

dicotyledonous root diagram

dicotyledonous root diagram serves as a vital tool for students, educators, and plant enthusiasts seeking to understand the intricate structure of dicot roots. This article delves into a comprehensive exploration of the dicotyledonous root diagram, including its essential components, functions, and differences from monocot roots. Readers will discover the significance of each tissue layer, the practical applications of studying root anatomy, and tips for drawing and labeling an accurate diagram. Additionally, this guide will address common misconceptions and provide useful insights into how dicotyledonous roots support overall plant health and growth. Whether you're preparing for exams or seeking in-depth botanical knowledge, this resource presents everything you need to know about the dicotyledonous root diagram in a clear, engaging, and SEO-optimized format.

- Understanding Dicots and Their Roots
- Key Features of Dicotyledonous Root Diagram
- Anatomy of Dicotyledonous Root
- Step-by-Step Guide to Drawing and Labeling
- Comparison: Dicotyledonous vs Monocot Roots
- Functions of Different Root Tissues
- Common Misconceptions and Mistakes
- Practical Importance of Dicotyledonous Root Diagram
- Frequently Asked Questions

Understanding Dicots and Their Roots

Dicotyledonous plants, commonly referred to as dicots, are a major group within the angiosperms characterized by seeds containing two embryonic leaves or cotyledons. The dicotyledonous root system is a fundamental aspect of their anatomy, providing insights into the plant's adaptation, nutrient absorption, and overall physiology. The dicotyledonous root diagram is a visual representation that highlights the arrangement and structure of various tissues within the root, making it an indispensable educational resource. Understanding dicot roots is essential for identifying plant species, studying evolutionary traits, and exploring the functional roles of root anatomy in agricultural and ecological contexts.

Key Features of Dicotyledonous Root Diagram

The dicotyledonous root diagram illustrates several distinctive features that set dicot roots apart from those of monocots. Accurate diagrams reveal clear organization of tissues, consistent with the internal structure of roots found in dicot plants. Recognizing these features is crucial for students, botanists, and agricultural professionals when analyzing root samples or teaching plant anatomy.

Distinctive Characteristics

- Presence of a well-defined cortex and stele
- Radial arrangement of vascular tissues
- Prominent xylem and phloem arms
- Endodermis with Casparian strips
- Pericycle responsible for lateral root formation

Visual Elements in Diagrams

A typical dicotyledonous root diagram includes labeled sections such as cortex, endodermis, pericycle, xylem, phloem, and epidermis. Color-coding or shading is often used to distinguish these layers, enhancing clarity and educational value. Diagrams may also indicate the orientation of vascular tissues, demonstrating how they facilitate water and nutrient transport.

Anatomy of Dicotyledonous Root

The anatomy of dicotyledonous roots is systematically arranged to optimize the plant's absorption and transport functions. Each tissue layer has unique structural and physiological properties, collectively supporting the plant's growth and stability. The dicotyledonous root diagram provides a cross-sectional view, highlighting the spatial relationship between different tissues.

Epidermis

The outermost layer, known as the epidermis, consists of a single row of thin-walled cells. It serves as the primary protective barrier against pathogens and physical damage, while facilitating water absorption through root hairs.

Cortex

Situated beneath the epidermis, the cortex comprises several layers of parenchyma cells. It functions as a storage site for food and assists in the movement of water and minerals toward the vascular tissues.

Endodermis

The endodermis is a single layer of tightly packed cells marked by Casparian strips, which regulate the entry of water and dissolved substances into the stele. This selective barrier is essential for maintaining internal balance and preventing unwanted substances from entering the vascular system.

Pericycle

Located just inside the endodermis, the pericycle is a thin layer of cells responsible for the initiation of lateral roots. Its regenerative capacity aids in root branching, contributing to greater soil exploration and nutrient uptake.

Vascular Tissues: Xylem and Phloem

The central stele houses the vascular tissues—xylem and phloem—arranged in a characteristic star-shaped pattern in dicot roots. Xylem facilitates water and mineral transport from roots to shoots, while phloem distributes organic nutrients throughout the plant. The alternation of xylem and phloem arms is a key feature identified in dicotyledonous root diagrams.

Step-by-Step Guide to Drawing and Labeling

Creating an accurate dicotyledonous root diagram is essential for learning and assessment. This section provides a systematic approach to drawing and labeling each part, ensuring clarity and precision.

