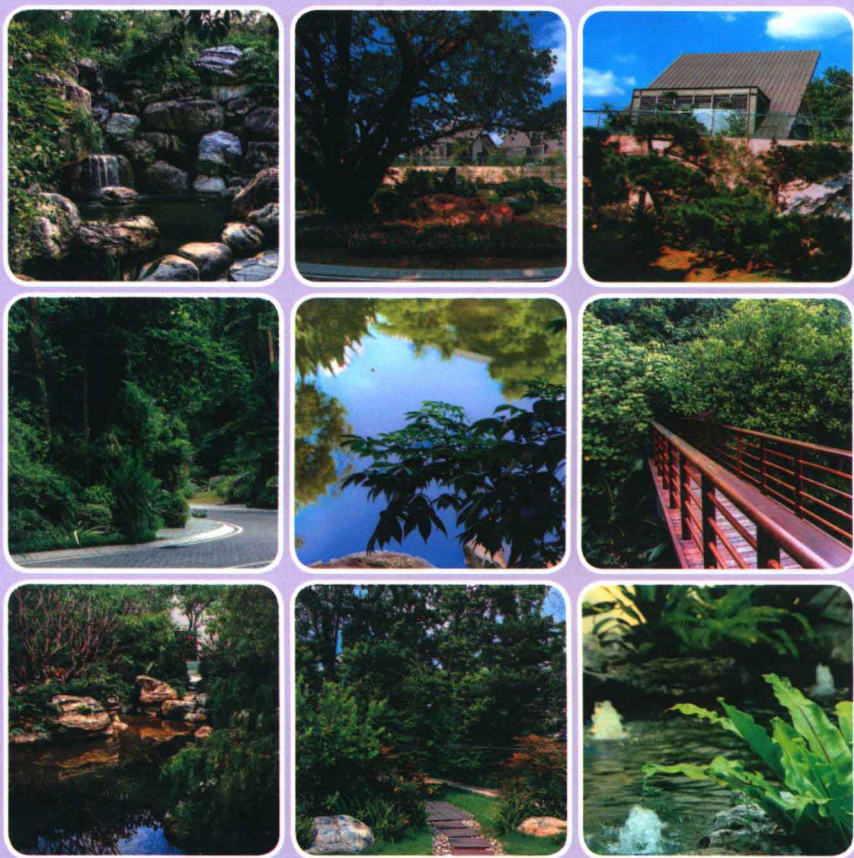


教育部财政部首批特色专业建设项目资助
热带园艺专业特色教材系列

热带园艺专业英语

Special English for Tropical Horticulture

李绍鹏 陈艳丽 主编



中国建筑工业出版社

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图书在版编目 (CIP) 数据

热带园艺专业英语/李绍鹏等主编. —北京: 中国建筑工业出版社, 2012. 12

(热带园艺专业特色教材系列)

ISBN 978-7-112-15002-1

I. ①热… II. ①李… III. ①热带-园艺-英语-高等学校-教材
IV. ①H31

中国版本图书馆 CIP 数据核字 (2012) 第 299849 号

责任编辑: 郑淮兵 杜一鸣

责任设计: 董建平

责任校对: 姜小莲 王雪竹

热带园艺专业特色教材系列

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*

中国建筑工业出版社出版、发行 (北京西郊百万庄)

各地新华书店、建筑书店经销

北京科地亚盟排版公司制版

北京同文印刷有限责任公司印刷

*

开本: 787×1092 毫米 1/16 印张: 18½ 字数: 450 千字

2013 年 3 月第一版 2013 年 3 月第一次印刷

定价: 39.00 元

ISBN 978-7-112-15002-1
(23072)

