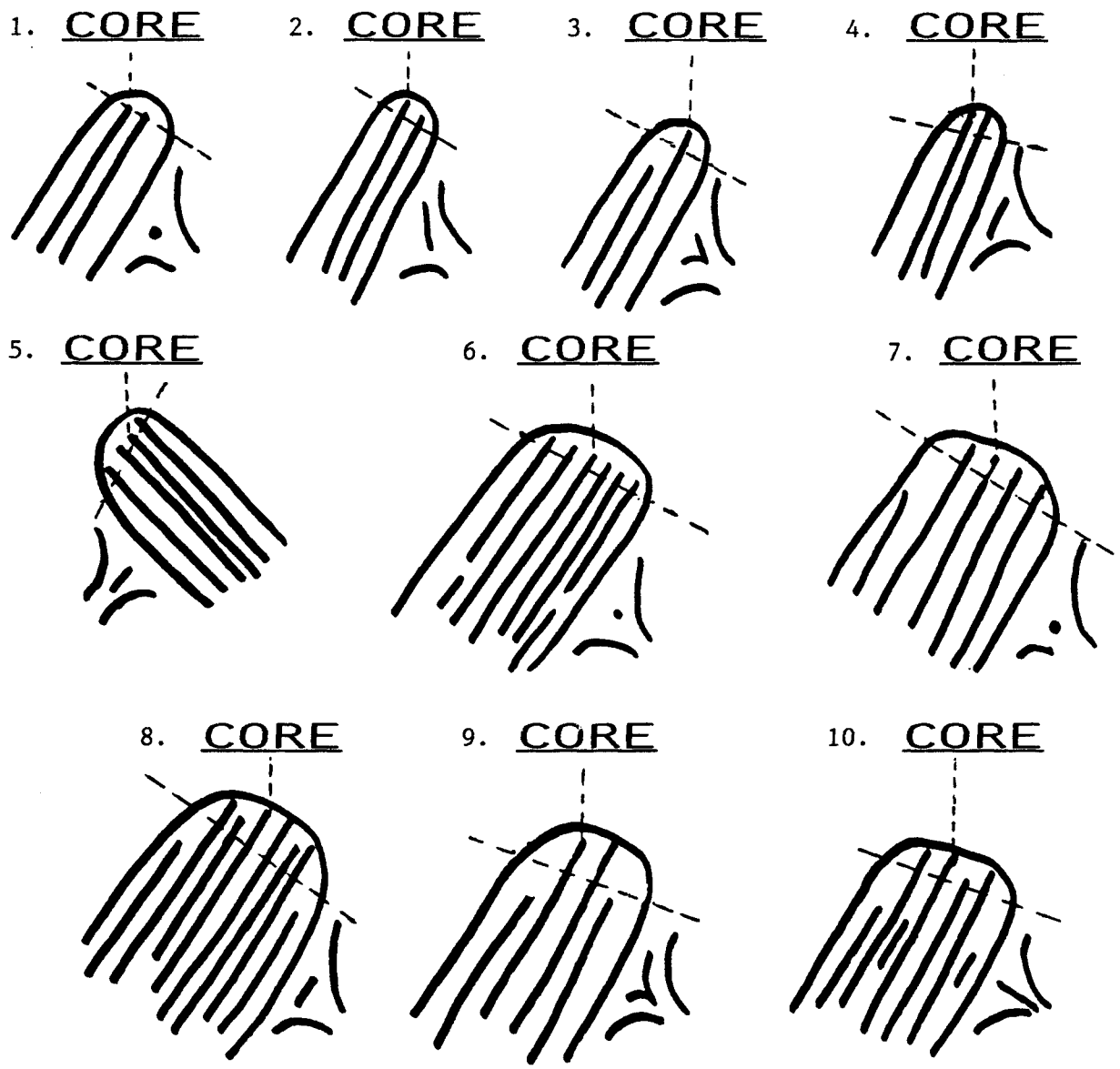
1. THE CORE IS LOCATED ON THE SHOULDER OF THE INNERMOST LOOP FARTHEST FROM THE DELTA.



2. THE CORE IS LOCATED ON THE SPIKE OR ROD IN THE CENTER OF THE INNERMOST RECURVE, PROVIDED, THE SPIKE OR ROD RISES AS HIGH AS THE SHOULDERS.



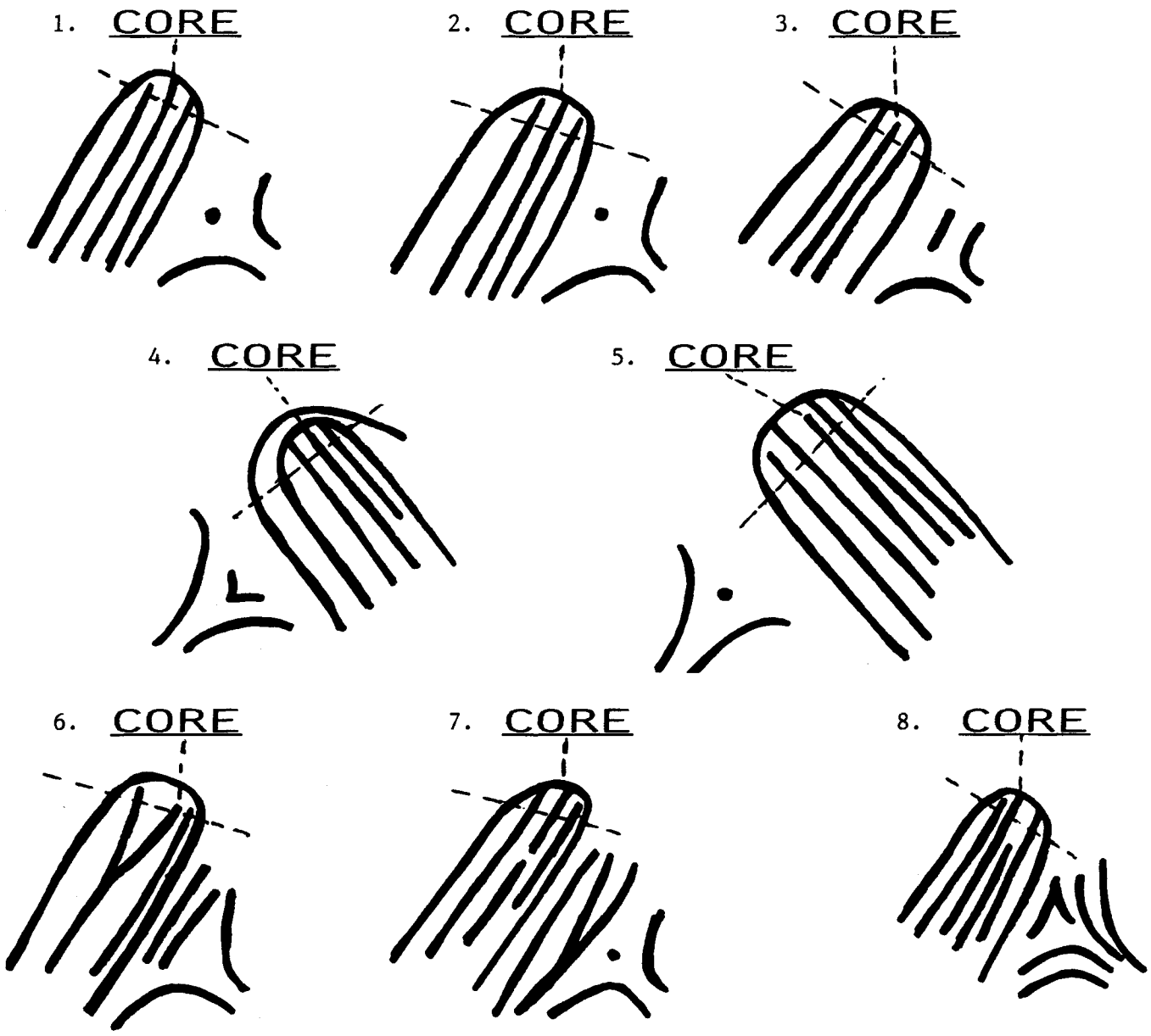
3. IF THERE ARE AN EVEN NUMBER OF SPIKES OR RODS AS HIGH AS THE SHOULDERS, THE CORE IS LOCATED ON THE END OF THE FARTHEST OF THE INNERMOST SPIKES FROM THE DELTA, WHETHER OR NOT THE SPIKE OR ROD TOUCHES THE INSIDE OF THE RECURVE.



FIRST FIND SUFFICIENT RECURVE

CORE

4. IF THERE ARE AN ODD NUMBER OF SPIKES OR RODS AS HIGH AS THE SHOULDERS, THE CORE IS LOCATED ON THE END OF THE CENTER SPIKE, WHETHER OR NOT THE SPIKE OR ROD TOUCHES THE INSIDE OF THE RECURVE.



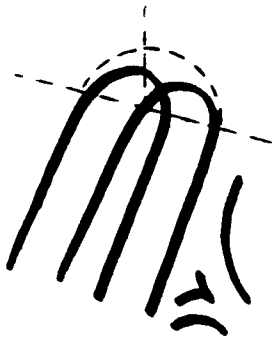
FIRST FIND SUFFICIENT RECURVE

CORE

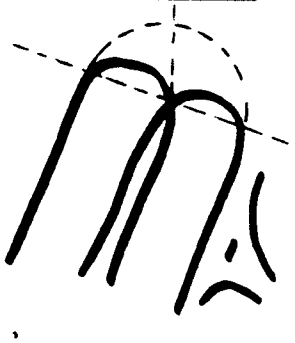
5. INTERLOCKING LOOPS:

JOIN THE TWO LOOPS TOGETHER BY AN IMAGINARY RECURVE, MAKING ONE LOOP WITH ROD OR RODS INSIDE, COUNT NUMBER OF ROD OR RODS SHOULDER HIGH IN ORDER TO LOCATE THE CORE.

1. CORE

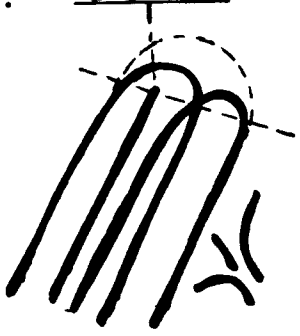


2. CORE

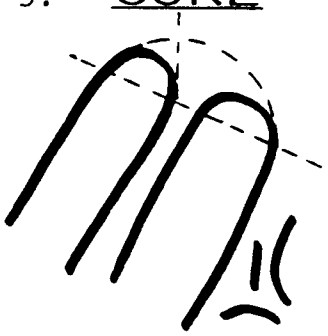


3. CORE

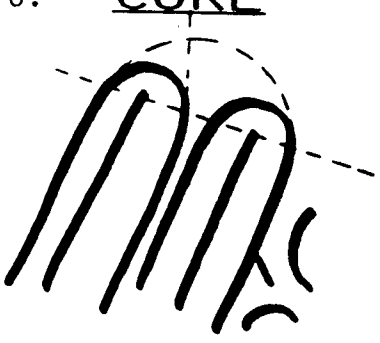
4. CORE



5. CORE



6. CORE



RIDGE COUNTING

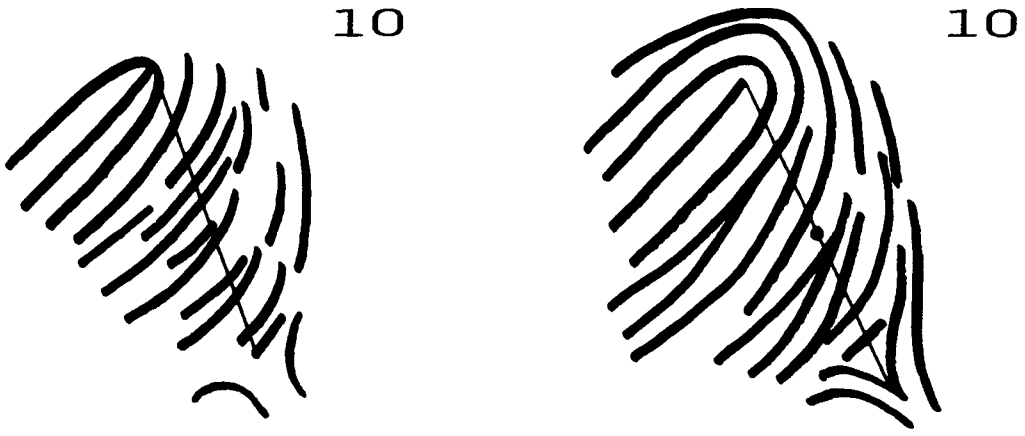
A. DRAW A LINE BETWEEN DELTA AND CORE. IF THE LINE TOUCHES OR CROSSES A RIDGE, THERE IS A RIDGE COUNT.

1. ONE RIDGE MUST BE A <u>LOOPING RIDGE</u>.

2. <u>DELTA</u> AND <u>CORE</u> ARE <u>NOT</u> <u>COUNTED</u>.

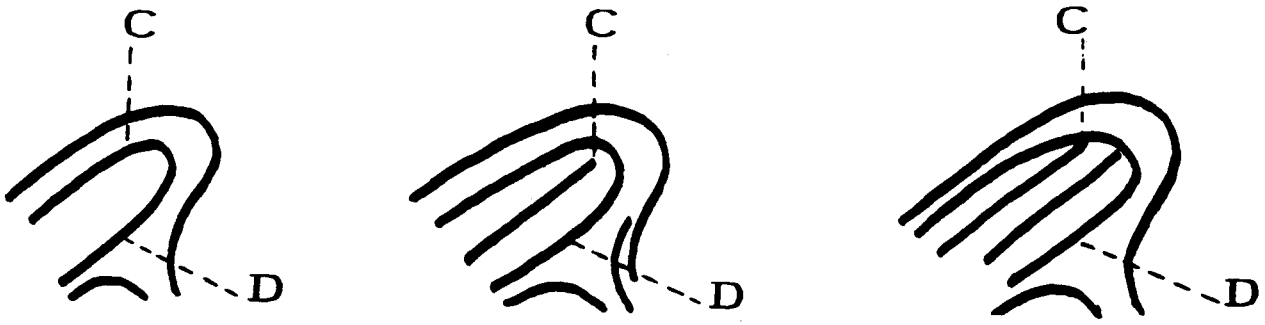
3. FRAGMENTS AND DOTS ARE COUNTED AS RIDGES ONLY IF THEY APPEAR AS THICK AS THE SURROUNDING RIDGES.

