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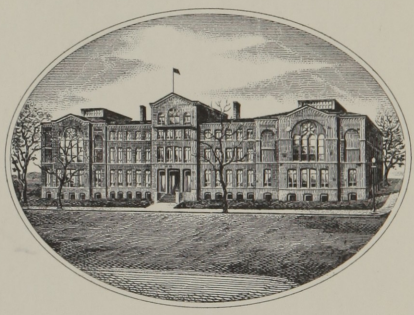

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# SYLLABUS

OF THE

# COURSE OF LECTURES,

ON

# BOTANY,

DELIVERED IN COLUMBIA COLLEGE,

*BY DAVID HOSACK, M. D.*

PROFESSOR OF BOTANY IN COLUMBIA COLLEGE,

MEMBER OF THE LINNÆAN SOCIETY OF LONDON, AND OF THE ROYAL MEDICAL AND PHYSICAL SOCIETIES OF EDINBURGH.

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M,DCC,XCV.

AR 23 Je '52

*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.

52/457

# PART I.

## STRUCTURE AND PHILOSOPHY OF VEGETABLES.

### A.—*GENERAL DIVISION OF NATURAL HISTORY.*

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

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

Opinions of *Tournefort*, *Linnæus*, &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 fossile kingdoms—their *animal* nature illustrated by the discoveries of *Peyssonel*, *Trembley*, *Jussieau*, *Donati*, *Ellis*, &c.—

## B.—*COMPARISON OF PLANTS AND ANIMALS.*

1 Their origin.
2 ———Growth and manner of receiving nourifhment.
3 Food.
4 Climate.
5 Secretion and excretion.
6 Senfation—volition—motion—fleep—watching.
7 Sexes.
8 Propagation.
9 Difeafes.
10 Death.
11 Natural decompofition.
12 Chemical Analyfis.

CONCLUSION—Animals and Vegetables links of the fame chain of being—objections to by fome Metaphyficians, confidered.

## C.—*GENERAL ARRANGEMENT OF VEGETABLES.*

1 Palms.
2 Trees.
3 Shrubs.
4 Herbs.
5 Graffes.
6 Ferns.
7 Fungi.
8 Moffes.
9 Algœ.

—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 Resins.
3 Gum Resins.
4 Balsams.
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.—

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* 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 Corculum,
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,
6 Earth,

} Not essential to the first 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 Compofition.
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 Insertion.
4 Direction.
5 Surface.

### B.—SIMPLE LEAVES.

1 Place of insertion.
2 Manner of insertion.
3 Relative situation.
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 Capitulum.
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.

HIPPOCRATES, 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.

Tranflations and Compilations from the Grecian and Roman writings—

—Decline of learning until the fifteenth Century—

## SECOND PERIOD.

—Age of Commentators and Tranſlators 1500
BRUNFELSIUS—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—genius, 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, "Pinax Theatri Botanici," 6000 plants—with ſynonymes of the ancients, 1623
PARKINSON—"Theatrum Botanicum," 1640
JUNGIUS—"Doxoſcopiæ 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

SCHEUCHZER—Agroſtagraphia. 1719
BOORHAAVE—New Syſtem. 1720
MAGNOL—New Syſtem. 1720
HALES—"Vegetable Statics." 1727
MICHELI—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 Lapponnica," new edition by Smith, 1792.
"Prœlectiones in Ordines Naturales," by Giſcke, 1792, &c. &c. &c.
DILLENIUS—"Hiſtoria Muſcorum." 1741
RUMPHIUS—"Herbarium Amboinenſe." 1741
HALLER—"Stirpes Helveticœ." 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." 1758
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 Japponnica." 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 inditæ," 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 Linnœan Society of London. 1791
MARTYN—" Flora Rustica." " Language of Botany," &c. &c. &c. 1793

## B.—*LINNÆAN ARRANGEMENT.*

### A.—ARTIFICIAL, or SEXUAL SYSTEM.

—Divided into—

1 Clafses.
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 Difpofition, &c.

} Of the Stamina.

—Illustration—

(b.)—ORDERS FORMED FROM

1 The number
2 Fertility
3 Situation

} Of the Pistilla.

4 Structure of the Pericarpium.

5 Number
6 Connection
7 Difpofition, &c.

} 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—

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