

**Syllabus of the course of lectures on botany, delivered in Columbia College
/ by David Hosack.**

Contributors

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For Doct^r Sims

President of Med. Society

with respect

from Father.

SYLLABUS

COLUMBIA MEDICAL SOCIETY
COURSE OF LECTURES,
ON
BOTANY,

DELIVERED IN COLUMBIA COLLEGE,

BY DAVID HOSACK, M. D.

PROFESSOR OF BOTANY IN COLUMBIA COLLEGE,
MEMBER OF THE LINNEAN SOCIETY OF LONDON, AND
OF THE ROYAL MEDICAL AND PHYSICAL
SOCIETIES OF EDINBURGH.

NEW-YORK:—PRINTED BY JOHN CHILDS,

M,DCC,XCV.

ST. JAMES'S



EXETERED IN COLLEGE

BY DAVID HOGG, M.D.

PROFESSOR OF BOTANY IN COLLEGE

OF THE UNIVERSITY OF DUBLIN, AND

OF THE ROYAL HORTICULTURAL SOCIETY

OF IRELAND.

Printed by J. J. Moore, Dublin.


1840.

*At a meeting of the TRUSTEES of Columbia College, held at
the College Hall, on Monday the ninth day of July, 1792 :*

ORDERED, That every Professor of this College who teaches by Lecture, do publish within one year, a Syllabus of his Course of Lectures.

Extract from the Minutes,

ROBERT HARPUR, CLK.



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PART I.

STRUCTURE AND PHILOSOPHY OF VEGETABLES.

A.—GENERAL DIVISION OF NATURAL HISTORY.

1	METEOROLOGY	} History of the	ATMOSPHERE,	} kingdoms.
2	HYDROGRAPHY		WATERS,	
3	GEOLOGY		EARTH,	
4	ZOOLOGY		ANIMAL	
5	BOTANY		VEGETABLE	
6	MINERALOGY		MINERAL	

—Division of bodies into *animal*—*vegetable* and *mineral* considered—objections to—

Opinions of *Tournefort*, *Linnaeus*, &c. examined.—

Minerals—characters which distinguish them from animals and vegetables—

Vegetables—their near approach to the animal kingdom—

Distinctions proposed by

JUNGIUS,
BOORHAAVE
TOURNEFORT,
LUDWIG,
LINNÆUS,
ALSTON,
HEDWIG—

Corals and *Zoophytes*, referred by some authors to the vegetable and fossil kingdoms—their *animal* nature illustrated by the discoveries of *Peyssonel*, *Trembley*, *Jussieu*, *Donati*, *Ellis*, &c.—

B.—COMPARISON OF PLANTS AND ANIMALS.

- 1 Their origin.
- 2 ———Growth and manner of receiving nourishment.
- 3 Food.
- 4 Climate.
- 5 Secretion and excretion.
- 6 Sensation—volition—motion—sleep—watching.
- 7 Sexes.
- 8 Propagation.
- 9 Diseases.
- 10 Death.
- 11 Natural decomposition.
- 12 Chemical Analysis.

CONCLUSION—Animals and Vegetables links of the same chain of being—objections to by some Metaphysicians, considered.

C.—GENERAL ARRANGEMENT OF VEGETABLES.

- 1 Palms.
- 2 Trees.
- 3 Shrubs.
- 4 Herbs.
- 5 Grasses.
- 6 Ferns.
- 7 Fungi.
- 8 Mosses.
- 9 Algae.

—Characters of each illustrated.—

D.—COMPONENT PARTS OF A PLANT.

- 1 Root,
- 2 Trunk,
- 3 Branches.
- 4 Leaves.

5 Supports.

6 Flower.

7 Fruit.

—Exceptions to—

E.—ANATOMY OF PLANTS.

A.—SOLIDS.

1 Epidermis.

2 Rete Mucosum.

3 Cortex—its inner layer LIBER—

4 Alburnum.

5 Lignum.

6 Medulla.

7 Vasa Propria.

8 Tracheæ.

—Structure and functions illustrated by dissection and experiment.—

B.—FLUIDS.