4. IF YOU CROSS A BIFURCATION, COUNT EACH OF ITS ARMS.

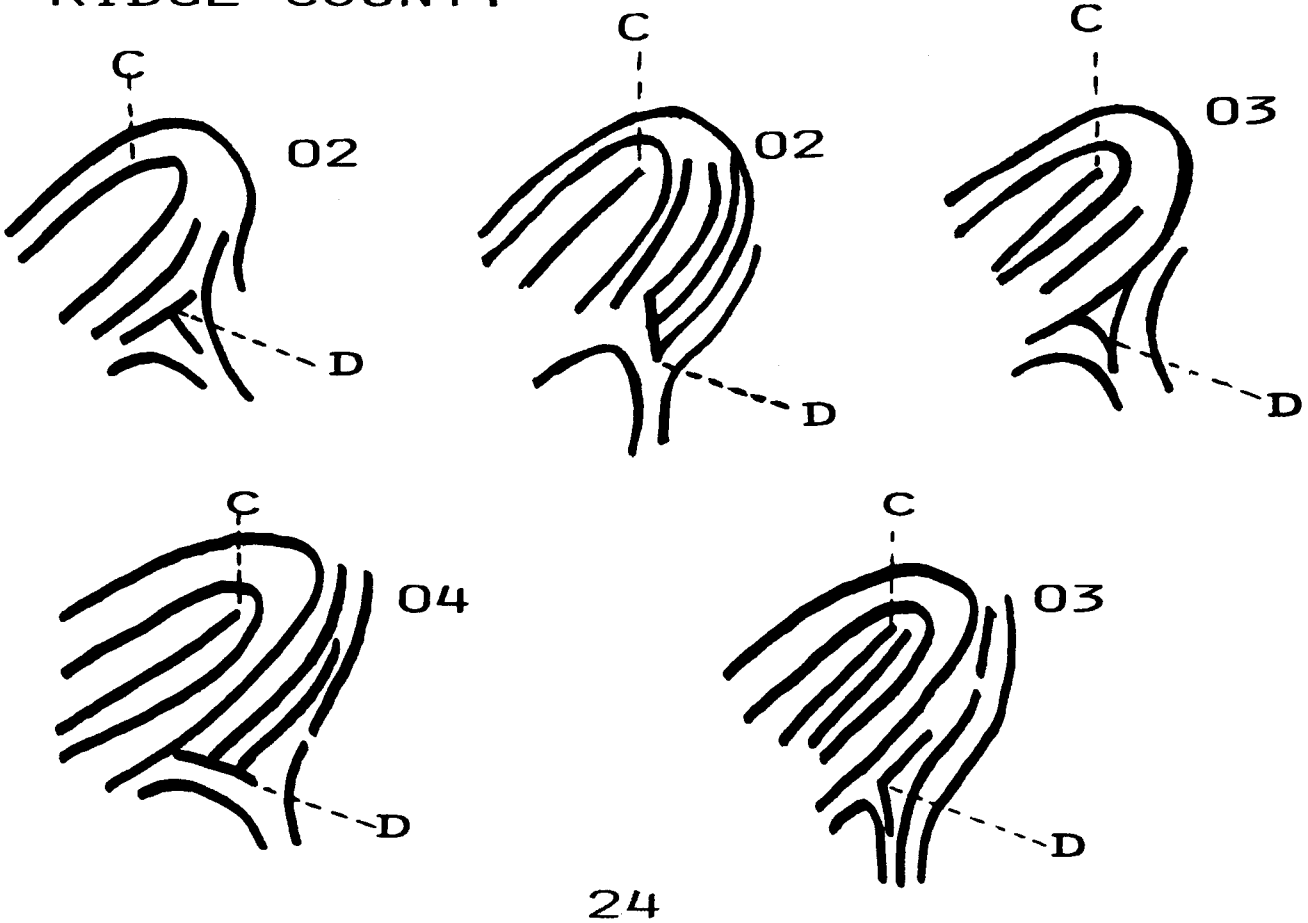


RIDGE COUNTING

5. IF THE DELTA IS LOCATED ON THE ONLY LOOPING RIDGE, THERE IS NO RIDGE COUNT.

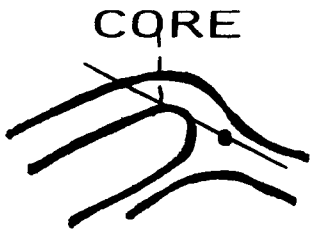


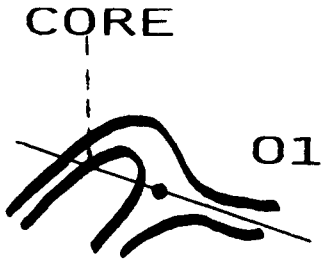
6. WHITE SPACE MUST INTERVENE BETWEEN DELTA AND THE FIRST RIDGE COUNT.



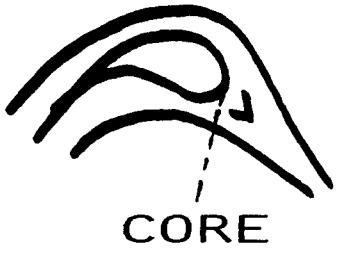
RIDGE COUNTING

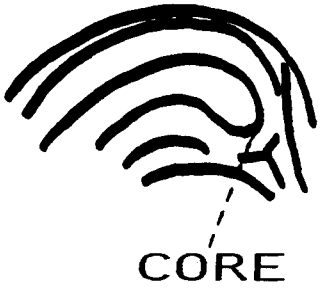
7. IF THE DELTA IS LOCATED ABOVE THE SHOULDERS OF A SINGLE LOOPING RIDGE, AND THE CORE IS ON THE SHOULDER, THERE IS NO RIDGE COUNT UNLESS THE IMAGINARY LINE <u>CUTS</u> THE <u>RECURVE</u>.



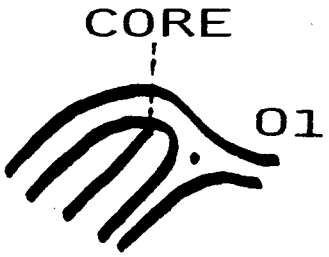


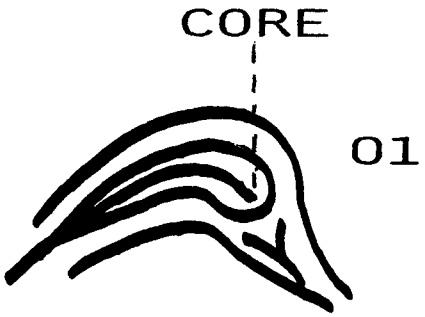
A. IF THE LOOPING RIDGE IS ABOVE THE DELTA, THE CORE IS PLACED IN THE <u>CENTER</u> OF THE RECURVE, PROVIDED THE SHOULDERS ARE OF EQUAL DISTANCE FROM THE DELTA.





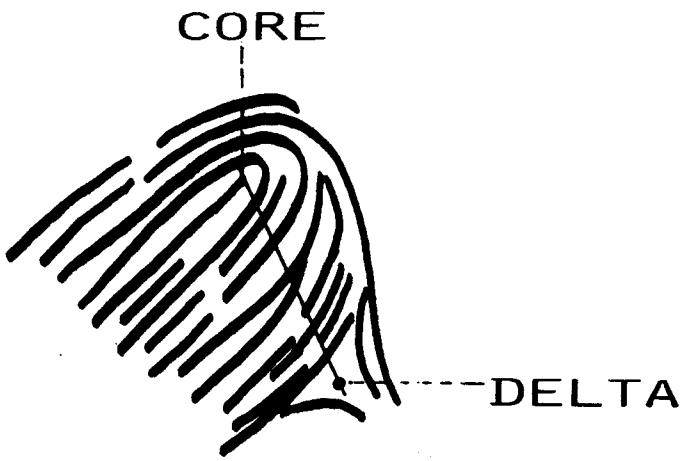
B. IF A ROD OR SPIKE IS AS HIGH AS THE SHOULDERS, THE CORE IS PLACED ON THE END OF THE ROD.



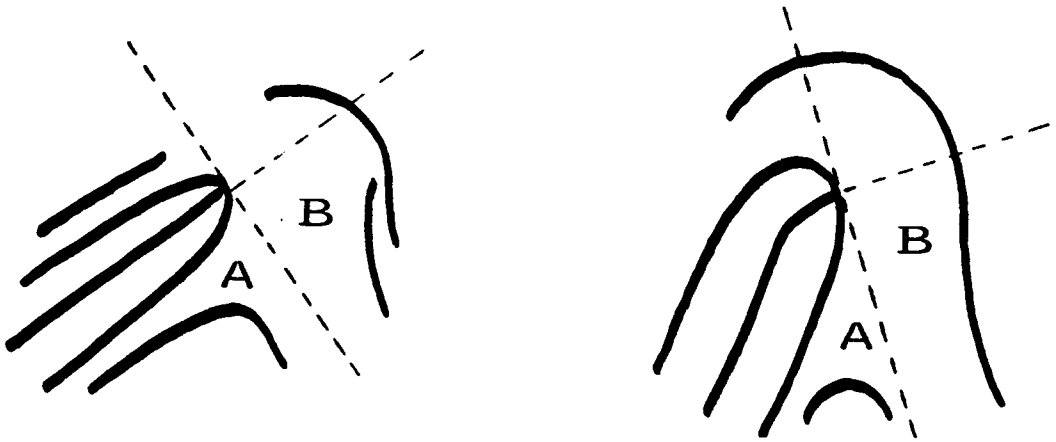


RIDGE COUNTING

8. NATURAL AND UNNATURAL BREAKS IN RIDGES. THE DISTINCTION IS UP TO THE JUDGMENT OF THE INDIVIDUAL CLASSIFIER.



9. WHEN THE CORE IS PLACED ON A SPIKE WHICH TOUCHES THE INSIDE OF THE INNERMOST SUFFICIENT RECURVING RIDGE, THE RECURVE IS INCLUDED IN THE RIDGE COUNT ONLY WHEN THE DELTA IS LOCATED BELOW A LINE DRAWN AT RIGHT ANGLES TO THE SPIKE.



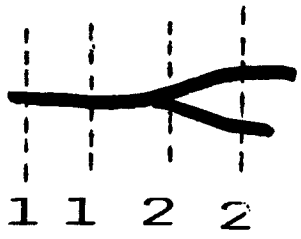
IF THE DELTA IS LOCATED IN AREA A, THE RECURVING RIDGE IS COUNTED. IF THE DELTA IS LOCATED IN AREA B, THE RECURVING RIDGE IS NOT COUNTED.

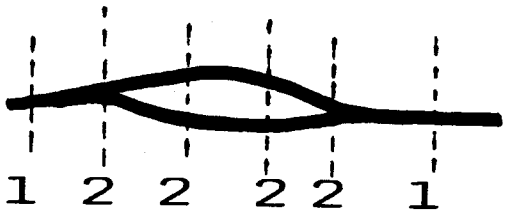
RIDGE COUNTING

1-COUNT

2-COUNTS

3-COUNTS





17-COUNTS

2-COUNTS

4-COUNTS

LOOPS

1.

12 counts

2.

2 counts

3.

6 counts

4.

16 counts

5.

7 counts

6.

20 counts

7.

1 count

8.

5 counts

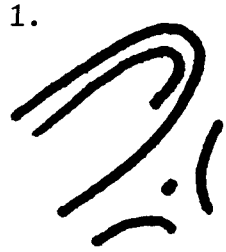
9.

15 counts

LOOP QUIZ

Circle each pattern number which meet the requirements of a loop.

1.



2.

3.

4.

5.

6.

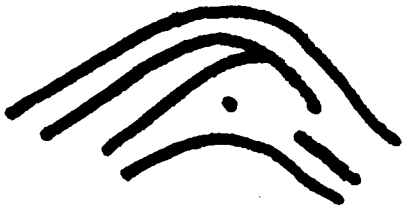
7.

8.

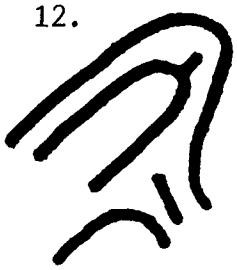
9.

10.

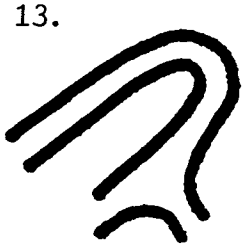
11.



12.



13.



14.

15.

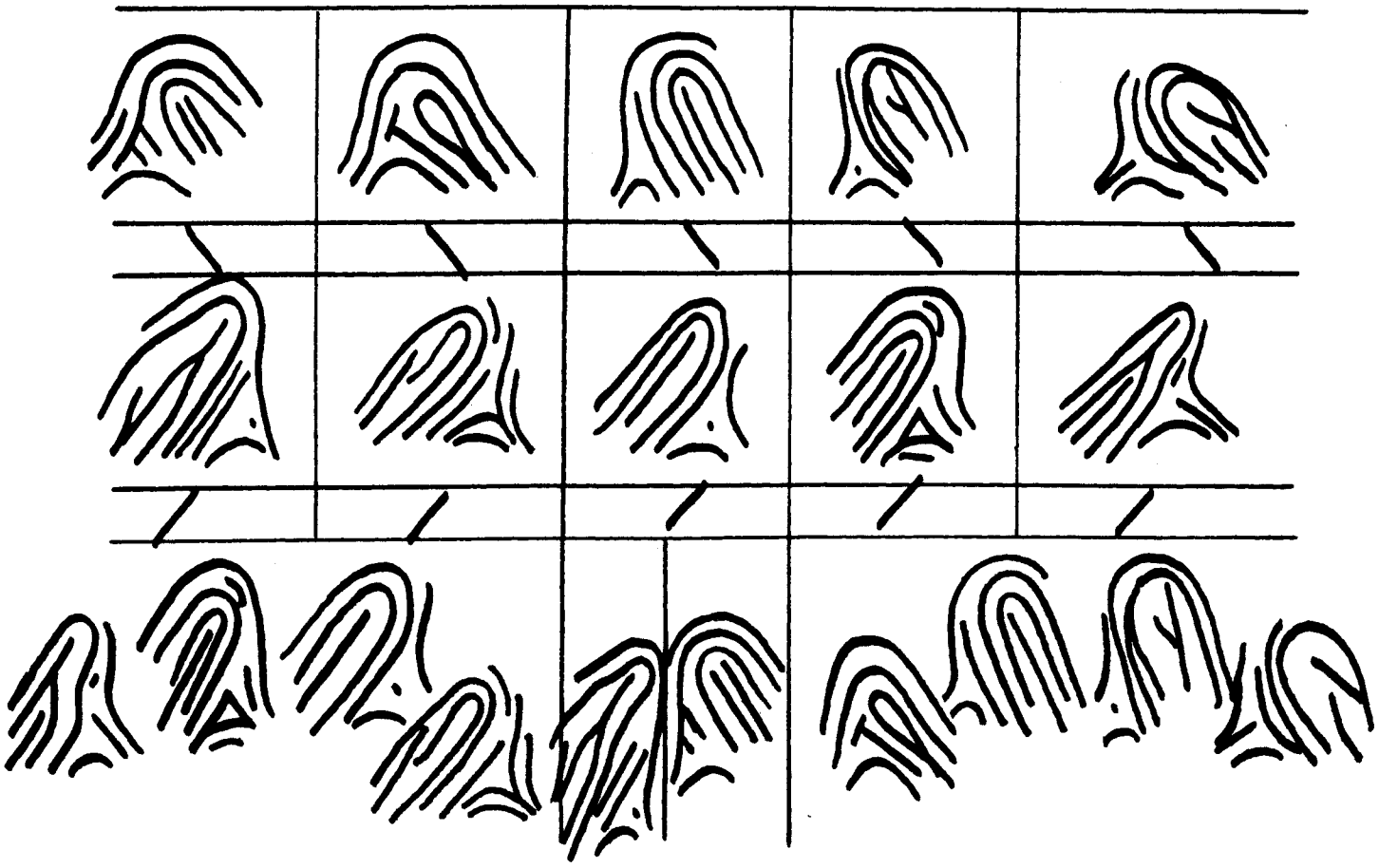
16.

17.

TYPES OF LOOPS

1. ULNAR LOOPS FLOW TOWARD THE LITTLE FINGER. -- ULNA BONE --

2. AN ULNAR LOOP IS INDICATED BY A DIAGONAL LINE - - IN THE DIRECTION THE LOOP FLOWS.

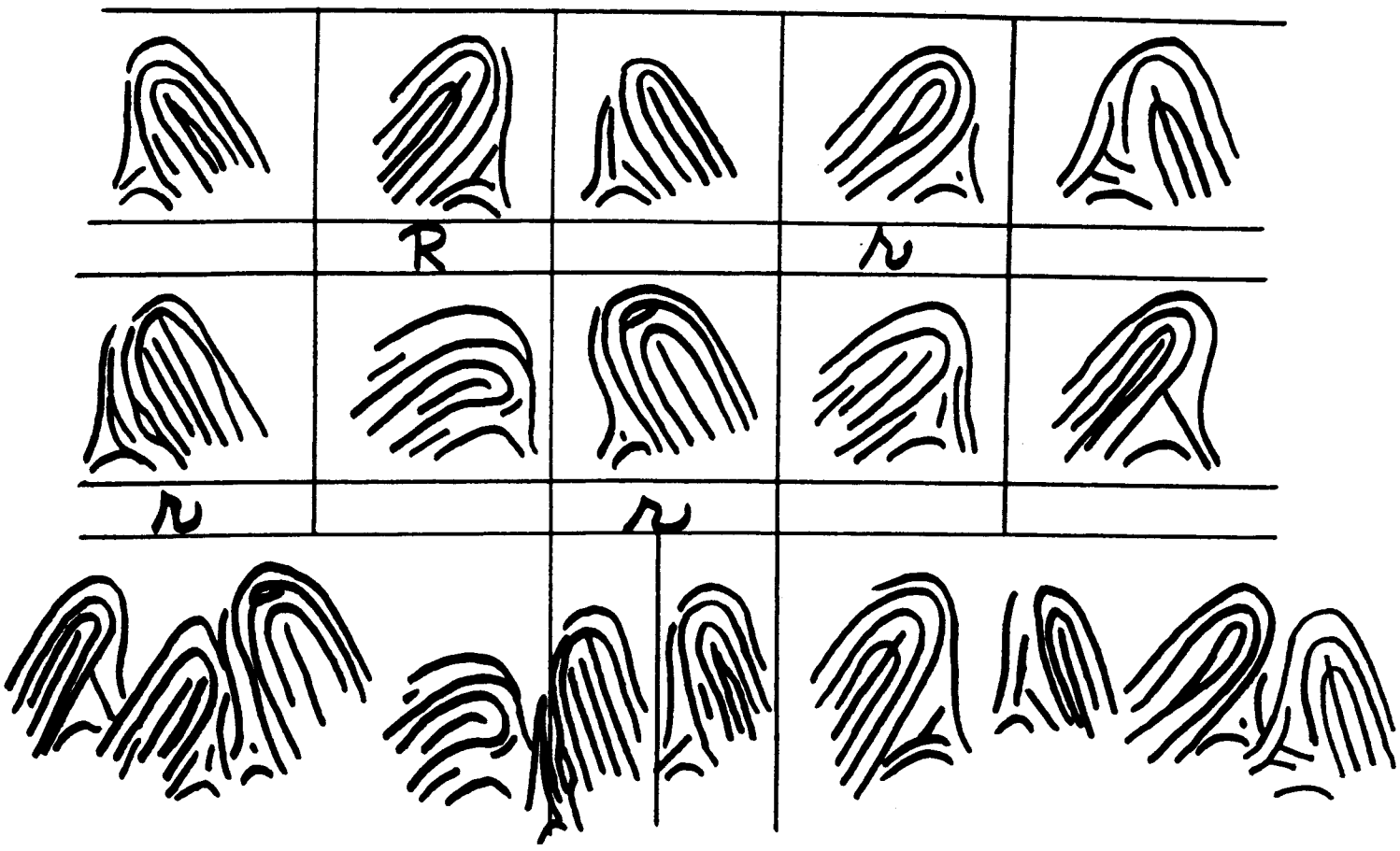


THE DIRECTION OF FLOW APPLIES TO THE FINGERS ON THE HAND AND NOT AS THEY APPEAR ON THE FINGERPRINT CARD.