Materials Required

- Pencil, eraser, and ruler
- Blank sheet of paper
- Colored pencils (optional for enhanced labeling)

- Reference books or images

Drawing Process

1. Begin with a neat circular outline to represent the root cross-section.
2. Draw the outermost layer as the epidermis, followed by the cortex with several concentric circles.
3. Indicate the endodermis as a distinct ring within the cortex.
4. Add the pericycle just inside the endodermis.
5. Depict the star-shaped xylem in the center, alternating with phloem patches.
6. Label each part clearly, using color or shading for distinction.

Comparison: Dicotyledonous vs Monocot Roots

Understanding the differences between dicotyledonous and monocot roots is crucial for accurate identification and analysis. While both types share basic functions, their anatomical arrangements vary significantly.

Key Differences

- Dicot roots feature a star-shaped xylem; monocot roots have circular or scattered vascular bundles.
- Pericycle in dicots initiates lateral roots, while monocots have a less prominent pericycle.
- Number of xylem arms is typically fewer in dicots compared to monocots.
- Secondary growth occurs in dicot roots but is rare in monocots.

Significance for Identification

These differences aid botanists and agriculturalists in classifying plant species, understanding evolutionary relationships, and choosing appropriate crop varieties for specific conditions.

Functions of Different Root Tissues

Each tissue illustrated in the dicotyledonous root diagram plays a vital role in plant health and growth. Effective functioning of these tissues determines the plant's ability to absorb nutrients, resist stress, and anchor itself securely in the soil.

Epidermis and Root Hairs

Root hairs, extensions of epidermal cells, increase surface area for water and mineral absorption. This adaptation is especially pronounced in dicot roots.

Cortex

The cortex stores starch and facilitates the movement of water inward. Its loose arrangement allows for efficient gas exchange.

Endodermis and Casparian Strip

The Casparian strip within the endodermis acts as a checkpoint, selectively allowing essential substances into the stele and blocking harmful agents.

Pericycle and Lateral Root Formation

Active meristematic cells in the pericycle generate new lateral roots, supporting plant expansion and soil exploration.

Xylem and Phloem

Xylem channels water and minerals from the soil to aerial parts, while phloem distributes photosynthates throughout the plant, ensuring growth and energy supply.

Common Misconceptions and Mistakes

Errors often arise when interpreting or drawing dicotyledonous root diagrams. Awareness of these common issues enhances accuracy and educational outcomes.

Mislabeling Tissues

Confusing the arrangement of xylem and phloem, or omitting the pericycle layer, can lead to incorrect diagrams. Always cross-check with reliable references.

Overlooking Casparian Strip

The Casparian strip is sometimes left unlabeled, despite its crucial role in the endodermis. Ensure it is distinctly marked in every diagram.

Incorrect Vascular Arrangement

Drawing circular vascular bundles instead of the star-shaped xylem typical of dicot roots is a frequent mistake. Pay attention to the characteristic pattern.

Practical Importance of Dicotyledonous Root Diagram

The dicotyledonous root diagram is more than an academic exercise; it has practical implications in agriculture, horticulture, and plant research. Accurate understanding of root anatomy aids in crop management, disease identification, and breeding programs. Knowing the structure and function of dicot roots enables professionals to optimize nutrient delivery, diagnose root-related issues, and improve plant resilience. For students, mastering the dicotyledonous root diagram is essential for exams, laboratory work, and foundational botanical knowledge.

Frequently Asked Questions

Q: What is a dicotyledonous root diagram?

A: A dicotyledonous root diagram is a visual representation showing the internal structure and arrangement of tissues in the root of a dicot plant. It typically includes labeled sections such as epidermis, cortex, endodermis, pericycle, xylem, and phloem.

Q: How does the dicotyledonous root differ from monocot root?

A: Dicots have roots with a star-shaped xylem at the center and fewer vascular bundles, while monocots feature a circular arrangement of vascular tissues and more bundles. Dicots also commonly

undergo secondary growth, unlike monocots.

Q: What is the function of the pericycle in dicot roots?

A: The pericycle is a layer of cells inside the endodermis responsible for initiating lateral roots, contributing to the plant's ability to explore the soil and absorb nutrients efficiently.

Q: Why is the Casparian strip important in dicotyledonous root anatomy?

A: The Casparian strip, found in the endodermis, acts as a selective barrier controlling the movement of water and nutrients into the vascular system, protecting the plant from harmful substances.

Q: What are the main tissues labeled in a dicotyledonous root diagram?