(a).—NUTRITIOUS FLUIDS,

1 Lymph.

2 Sap.

—Circulation of the sap—doctrine of the Ancients—experiments of
HALES, HOPE, WALKER, &c.

(b).—SECRETED FLUIDS,

1 Gums.

2 Refins.

3 Gum Refins.

4 Balfams.

5 Oils—fixed and volatile.

6 Aroma—grateful and poisonous,

7 Water.

8 Vital air.

C.—ANOMALOUS SUBSTANCES.

1 Saline Substances.

- i Sugar,
- ii Manna,
- iii Nectar,
- 2 Farina,
- 3 Fœcula,
- 4 Colouring Matter.

—Observations on colours and the principles of dyeing.—

F.—CHEMICAL ANALYSIS OF VEGETABLES. *

1 Oxygen,	}	Common to all vegetables.
2 Hydrogen,		
3 Carbon,		
4 Nitrogen,	}	Contained in particular vegetables.
5 Phosphorus,		
6 Sulphur,		
7 Acids,		
8 Alkalis,		
9 Earths,		
10 Metals,		

G.—FOOD OF PLANTS.

- 1 Air,
- 2 Water,
- 3 Earth,
- 4 Heat,
- 5 Light.

—All necessary to the perfect growth of plants—illustrated by experiments and observations.—

* For the instruction of those who may not be acquainted with the principles of the new system of Chemistry, the Professor takes occasion to introduce a general sketch of the discoveries and improvements lately made in this branch of Science—referring for a particular detail to the valuable lectures of Professor Mitchill.

—Experiments of VAN HELMONT,

BOYLE,

HALES,

DU HAMEL,

TILLET,

HASSENFRATZ,

SENEBIER—

—Chemical Analysis of the *food* of plants compared with the Chemical Analysis of *plants*—

H.—*SOILS*.

1 Variety.

2 Composition.

3 Manner of Operation.

I.—*MANURES*.

1 Animal.

2 Vegetable,

3 Mineral.

4 Electricity.

—Operation of Manures—how far useful or injurious.—

K.—*OF THE SEED*.

A.—*DIFFERENT KINDS*.

1 Seed properly so called.

2 Nux.

3 Propago.

B.—*COMPONENT PARTS OF THE SEED*.

1 Arillus,

2 Hilum,

3 Foramen,

4 Cotyledon,

5 Coretulum,

i Plumula,

ii Radicula,

6 Corona,

7 Ala.

—Structure and Functions of each illustrated by dissection and experiments.

C.—VEGETATION OF THE SEED.

1 Impregnation.

2 Air.

3 Moisture.

4 Heat.

5 Light, } Not essential to the first

6 Earth, } growth of the Seed. }

Necessary to Vegetation.

—Experiments of Curtis—process of Vegetation described.

D.—PROPAGATION.

(a.)—NATURAL PROPAGATION.

1 Seeds.

2 Roots.

3 Suckers.

4 Stems.

5 Bulbs.

6 Leaves.

(b.)—ARTIFICIAL PROPAGATION.

1 Cutting,

2 Layers.

3 Engrafting.

4 Inoculation.

—Structure of Buds—

—Equivocal generation, objections to—

L.—OF THE ROOT.

A.—DIFFERENCE OF STRUCTURE AND SHAPE.

- 1 Bulbous.
- 2 Tuberous.
- 3 Fibrous.

B.—MANNER OF GROWTH.

- 1 Creeping.
- 2 Horizontal.
- 3 Perpendicular.

C.—DURATION.

- 1 Annual.
- 2 Biennial.
- 3 Perennial.

—Exceptions from Culture, Climate, &c.

M.—OF THE TRUNK.

A.—DIFFERENT KINDS.

- 1 Caulis.
- 2 Culmus.
- 3 Scapus.
- 4 Frons.
- 5 Stipes.