TYPES OF LOOPS

3. RADIAL LOOPS FLOW TOWARD THE THUMB.
-- RADIUS BONE --

4. RADIAL LOOP IS INDICATED BY A CAPITAL "R" IN FINGERS TWO AND SEVEN AND BY A SMALL "r" IN ALL OTHER FINGERS.

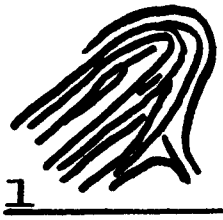


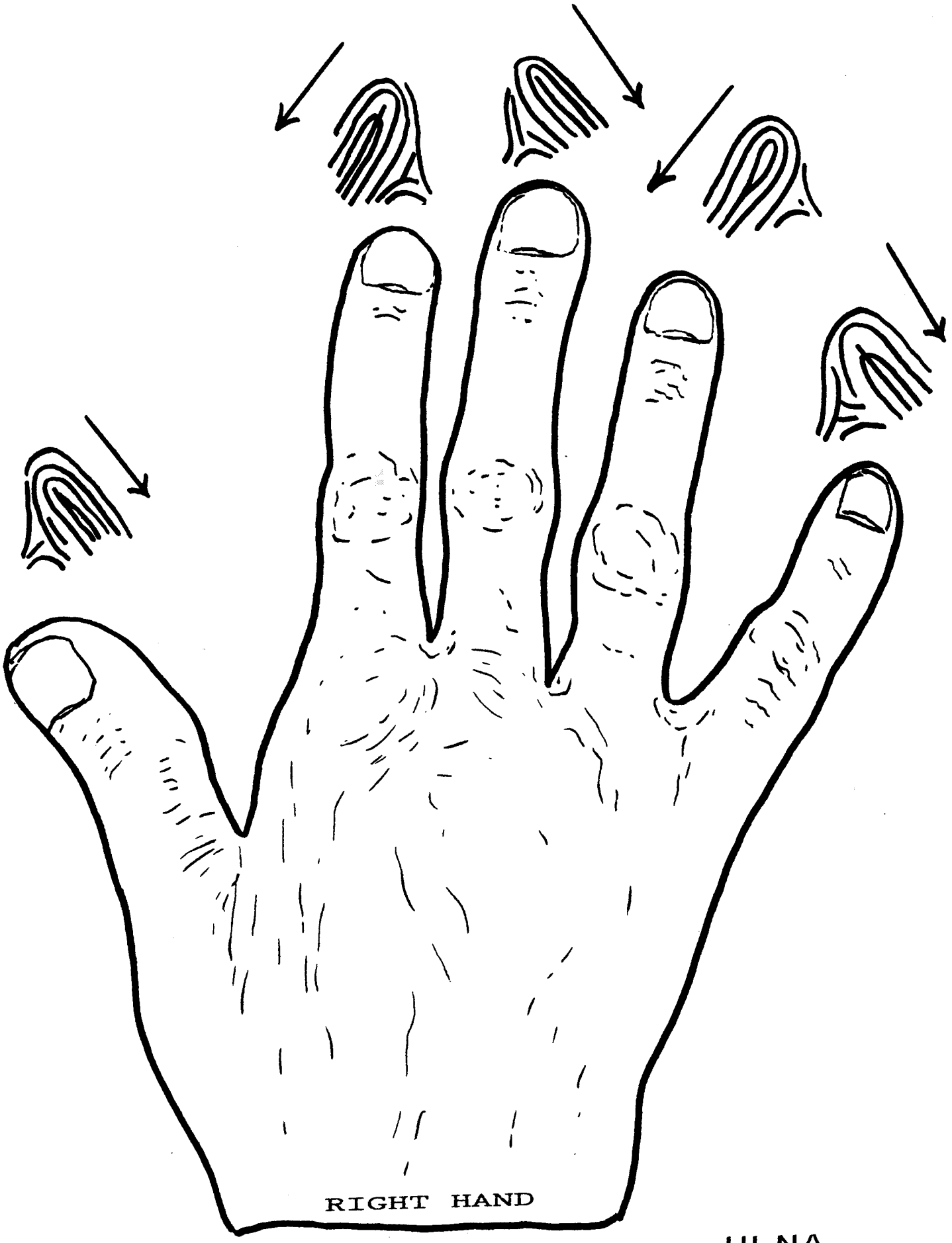
THE DIRECTION OF FLOW APPLIES TO THE FINGERS ON THE HAND AND NOT AS THEY APPEAR ON THE FINGERPRINT CARD.

SEE ILLUSTRATION PAGE 33

LOOP - TYPE QUIZ

 1	 2	 3	 4	 5
 6	 7	 8	 9	 10

 1	 2	 3	 4	 5
 6	 7	 8	 9	 10


RIGHT HAND
RADIUS
ULNA

ARCHES

TWO TYPES: PLAIN TENTED

PLAIN ARCH

A PLAIN ARCH IS THAT TYPE OF PATTERN IN WHICH THE RIDGES ENTER UPON ONE SIDE MAKE A RISE OR WAVE IN THE CENTER, AND FLOW OR TEND TO FLOW OUT UPON THE OPPOSITE SIDE.

1. 

2. 

3. 

4. 

5. 

6. 

7. 

8. 

9. 

10. 

11. 

12. 

A PLAIN ARCH CANNOT HAVE A LOOPING RIDGE, AND UPTHRUST, OR A RECURVE.

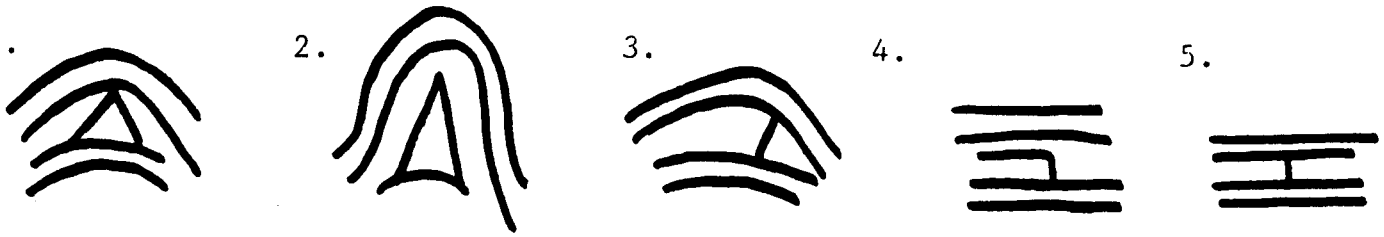
1. CAPITAL "A" IN FINGERS NUMBER TWO AND SEVEN.

2. SMALL "a" IN FINGERS OTHER THAN TWO AND SEVEN.

TENTED ARCH

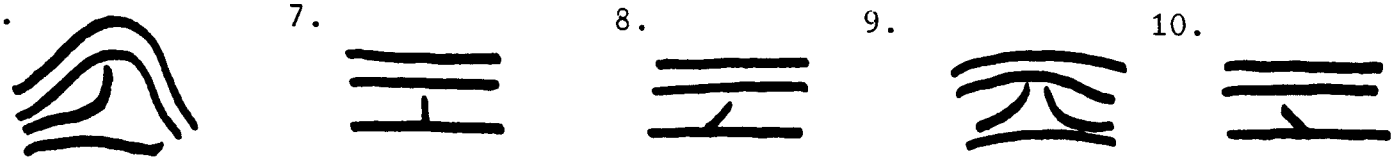
TENTED ARCH: A TENTED ARCH IS THAT TYPE OF PATTERN WHICH POSSESSES EITHER AN ANGLE, AN UPTHRUST OR TWO OF THE THREE BASIC CHARACTERISTICS OF THE LOOP.

1. 2. 3. 4. 5.



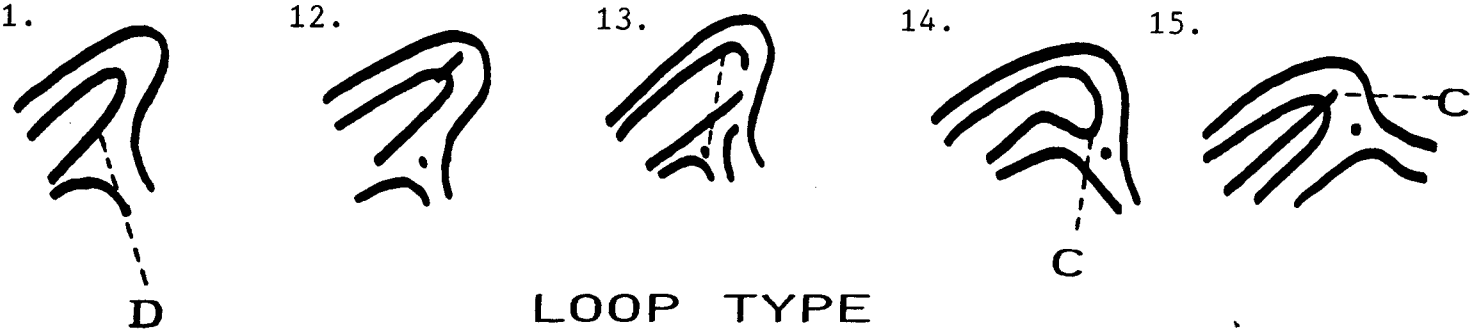
ANGLE

6. 7. 8. 9. 10.



UPTHRUST

11. 12. 13. 14. 15.



LOOP TYPE

TENTED ARCH

TYPES OF TENTED ARCHES

1. ANGULAR TYPE:
   A. FORMED BY TWO RIDGES MEETING AT AN ANGLE. ONE CONTINUOUS RIDGE CANNOT FORM AN ANGLE.

   B. ANGLE MUST BE 90 DEGREES OR LESS.

1. 

2. 

3. 

4. 

5. 

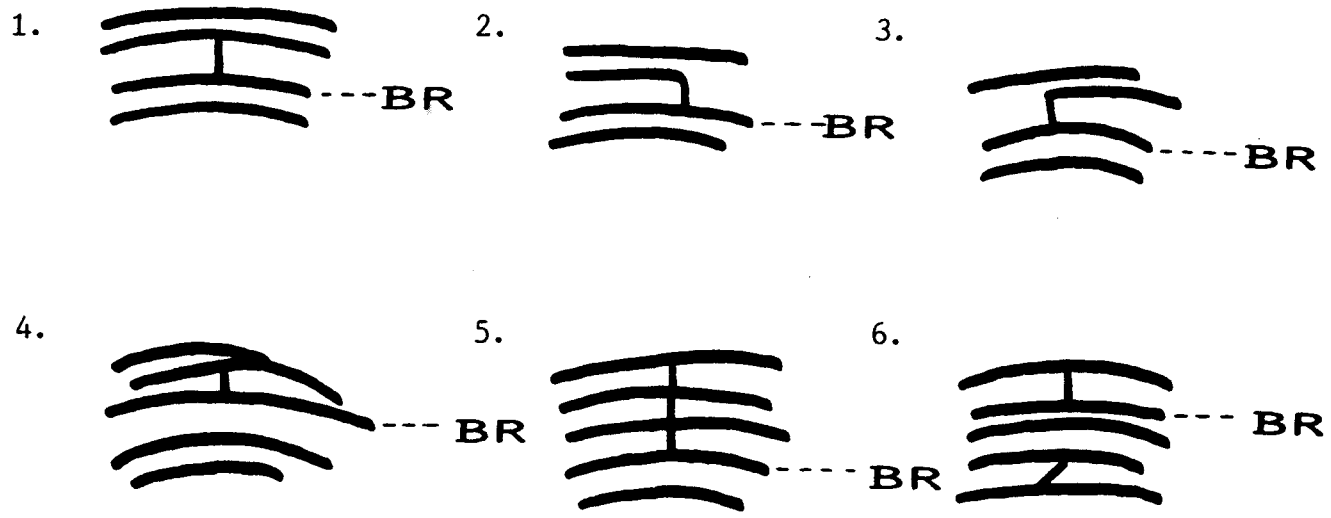
6. 

7. 

8. 

TENTED ARCH

C. THE ANGLE MAY BE FORMED ON THE BASE RIDGE BUT - THE ANGLE - MUST BE EXACTLY NINETY DEGREES - IN THIS CASE - OR IT IS CONSIDERED TO BE A BIFURCATION. THE BASE RIDGE IS THE PLAIN ARCH RIDGE DIRECTLY BENEATH THE RIDGE IN QUESTION.



BR --- BASE RIDGE

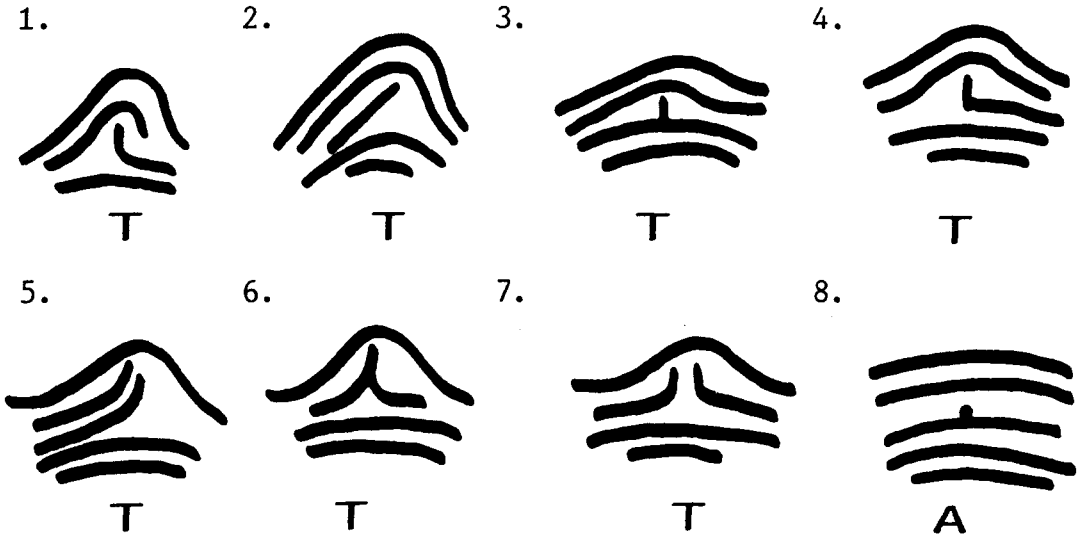
D. MOST ANGULAR TYPE TENTED ARCHES <u>HAVE A TENDENCY</u> TO FLOW IN ONE SIDE OF THE PATTERN AND OUT ON THE OPPOSITE SIDE.

TENTED ARCH

2. UPTHRUST TYPE:
   A. AN UPTHRUST MUST BE AN ENDING RIDGE--A RIDGE WHICH ENDS IN SPACE.

   B. AN UPTHRUST MUST MAKE A DEFINITE CHANGE OF DIRECTION FROM THE BASE RIDGE. THE UPTHRUST <u>MUST</u> ANGLE FORTY-FIVE DEGREES OR MORE FROM BASE RIDGE. THE BASE RIDGE IS THE PLAIN ARCH RIDGE DIRECTLY BENEATH THE RIDGE IN QUESTION.

