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B.Sc. Part-I, (Zool. Stud.)

Paper - I.B.

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TYPES OF CHROMOSOMES :-

In the position of the centromere in the chromosomes, they are classified into following four types:

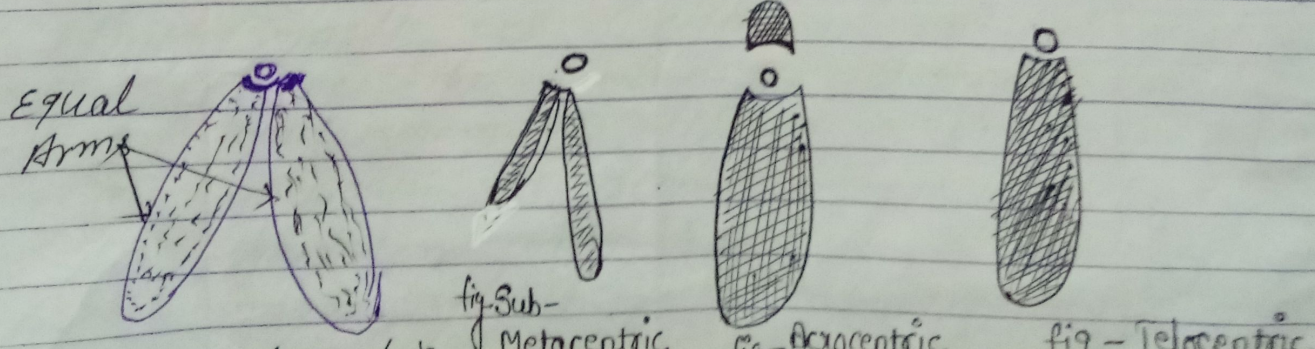
- (1) METACENTRIC :- (i) The centromere is situated either in the midpoint or near the midpoint in position.  
(ii) Two arms are either equal or nearly equal in length.  
(iii) The chromosome appears 'V' shaped in Anaphase. This type of chromosome is found in ~~invertebrates~~ amphibians.

- (2) SUB-METACENTRIC :- (i) The centromere is located on some distance away from the midpoint i.e. submedian in position.  
(ii) The arms are unequal in length. The chromosome appears 'L'-shaped.

- (3) ACROCENTRIC :- In this type of chromosome, centromere divides the chromosome into one very small segment and one very large segment.

- (4) TELOCENTRIC :- In this type of chromosome, centromere is present at one end.

- (5) ACENTRIC :- In this type of chromosome, centromere is absent.



[B] In eukaryotic cells, on the basis of size and other characters, chromosomes are of two types: —

(1) AUTOSOME: — These chromosomes do not take part in sex determination but necessary for producing somatic characters like number is more than sex chromosome. For example, in human cell out of 46 chromosomes, 44 are autosome.

(2) SEX CHROMOSOME (HETEROSOME): — These chromosomes are necessary for sex determination. In human cells its number is 2. The larger one is called X-chromosome and the smaller one is called Y-chromosome. In human male, both "XY" are present, but in human female, only "XX" are present.

[C] on the basis of number of chromosome, it may be of two types: —

(1) HAPLOID → In this type of chromosome, only single partner of pairs are present. — In human sperm & egg haploid number of chromosome is 23. it is denoted by 'n', The haploid set of chromosome is called genome.