A: The main tissues include the epidermis, cortex, endodermis, pericycle, xylem, and phloem. Each plays a unique role in root function and plant health.

Q: How do you draw and label a dicotyledonous root diagram?

A: Start with a circular outline, add layers for epidermis, cortex, endodermis, and pericycle, then draw star-shaped xylem with phloem patches in between. Label each part clearly for accuracy.

Q: What is the role of root hairs in dicotyledonous roots?

A: Root hairs, extensions of epidermal cells, increase the surface area for absorption, enabling efficient uptake of water and minerals from the soil.

Q: Can dicotyledonous roots undergo secondary growth?

A: Yes, dicot roots commonly undergo secondary growth due to the presence of vascular cambium, resulting in increased thickness and enhanced transport capacity.

Q: Why is studying the dicotyledonous root diagram important for agriculture?

A: Understanding root anatomy helps in diagnosing plant health, optimizing nutrient delivery, and improving crop resilience, which are essential for successful agricultural practices.

Q: What common mistakes should be avoided when labeling a dicotyledonous root diagram?

A: Avoid mislabeling the vascular tissues, omitting the pericycle, neglecting the Casparian strip, and drawing incorrect vascular arrangements that do not match the dicot pattern.

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Dicotyledonous Root Diagram: A Comprehensive Guide

Understanding plant anatomy is fundamental to botany, agriculture, and even horticulture. This detailed guide dives deep into the fascinating world of dicotyledonous roots, providing a comprehensive overview illustrated with a clear dicotyledonous root diagram. We'll explore the key features, functions, and variations within this crucial plant structure, equipping you with the knowledge to confidently identify and analyze dicot roots. This post will be your go-to resource for all things dicotyledonous root related.

What is a Dicotyledonous Root?

Dicots, or dicotyledons, are a group of flowering plants characterized by having two cotyledons (embryonic leaves) in their seeds. Their roots, unlike monocots, exhibit several distinguishing features that are crucial to understand. A dicotyledonous root system typically develops from the radicle, the embryonic root, and forms a taproot system. This is in contrast to the fibrous root system found in many monocots. The taproot is the main, central root that grows vertically downwards, with smaller, lateral roots branching off. This structure is well-suited for anchoring the plant firmly in the soil and accessing water and nutrients from deeper layers.

Key Features of a Dicotyledonous Root Diagram

A typical dicotyledonous root diagram will highlight several key anatomical features:

1. Taproot:

The prominent central root, extending vertically downward. It acts as the primary anchor and water/nutrient absorber. The size and length of the taproot can vary significantly depending on the species and environmental conditions.

2. Lateral Roots (Secondary Roots):

These roots branch out at angles from the taproot. They increase the surface area for absorption and provide additional anchoring. The branching pattern can be described as hierarchical, with smaller tertiary roots arising from secondary roots.

3. Root Hairs:

Microscopic extensions of the epidermis (outer layer) of the root. They vastly increase the surface area for efficient absorption of water and dissolved minerals from the soil. These delicate structures are crucial for nutrient uptake.

4. Root Cap:

A protective covering at the tip of the growing root. It shields the delicate meristematic tissue (actively dividing cells) from abrasion as the root pushes through the soil. The root cap also secretes mucilage, lubricating the passage of the root.

5. Vascular Cylinder (Stele):

The central core of the root containing the xylem and phloem tissues. Xylem transports water and minerals upwards, while phloem transports sugars and other organic compounds downwards. The arrangement of the xylem and phloem is a defining characteristic of dicot roots, typically forming a star-shaped pattern.

6. Cortex:

The region between the vascular cylinder and the epidermis. It consists of parenchyma cells, which store food and water. The cortex also plays a role in the radial transport of water and nutrients.

7. Endodermis:

A single layer of cells surrounding the vascular cylinder. This layer regulates the passage of water and minerals into the vascular tissue, preventing uncontrolled movement. The Casparian strip, a band of suberin within the endodermal cells, plays a crucial role in this regulation.

Variations in Dicotyledonous Root Structure

While the taproot system is characteristic of dicots, variations exist. Some species may have modified taproots, such as:

Fusiform Roots: Spindle-shaped taproots that are thicker in the middle and taper towards the ends.

Napiform Roots: Turnip-shaped taproots, with a large swollen upper part.

Conical Roots: Cone-shaped taproots that gradually taper downwards.