   C. AN UPTHRUST MUST BE AS HIGH AS THE SURROUNDING RIDGES ARE THICK. DOTS DO NOT HAVE ANY DIRECTION.



TENTED ARCH

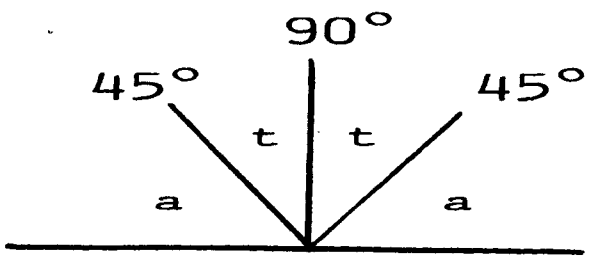
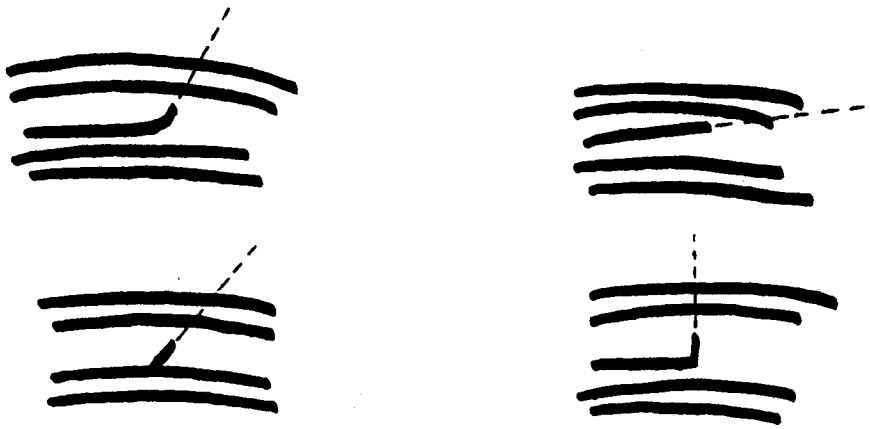


FIGURE A

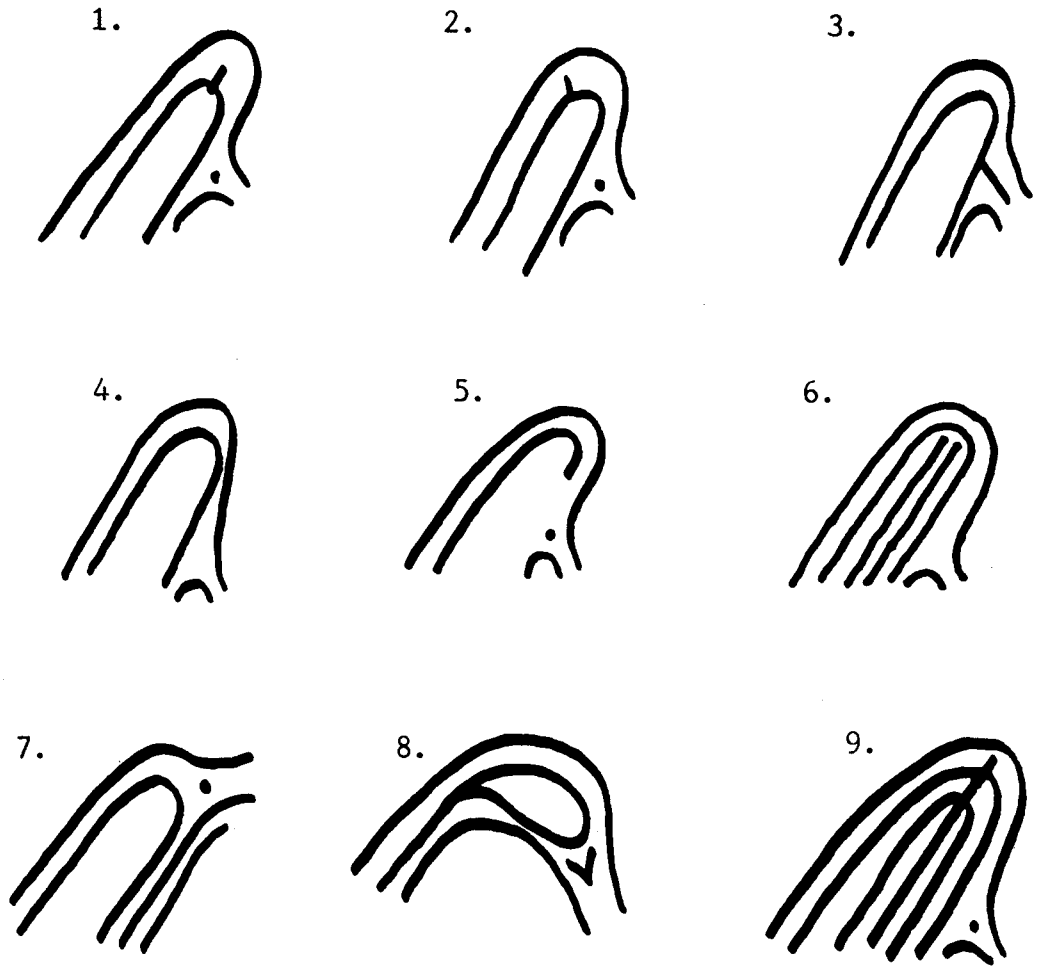


USING FIGURE A COMPARE ENDING RIDGES IN FOUR DRAWINGS ABOVE TO ESTABLISH WHAT DEGREE OF ANGLE THE ENDING RIDGE IN QUESTION COMPARES TO THE BASE RIDGE.

THE BASE RIDGE BEING THE PLAIN ARCH RIDGE BELOW THE RIDGE IN QUESTION.

TENTED ARCH

3. RECURVING TYPE:
   TENTED ARCHES HAVING TWO OF THE THREE BASIC CHARACTERISTICS OF THE LOOP.
   A. MUST LACK ONE OF THE THREE BASIC CHARACTERISTICS OF A LOOP: DELTA - RECURVE - RIDGE COUNT
   B. ORDINARILY, MOST HAVE A LOOPING RIDGE. (NOT ALL)



TENTED ARCH

C. TWO ENDING RIDGES, ON OR ABOUT THE SAME PLANE, PLUS A DELTA FORMATION, IS CLASSIFIED AS A TENTED ARCH.

1. 
2. 
3. 
4. 

1. THESE ENDING RIDGES MUST BE DEFINITE ENDING RIDGES. THE ENDING RIDGES MUST NOT TURN DOWNWARD.

5. 
6. 
7. 

A A A

2. JOIN THE TWO ENDING RIDGES BY AN IMAGINARY RECURVE SO THAT A RIDGE COUNT IS OBTAINED.

8. 
9. 
10. 

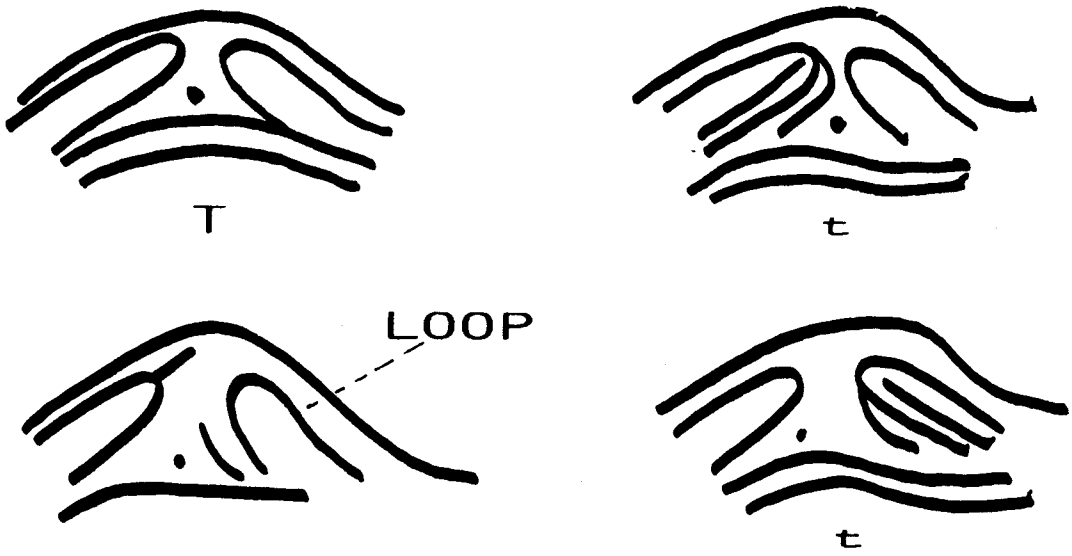
3. IF NO RIDGE COUNT IS OBTAINED, IT IS CLASSIFIED AS A PLAIN ARCH.

11. 
12. 

A A

TENTED ARCH

4. ARBITRARY TYPE OF TENTED ARCH:
   A. ONLY ONE POSSIBILITY.
   B. HAS TWO EQUALLY GOOD LOOP FORMATIONS, GOING IN THE OPPOSITE DIRECTION, AND ONE DELTA.



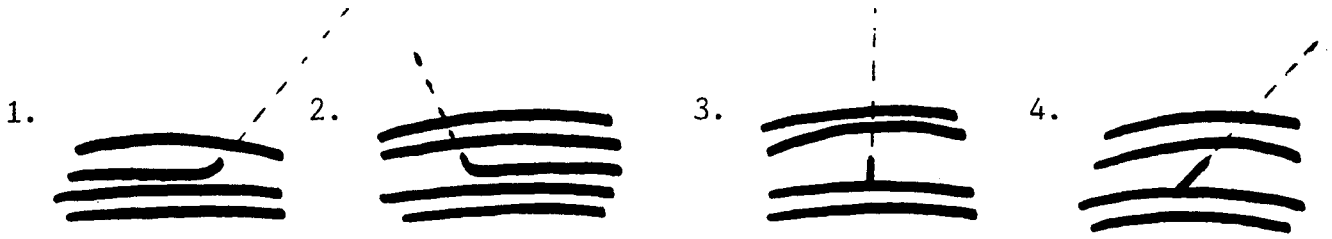
SYMBOLS

1. CAPITAL - T - IN FINGERS NUMBER TWO AND SEVEN.

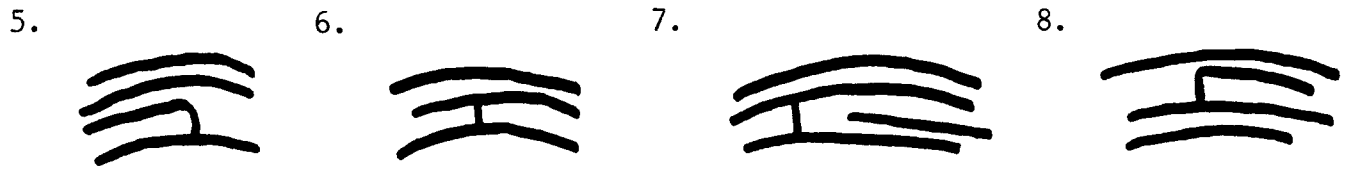
2. SMALL - t - IN FINGERS OTHER THAN NUMBER TWO AND SEVEN.

TENTED ARCHES

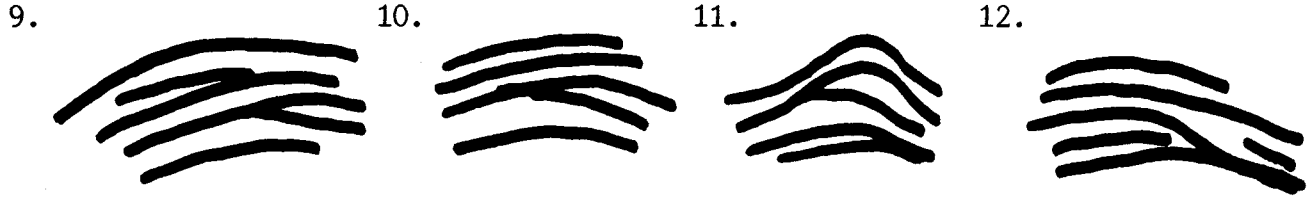
IF RIDGE ENDS IN SPACE, RIDGE MUST CHANGE DIRECTION 45 DEGREES OR MORE TO BE CLASSIFIED AS A TENTED ARCH.



IF RIDGE IN QUESTION TOUCHES RIDGE ABOVE OR BELOW, THE RIDGE IN QUESTION MUST FORM A 90 DEGREE ANGLE.



ALL RIDGES TOUCHING RIDGE BELOW OR ABOVE NOT AT 90 DEGREES ARE CONSIDERED BIFURCATIONS. BOTH ARMS OF THE BIFURCATION ARE CLASSIFIED AS PLAIN ARCH RIDGES.



TENTED ARCH

WHEN CLASSIFYING AN ENDING RIDGE - IF THE RIDGES ON BOTH SIDES OF THE ENDING RIDGE FOLLOW ITS DIRECTION OR FLOW TREND, THE PRINT MAY BE CLASSIFIED AS PLAIN ARCH. IF HOWEVER, THE RIDGES ON ONLY ONE SIDE FOLLOW ITS DIRECTION, THE PRINT IS A TENTED ARCH.

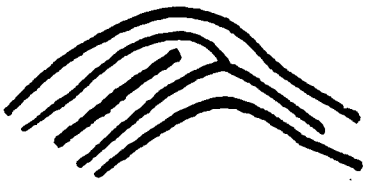


FIGURE 1

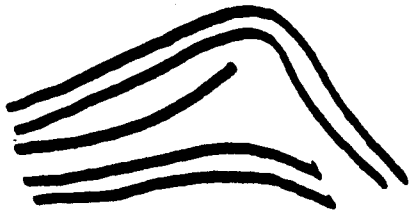


FIGURE 2

FIGURE 3

FIGURE 4

FIGURE 3 IS A PLAIN ARCH BECAUSE IT IS READILY SEEN THAT THE APPARENT UPTHRUST IS A CONTINUATION OF RIDGE B.

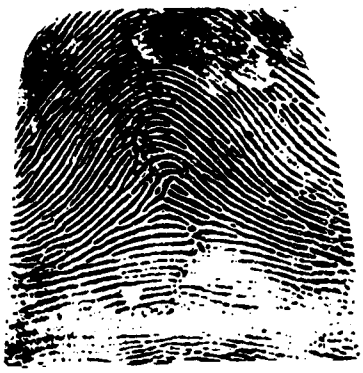
FIGURE 4 IS A TENTED ARCH BECAUSE RIDGE A IS AN INDEPENDENT UPTHRUST, AND NOT A CONTINUATION OF RIDGE B.

TENTED ARCHES

1. 

2. 

3. 

4. 

5. 

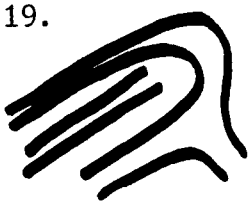
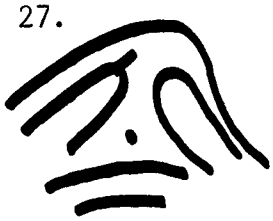
6. 

7. 

8. 

9. 

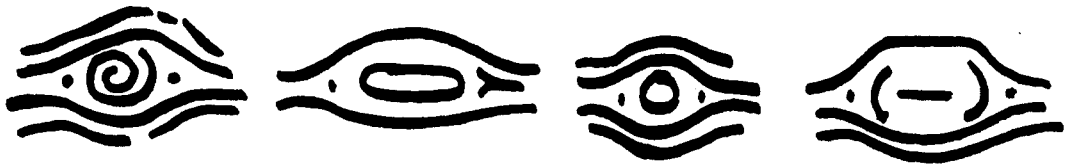
PATTERN QUIZ

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 
11. 
12. 
13. 
14. 
15. 
16. 
17. 
18. 
19. 
20. 
21. 
22. 
23. 
24. 
25. 
26. 
27. 
28. 
29. 
30. 

WHORLS

I. MINIMUM REQUIREMENTS ARE TWO DELTAS AND A RECURVE IN FRONT OF EACH.

A. IT CAN BE SPIRAL, OVAL, CIRCULAR, OR ANY VARIANT OF A CIRCLE.



II. TYPES OF WHORLS:

1. PLAIN WHORL

A PLAIN WHORL CONSISTS OF ONE OR MORE RIDGES WHICH MAKE OR TEND TO MAKE A COMPLETE CIRCUIT, WITH TWO DELTAS, BETWEEN WHICH, WHEN AN IMAGINARY LINE IS DRAWN, AT LEAST ONE RECURVING RIDGE WITHIN THE INNER PATTERN AREA IS CUT OR TOUCHED.

<u>REMEMBER</u>

A. TWO DELTAS AND AT LEAST ONE RECURVING RIDGE IN FRONT OF EACH.

B. AN IMAGINARY LINE DRAWN FROM DELTA TO DELTA MUST CUT OR TOUCH AT LEAST ONE RECURVING RIDGE WITHIN THE INNER PATTERN AREA.