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前 言

Foreword

“园艺专业英语”课程是很多高校园艺专业本科生和硕士生的必修课程。一般是在学生经过两年的基础英语学习，掌握一定程度英语语言知识和专业技能的基础上，再进行专业英语方面的训练，目的在于让学生深入了解专业英语文体特征和专业英语文献阅读方法，培养学生专业英语学习和英文科研论文的写作能力。国内目前有关园艺专业英语的正式教材较少，而且主要是针对温带园艺而编，有关热带亚热带特色的园艺专业英语教程，目前国内尚无这方面的教材出版。为此我们特组织主讲专业英语课程的老师编写了这本《热带园艺专业英语》，以为热带园艺专业英语教学提供适宜教材。

本教材分三部分组成：正文、阅读材料和练习题。正文及阅读材料主要摘选自园艺专业的原版欧美教材、书籍、杂志、国际会议论文以及从网站下载的材料等，内容涵盖了园艺学的基础知识（总论），以及热带果树、热带蔬菜、热带花卉及设施园艺、无土栽培等方面的技术和研究动态（各论），并在最后一篇课文里详细介绍了如何撰写英文科研论文。每课正文为精读内容，阅读材料为泛读内容，用于扩大学生的专业词汇和知识面。教材内容按照从基础到应用，从总论到各论的递进式安排，使学生在掌握园艺专业英语词汇、语言特点的同时，系统地了解和学习热带园艺的一些发展和研究动向，并能够熟悉科研论文的写作方法。部分课文配有插图和表格，力求将知识性和趣味性相结合，便于学生理解，提高其学习兴趣。为巩固学习，我们在每篇课文后面都根据该课学习内容设计了一定的练习题，便于学生对课文理解和掌握。此外，在本教材的附录部分里，我们将本教材的词汇整理成总词汇表，并制作了热带园艺作物名录，以便师生查阅。

本书的编写分工：第 1、5、14、15、18 课由李绍鹏编写；第 2、3、4、6、11、24、26、29 课由陈艳丽编写；第 9、12、16、22、23 课由李茂富编写，第 10、13、19、20、25 课由王旭编写；第 7、8、17、21 课由姜成东编写；第 27、28 课由刘建编写；第 30 课由冯素萍编写，全书的附录部分（热带亚热带园艺作物名录与专业英语词汇表）由冯素萍和陈艳丽整理编校，全书由李绍鹏、陈艳丽统稿。

本书承蒙宋希强教授审稿，在此谨表谢意。由于编者水平有限，书中难免有疏漏不妥之处，希望读者多提宝贵意见，以便再版时修订。

李绍鹏 陈艳丽

2010.12

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Lesson 1

Part A Introduction and Commercial Branches of Horticulture

Selected and rewritten from *Horticulture*, by R. Gordon Halface & John A. Barden McGraw.

Horticulture is the intensive cultivation of plants. The term *horticulture* in English to refer to the science and art of growing fruits, vegetables, flowers, and ornamental plants.

Horticulture encompasses all life—especially humanity—and bridges the gap between science, art, and human beings. A horticulturist cannot simply deal with plants as a science or as an art but must study plants as food for people and as an aesthetic and functional part of the environment. Human beings survive through horticultural foods and through the landscape. In a sense a horticulturist touches the beauty, perfection, and serenity of nature and all its boundless moods and temperaments. All this is accomplished with the final and total effect of helping mankind survive in a beautiful world.

Agriculture and Horticulture in the New World

Agriculture always has played and always will play a great role in the history and development of any given country. Early civilizations referred to agriculture as the cultivation of field crops. *Agri* is Latin for “field”, the word “agriculture” in its earliest connotations was used exclusively for the cultivation of a field. The present view of agriculture includes the production of both plants and animals. Horticulture is only one part of the broad field of agriculture.

For thousands of years vegetable gardens and fruit trees have been planted and cultivated to provide the family with its horticultural needs. Commercial horticulture, on the other hand, is a more recent innovation. Horticulture departments in all landgrant universities have provided programs in teaching, research, and extension services to supply the needed information for the growing horticultural industry. Through scientific research the horticultural industry has expanded to meet the ever-increasing demand for its products.