The Importance of Studying Dicotyledonous Roots

Understanding the structure and function of dicotyledonous roots is crucial for several reasons:

Agriculture: Knowledge of root systems helps in optimizing agricultural practices, such as irrigation and fertilization.

Plant Breeding: Understanding root architecture is important for breeding drought-tolerant and nutrient-efficient crops.

Ecology: Root systems play a significant role in soil stability, nutrient cycling, and overall ecosystem health.

Horticulture: Proper root management is vital for successful plant cultivation and propagation.

Conclusion

This comprehensive guide provided a detailed overview of the dicotyledonous root, illustrated with a conceptual dicotyledonous root diagram. We explored the key anatomical features, variations, and the significance of studying these intricate plant structures. By understanding the intricacies of the dicot root system, we can better appreciate the complexity and vital role of plants in our world.

FAQs

1. What is the difference between a dicot root and a monocot root? Dicot roots typically have a taproot system with a central taproot and lateral branches, while monocot roots usually have a fibrous root system with numerous thin roots arising from the stem base.
2. How does the root cap protect the root apex? The root cap protects the delicate meristematic cells at the root tip from damage as the root pushes through the soil. It also secretes mucilage to lubricate the root's passage.
3. What is the function of the endodermis? The endodermis acts as a selective barrier, regulating the passage of water and minerals into the vascular cylinder. The Casparian strip within the endodermis is crucial for this function.
4. How do root hairs contribute to water and nutrient uptake? Root hairs vastly increase the surface area of the root, significantly enhancing the absorption of water and dissolved minerals from the

soil.

5. Can you provide examples of plants with modified taproots? Examples include carrots (napiform), radishes (napiform), and parsnips (fusiform). These plants store nutrients in their modified taproots.

dicotyledonous root diagram: Biology Expression Imran Ibrahim, 2007

dicotyledonous root diagram: Inanimate Life George M. Briggs, 2021-07-16

dicotyledonous root diagram: ISC Biology Book-II For Class-XII Dr. P.S. Verma, Well-labelled illustrations, diagrams, tables, figures and experiments have been given to support the text, wherever necessary.

dicotyledonous root diagram: Anatomy of Flowering Plants Paula J. Rudall, 2007-03-15 In the 2007 third edition of her successful textbook, Paula Rudall provides a comprehensive yet succinct introduction to the anatomy of flowering plants. Thoroughly revised and updated throughout, the book covers all aspects of comparative plant structure and development, arranged in a series of chapters on the stem, root, leaf, flower, seed and fruit. Internal structures are described using magnification aids from the simple hand-lens to the electron microscope. Numerous references to recent topical literature are included, and new illustrations reflect a wide range of flowering plant species. The phylogenetic context of plant names has also been updated as a result of improved understanding of the relationships among flowering plants. This clearly written text is ideal for students studying a wide range of courses in botany and plant science, and is also an excellent resource for professional and amateur horticulturists.

dicotyledonous root diagram: Biology Class XI by Dr. Suneeta Bhagiya Megha Bansal

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dicotyledonous root diagram: Practical Botany C. J. Wallis, 2013-10-22 Practical Botany for Advanced Level and Intermediate Students, Fifth Edition is a five-part laboratory manual covering the syllabuses in Botany of the advanced level students and other examinations of similar standard. This laboratory manual must be used in conjunction with textbooks of botany. The Introduction presents general instructions for practical work and for the keeping of practical notebooks and a list of apparatus and instruments required, as well as a summary of the characteristics of living organisms, the differences between plants and animals and the principles of plant classification. Part I describes the features and methods of use of the microscope, while Part II contains intensive discussions on the evaluation of the morphological, cytological, and histological aspects of plants. The remaining parts cover the biochemical, physiological, and genetic aspects of the plant experiments. This book is directed toward advanced and intermediate level botany teachers and students.

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dicotyledonous root diagram: *Teaching of Biology* S. Choudhary,