WHORLS

1.

2.

3.

4.

5.

6.

PLAIN WHORLS

2. CENTRAL POCKET LOOP WHORL

A CENTRAL POCKET LOOP WHORL CONSISTS OF AT LEAST ONE RECURVING RIDGE, OR AN OBSTRUCTION AT RIGHT ANGLE TO THE LINE OF FLOW, WITH TWO DELTAS, BETWEEN WHICH, WHEN AN IMAGINARY LINE IS DRAWN, NO RECURVING RIDGE WITHIN THE INNER PATTERN AREA IS CUT OR TOUCHED.

A. RECURVING TYPE:

1. SIMILAR TO PLAIN WHORL, TWO DELTAS AND AT LEAST ONE RIDGE WHICH MAKES OR TENDS TO MAKE A COMPLETE CURCUIT.

2. DIFFERENCE FROM A PLAIN WHORL - AN IMAGINARY LINE DRAWN FROM DELTA TO DELTA MUST NOT CUT OR TOUCH A RECURVING RIDGE IN FRONT OF THE INNER DELTA.

LINE OF FLOW OF WHORLS

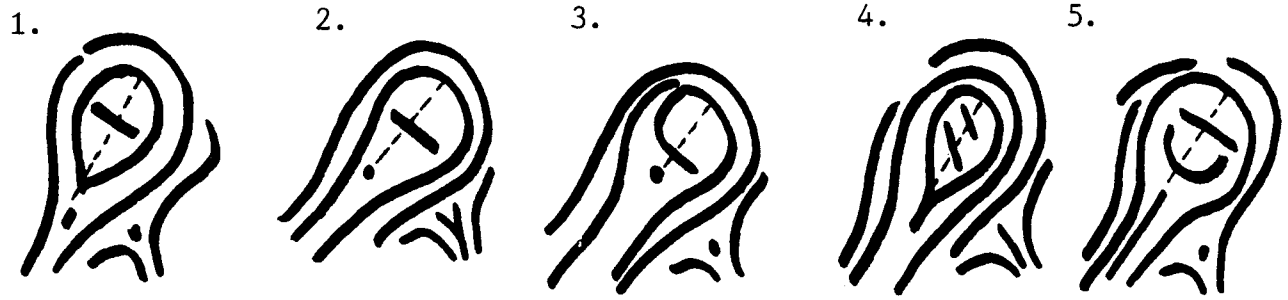
THE LINE OF FLOW OF A CENTRAL POCKET LOOP WHORL IS DETERMINED BY DRAWING AN IMAGINARY LINE BETWEEN THE INNER DELTA AND THE CENTER OF THE INNERMOST RECURVING RIDGE.

CENTRAL POCKET LOOP WHORL

B. OBSTRUCTION TYPE:

1. THE OBSTRUCTION MUST BE AT A RIGHT ANGLE TO THE LINE OF FLOW IN ORDER TO BE A WHORL.

2. A RECURVE HAS PRIORITY OVER AN OBSTRUCTION.



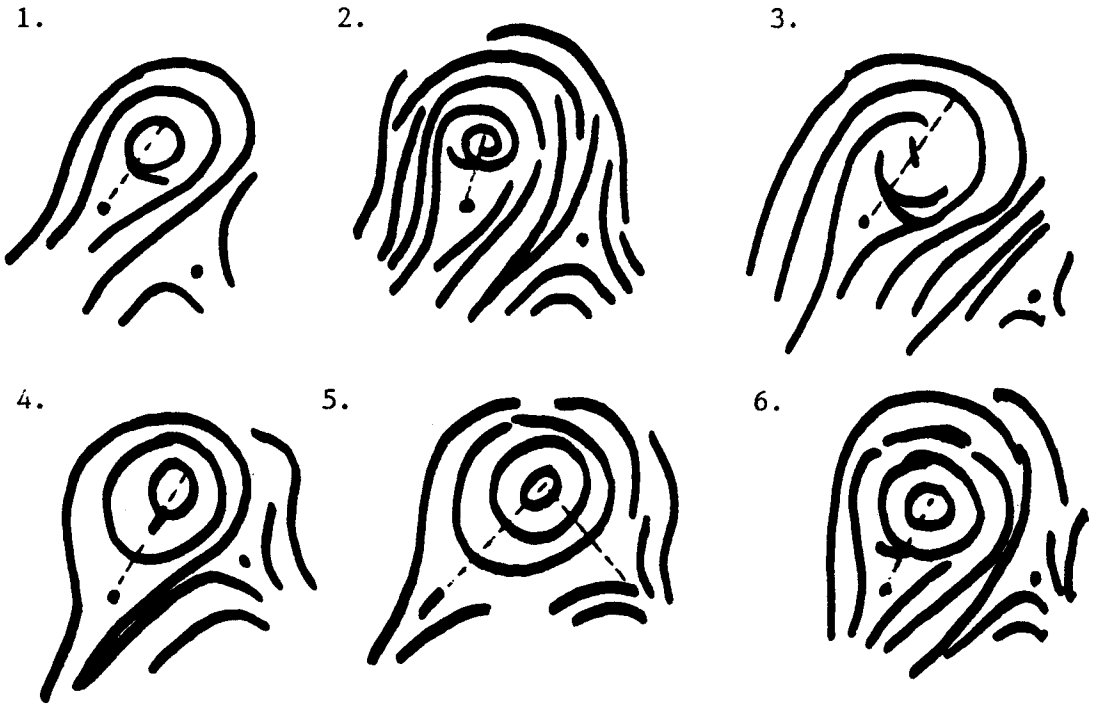
WHORLS

WHORL APPENDAGE RULE:

1. THE LINE OF FLOW IS ALSO USED TO DETERMINE IF THE APPENDAGE SPOILS THE RECURVE OF A WHORL.

   A. IF THE APPENDAGE COMES OFF THE RECURVE AT THE LINE OF FLOW, THE RECURVE IS SPOILED.

   B. THE ESSENTIAL DIFFERENCE BETWEEN A LOOP AND A WHORL APPENDAGE IS THE LOOP APPENDAGE MUST COME OFF THE RECURVE AT A RIGHT ANGLE. WHORL APPENDAGE REGARDLESS OF ANGLE SPOILS THE RECURVE.

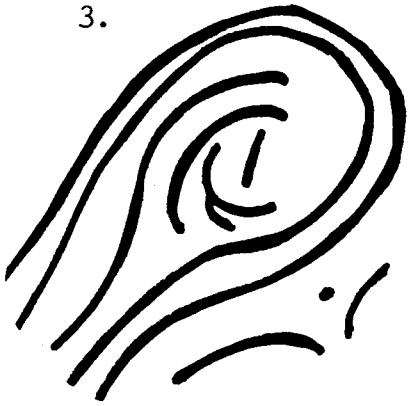


WHORLS
APPENDAGE RULE QUIZ

1.

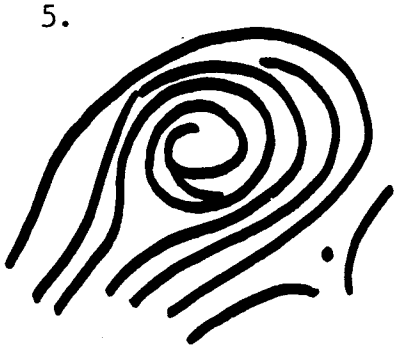
2.

3.



4.

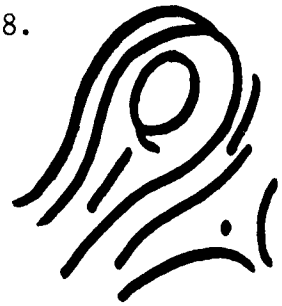
5.



6.

7.

8.



9.

10.

11.

CENTRAL POCKET LOOP WHORLS

1.

2.

3.

4.

5.

6.

3. DOUBLE LOOP WHORL:

A DOUBLE LOOP WHORL CONSISTS OF TWO SEPARATE LOOP FORMATIONS WITH TWO SEPARATE AND DISTINCT SETS OF SHOULDERS AND TWO DELTAS.

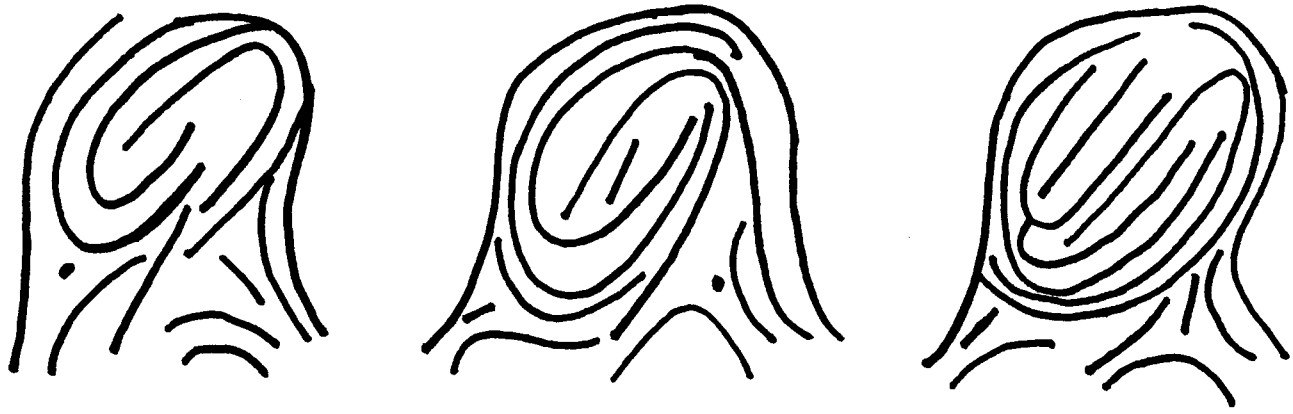
---REMEMBER---

A. TWO SEPARATE LOOP FORMATIONS.
B. TWO SEPARATE AND DISTINCT SETS OF SHOULDERS.
C. TWO DELTAS.

D. NO RIDGE COUNT IS NEEDED FOR LOOPS IN A DOUBLE LOOP WHORL.
E. THE APPENDAGE RULE FOR A DOUBLE LOOP WHORL IS THE SAME AS THAT FOR A LOOP.
F. LOOP APPENDAGE RULE---
SUFFICIENT RECURVE CONSISTS OF THE SPACE BETWEEN THE SHOULDERS OF A LOOP, FREE OF ANY APPENDAGES WHICH ABUT UPON IT AT A RIGHT ANGLE.

DOUBLE LOOP WHORL

"S" TYPE LOOP WHORLS ARE NOT DOUBLE LOOP WHORLS



INTERLOCKING LOOPS ARE NOT DOUBLE LOOP WHORLS

DOUBLE LOOP WHORLS

1.

2.

3.

4.

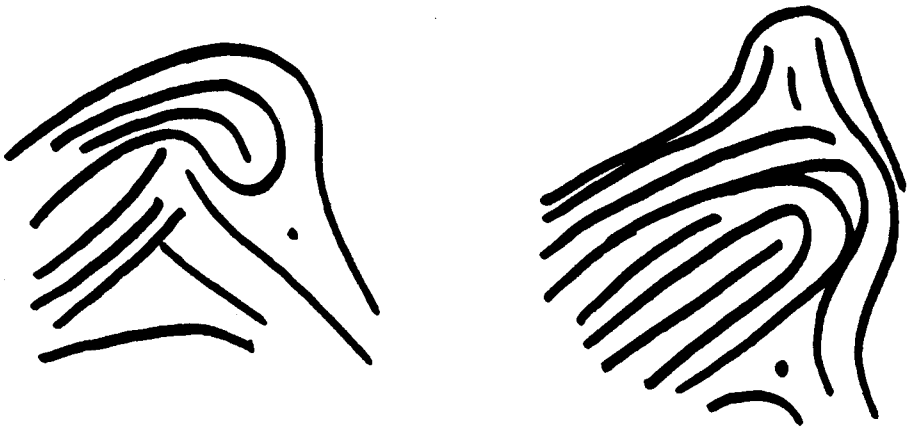
5.

6.

4. ACCIDENTAL WHORL:
   AN ACCIDENTAL CONSISTS OF A COMBINATION OF TWO DIFFERENT TYPES OF PATTERNS WITH THE EXCEPTION OF THE PLAIN ARCH, WITH TWO OR MORE DELTAS OR A PATTERN WHICH POSSESSES SOME OF THE REQUIREMENTS FOR TWO OR MORE DIFFERENT TYPES OR A PATTERN WHICH CONFORMS TO NONE OF THE DEFINITIONS.

   A. COMBINATION OF TWO DIFFERENT TYPES OF PATTERNS WITH THE EXCEPTION OF THE PLAIN ARCH.
   B. TWO OR MORE DELTAS. THE ACCIDENTAL WHORL IS THE ONLY TYPE OF PATTERN WHICH MAY POSSESS MORE THAN TWO DELTAS.
   C. PATTERNS POSSESSING SOME OF THE REQUIREMENTS OF TWO OR MORE DIFFERENT TYPES OF PATTERNS, WITH THE EXCEPTION OF THE PLAIN ARCH.
   D. PATTERNS CONFORMING TO NONE OF THE DEFINITIONS.

E. A COMBINATION OF A LOOP AND TENTED ARCH FORMATION MUST HAVE THE LOOP FORMATION APPEARING OVER THE TENTED ARCH. ANY LOOP AND TENTED ARCH FORMATION NOT IN THIS POSITION SHALL HAVE THE LOOP FORMATION AS THE PREFERRED PATTERN. THE OVERALL IMPRESSION WOULD THEN BE GIVEN THE CLASSIFICATION OF EITHER AN ULNAR OR RADIAL LOOP.



THIS NOT THIS

ACCIDENTAL WHORL

1.

2.

3.

4.

5.

6.

WHORL SYMBOLS

1. PLAIN WHORL.....P

2. CENTRAL POCKET LOOP WHORL...C

3. DOUBLE LOOP WHORL.....a

4. ACCIDENTAL WHORL.....X

5. FOR CLASSIFYING AND GENERAL SEARCHING, "W" IS USED TO INDICATE ALL WHORL TYPES BELOW THE FINGERPRINT BLOCK.

6. THE TYPE OF WHORL SHOULD BE INDICATED IN THE UPPER RIGHT CORNER OF THE FINGERPRINT BLOCK PRECEDING THE WHORL TRACING.

   EXAMPLES: PI, PM, PO, CI, CM, CO, ETC.

WHORL TRACINGS

1. TRACE FROM LEFT DELTA, TO A POINT OPPOSITE THE RIGHT DELTA.
2. TRACE FROM THE FARTHEST LEFT DELTA TO A POINT OPPOSITE THE FARTHEST RIGHT DELTA WHEN THERE ARE THREE OR MORE DELTAS PRESENT.
3. DROP DOWN AT ENDING RIDGES. FOLLOW THE LOWER FORK OF A BIFURCATION.
4. STOP AT A POINT OPPOSITE THE RIGHT DELTA AND COUNT RIDGES BETWEEN THAT POINT AND THE DELTA.
5. IF THERE ARE THREE OR MORE RIDGES INSIDE THE RIGHT DELTA, THE TRACING IS AN - I - <u>INNER</u>.
6. IF THERE ARE THREE OR MORE RIDGES OUTSIDE THE RIGHT DELTA, THE TRACING IS AN - O - <u>OUTER</u>.
7. IF THERE ARE ONE OR TWO RIDGES EITHER INSIDE OR OUTSIDE THE RIGHT DELTA, OR IF THE TRACING STOPS ON THE RIGHT DELTA ITSELF, THE TRACING IS AN - M - <u>MEETING</u>.
8. IT IS NOT NECESSARY TO COUNT MORE THAN THREE RIDGES.
9. DO NOT COUNT DELTA OR TRACING RIDGE. THE TRACING RIDGE IS THE RIDGE WHERE THE TRACING STOPPED OPPOSITE THE RIGHT DELTA.

WHORL TRACINGS

CI

PM

CI

PO

PO

WHORL TRACINGS

10. TRACING DOUBLE LOOPS:

IN TRACING DOUBLE LOOPS OR ACCIDENTALS THE PROBLEM OF WHERE TO STOP TRACING IS SOMETIMES PRESENTED.

THE RULE IS, WHEN THE TRACING PASSES INSIDE OF THE RIGHT DELTA, STOP AT THE NEAREST POINT TO THE RIGHT DELTA ON THE UPWARD TREND AS IN FIGURE 2.

IF NO UPWARD TREND IS PRESENT CONTINUE TRACING UNTIL A POINT OPPOSITE THE RIGHT DELTA, OR THE DELTA ITSELF, IS REACHED FIGURE 3.