Horticulture in Relation to Other Disciplines

Horticulture is related to many other disciplines. Horticulture includes landscaping and the production, storage, and marketing of fruits, vegetables, floricultural products and nursery crops. Agronomy encompasses the production of grains, fibers and other field crops as well as soil science. Forestry includes forest management and wood production and

utilization. All are applied sciences in the field of agriculture, and all are interrelated. Botany and its various branches, including plant physiology, are pure sciences dealing with the fundamental principles of plant life. Horticulturists, agronomists, and foresters generally apply these fundamental principles to the production and utilization of plants. They generate, assimilate, and disseminate information about solutions to the problems encountered in the industry. The field of horticulture relies on many other disciplines including chemistry, physics, botany, engineering, architecture, plant pathology, bacteriology, geology, meteorology, economics, entomology, genetics, and ecology. It is the incorporation of various aspects of each which makes horticulture such a diverse and exciting career. A complete understanding of horticultural problems involves research in several of the basic and applied sciences.

Commercial Branches of Horticulture

There are five basic branches of horticulture today. Probably the oldest of these is *pomology*, fruit production. Other areas are *olericulture*, vegetable production; *floriculture*, flower production; *nursery culture*, nursery crop production; and *landscape design*, landscaping. These divisions can be broken down into different commercial branches such as the production and marketing of seed, nursery stocks, specialty and greenhouse crops, and pharmaceutical crops; market gardening; private gardening; operation of trial grounds; arboriculture; education; turf production and management; landscape design; advertising; photography; special promotions; processing and storage; and operation of support industries, such as the manufacture, sale, and service of equipment, machinery, growing structures, and pesticides and other chemicals.

Pomology The study of fruit production is called *pomology*, workers in the field are called *pomologists*. The horticulturist defines a fruit as expanded and ripened ovary with attached and subtending reproductive structures. Generally a fruit is considered to be the edible fleshy portion of a woody herbaceous or perennial plant whose development is closely associated with the flower. In some cases the ovary may be only a small portion of the fruits.

Fruit crops include the deciduous tree fruits which are divided into pome fruits (pear, apple, and quince) and drupe or stone fruits (peach, cherry, plum, apricot, and almond); the small fruits (blueberry, blackberry, raspberry, grape, strawberry currant, gooseberry, and cranberry); the nut tree fruits (pecan, filbert, walnut, chestnut, and macadamia nut); and the evergreen or tropical fruits (lemon, orange, tangerine, lime, and grapefruit as well as banana, mango, date, avocado, pineapples, and papaya).

Olericulture The study of vegetable production is called *olericulture*, workers in the field are called *olericulturists*. A vegetable is the edible portion of an herbaceous garden plant. There is no clear-cut delination between fruits and vegetables, however, some crops such as tomatoes and melons, are classed as vegetable crops but are valued horticulturally for their production of fruits. Other vegetable crops—such as lettuce, celery, potatoes,

and carrots—are valued for their edible leaf, stem or root organs instead of their fruits.

Vegetables are used either fresh or processed. Onions, tomatoes and potatoes enter world trade in the unprocessed form, but most vegetables must be processed before shipment because of their bulk or perishable nature. Fresh vegetables therefore, do not enter world trade as extensively as some of the fruit crops. Vegetable production is classified as either market garden or truck crop. *Market gardening* refers to the growing of an assortment of vegetables for local or roadside markets and *truck crop* production refers to large-scale production of a limited number of crops for wholesale markets and shipping.

Floriculture The study of growing, marketing and arranging flowers and foliage plants is called *floriculture*, workers in the field are called *floriculturists*. Flowers and other ornamental plants have always played an important part in our lives. They have been used for generations to express joy or sympathy. Today flowers encompass every social function, being extensively used in arrangements, in corsages, and as pot plants.

Floricultural plants are classified as cut flowers, flowering pot plants, foliage plants, and bedding plants. Cut-flower production has dominated the floral industry. Roses, carnations, chrysanthemums, snapdragons, and orchids are grown for cut flowers predominantly in the greenhouse, whereas most gladioli, chrysanthemums, and straw flowers are grown outdoors during the summer or in suitable mild climates.