dicotyledonous root diagram: Teaching Plant Anatomy Through Creative Laboratory Exercises R. Larry Peterson, Carol A. Peterson, Lewis H. Melville, 2008 This easy-to-follow, full-colour guide was created for instructors teaching plant structure at the high school, college, and university levels. It benefits from the experience of the authors, who in teaching plant anatomy over many years, came to realize that students learn best by preparing their own microscope slides from fresh plant samples. The exercises contained in this book have been tested, require minimal supplies and equipment, and use plants that are readily available. Detailed instructions are given for sectioning and staining of plant material. The book contains a glossary of terms, an index, and a list of suppliers of materials required. A CD-ROM of all the illustrations is included for easy downloading into PowerPoint presentations. Although a number of new plant anatomy texts have been published in recent years, none is as innovative, exciting and user-friendly as *Teaching Plant Anatomy Through Creative Laboratory Exercises* by Peterson, Peterson and Melville. What makes this book so usable from high school biology courses on through to upper level university plant structure labs is the wealth of experience that the authors have incorporated into this comprehensive clearly illustrated text. Using mostly photomicrographs of hand sections and wonderfully clear colour illustrations, they cover all aspects of plant structure from organelles to organs. The book also outlines some easy to use techniques, such as hand sections and clearings and macerations, which will certainly be very useful for any plant related lab. This book really does bring plant anatomy to life and will be a must for any course that deals with plant structure even if it's just to prepare plant material for molecular techniques. An excellent contribution to any botanical teaching where you want your students to get a hands-on approach to the subject.... Dr. Usher Posluszny, University of Guelph

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dicotyledonous root diagram: The Vascular Cambium Muhammad Iqbal, 1990-09-07 The vascular cambium, a lateral meristem responsible for the radical growth of woody plants, has long been a subject for active research in both temperate and tropical regions. This work provides comprehensive coverage of all aspects of the vascular cambium and represents an up-to-date review of the knowledge accumulated over the last twenty years. Chapters cover origin and development of cambial cells, phenomena of orientation in the cambium, seasonal and environmental influences on cambial activity. There is also a discussion of the evolution of the cambium in geologic time.

dicotyledonous root diagram: The Plant Cell Cycle and Its Interfaces Dennis Francis, 2001 The Plant Cell Cycle and Its Interfaces is a timely review of what is known and what we need to know about important plant cell cycle interfaces. Only through proper understanding can we underpin the manipulation of crop plants and, in turn, provide the vital resources for an ever-increasing human population. Written by contributors from leading laboratories around the world, the book addresses fundamental questions about plant growth and development such as how plant growth regulators regulate the cell cycle, how nutrients drive the cell cycle, and how homeotic genes interface with the cell cycle at these key transition points.

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dicotyledonous root diagram: Fundamentals of Practical Biology Margaret Ndukwe, 2016-04-30 This book has been designed to meet the requirements of the new Practical Biology curriculum for Senior Secondary Schools and Colleges. It is comprehensive, simplified and easy to use. The concepts are well developed and illustrated by clearly labelled diagrams, charts, tables and relevant tests to give the student hands on exercise. It is hoped that this book will assist candidates to get the idea of what is required of them in Practical Biology and Alternative to Practical Biology examinations.

dicotyledonous root diagram: Biology-vol-I Dr S Venugopal, A text book on Biology

dicotyledonous root diagram: CBSE/NCERT Biology Class - 11 Dr. O. P. Saxena, , Dr. Sunita Bhagia, Megha Bansal, 2023-07-30 1. The Living world, 2. Biological Classification, 3. Plant Kingdom, 4. Animal Kingdom, 5. Morphology of Flowering Plants, 6. Anatomy of Flowering Plants, 7. Structural Organisation in Animals, 8. Cell : The Unit of Life, 9. Biomolecules, 10. Cell Cycle and Cell Division, 11. Transport in Plants, 12. Mineral Nutrition in Plants, 13. Photosynthesis in Higher Plants, 14. Respiration in Plants, 15. Plant Growth and Development, 16. Digestion and Absorption, 17. Breathing and Exchange of Gases, 18. Body Fluids and Circulation, 19. Excretory Products and Their Elimination, 20. Locomotion and Movements, 21. Neural Control and Coordination, 22. Chemical Coordination and Regulation, 1 Chapterwise Value Based Questions (VBQ), 1 Latest Model

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dicotyledonous root diagram: Biology Class- XI - SBPD Publications Dr. O.P. Saxena, , Dr. Sunita Bhagia, , Megha Bansal, 2022-02-17 1. The Living World, 2. Biological Classification, 3. Plant Kingdom, 4. Animal Kingdom, 5. Morphology Of Flowering Plants 6. Anatomy Of Flowering Plants 7. Structural Organisation In Animals, 8. Cell : The Unit Of Life 9. Biomolecules 10. Cell Cycle And Cell Division, 11. Transport In Plants, 12. Mineral Nutrition, 13. Photosynthesis In Higher Plants, 14. Respiration In Plants 15. Plant Growth And Development, 16. Digestion And Absorption, 17. Breathing And Exchange Of Gases, 18. Body Fluids And Circulation, 19. Excretory Products And Their Elimination, 20. Locomotion And Movements, 21. Neural Control And Coordination, 22. Hemical Coordination And Integration Chapter Wise Value Based Questions (VBQ) Latest Model Paper (BSEB) With OMR Sheet Examinations Paper (JAC) with OMR Sheet .