ACCIDENTALS OFTEN POSSESS THREE OR MORE DELTAS. IN TRACING THEM ONLY THE EXTREME DELTAS ARE CONSIDERED. THE TRACING BEGINNING AT THE EXTREME LEFT DELTA AND PROCEEDING TOWARD THE EXTREME RIGHT DELTA, FIGURE 1.

FIGURE 1

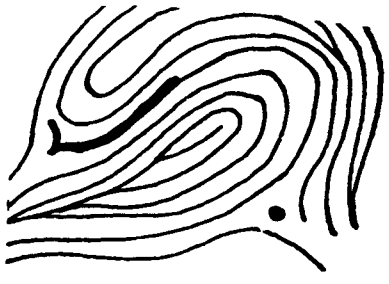


FIGURE 2

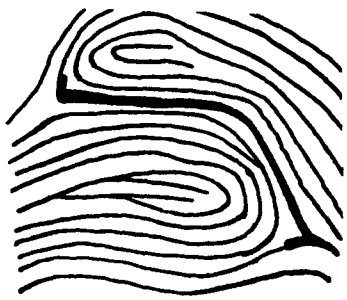


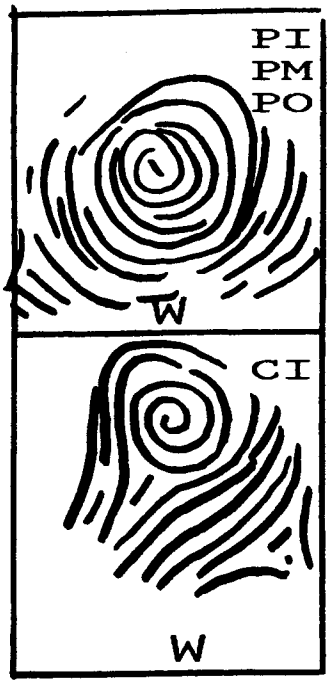
FIGURE 3

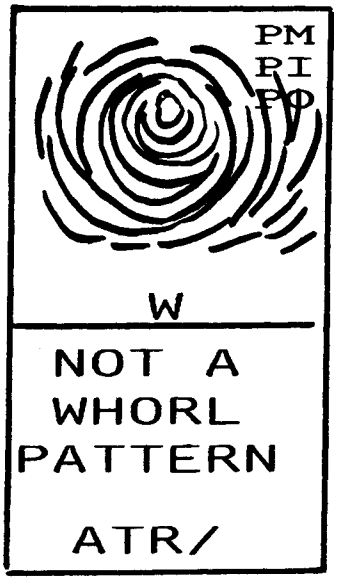
TRACING WHORLS--UNPRINTED DELTAS

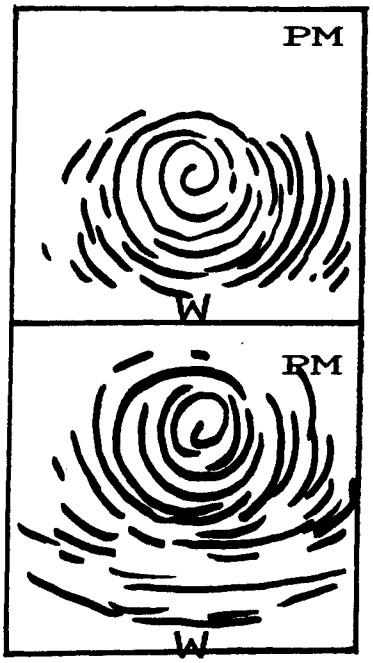
A WHORL-TYPE PATTERN WHICH HAS BEEN FULLY ROLLED FROM NAIL TO NAIL WITHOUT A DELTA BEING VISIBLE ON EITHER SIDE, WILL BE GIVEN THE TRACING OF THE OPPOSITE FINGER AND REFERENCED TO THE TWO OTHER TRACINGS. IF THE OPPOSITE PATTERN IS NOT A WHORL, THE WHORL-TYPE PATTERN WILL BE CLASSIFIED AS A MEET TRACING, AND REFERENCED TO AN INNER AND OUTER TRACING.

IF TWO WHORLS APPEAR OPPOSITE EACH OTHER AND NO DELTAS ARE VISIBLE, BOTH WHORLS WILL BE CLASSIFIED AS MEET TRACINGS.

WHEN A WHORL-TYPE PATTERN HAS ONLY ONE DELTA SHOWING, THE GENERAL CONTOUR OF THE PATTERN, AS WELL AS THE DELTA, MUST BE TAKEN INTO CONSIDERATION TO CLASSIFY IT PROPERLY.







LEAVE BLANK

1-258 (Rev. 2-20-74)

TYPE OR PRINT ALL INFORMATION IN BLACK

LAST NAME NAM FIRST NAME MIDDLE NAME

FBI LEAVE BLANK

STATE USAGE

ALIASES

CONTRIBUTOR ORI

SIGNATURE OF PERSON FINGERPRINTED

DATE OF BIRTH DOB Month Day Year

THIS DATA MAY BE COMPUTERIZED IN LOCAL, STATE AND NATIONAL FILES

DATE | SIGNATURE OF OFFICIAL TAKING FINGERPRINTS

DATE ARRESTED OR RECEIVED DOA

SEX	RACE	HGT.	WGT.	EYES	HAIR

PLACE OF BIRTH POB

CHARGE

YOUR NO. OCA

FBI NO. FBI

SID NO. SID

LEAVE BLANK

CLASS. NUMERATOR (EVEN)

REF. DENOMINATOR (ODD)

FINAL DISPOSITION

SOCIAL SECURITY NO. SOC

NCIC CLASS - FPC

CAUTION

1-11=S 12-16=M 17 OR OVER = L WHEN # 6 IS AN "L" USE THIS SET 1-17=S 18-22=M 23 AND OVER = L FOR # 1 FINGER 16 1. R. THUMB	16 1 - 9 = I 10 AND OVER = 0 2. R. INDEX	8 1 - 10 = I 11 AND OVER = 0 3. R. MIDDLE	8 1 - 15 = I 16 AND OVER = 0 4. R. RING	4 5. R. LITTLE
4 1 - 11 = S 12 - 16 = M 17 AND OVER = L 6. L. THUMB	2 1 - 9 = I 10 AND OVER = 0 7. L. INDEX	2 1 - 10 = I 11 AND OVER = 0 8. L. MIDDLE	1 1 - 15 = I 16 AND OVER = 0 9. L. RING	1 10. L. LITTLE

+1 +1

FBI/DOJ

PRIMARY - THE PRIMARY CLASSIFICATION IS OBTAINED THROUGH THE SUMMATION OF THE VALUE OF THE WHORL TYPE PATTERNS AS THEY APPEAR IN THE VARIOUS FINGERS: NUMBERS 2, 4, 6, 8, 10, (EVEN FINGERS), BEING USED AS THE NUMERATOR, AND NUMBERS 1, 3, 5, 7, 9, (ODD FINGERS), AS THE DENOMINATOR.

SECONDARY - THE SECONDARY CLASSIFICATION IS THE TYPE OF PATTERN APPEARING IN THE INDEX FINGERS.

SMALL LETTER GROUP - PRINTS IN WHICH AN ARCH OR TENTED ARCH APPEAR IN ANY FINGER, OR WITH A RADIAL LOOP IN OTHER THAN THE INDEX FINGERS, CONSTITUTE THE SMALL LETTER GROUP. AN ARCH, TENTED ARCH, OR RADIAL LOOP APPEARING IN ANY FINGER IS CARRIED INTO THE CLASSIFICATION FORMULA AS A, I, OR R, - AND IN ITS RESPECTIVE RELATIVE POSITION. THE APPEARANCE OF AN ARCH, TENTED ARCH, OR RADIAL LOOP IN OTHER THAN THE INDEX FINGERS AND THUMBS ELIMINATES THE SUB-SECONDARY CLASSIFICATION.

SUB-SECONDARY - THE SUB-SECONDARY CLASSIFICATION IS THE VALUE OF THE RIDGE COUNTS OR THE TRACINGS OF NUMBERS 2, 3, 4, 7, 8, 9.

MAJOR - THE MAJOR CLASSIFICATION IS THE VALUE OF THE RIDGE COUNTS OR THE TRACINGS OF NUMBERS 1, 6, (THUMBS).

FINAL - THE FINAL IS THE RIDGE COUNT OF THE RIGHT LITTLE FINGER, IF A LOOP. IF NOT A LOOP, THE LEFT LITTLE FINGER IS USED. IF NEITHER IS A LOOP, NO FINAL IS USED.

KEY - THE KEY IS THE RIDGE COUNT OF THE FIRST LOOP APPEARING IN OTHER THAN THE LITTLE FINGERS. IF NONE APPEAR, NO KEY IS USED.

RIDGE COUNTING - IN LOOPS, ALL THE RIDGES INTERVENING BETWEEN THE DELTA AND THE CORE THAT CROSS OR TOUCH A LINE FROM DELTA TO CORE, ARE COUNTED. NEITHER DELTA NOR CORE IS COUNTED. NO RIDGE IS COUNTED TWICE. DOTS AND FRAGMENTS ARE COUNTED IF THEY ARE AS THICK AND HEAVY AS THE OTHER RIDGES.

WHORL TRACING - WHORLS ARE TRACED FROM THE EXTREME LEFT DELTA TO THE EXTREME RIGHT DELTA, DROPPING DOWN AT BIFURCATIONS OR DEFINITE BREAKS IN THE RIDGE. AT THE NEAREST POINT TO THE RIGHT DELTA, THE RIDGES INTERVENING BETWEEN THE TRACING LINE AND THE DELTA ARE COUNTED. IF THERE ARE THREE OR MORE ON THE INSIDE, IT IS AN INNER, (I). IF THREE OR MORE OUTSIDE, IT IS AN OUTER, (O). ALL OTHERS ARE MEET, (M). NEITHER TRACING LINE NOR DELTA IS COUNTED.

Key	Major	Primary	Secondary	Sub-Secondary	Final
16	M	9	R	IIO	15
	M	2	U	00I	

Key	Major	Primary	Secondary	Small Letter Group	Final
19	L	5	R	r	9
	M	3	W	at	

CLASSIFICATION FORMULA

I. PRIMARY

A. FOR THE PURPOSE OF OBTAINING THE PRIMARY CLASSIFICATION, DEFINITE NUMERICAL VALUES ARE ASSIGNED TO EACH OF THE TEN FINGER BLOCKS AS SHOWN ON PAGE 65.

B. WHEN A WHORL APPEARS IT ASSUMES THE VALUE OF THAT FINGER BLOCK. ALL PATTERNS OTHER THAN WHORLS ARE DISREGARDED IN COMPUTING THE PRIMARY.

C. THE NUMERATOR IS THE TOTAL SUM OF THE NUMERICAL VALUES OF THE WHORL TYPE PATTERNS APPEARING IN THE <u>EVEN</u> FINGERS 2,4,6,8,10, PLUS ONE. PLACE THIS NUMERATOR ABOVE THE CLASSIFICATION LINE.

D. THE DENOMINATOR IS THE TOTAL SUM OF THE NUMERICAL VALUES OF THE WHORL TYPE PATTERNS APPEARING IN THE <u>ODD</u> FINGERS 1,3,5,7, 9, PLUS ONE. PLACE THIS DENOMINATOR BELOW THE CLASSIFICATION LINE.

E. THE ARBITRARY ONE IS ADDED TO THE NUMERATOR AND DENOMINATOR.

CLASSIFICATION FORMULA

--NOTE--

AFTER THE PRIMARY IS OBTAINED, THE REMAINING PORTION OF THE CLASSIFICATION FORMULA IS ARRANGED AS THE IMPRESSIONS APPEAR IN THE RIGHT HAND FOR THE NUMERATOR AND THE IMPRESSIONS APPEARING IN THE LEFT HAND FOR THE DENOMINATOR.

II. SECONDARY

- A. THE SECONDARY IS OBTAINED FROM THE PATTERN TYPES PRESENT IN THE INDEX FINGERS.
- B. NUMBER TWO FINGER IS THE NUMERATOR.
- C. NUMBER SEVEN FINGER IS THE DENOMINATOR.
- D. THE SECONDARY IS BROUGHT UP ON THE CLASSIFICATION LINE TO THE RIGHT OF THE PRIMARY.
- E. AN ULNAR LOOP IN THE SECONDARY IS BROUGHT UP AS A CAPITAL U.

REMEMBER:

PLACE THE NUMERATOR ABOVE THE CLASSIFICATION LINE.

PLACE THE DENOMINATOR BELOW THE CLASSIFICATION LINE.

CLASSIFICATION FORMULA

III. SMALL LETTERS

A. SMALL LETTERS CONSIST OF CAPITAL "A" SMALL "a" CAPITAL "T" SMALL "t" OR SMALL "r" ONLY.

B. SMALL LETTERS ARE BROUGHT UP ON THE CLASSIFICATION LINE IN THEIR RELATIVE POSITIONS TO THE INDEX FINGERS.

C. ALL SMALL LETTERS MUST BE INDICATED IN THE CLASSIFICATION FORMULA.

D. DASHES ARE USED IN THE FORMULA TO INDICATE AN ULNAR LOOP OR A WHORL INTERVENING BETWEEN THE INDEX FINGER AND THE FIRST SMALL LETTER, OR BETWEEN TWO SMALL LETTERS.

E. CONSECUTIVE SMALL LETTERS ARE INDICATED: 2a, 2t, 3a, etc.

REMEMBER:

AFTER BRINGING UP THE SECONDARY--LOOK FOR ANY SMALL LETTERS(a,t,r) ON EITHER SIDE OF FINGERS TWO AND SEVEN. BRING UP ON THE CLASSIFICATION LINE IN THE SAME RELATIVE POSITION TO THE INDEX FINGERS, USING DASHES IF NECESSARY. DASHES WILL ONLY APPEAR ON THE RIGHT SIDE OF THE SECONDARY IN THE CLASSIFICATION FORMULA.

CLASSIFICATION FORMULA

IV. SUBSECONDARY

A. THE SUBSECONDARY IS TAKEN FROM FINGERS 2-3-4, NUMERATOR, AND 7-8-9, DENOMINATOR.
B. THE SUBSECONDARY IS BROUGHT UP ON THE CLASSIFICATION LINE TO THE RIGHT OF THE SECONDARY.
C. DEFINITE VALUES ARE ASSIGNED TO THE RIDGE COUNTS IN THESE FINGERS. SEE PAGE 65.
D. USE ROMAN NUMERALS, I.E. I, II, III.
E. WHORL TRACINGS ARE BROUGHT UP AS PART OF THE SUBSECONDARY.
F. A SMALL LETTER TO THE RIGHT OF THE INDEX FINGERS ELIMINATES THE SUBSECONDARY WITH THE EXCEPTION OF SOME LARGE SEARCHES WHERE IT IS USED AS A SUPER EXTENSION.

CLASSIFICATION FORMULA

V. MAJOR

A. THE MAJOR IS TAKEN FROM THE THUMBS.

B. THE MAJOR IS BROUGHT UP ON THE CLASSIFICATION LINE TO THE LEFT OF THE PRIMARY.

C. NUMBER ONE FINGER HAS TWO SETS OF VALUES AS A LOOP AND IS USED AS THE NUMERATOR. SEE PAGE 65.

D. NUMBER SIX FINGER HAS ONE SET OF VALUES AS A LOOP AND REMAINS CONSTANT. NUMBER SIX IS USED AS THE DENOMINATOR.

E. IN A COMBINATION OF LOOP AND WHORL WHEN NUMBER SIX FINGER IS A WHORL AND NUMBER ONE FINGER IS A LOOP USE THE TRACING OF NUMBER SIX FOR THE DENOMINATOR AND THE FIRST SET OF VALUES IN NUMBER ONE TO DETERMINE THE NUMERATOR.

F. IF WHORLS ARE PRESENT IN BOTH THUMBS, THE TRACINGS ARE USED.

G. A SMALL LETTER (a,t,r) IN EITHER OR BOTH THUMBS ELIMINATES THE MAJOR.

REMEMBER:

DETERMINE THE VALUE OF NUMBER SIX FINGER FIRST. IF NUMBER SIX HAS A RIDGE COUNT OF 17 OR MORE, USE THE SECOND SET OF VALUES FOR NUMBER ONE FINGER.

CLASSIFICATION FORMULA

VI. FINAL

A. THE FINAL IS BROUGHT UP TO THE RIGHT OF THE SUBSECONDARY.

B. THE FINAL IS TAKEN FROM NUMBER FIVE FINGER IF NUMBER FIVE IS A LOOP, EITHER ULNAR OR RADIAL. IF NUMBER FIVE IS NOT A LOOP, THE FINAL IS TAKEN FROM THE LOOP IN NUMBER TEN FINGER. IF NEITHER FIVE NOR TEN IS A LOOP, THERE IS NO FINAL, UNLESS THE EXCEPTION STATED BELOW IN D.

