

# NATURAL SYSTEMS :

(A brief description of Plant Classification)

For BOTANY  
B.Sc. Part III (H)  
Paper - VII  
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AHMAD MASOOD  
DEPTT. OF BOTANY  
H. D. JAIN COLLEGE  
ARA

MOB: 9430293428

- (a) These systems followed the artificial systems of classification — Linnaeus' system being the last artificial system,
- (b) prevailed till the advent of phylogenetic combinations proposed after Darwin's theory of evolution,
- (c) based on the gross morphology, utilizing as many taxonomic characters as possible given
- (d) The last of natural systems was by Benthām and Hooker (1862-83), which though appeared after the publication of the Darwin's theory of evolution, was pre-evolutionary in concept.

## Some important contributors

Although Linnaeus' system provided the basic framework of grouping a large number of taxa, but several unrelated plants came together. Thus a need was felt for a more objective classification, considering as many characters as possible and which should be based on natural affinities. French botanists took the lead in developing natural systems.

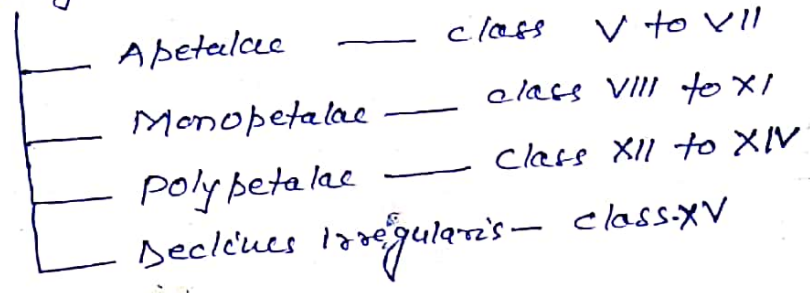
### Michel Adanson (1727-1806):

A French botanist, devised his system in two-volume work Families des Plantes (1763). He recognized 58 natural orders, utilizing as many features as possible in classifying the plants. Present-day Numerical taxonomy is based on the idea conceived by Adanson and now developed into Neo-Adansonian principles.

### Antoine Laurent de Jussieu (1748-1836):

He is considered as the first person to publish an elaborated natural classification. de Jussieu's family heard a lot about his uncle Bernard (1699-1776) arranged plants but never published it. Antoine used this information and made several changes in his publication Genera plantarum (1789). An outline of his classification is presented herein —

- 1. Acotyledones - plants without cotyledons - class I
- 2. Monocotyledones - plants with one cotyledon - class II to IV
- 3. Dicotyledones - plants with two cotyledons.



Thus a total of 15-classes were considered, the placement of plants are mainly based on the position of stamens with respect to ovary.

Acotyledones in addition to cryptogams contained some hydrophytes whose reproduction was not known then. Declines irregularis mostly included plants without corolla and ♂ and ♀ flowers on different plants, and also the Gymnosperms.

The classes were further divided into 100 natural orders (equivalent to present day family). In his classification, de Jussieu adopted the views of John Ray as to the primary divisions.

Robert Brown (1773-1858):

An English (Scottish) botanist. He didn't publish any system of his own, but contributed a lot to the better understanding of the morphology of the flowers and seed. He was the first person to demonstrate conclusively that the gymnosperms were a discrete group from the angiosperms as they have naked ovules and seeds.

In his publication Prochromis Florae Novae Hollandiae in 1827, he followed Jussieu's system.

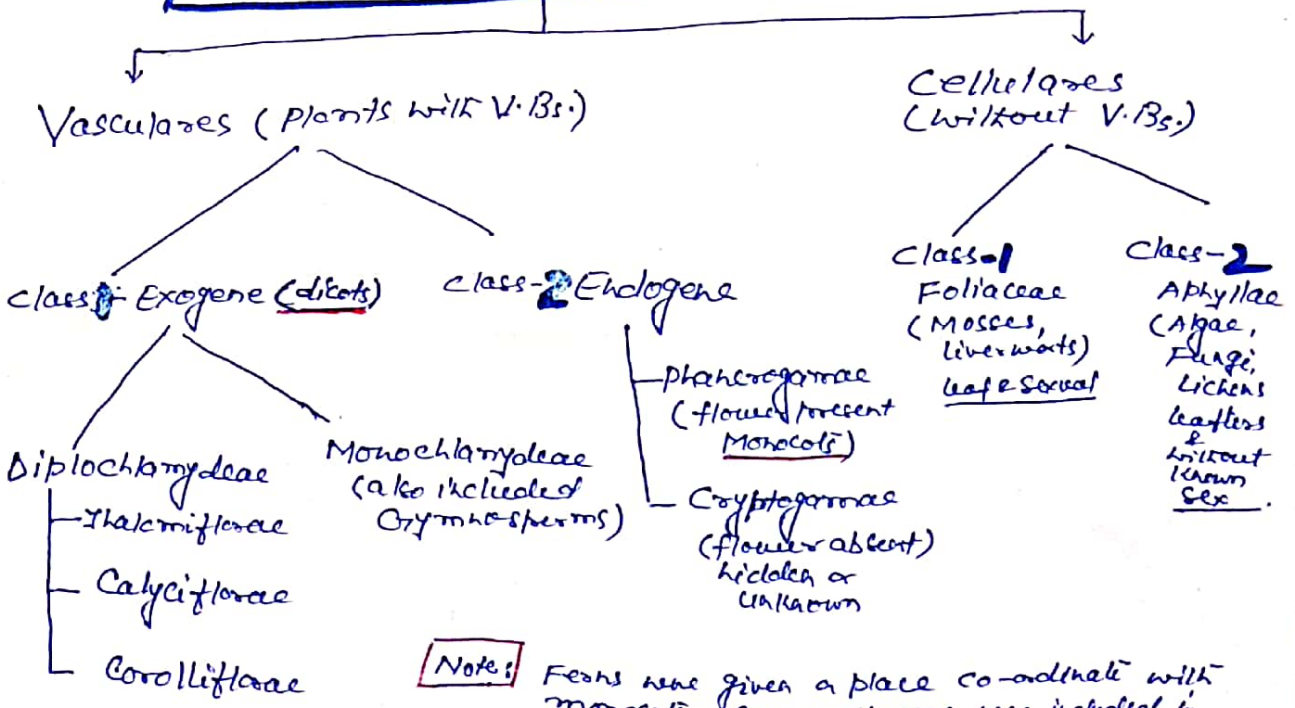
Augustin Pyramus de Candolle (1778-1841):  
a French botanist, ~~but~~ born in Switzerland  
<sup>took</sup> but his education in Paris.