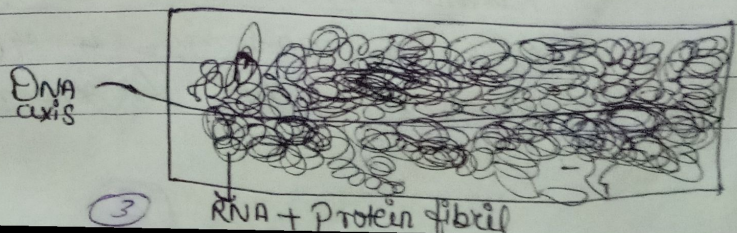
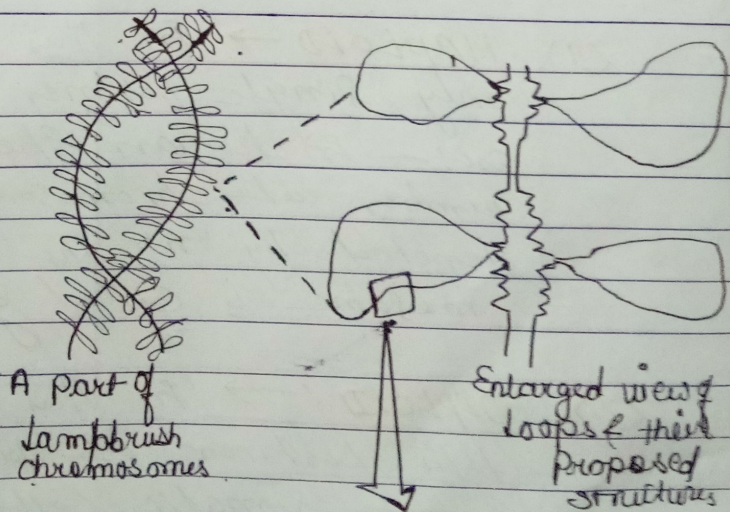
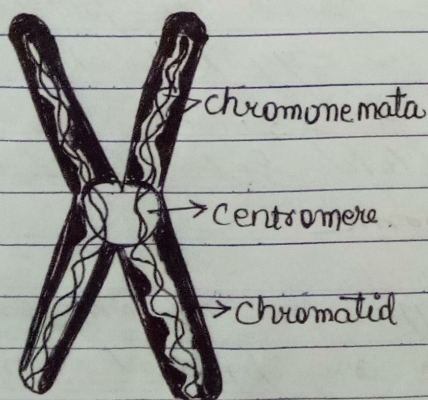
(2) DIPLOID → In this type of chromosome both partner of pairs are present in human somatic cells, The diploid number of chromosome is 46. it is denoted by "2n". The diagram which represent

The diploid number of chromosome is called karyogram.

DYAD CHROMOSOME:— During cell division, chromosomes become shorter and thicker and each chromosome split vertically but attached at the point of centromere. Such type of chromosome is called dyad chromosome and each half part of chromosome is called chromatid. The two chromatids of same chromosome is called sister chromatids.

SPECIAL TYPE OF CHROMOSOME:—

(1) LAMPBRUSH CHROMOSOME:— In the yolk egg of some vertebrates, some giant chromosomes are found which is similar to brush used for cleaning of lamps. Such type of chromosome is called lampbrush chromosome. It's length is approx 800-1000  $\mu\text{m}$ . Due to extra length of chromosome, some loops are found in each loop. Central DNA axis is present which is surrounded by protein bounded RNA.



12) POLYTENE CHROMOSOME :— it is also an important giant chromosome, which is first time reported by Balbiani in 1881 in salivary gland of diptera insect. its length is approx. 2000  $\mu\text{m}$ . At the surface of chromosome, some transverse, dark and light bands of euchromatin and heterochromatin are found respectively.

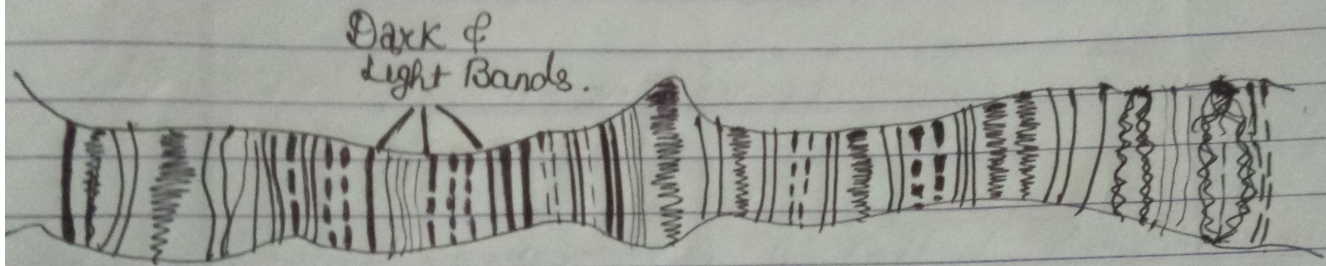


Fig:— polytene chromosome.