dicotyledonous root diagram: Content Structure, Cognitive Structure and Their Relationship Alan Norman Rudnitsky, 1976

dicotyledonous root diagram: Developmental Biology of Flowering Plants V. Raghavan, 2012-12-06 The study of plant development using molecular and genetic techniques is rapidly becoming one of the most active areas of research on flowering plants. Developmental Biology of Flowering Plants relates classical developmental work with the outstanding problems of the future in the study of plant development. An important feature of this book is the integration of results from molecular and genetic studies on various aspects of plant development in a cellular and physiological context.

dicotyledonous root diagram: *A Textbook of ISC Biology XI* Sarita Aggarwal, A Textbook of ISC Biology for Class XI

dicotyledonous root diagram: University Botany Ii : (Gymnosperms, Plant Anatomy, Genetics, Ecology) S M Reddy, S J Chary, 2003 This Book Is Written Strictly In Accordance With The Revised Common Core Syllabus Recommended By Andhra Pradesh State Council Of Higher Education. It Also Caters The Needs Of Undergraduate Students Of Other Indian Universities. This Book Covers Gymnosperms, Plant Anatomy, Genetics And Ecology. Recent Developments In The Subject Matter Have Been Incorporated In The Book. The Book Has A Systematic Presentation. Important Questions And Their Solutions Are Given At The End Of Each Chapter. Every Care Has Been Taken To Present The Subject In A Simple And Lucid Language. The Book Is Profusely Illustrated. This Book Is Written Strictly In Accordance With The Revised Common Core Syllabus Recommended By Andhra Pradesh State Council Of Higher Education. It Also Caters The Needs Of Undergraduate Students Of Other Indian Universities. This Book Covers Gymnosperms, Plant Anatomy, Genetics And Ecology. Recent Developments In The Subject Matter Have Been Incorporated In The Book. The Book Has A Systematic Presentation. Important Questions And Their Solutions Are Given At The End Of Each Chapter. Every Care Has Been Taken To Present The Subject In A Simple And Lucid Language. The Book Is Profusely Illustrated. This Book Is Written Strictly In Accordance With The Revised Common Core Syllabus Recommended By Andhra Pradesh State Council Of Higher Education. It Also Caters The Needs Of Undergraduate Students Of Other Indian Universities. This Book Covers Gymnosperms, Plant Anatomy, Genetics And Ecology. Recent Developments In The Subject Matter Have Been Incorporated In The Book. The Book Has A Systematic Presentation. Important Questions And Their Solutions Are Given At The End Of Each Chapter. Every Care Has Been Taken To Present The Subject In A Simple And Lucid Language. The Book Is Profusely Illustrated.

dicotyledonous root diagram: *Transport in Plants II* U. Lüttge, M.G. Pitman, 1976-05-01 As

plant physiology increased steadily in the latter half of the 19th century, problems of absorption and transport of water and of mineral nutrients and problems of the passage of metabolites from one cell to another were investigated, especially in Germany. JUSTUS VON LIEBIG, who was born in Darmstadt in 1803, founded agricultural chemistry and developed the techniques of mineral nutrition in agriculture during the 70 years of his life. The discovery of plasmolysis by NAGEL! (1851), the investigation of permeability problems of artificial membranes by TRAUBE (1867) and the classical work on osmosis by PFEFFER (1877) laid the foundations for our understanding of soluble substances and osmosis in cell growth and cell mechanisms. Since living membranes were responsible for controlling both water movement and the substances in solution, permeability became a major topic for investigation and speculation. The problems then discussed under that heading included passive permeation by diffusion, Donnan equilibrium adjustments, active transport processes and antagonism between ions. In that era, when organelle isolation by differential centrifugation was unknown and the electron microscope had not been invented, the number of cell membranes, their thickness and their composition, were matters for conjecture. The nature of cell surface membranes was deduced with remarkable accuracy from the reactions of cells to substances in solution. In 1895, OVERTON, in U. S. A. , published the hypothesis that membranes were probably lipid in nature because of the greater penetration by substances with higher fat solubility.

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