Flowering pot plants are sold as whole plants in bloom. These include the Easter lilies, poinsettias, cyclamens, geraniums, begonias, and hydrangeas. Foliage plants are non-flowering plants grown in greenhouses or produced outside. Examples are philodendrons, ferns, and palms.

Nursery culture In the United States the production of fruit crops led to the development of the nursery industry. Although many nurseries do produce fruit trees, the great majority of the nursery business today is developed to production of perennial ornamentals. A person who produces or distributes ornamental plants is called a *nursery grower*. A person who does research, teaching, or extension in this area is called an *ornamental horticulturist*.

The nursery trade involves the propagation, growing, and maintenance of young trees and shrubs and herbaceous annuals, biennials, and perennials other than bedding plants. The production of young fruit trees, some perennial vegetables (asparagus, rhubarb, and chives) and small fruit plants is an important part of this industry. Another important area in the production of young ornamental plants is turf for landscaping public and private buildings and residences, roadsides, and parks. The nursery industry also produces evergreen trees for use as Christmas trees.

Landscape design Landscape design is the profession concerned with the planning and planting of outdoor space to secure the most desirable relationship between land forms, structures, and plants to best meet man's needs for function and beauty. It is part of horticulture because the essence of the landscape is living plant material. A person who is a

landscape designer sells landscape design plans—which include general plans, construction plans, planting plans and specifications—but does not sell plants.

Landscape is not decorating the environment by planting trees and shrubs, it is the aesthetic and functional development of space. Plants and construction materials are used to enhance the site not to detract from it. Landscape maintenance should be considered with the design or the end result will be a breakdown in the desired environmental impact.

A landscape design encompasses the entire area, not only the garden area, the house, the utility, the comfort, and the aesthetic effect should all be considered in landscape design. The desires and space needs of the homeowner and family, coupled with their likes and dislikes, must be analyzed before a design is begun.

The landscape designer is educated in art and science related to landscaping. He or she must be competent in many engineering and architectural process and techniques, and needs sensitivity in order to analyze the environment so that a work of art rather than a hodgepodge is created. Some landscapers try to decorate with their design, this detracts from the natural environment. The landscape designer should try to blend structures and personalities into the existing environment through good site planning and planting.

Glossary

1. horticulture *n.* 园艺, 园艺学
2. ornamental plant 观赏植物
3. landscape *n.* 园林, 景观
4. connotation *n.* 内涵, 含义
5. commercial horticulture *n.* 商品园艺学, 市场化园艺
6. floricultural product *n.* 花卉园艺产品
7. nursery crop *n.* 苗圃作物
8. agronomy *n.* 农艺学, 农学
9. forestry *n.* 林业, 林学, 森林学
10. plant physiology 植物生理学
11. architecture *n.* 建筑学, 体系结构
12. plant pathology 植物病理学
13. bacteriology *n.* 细菌学
14. meteorology *n.* 气象学, 气象
15. entomology *n.* 昆虫学
16. genetic *adj.* 遗传的, 起源的
17. ecology *n.* 生态学
18. olericulture *n.* 蔬菜栽培学
19. floriculture *n.* 花卉; 花卉栽培
20. landscape design 景观设计, 园林设计
21. pharmaceutical crop 药用植物