C. IF THE FINAL IS TAKEN FROM THE NUMBER FIVE FINGER, IT IS PLACED ABOVE THE CLASSIFICATION LINE. IF THE FINAL IS TAKEN FROM THE NUMBER TEN FINGER, IT IS PLACED BELOW THE CLASSIFICATION LINE.

D. IF ALL TEN FINGERS ARE WHORLS, NUMBER FIVE FINGER IS COUNTED AND BROUGHT UP AS A FINAL. WHORLS ARE COUNTED AS IF ULNAR LOOPS. A WHORL IN THE RIGHT HAND IS COUNTED FROM LEFT DELTA TO CORE. IN THE LEFT HAND, COUNT FROM RIGHT DELTA TO CORE. HORIZONAL DOUBLE LOOPS ARE COUNTED FROM THE DELTA TO THE NEAREST CORE.

CLASSIFICATION FORMULA

VI. FINAL CONTINUED --

A VERTICAL DOUBLE LOOP IS COUNTED FROM THE LEFT DELTA TO THE UP-RIGHT LOOP. IF THERE ARE TWO OR MORE CORES, USUALLY APPLIES TO ACCIDENTAL WHORLS, THE RIDGE COUNT IS MADE FROM LEFT DELTA-RIGHT HAND, OR RIGHT DELTA-LEFT HAND, TO THE NEAREST CORE.

VII. KEY

A. THE KEY IS BROUGHT UP ON THE CLASSIFICATION LINE TO THE LEFT OF THE MAJOR.

B. THE KEY IS TAKEN FROM THE RIDGE COUNT OF THE FIRST LOOP BEGINNING WITH THE RIGHT THUMB EXCLUSIVE OF THE LITTLE FINGERS. EITHER ULNAR OR RADIAL LOOPS ARE USED FOR THE KEY.

C. THE KEY IS ALWAYS PLACED ABOVE THE CLASSIFICATION LINE, REGARDLESS OF THE FINGER USED.

CLASSIFICATION FORMULA:

THE CLASSIFICATION FORMULA SHOULD BE BROUGHT UP CLEARLY AND LEGIBLY.

IN THE 32-32 PRIMARY, IF THE NUMBER FIVE FINGER IS AMPUTATED OR SCARRED, THE FINAL IS TAKEN FROM THE NUMBER TEN FINGER. HOWEVER, IN THIS CASE THE RIDGE COUNT OF NUMBER TEN FINGER IS ALSO ENTERED IN THE NUMBER FIVE FINGER BLOCK, AND THE FINAL IS PLACED ABOVE THE CLASSIFICATION LINE.

AUTOMATIC REFERENCE OF RIDGE COUNTS:

1. THE FINAL AND KEY ARE AUTOMATICALLY SEARCHED TWO COUNTS BELOW THE LOWEST COUNT AND TWO COUNTS ABOVE THE HIGHEST COUNT.

LINE COUNTS:

1. LINE COUNTS ARE THOSE RIDGE COUNTS IN WHICH A DIFFERENCE OF ONE COUNT EITHER ADDED OR SUBTRACTED WILL MAKE A CHANGE IN THE CLASSIFICATION FORMULA.

   A. LINE COUNTS MUST BE SEARCHED ON BOTH SIDES OF THE LINE.

GENERAL REFERENCE RULES:

1. IF UNABLE TO DETERMINE THE EXACT PATTERN, RIDGE COUNT OR TRACING, A REFERENCE IS NECESSARY.
   A. AMPUTATIONS, SCARS, SKIN CONDITIONS, BLURRED AND SMUDGED PATTERNS, ETC. FALL IN THIS CATEGORY.
   B. CREASES AND SCARS CAUSE UNNATURAL BREAKS IN RIDGES.
   C. INKING VARIATIONS MAY CAUSE RIDGE COUNT AND TRACING REFERENCES.
   D. QUESTIONABLE DELTAS MAY CAUSE RIDGE COUNT AND TRACING REFERENCES.
   E. A QUESTIONABLE CORE MAY CAUSE A RIDGE COUNT REFERENCE.

REVERSE INTERPRETATIONS

NO SET RULE CAN BE DEVISED WHEN, AND WHEN NOT, TO CLASSIFY A FINGERPRINT PATTERN WITH A REVERSE INTERPRETATION. INDIVIDUAL JUDGMENT IS THE ONLY STANDARD. THE TEST IS, IF THE PATTERN, IN THE OPINION OF THE CLASSIFIER, IS ROLLED ONLY TO A NORMAL WIDTH, IT SHOULD BE CLASSIFIED AS IT APPEARS. IF IT APPEARS TO BE ROLLED TO A WIDTH BEYOND A NORMAL DEGREE, IT SHOULD BE CLASSIFIED AS IF ROLLED ONLY TO A NORMAL DEGREE, AND REFERENCED. AGE, WEIGHT, SIZE OF FINGERS AS SEEN IN THE PLAIN IMPRESSION INKING AND EXPERIENCE OF THE CLASSIFIER ARE ALL FACTORS IN ARRIVING AT THE CORRECT DECISION. IF IN DOUBT, REFER IT TO THE UNIT SUPERVISOR.

PRIMARY REFERENCES

1. PRIMARY REFERENCES ARE OBTAINED FROM FINGERS REFERENCED TO OR FROM A WHORL.
2. ALL PRIMARY REFERENCES ARE INDICATED ON THE REFERENCE LINE.

PRIMARY REFERENCE CHART

ONE	FINGER	.....2 PRIMARIES
TWO	"	4
THREE	"	8
FOUR	"	16
FIVE	"	32
SIX	"	64
SEVEN	"	128
EIGHT	"	256
NINE	"	512
TEN	"	1024

THE NUMBER OF PRIMARIES DOUBLES EACH TIME A FINGER IS REFERENCED TO OR FROM A WHORL.

SECONDARY REFERENCES:

1. IT IS NECESSARY TO BRING UP ALL SECONDARY REFERENCES TO THE REFERENCE LINE, IN SEQUENTIAL ORDER, IN THE 1 OVER 1 PRIMARY ONLY.

2. SECONDARY REFERENCES ARE BROUGHT UP TO THE REFERENCE LINE IN FRONT OF PRIMARY REFERENCES IN SEQUENTIAL ORDER.

3. ONLY THE SECONDARY REFERENCES WHICH WOULD BE USED IN THE 1 OVER 1 PRIMARY ARE BROUGHT UP ON THE REFERENCE LINE. NO REFERENCE IS EVER INDICATED IN THE CLASSIFICATION FORMULA OR ON THE CLASSIFICATION LINE ITSELF. REFERENCES ARE INDICATED IN THE FINGER BLOCKS, AND ON THE REFERENCE LINE. THE REFERENCES SHOWN ON THE REFERENCE LINE ARE:

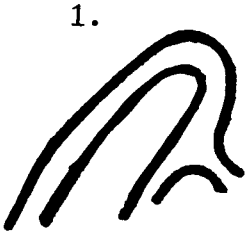
   A. ALL PRIMARY REFERENCES.

   B. SECONDARY REFERENCES IN THE 1 OVER 1 PRIMARY ONLY (AND ONLY WHEN THE HEAD PRIMARY IS 1 OVER 1.)

   C. CERTAIN FILE REFERENCES, I.E., AMP, REF, PD, FEMALE.

AUTOMATIC REFERENCE RULES

1. ANY TENTED ARCH CONTAINING A LOOPING RIDGE MUST BE REFERENCED TO A LOOP.

1. 
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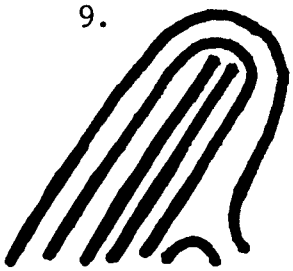
9. 
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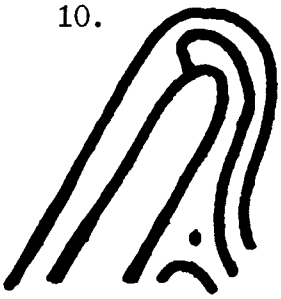
10. 
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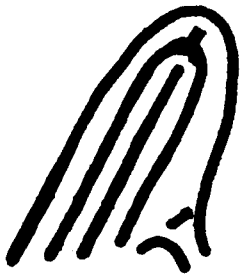
11. 
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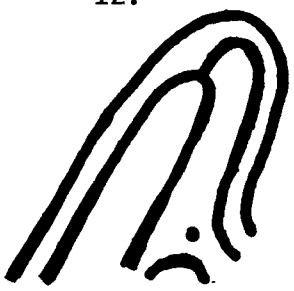
12. 
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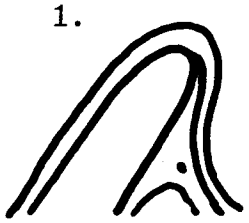
AUTOMATIC REFERENCE RULES

2. ANY LOOP PATTERN CONSISTING OF A SINGLE LOOPING RIDGE, WHICH HAS AN APPENDAGE BETWEEN THE SHOULDERS, MUST BE REFERENCED TO A TENTED ARCH PROVIDED THAT THE APPENDAGE DOES NOT COME IN FRONT OF THE DELTA.

1. 

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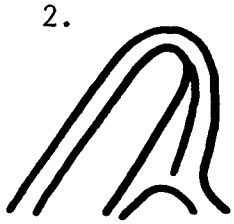
2. 

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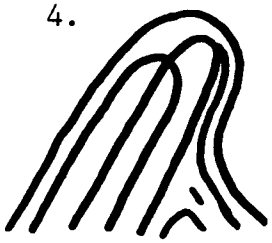
4. 

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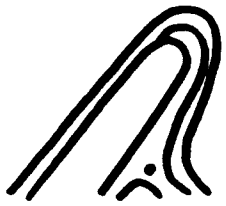
6. 

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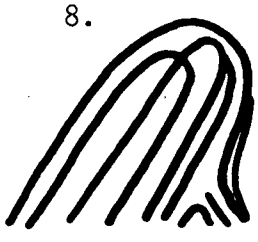
8. 

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AUTOMATIC REFERENCE RULES

3. ANY ANGULAR TYPE TENTED ARCH MUST BE REFERENCED TO A PLAIN ARCH.

   ONE EXCEPTION IS THE VERY ACUTE ANGLE.

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2.

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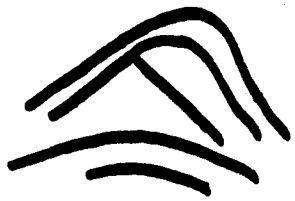
3.



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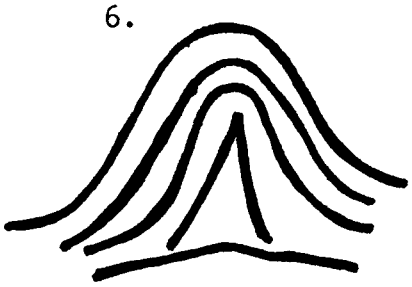

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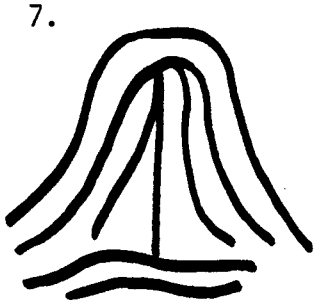

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AUTOMATIC REFERENCE RULES

4. ANY TENTED ARCH COMPOSED OF TWO ENDING RIDGES ON OR ABOUT THE SAME PLANE PLUS A DELTA FORMATION MUST BE REFERENCED TO A PLAIN ARCH, PROVIDED, NEITHER RIDGE HAS A DEFINITE UPTHRUST. REFERENCED BECAUSE OF A CHANGE IN DEFINITION. THESE WERE ORIGINALLY CLASSIFIED AS PLAIN ARCHES.

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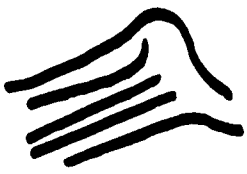
4. 

t

5. 

t

6. 

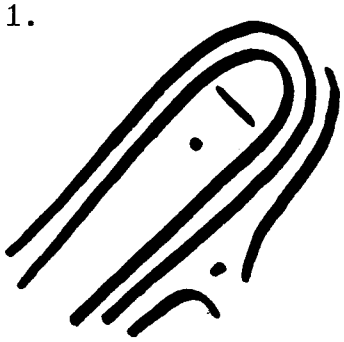
t

AUTOMATIC REFERENCE RULES

5. ANY OBSTRUCTION TYPE CENTRAL POCKET LOOP WHORL MUST BE REFERENCED TO A LOOP.

   A. REFERENCED BECAUSE OF A CHANGE OF DEFINITION. THIS WAS ORIGINALLY CLASSIFIED AS A LOOP.

1.



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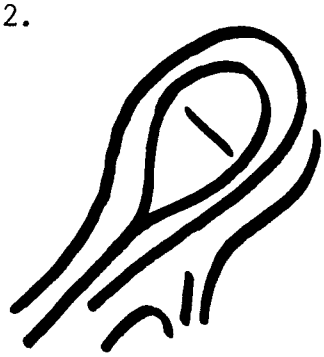
2.



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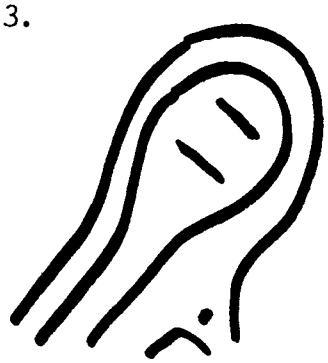
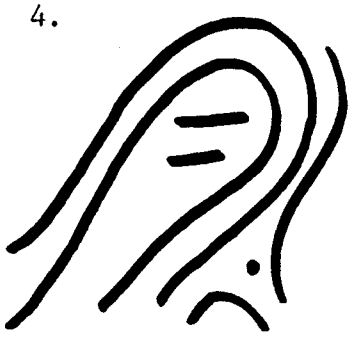
3.



W?/

4.



/

QUESTIONABLE PATTERNS

1.

2.

3.

4.

5.

6.

7.

8.

9.

AUTOMATIC REFERENCE
QUIZ

1. 

2. 

3. 

4. 

5. 

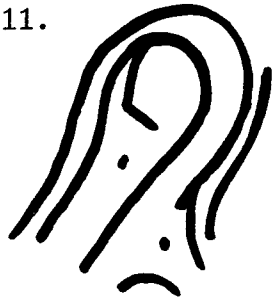
6. 

7. 

8. 

9. 

10. 

11. 

12. 

13. 

14. 

15. 

NCIC CLASSIFICATION - FINGERPRINT CLASS

PATTERN	CODE
PLAIN ARCH	AA
TENTED ARCH	TT
ULNAR LOOP	TWO NUMERIC CHARACTERS INDICATING EXACT RIDGE COUNT. IF THE RIDGE COUNT IS LESS THAN 10, PRECEDE WITH ZERO.
RADIAL LOOP	TWO NUMERIC CHARACTERS--EXACT RIDGE COUNT PLUS ARBITRARY 50.
PLAIN WHORL	"P" FOLLOWED BY TRACING "I", "M" OR "O".
CENTRAL POCKET LOOP WHORL	"C" FOLLOWED BY TRACING "I", "M" OR "O".
DOUBLE LOOP WHORL	SMALL "d" FOLLOWED BY TRACING "I", "M" OR "O".
ACCIDENTAL WHORL	"X" FOLLOWED BY TRACING "I", "M" OR "O".

MISSING FINGERS AND AMPUTATIONS ARE INDICATED BY "XX".

COMPLETE SCARS AND MUTILATIONS ARE INDICATED BY "SR".

THE NCIC FORMULA FOR THE HENRY CLASSIFICATION SHOWN IN EXAMPLE BELOW WOULD APPEAR:

P O P I C M P M C I S R P M C I P O P O

PO	PI	CM	PM	CI 10
W	W	W	W	W
W C d X Complete Scar SR O I M 1-OUT	PM	CI	PO	PO
W?a t r /	W	W	W	W

CLASSIFICATION QUIZ _____

TT	60	AA	PO	05
t	R	a	W	\
dO	19	54	08	(W C d X) SR (5 1 25) COMPLETE SCAR (I M O)
W	/	r	/	/atrw

_____

20	PM	CI	(W C d X) AMP XX (10 1 25 I M O)	07
\	W	W	\atrw	\
14	dO	XO	10	12
/	W	W	/	/

BLOCKING OUT
OR
PRELIMINARY CLASSIFICATION

BLOCKING OUT IS NECESSARY TO AID THE MANUAL NAME SEARCH UNIT IN MAKING A NAME SEARCH.