B.—DIFFERENT SPECIES ARISING FROM—

- 1 Structure.
- 2 Height.
- 3 Direction.
- 4 Shape.
- 5 Surface.
- 6 Composition.
- 7 Branches.
- 8 Colour.

—Illustration.—

N.—OF THE LEAVES.

A.—COMPONENT PARTS OF A LEAF,

(a).—FOLIUM.

- 1 Its base.
- 2 Apex.
- 3 Surfaces.
- 4 Parenchyma.

(b).—PETIOLUS.

- 1 Its Shape.
- 2 Length.
- 3 Infertion.
- 4 Direction.
- 5 Surface.

B.—SIMPLE LEAVES.

- 1 Place of infertion.
- 2 Manner of infertion.
- 3 Relative fituation.
- 4 Direction.
- 5 Shape.
- 6 Surface.
- 7 Length and expansion.
- 8 Substance.
- 9 Duration.—

C.—COMPOUND LEAVES.

—Degree of Composition.

—Illustration.—

D.—FUNCTIONS OF LEAVES.

- 1 Use in the vegetable œconomy as organs of respiration.
- 2 Influence upon the Atmosphere.—

Experiments of MILLER,

HALES,

MARIOTTE,

BONNET,

DU HAMEL,

PRIESTLEY,

INGENHOUSZ,

SENEBIER.

O—*FULCRA*, MORE PROPERLY CALLED APPENDICULÆ.

- 1 Stipulæ.
- 2 Bracteæ.
- 3 Cirrhus.
- 4 Spini.
- 5 Aculei.
- 6 Pili.
- 7 Glandula.—

—Illustration.—

P.—ORGANS OF FRUCTIFICATION.

A.—PEDUNCULUS.

- 1 Its composition,
- 2 Place of insertion.
- 3 Relative situation.
- 4 Direction.
- 5 Structure.

B.—RECEPTACULUM.

- 1 Its composition,
- 2 Surface.

C.—CALYX.

- 1 Perianthium.
- 2 Involucrum.
- 3 Gluma.
- 4 Spatha.
- 5 Calyptra.
- 6 Volva.

Characters of each.

- 1 Shape.
- 2 Number.
- 3 Divisions.
- 4 Number of pieces.
- 5 Situation.
- 6 Colour.
- 7 Duration.

D.—COROLLA.

- 1 Its shape.
- 2 Regularity.
- 3 Divisions.
- 4 Number of pieces.
- 5 Place of insertion.
- 6 Colour.
- 7 Duration.—

E.—STAMINA.

(a).—FILAMENTUM.

- 1 Its length.
- 2 Proportion.
- 3 Figure.
- 4 Number.
- 5 Connection.
- 6 Insertion.

(b).—ANTHERA.

- 1 Shape.

- 2 Number.
- 3 Disposition.
- 4 Structure.
- 5 Pollen.

F.—PISTILLUM.

(a).—GERMEN.

- 1 Its situation.
- 2 Structure.

(b).—STYLUS.

- 1 Shape.
- 2 Number.
- 3 Division.
- 4 Length.
- 5 Direction.

(c).—STIGMA.

- 1 Shape.
- 2 Number.—

Sexes of plants—imperfectly known to the ancients—established by
Linnæus—

Experiments of LINNÆUS,
SMITH, &c.

Objections of—ALSTON—

—SMELLIE—

—SPALANZANI—considered—

G.—PERICARPIUM.

- 1 Capsula,
- 2 Conceptaculum,
- 3 Siliqua.
- 4 Legumen.
- 5 Drupa.
- 6 Pomum.
- 7 Bacca.
- 8 Strobilus.—

H.—SEED.

—(SEE PAGE 9.)

Q—INFLORESCENCE.

- 1 Spadix.
- 2 Verticillus.
- 3 Capitalum.
- 4 Spica.
- 5 Panicula.
- 6 Amentum.
- 7 Racemus,
- 8 Fasciculus.
- 9 Umbella.
- 10 Cyma.
- 11 Corymbus.
- 12 Thyrsus.