22. arboriculture *n.* 树木栽培学, 树艺学
23. pesticide *n.* 农药, 杀虫剂
24. pomology *n.* 果树学, 果树栽培学
25. woody plant 木本植物; herbaceous plant 草本植物
26. perennial plant 多年生植物, 宿根植物
27. deciduous tree 落叶树, 落叶树种
28. pome fruit 仁果类水果, 仁果, 梨果
29. quince *n.* 榲桲, 榲桲属
30. drupe *n.* 核果
31. stone fruit 核果类果树, 核果类
32. cherry *n.* 樱桃
33. plum *n.* 李子
34. apricot *n.* 杏, 杏树
35. almond *n.* 杏仁, 扁桃树, 巴旦杏树
36. blueberry *n.* 越橘, 蓝莓
37. blackberry *n.* 黑莓
38. raspberry *n.* 树莓
39. grape *n.* 葡萄
40. strawberry *n.* 草莓
41. gooseberry *n.* 醋栗, 醋栗树
42. cranberry *n.* 蔓越橘
43. pecan *n.* 美洲山核桃
44. filbert *n.* 榛, 榛属
45. walnut *n.* 胡桃
46. chestnut *n.* 栗子
47. macadamia nut 澳洲坚果
48. evergreen plant 常绿植物
49. lemon *n.* 柠檬
50. tangerine *n.* 柑橘, 橘子
51. lime *n.* 来檬
52. grapefruit *n.* 葡萄柚
53. date *n.* 椰枣, 枣椰子
54. avocado *n.* 油梨
55. pineapple *n.* 菠萝
56. papaya *n.* 番木瓜
57. lettuce *n.* 生菜
58. celery *n.* 芹菜
59. carrot *n.* 胡萝卜
60. onion *n.* 洋葱

61. perishable *adj.* 易腐的
62. flower arrangement 插花
63. corsage *n.* 装饰的花束
64. cut flower 切花, 鲜切花
65. flowering pot plant 盆栽观花植物
66. foliage plant 观叶植物
67. bedding plant 花坛植物
68. carnation *n.* 康乃馨, 香石竹
69. chrysanthemum *n.* 菊花, 菊
70. snapdragon *n.* 金鱼草, 金鱼草属
71. gladioli *n.* 唐菖蒲, 唐菖蒲属
72. straw flowers 麦秆菊, 蜡菊, 贝细工
73. Easter lily 复活节百合
74. poinsettia *n.* 一品红, 猩猩木
75. cyclamen *n.* 仙客来, 仙客来属
76. geranium *n.* 天竺葵, 老鹤草属
77. begonia *n.* 秋海棠, 秋海棠属
78. hydrangea *n.* 绣球花, 绣球花属
79. philodendron *n.* 喜林芋, 喜林芋属
80. ferns *n.* 蕨类植物, 蕨类, 真蕨纲
81. palm *n.* 棕榈树, 棕榈科植物
82. perennial ornamental 多年生的观赏植物
83. propagation *n.* 繁殖; [物]传播
84. asparagus *n.* 芦笋, 石刁柏
85. rhubarb *n.* 大黄, 食用大黄
86. chive *n.* 细香葱

Exercises

A. Please answer the following questions in English.

1. Please define the *horticulture*.
2. What is the relationship between agriculture and horticulture?
3. What are the relationships between horticulture and other disciplines?
4. How many commercial branches of horticulture are there in this text?
5. How to define *pomology*, *olericulture* and *floriculture*?

B. Please translate the following paragraph into Chinese.

All animals including human beings are dependent upon the process of photosynthesis, which takes place only in green plants. Photosynthesis transforms light energy into chemical energy which is necessary for life process in green plants. Since each progressive step in the food chain results in a reduction of energy available for transfer, much energy must be

converted to satisfy the physiological needs and comfort desires of human population. To meet these demands, the farmers and gardeners of the world must understand the principles of crop growth in order to apply the most productive cultural practices to produce the highest possible yields of high-quality crops.

C. Please translate the following sentences into English.

1. 园艺业, 即园艺生产产业, 它包括蔬菜生产、果树生产、西瓜和甜瓜类生产、花卉和观赏树木生产、芳香与药用植物生产等。

2. 未来的中国大农业——农作业(粮棉油)、园艺业、畜牧业——是三个产业平分天下, 园艺业的前景令人鼓舞。

Part B Basic Botanical Background of Horticulture Crop

Selected and rewritten from *Horticulture: A Basic Awareness*, by Robert F. Baudendistel.