IN BLOCKING OUT THERE ARE SIX PARTS OF THE CLASSIFICATION FORMULA TO BE BROUGHT UP -- NOT NECESSARILY ALL PARTS WILL APPEAR ON EVERY FINGERPRINT CARD. IN THE MAJORITY OF THE CASES THE PRIMARY AND SECONDARY WILL BE THE ONLY PARTS BROUGHT UP ON THE CLASSIFICATION LINE.

SIX STEPS IN BLOCKING OUT

1. PRIMARY
2. SECONDARY
3. ALL SMALL LETTERS
4. ALL PRIMARY REFERENCES
5. ALL SECONDARY REFERENCES IF THE PRIMARY IS ONE OVER ONE
6. IN ALL ONE OVER ONE ALL LOOP GROUP WITH NO SMALL LETTERS, THE LOOP IN FINGERS NUMBER ONE AND SIX ARE COUNTED AND A KEY IS BROUGHT UP.

AMPUTATIONS AND SCARRED PATTERNS

A. QUALIFICATION FOR AMPUTATIONS

I. AMPUTATED FINGERS OR FINGERS MISSING AT BIRTH MUST BE COMPLETELY MISSING OR AT LEAST ONE-HALF OF THE PATTERN AREA MISSING.

II. THERE MUST BE A NOTATION FROM THE CONTRIBUTOR TO THE EFFECT THAT THE FINGER IS - MISSING - MISSING AT BIRTH - AMPUTATED - CUT-OFF - SHOT-OFF - ETC.

FINGERS THAT ARE PARALYZED, BURNED, BANDAGED, BENT UNDER, SORE, ETC, CANNOT BE PROCESSED AS AMPUTATED FINGERS, AND ARE NORMALLY RETURNED TO CONTRIBUTOR FOR A LATER ATTEMPT AT PRINTING.

B. PROCEDURE FOR CLASSIFICATION AND HANDLING OF AMPUTATIONS.

I. THE WORD AMP IS USED IN THE CRIMINAL JUSTICE INFORMATION SERVICES DIVISION FOR ALL MISSING FINGERS AND MUST BE STAMPED IN <u>RED</u> IN THREE DIFFERENT AREAS ON THE FINGERPRINT CARD.

1. ABOVE THE CLASSIFICATION FORMULA.

AMPUTATIONS CONTINUED --

2. IN THE ROLLED IMPRESSION FINGER BLOCK WHERE EACH FINGER IS MISSING.

3. IN THE PLAIN IMPRESSION AREA REPRESENTING THE MISSING FINGER.

NOTE: AMPUTATED FINGERS ARE INDICATED BY "XX" IN THE FINGERPRINT BLOCK FOR THE NCIC CLASSIFICATION. SEE PAGES 87, 88.

II. CLASSIFICATION OF AMPUTATED FINGERS.

1. IF ONE FINGER ON THE FINGERPRINT CARD IS MISSING - GIVE THE MISSING FINGER THE CLASSIFICATION OF THE OPPOSITE FINGER, INCLUDING PATTERN AND RIDGE COUNT, OR TRACING. THERE ARE NO EXCEPTIONS TO THIS RULE.

2. REFERENCE MISSING FINGER TO ALL REMAINING PATTERNS.

3. REFERENCE RIDGE COUNT OR TRACING ACCORDING TO HOW USED IN CLASSIFICATION FORMULA.

A. IF RIDGE COUNT OR TRACING HAS NO EFFECT ON THE FORMULA DO NOT REFERENCE.

AMPUTATIONS CONTINUED --

B. IF RIDGE COUNT AFFECTS FINAL OR KEY -- USE 1-OUT.

C. WHEN NUMBER FIVE FINGER IN THE 32 OVER 32 PRIMARY IS AMPUTATED, COUNT NUMBER TEN FINGER FROM RIGHT DELTA TO CORE AS IF IT WERE AN ULNAR LOOP AND BRING THE COUNT UP IN BOTH NUMBER TEN AND NUMBER FIVE FINGER BLOCKS. NOTE-- IN THIS PRIMARY THE FINAL IS ALWAYS BROUGHT UP ABOVE THE CLASSIFICATION LINE.

4. MISSING AT BIRTH FINGERS ARE TREATED AS AMPUTATIONS AND ARE GIVEN THE IDENTICAL CLASSIFICATION OF THE OPPOSITE FINGER, WITH NO ADDITIONAL REFERENCES.

III. TWO OR MORE FINGERS AMPUTATED

1. TWO OR MORE FINGERS MISSING ARE CLASSIFIED AS THE OPPOSITE FINGERS ONLY. - NO ADDITIONAL REFERENCES -

2. TWO AMPUTATED FINGERS OPPOSITE EACH OTHER ARE CLASSIFIED AS WHORLS WITH MEETING TRACING, NOTHING MORE.

IV. PARTIAL AMPS OR TIP AMPS

PARTIALLY AMPUTATED FINGERS OFTEN PRESENT VERY COMPLEX PROBLEMS AND IT IS A MATTER OF EXPERIENCE AND JUDGMENT AS TO THEIR PREFERRED CLASSIFICATION.

1. IN THOSE INSTANCES IN WHICH <u>HALF OR MORE THAN HALF</u> OF THE PATTERN AREA IS MISSING, IT IS CLASSIFIED AS THE OPPOSITE FINGER FIRST, AND REFERENCED TO WHAT IT COULD HAVE BEEN.

2. IF <u>LESS THAN HALF</u> OF THE PATTERN AREA IS MISSING, YOU WOULD CLASSIFY THE PARTIAL AMP AS IT APPEARS AND REFERENCE IT TO THE OPPOSITE FINGER. THE AMP STAMP WILL APPEAR ON THE REFERENCE LINE ONLY.

CLASSIFICATION OF SCARRED PATTERNS:

IT IS NECESSARY THAT ALL SCARRED PATTERNS BE FULLY REFERENCED. SINCE THE RULES FOR CLASSIFYING PARTIAL SCARS DIFFER FROM THE CLASSIFICATION RULES OF COMPLETE SCARS, IT IS EXTREMELY IMPORTANT THAT IT FIRST BE DETERMINED WHETHER THE IMPRESSION IS A PARTIAL SCAR OR A COMPLETE SCAR. IN CONNECTION WITH THIS PROPER CLASSIFICATION, THE FOLLOWING RULES SHOULD BE OBSERVED.

PARTIAL SCARS:

AN IMPRESSION IS DETERMINED TO BE A PARTIAL SCAR WHEN THE SCARRED PATTERN COULD HAVE BEEN ONLY ONE OR AT MOST TWO OF THE THREE GENERAL PATTERN TYPES.

1. IN THIS CASE THE PATTERN IS GIVEN THE CLASSIFICATION OF THE OPPOSITE FINGER IF IT REASONABLY COULD HAVE HAD THE SAME CLASSIFICATION, AND REFERENCED TO ANY OTHER POSSIBILITY. IF IT COULD NOT REASONABLY HAVE HAD THE SAME CLASSIFICATION AS THE OPPOSITE FINGER, CLASSIFY AS IT APPEARS AND REFERENCE TO ANY OTHER APPROPRIATE POSSIBILITY.

2. PATTERNS, RIDGE COUNTS AND TRACINGS ARE CLASSIFIED SEPARATELY, I.E., IF THE SCAR AFFECTS THE PATTERN TYPE, BUT NOT THE RIDGE COUNT OR TRACING, THEN IT IS NOT NECESSARY TO REFERENCE THE RIDGE COUNT OR TRACING. IF THE SCAR AFFECTS THE RIDGE COUNT OR TRACING BUT NOT THE PATTERN TYPE, THEN IT IS NOT NECESSARY TO REFERENCE THE PATTERN TYPE.

NOTE: ANY IMPRESSION WITH A PARTIAL SCAR, WHICH REQUIRES A REFERENCE TO ANY OTHER PATTERN BECAUSE OF THE SCAR, SHOULD BE REFERENCED TO "SR".

COMPLETE SCARS:

AN IMPRESSION IS DETERMINED TO BE A COMPLETE SCAR WHEN THE SCARRED PATTERN COULD HAVE BEEN ANY OF THE THREE GENERAL PATTERN TYPES.

1. IN THIS CASE, THE SCARRED PATTERN IS GIVEN THE CLASSIFICATION OF THE OPPOSITE FINGER (PATTERN, RIDGE COUNT, TRACING), REGARDLESS OF THE FACT THAT THE SCARRED PATTERN COULD, IN SOME INSTANCES VERY OBVIOUSLY NEVER HAD EXACTLY THE SAME CLASSIFICATION OF THE OPPOSITE FINGER.

2. IN THE CLASSIFICATION OF COMPLETE SCARS, IT IS WELL TO REMEMBER THAT THE THREE GENERAL PATTERN TYPES ARE ARCHES, LOOPS, AND WHORLS. THEN FOR THE COMPLETE SCAR RULE, THE SCARRED PATTERN, IF IT COULD HAVE BEEN EITHER A PLAIN OR A TENTED ARCH, IT WOULD FALL INTO THE ARCH GROUP. IF IT COULD HAVE BEEN EITHER A RADIAL OR ULNAR LOOP, IT WOULD FALL INTO THE LOOP GROUP. IF IT COULD HAVE BEEN ANY OF THE WHORL TYPES, IT WOULD FALL INTO THE WHORL GROUP. IT IS NOT NECESSARY THAT A PATTERN BE COMPLETELY UNCLASSIFICABLE IN ORDER TO BE CLASSIFIED AS A COMPLETE SCAR.

NOTE: AN IMPRESSION WITH A COMPLETE SCAR IS INDICATED WITH "SR" IN THE FINGERPRINT BLOCK FOR THE NCIC CLASSIFICATION. SEE PAGES 87, 88.

EXTRA FINGERS ARE TREATED AS THOUGH THE FINGER ON THE OUTSIDE OF THE HAND WERE NOT PRESENT.

SCARRED PATTERNS

1.

2.

3.

4.

5.

COMPLETE SCARS

CLASSIFY COMPLETELY SCARRED IMPRESSIONS BY THE SAME RULES USED FOR AMPUTATED FINGERS.

HOWEVER, OMIT AMP STAMP AND INDICATE SR IN THE FINGERPRINT BLOCK.

SEE PAGES 91, 92, 93

CLASSIFICATION OF AMPUTATED FINGERS

A COMBINATION OF COMPLETELY SCARRED IMPRESSION AND COMPLETE AMPUTATION SHOULD BE CLASSIFIED AS ALL COMPLETE AMPUTATIONS. OMIT THE AMP STAMP IN COMPLETELY SCARRED FINGERPRINT BLOCK OR BLOCKS.

SEE PAGE 93

TWO OR MORE FINGERS AMPUTATED

FILING SEQUENCE GUIDE

THE SEQUENCE MUST BE ARRANGED PROPERLY AT ALL TIMES TO MAKE POSSIBLE THE MOST ACCURATE WORK. PRINTS ARE SEQUENCED AND FILED IN THIS ORDER, ACCORDING TO :

I. PRIMARY: $\frac{1}{1}$ TO $\frac{32}{32}$

THE DENOMINATOR (BELOW THE LINE) REMAINS CONSTANT UNTIL ALL NUMERATOR (ABOVE THE LINE) FIGURES HAVE BEEN EXHAUSTED FROM 1 TO 32. IN OTHER WORDS, ALL PRINTS IN THE 1 OVER 1 PRIMARY ARE FILED TOGETHER, FOLLOWED BY 2 OVER 1, 3 OVER 1, 4 OVER 1, ETC. UNTIL 32 OVER 1 IS REACHED. THEN THE DENOMINATOR WOULD CHANGE TO A 2 AND THE NEXT PRIMARY IS 1 OVER 2, FOLLOWED BY 2 OVER 2, 3 OVER 2, ETC. UNTIL 32 OVER 2 IS REACHED. EVENTUALLY THE 32 OVER 32 PRIMARY WILL BE REACHED.

II. SECONDARY:

A. SECONDARY SMALL-LETTER GROUP:

A rW3r
A TO rW3r

1. SEQUENCE ACCORDING TO THE PATTERNS IN THE INDEX FINGERS, GROUPED A OVER A TO W OVER W.

SECONDARY SMALL-LETTER
POSSIBLE COMBINATIONS

A T R U W A T R U W A T R U W
A A A A A T T T T T R R R R R

A T R U W A T R U W
U U U U U W W W W W

2. WITHIN EACH GROUP SEQUENCE:

THE DENOMINATOR BY--
(a) COUNT OF THE SMALL LETTERS
(O SL--1-2-3- OR 4 SL)
(b) POSITION OF THE SMALL LETTERS (THOSE TO THE LEFT PRECEDING THOSE TO THE RIGHT)
(c) TYPE OF SMALL LETTER(a-t-r)
THE NUMERATOR BY--
(a) COUNT
(b) POSITION
(c) TYPE

HERE AGAIN THE DENOMINATOR REMAINS CONSTANT UNTIL ALL NUMERATOR FIGURES HAVE BEEN EXHAUSTED BY COUNT-POSITION AND TYPE.

--EXAMPLE--

A aA tA rA Aa At Ar aAa aAt aAr
A A A A A A A A A

tAa tAt tAr rAa rAt rAr A2a Aat A2r
A A A A A A A A A

DASHES MAY APPEAR IN THE SMALL LETTER SEQUENCE AND WHEN THE SMALL LETTERS ARE THE SAME IN THE NUMERATOR AND DENOMINATOR, THEY ARE SEQUENCED AND FILED IN THIS ORDER:

a-DASH, DASH IN THE DENOMINATOR

b-DASH IN THE DENOMINATOR

c-NO DASHES IN THE DENOMINATOR

B. SECONDARY LOOP AND WHORL GROUP:

R W
TO
R W

WHEN NO SMALL LETTERS ARE PRESENT THE FOLLOWING POSSIBLE COMBINATIONS CAN APPEAR IN THE INDEX FINGERS:

R U W R U W R U W
R R R U U U W W W

III. SUBSECONDARY: III OOO
TO
III OOO

THE DENOMINATOR REMAINS CONSTANT UNTILL ALL NIMERATOR FIGURES HAVE BEEN EXHAUSTED:

--EXAMPLE--

III IIM IIO IMI IMM IMO IOI IOM IOO
III III III III III III III III III

MII MIM MIO MMI MMM MMO MOI MOM MOO
III III III III III III III III III

OII OIM OIO OMI OMM OMO OOI OOM OOO
III III III III III III III III III

NOTE -- THE SUBSECONDARY FIGURES CHANGE RIGHT TO LEFT AND EACH NUMERATOR IN TURN BECOMING THE DENOMINATOR FOR THE COMPLETE SEQUENCE.

IV. MAJOR:

WHEN LOOPS APPEAR IN BOTH THUMBS THE FOLLOWING POSSIBILE COMBINATIONS MAY APPEAR IN THE MAJOR.

S M L S M L S M L
S S S M M M L L L

WHEN WHORLS APPEAR IN BOTH THUMBS.

I M O I M O I M O
I I I M M M O O O

WHEN A COMBINATION OF LOOP AND WHORL APPEAR IN THE THUMBS THE SEQUENCE COULD POSSIBLY BE:

I M O I M O I M O
S S S M M M L L L

S M L S M L S M L
I I I M M M O O O

V. FINAL:

FILED IN NUMERICAL SEQUENCE FROM 1 OUT. FOR EXAMPLE, ASSUME THAT THERE ARE 10 PRINTS IN A GROUP HAVING A FINAL OF 8. ALL OF THESE SHOULD BE FILED TOGETHER

AND FOLLOWED BY THOSE PRINTS IN THE SAME GROUP HAVING A FINAL OF 9, ETC.

NOTE: SAME GROUP--MEANS THE SAME PRIMARY, SECONDARY, SMALL LETTRS OR SUBSECONDARY AND MAJOR OR SMALL LETTER

--EXAMPLE--

```
L 5 U III 8        L 5 U III 9
M 1 U IOI          M 1 U IOI

L 5 U III 10       L 5 U III 11
M 1 U IOI          M 1 U IOI
```

VI. KEY:

ASSUMING THE SEQUENCE HAS BEEN COMPLETED THRU THE FINAL AND THERE ARE FIVE PRINTS WITH THE SAME FINAL IN ANY ONE GROUP. ARRANGE BY KEY IN NUMERICAL SEQUENCE FROM 1 OUT.

--EXAMPLE--

```
12 M 9 U IIO 5     13 M 9 U IIO 5
   M 2 U IIM          M 2 U IIM

14 M 9 U IIO 5     15 M 9 U IIO 5
   M 2 U IIM          M 2 U IIM

16 M 9 U IIO 5
   M 2 U IIM
```


*U.S. Government Printing Office: 1994 — 301-178/85002