—Illustration—

—Calendarium Floræ, &c. &c.—

PART II.

SYSTEMATIC ARRANGEMENT OF VEGETABLES.

A—*HISTORY OF BOTANY.*

FIRST PERIOD.

I. STATE OF BOTANY AMONG THE GREECIANS.

H IPPOCRATES,	400 years. A. C.
THEOPHRASTUS—"Historia Plantarum"—500 plants	320 A. C.

II. STATE OF BOTANY AMONG THE ROMANS.

DIOSCORIDES—600 plants—	70 P. C.
PLINY—Compilation—1000 plants—	74
GALEN—	131

—Destruction of the Roman Empire—

—Decline of Learning until the 8th Century—

—Learning revived by the Arabians.—

III. STATE OF BOTANY AMONG THE ARABIANS.

Translations and Compilations from the Grecian and Roman writings—
—Decline of learning until the fifteenth Century—

SECOND PERIOD.

Age of Commentators and Translators	1500
BRUNFELSIIUS—first accurate prints of plants,	1532
First public Botanic Garden at Padua,	1533
CONRAD GESNER—first museum in Natural History—first suggested a systematic arrangement of plants into class— order—genus, and species,	1560
CÆSALPINUS—improved the proposed classification of Gesner,	1583
F. COLUMNA—first copperplates—improved the genera of plants, and Botanic language,	1592
J. BAUHIN, "Historia Plantarum Universalis,"	1613
CASPAR BAUHIN, "Pinex Theatri Botanici," 6000 plants—with synonymes of the ancients,	1623
PARKINSON—"Theatrum Botanicum,"	1640
JUNGIUS—"Doxoscopia Physicæ Minores"—containing the first principles of the Linnæan classification,	1657
SOCIETIES for Promoting Knowledge.	
Royal Society of London,	1665
Royal Academy of Sciences at Paris,	1666
GREW—"Anatomy of Plants,"	1671
MALPIGHIUS—"Anatomia Plantarum,"	1675
RHEEDE—"Hortus Malabaricus,"	1676
MORISON—"Historia Universalis Plantarum"—a new system of arrangement,	1678
RAY—"Methodus Plantarum Nova Synoptica,"	1682
"Historia Plantarum Generalis"	1686
"Synopsis Method Stirpium Britannicarum,"	1690
HERMAN; New System—"Flora Lugduno Batava,"	1690
RIVINUS, New System,	1690
PLUMIER—"Description des plantes de L'Amerique."	1693
SIR HANS SLOANE—"Natural History of Jamaica."	1696
TOURNEFORT—New system—improved the Genera—	1697
KOEMPFERS—"Amœnitates Exoticæ."	1712

SCHREUCHZER—Agrostographia.	1719
BOORHAAVE—New System.	1720
MAGNOL—New System.	1720
HALES—"Vegetable Statics."	1727
MICHEL—CRYPTOGAMIA.	1729
CATESBY—"Natural history of Carolina, &c."	1731

THIRD PERIOD.

LINNÆUS—Sexual System.—

"Fundamenta Botanica."	1735
"Species Plantarum."	1764.
"Genera Plantarum" new edition by Schreber, 1789.	
"Systema Vegetabilium," 14th edition by Murray, 1784.	
Do. do —by Gmelin, in his "Systema Natura Linnæi," 1791.	
"Philosophia Botanica."	
"Amœnitates Academicæ," new edition by Schreber, 1787.	
"Flora Lapponica," new edition by Smith, 1792.	
"Prælectiones in Ordines Naturales," by Giseke, 1792.	
&c. &c. &c.	