In his book Theorie elementaire de la botanique (1813), he proposed a new classification scheme based on natural principles and introduced the term taxonomy.

From 1816 until his death he worked in Geneva (Switzerland) and published a monumental work "Prodromus Systematis Naturalis Regni Vegetabilis" in which he described every species of seed plants known at that time. He published seven volumes himself. His son Alphonse de Candolle and grandson Casimir de Candolle continued the work and published ten more volumes, the last one in 1873.

The classification contained 161 natural orders which was increased to 213 in the last revision of his first work Theorie -- edited by his son Alphonse in 1844. The grouping is primarily based on the presence or absence of vascular structures.

**An outline of de Candolle system (1813)**



**Note:** Ferns were given a place co-ordinate with monocots. Gymnosperms were included in dicots. The importance of anatomical features highlighted and included in the classification.

AHMAD MAHMOOD

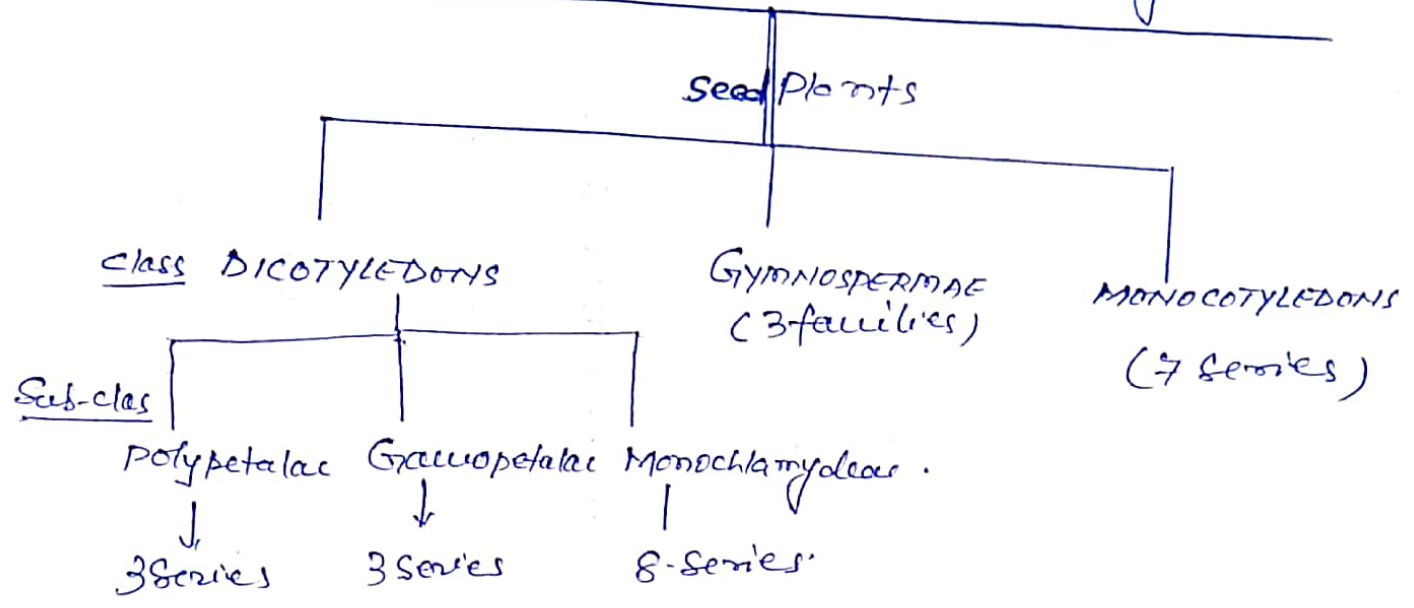
### John Lindley (1799-1865):

An English botanist. He published his book "Introduction to the Natural System of Botany", in which he gave a comprehensive natural system, the first natural classification in English. "The vegetable kingdom" (1846) was his another monumental work.

### George Bentham (1800-1884) and Sir Joseph Dalton Hooker (1817-1911):

- The two English botanists, associated with Royal Botanic Garden, Kew, gave the most outstanding and elaborate natural system of classification.
- The monumental work was published between 1862-1883 in the form of Genera Plantarum in three volumes.
- It contained the description of all genera of seed plants known to science at that time.
- This is not a compilation work of earlier authors, but they studied and examined each and every specimen themselves and put a record in the form of herbarium.
- The classification was a refinement of the system prepared by A.P. de Candolle and Lindley, which in turn were based on that of de Jussieu.
- It contained 202 families (originally named as Order has 200; 02 families was added later), 7569 genera and 97,205 species.
- This system was widely accepted in England and Commonwealth countries, but in Europe and America it didn't hold much ground where Englerian system has been preferred.

# An outline of Bentham & Hooker's System



Note! The details of the classification will be described separately.

AHMAD. MASOOD