(F) Satellites: They are round bodies on chromosome. One is of constant shape and size for a particular chromosome. They are away from secondary constriction. They are not on small part. They are seen in only some of the chromosomes.

ULTRA STRUCTURE OF CHROMOSOME

Under Electron microscope it is clear that there is no peliculer structure.
There are fine fibrils (2 nm - 4 nm in thickness). It suggests the presence of a single molecule of DNA.

(1965-66) fibrilar diameter
Alt Dupraw } ~~The thickness~~ may be more 230 A° at interphase and 300 A° during Metaphase. It suggests that ~~#~~ number of DNA fibrils may be ~~not~~ 2 or more than two i.e. 2 - 4, 6, 8, - - 32 etc.

Hence there are two views regarding strands of chromosome.

A) Duprew (1965): According to this DNA molecule is wrapped in a nucleoprotein.
This DNA-protein fibre is tightly coiled forming 250-300 A° fibril of each chromatid.
Both of the chromatids are held together at the Centromere by an unreplicated fibre

segment of DNA & until Anaphase.

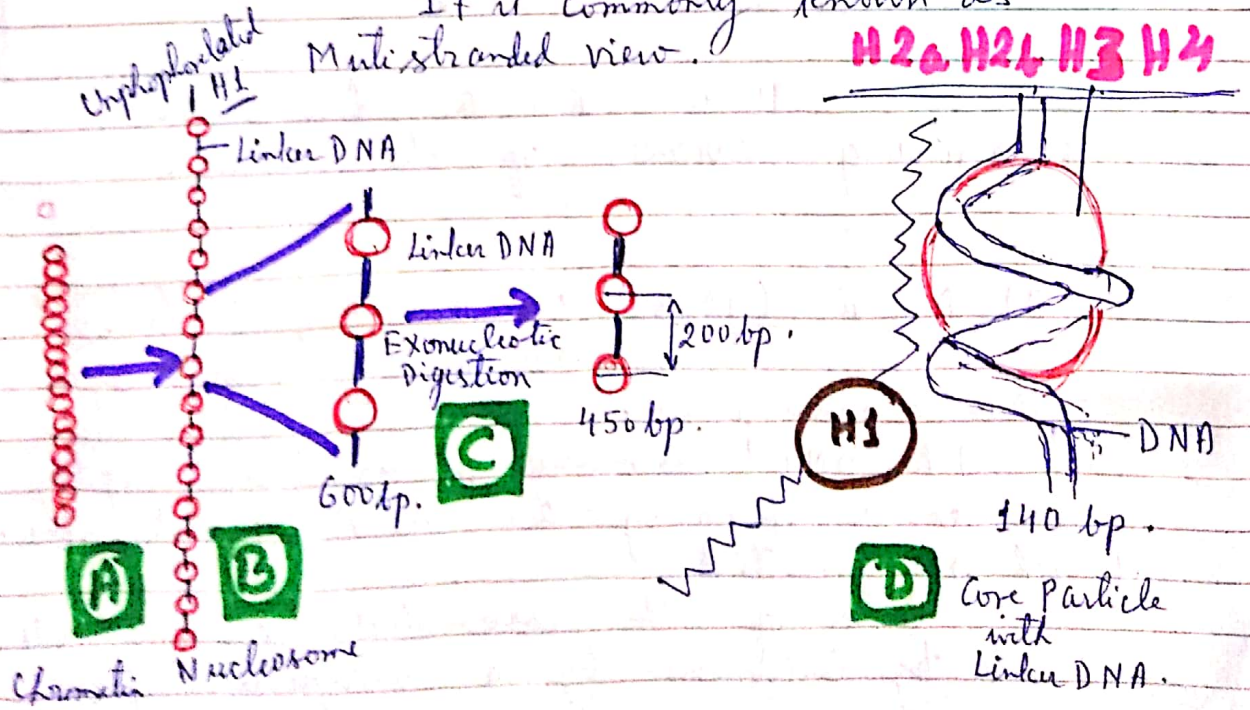
This model is commonly known as Folded fibre model or Unistrand View.

It is accepted by many workers.

B) Alt to this — A chromosome has two (2) chromatids. Each chromatid possess four (4) fibrils. There may be sixteen (16) chromosomal fibrils and thirty two (32) DNA molecules. The thickness of chromosome may be from (smallest) 100 A° to (largest) (1600 A°)

But it is not supported by Electron microscopic observations.

It is commonly known as Multistranded view.



Molecular Structure of Chromosome:

A/C R.D Kornberg and J.O. Thomas (1974)

DNA interacts with a tetramer of $H3_2 - H4_2$ and two molecules of an oligomere of H2A - H2B.

Tetramer possess two (2) molecules each of H3 and H4 histogen in association of two hundred (200) base pairs of DNA.

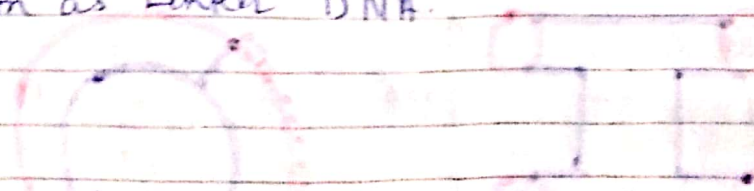
Each repeated unit has one molecule of H1 A histone.

In 1975 P. Oudet et. al. termed it Nucleosome.

A Nucleosome possess nucleosome core particle having one hundred forty six (146) base pairs with supercoiled DNA wrapped almost 1¾ twisting around a disc-shaped complex of eight (8) histone molecules.

There are two (2) copies of each histone H2A, H2B, H3B and H4 associated in an OCTOMER.

A DNA molecule of sixty (60) base pairs connects these nucleosomes. This DNA is known as Linker DNA.



H1 histone is just out the nucleosome core particle. H1 is associated with both ends of the DNA. DNA enters and exits from the core particle

The nucleosome core particle is a flat structure having dimensions of 57 x 110 x 110 A°

There may be three levels of coiling of unit fibre.

i) First Level: This is of DNA in string of nucleosome.
Coiling ratio 7 (nucleosome)

ii) Second Level: The string of nucleosome coils with 300 A° diameter.
i.e. Solenoid (6-8 nucleosomes).
Coiling level 6 (Solenoid)

iii) Third Level: Solenoid further coils into Supersolenoids structure having diameter of 4000 A° and 300 A° ~~thick around a wall of 300 A°~~
Coiling level 30-40 (Supersolenoid).
This supersolenoid structure is considered as an Unit Fibre.

There would be 1300 - 1500 fold ~~as~~ per unit fibre. These unit fibres correspond to chromosome. Like it further coils in chromosome.