DILLENIUS—"Historia Muscorum."	1741
RUMPHIUS—"Herbarium Amboinense."	1741
HALLER—"Stirpes Helveticæ."	1742
LUDWIG—"Institutiones Regni Vegetabilis."	1742
CLAYTON—"Flora Virginica."	1743
GMELIN—"Flora Sibirica."	1747
ALSTON—"Tyrocinium Botanicum."	1753
BONNET—"Recherches sur l'usage des feuilles."	1753
DU HAMEL—"Physique des Arbres."	
BERNARD DE JUSSIEAU—"Genera Plantarum secundum ordines naturales disposita."	1759
Do. new edition by Paulus Usteri	1791

HUDSON—"Flora Anglica."	1762
ADANSON—"Familles des Plantes."	1763
SIR JOSEPH BANKS, } DR. SOLANDER. }	1763
JACQUIN—"Historia Stirpium Americanarum."	1763
"Hortus Vindebonensis," 1770.	
"Flora Austriaca" 1773	
FLORA DANICA.	1766
SCHREBER—"History of Grasses."	1769
SIR JOHN HILL—"Vegetable system," new system.	1773
AUBLET—"Guiana."	1775
CURTIS—"Flora Londinensis."	1777
—"Observations on Grasses, 1790.	
—"Botanical Magazine," 1793.	
—"Observations on vegetation." &c. &c. &c.	
LIGHTFOOT—"Flora Scotica."	1778
LA MARCK—"Flore Francoise"—new system—	1778
HEDWIG—"Cryptogamia."	1782
PALLAS—"Flora Rossica."	1784
L'HERETIER—"Geraniologia"—"Sertum Anglicum."	1784
THUNBERG—"Flora Jappónica."	1784
MARSHALL—"Arbustrum Americanum."	1785
DICKSON—"Cryptogamia." &c. &c. &c.	1785
WALTHER—"Flora Caroliniana."	1788
GÆRTNER—"De Fructibus and Seminibus plantarum."	
—New System,	1788
SMITH—"Reliquæ Rudbeckianæ."	1789
—"Icones Plantarum hactenus ineditæ," 1789.	
—"Icones pictæ plantarum Rariorum," 1790.	
—"Spicilegium Botanicum." 1791.	
—"Botany of New Holland." 1793.	
&c. &c. &c.	
ENGLISH BOTANY.	1790
WOODVILLE—"Medical Botany."	1790
Transactions of the Linnæan Society of London.	1791
MARTYN—"Flora Rustica." "Language of Botany," &c. &c. &c.	1793

B.—LINNÆAN ARRANGEMENT.

A.—ARTIFICIAL, OF SEXUAL SYSTEM.

—Divided into—

- 1 Classes.
- 2 Orders.
- 3 Genera.
- 4 Species.
- 5 Varieties.

—Characters of each—

(a.)—CLASSES FORMED FROM

- 1 The number
- 2 Place of infertion
- 3 Proportion
- 4 Connection
- 5 Disposition, &c.

Of the Stamina.

—Illustration—

(b.)—ORDERS FORMED FROM

- 1 The number
- 2 Fertility
- 3 Situation
- 4 Structure of the Pericarpium.
- 5 Number
- 6 Connection
- 7 Disposition, &c.

Of the Pistilla.

Of the Stamina.

—Illustration—

(c.)—GENERA FORMED FROM THE ORGANS OF FRUCTIFICATION.

(d.)—SPECIES FORMED FROM

- 1 The Root.
- 2 Trunk.
- 3 Branches,
- 4 Leaves.
- 5 Fulcra, &c.

(e.)—VARIETIES—THE EFFECTS OF CLIMATE, CULTURE, &c.

—Illustration—

—Alterations of the Linnæan System proposed by Thunberg—Gmelin—
Sir William Jones, &c.

B.—NATURAL ORDERS OF LINNÆUS.

—Illustration—

C.—*SYSTEM OF JUSSIEAU.*

—Compared with the natural Orders of Linnæus—
—Advantages of each.—

D

—Plants useful in Diet—Medicine—Agriculture, &c. illustrated with
practical observations—

E

—Herbarium—advantages of—manner of preserving and arranging
plants—

—CONCLUSION—