All plant enthusiasts should have knowledge of the plant kingdom and the various terminologies associated with it. In this chapter, the parts of the plant will be covered, with special attention being paid to the functions of each.

The plant kingdom is separated into four major divisions:

1. *Thallophytes*. The simplest plant types are found in this division. They include the algae, bacteria, fungi, and lichens. Most lichens consist of an alga and a fungus living in harmony with each other.

2. *Bryophytes*. This division contains all the mosses and their relatives, the liverworts.

3. *Pteridophytes*. The ferns and their allies, the horsetails and club mosses, comprise this division.

4. *Spermatophytes*. This division comprises the largest number and the most complex of all the plants. They are referred to as the seed-bearing plants. The spermatophytes are further subdivided into the gymnosperms and the angiosperms.

The gymnosperms are characterized by being evergreen, cone-bearing plants. These include the pines, spruces, junipers, and firs. The angiosperms are known as the flowering plants. They, too, are further subdivided into monocotyledons and dicotyledons. Monocots have leaves that are narrow with parallel veins, and their flower parts occur in sets of three or multiples of three. Dicots are characterized by having two embryonic leaves, called cotyledons, and leaves that are broad with veins running at angles to the leaf's midrib. Their flower parts are arranged in sets of four or five.

Parts of the Plants

The Root There are five major functions associated with most plant roots. They are:

1. *Water and nutrient absorption*. This function is almost solely the responsibility of the minute root hairs. Without them, the uptake of water and nutrients would not be pos-

sible and plant death would result. This process is known as *osmosis*, or diffusion through a semi-permeable membrane. This occurs whenever there is a larger concentration of water and soluble nutrients in the soil than within the plant.

2. *Water conduction*. Once the water and nutrients enter the root hair, they are transported through the conducting tissues of the root and carried upwards through similar conducting tissues in the stem (xylem), eventually reaching their desired destination, the cells with the leaf or stem.

3. *Anchorage*. The larger roots are distributed throughout the soil area and serve to support the top growth and prevent the plant from being lifted out of the soil during periods of high winds.

4. *Storage of reserve food*. Any excess food produced by the cells in the leaves is conducted from the plant stem and may be stored in the roots for future growth.

5. *Propagation*. The roots of a few plants are used to produce new plants.

The Stem Plant stems are characterized by the production of buds, which give rise to new branches, leaves, and flowers. There are four major functions of plant stems. They are:

1. *Support*. Stems are necessary as support for branches, buds, and leaves.

2. *Conduction*. Plant stems are used to conduct the water and nutrients from the roots to the leaves and back again to the roots.

3. *Storage*. The stems, like the roots, are capable of storing the excess food produced by the process of photosynthesis.

4. *Propagation*. Both herbaceous (soft, nonwoody) and ligneous (woody) plant stems can be used to obtain new plants from stem cuttings.

A typical plant stem has a terminal bud and many lateral buds. These buds may be either flowering buds (large and fat) or vegetative buds (narrow and thin). All buds arise from a node, and the space between individual buds is known as the internodes. Buds may be found opposite each other on the stem or alternate on the stem, giving rise to only one leaf or stem.

Certain plants have modified stems that may be found above ground, such as thorns, tendrils, and stolons or runners. Modified storage stems found below ground include bulbs, corms, rhizomes, and tubers.

The Leaf Plant leaves have three distinct parts, the main body is known as the *blade*, which is either *simple*—in one piece—or *compound*, where the leaf is divided into segments or divisions called leaflets. The petiole, or leaf stalk, is attached to the blade and to the leaf base at the other end. The base is that portion of the leaf which is attached to the plant stem.

The four primary functions of plant leaves are:

1. *Photosynthesis*. This is the unique process of leaves whereby they convert water and carbon dioxide in the presence of sunlight to food in the form of carbohydrates.

2. *Respiration*. This process involves the oxidation of the manufactured food to perform the vital life functions within the plant. This process is not unique only to leaves, since it is carried on by all living cells.

3. *Transpiration*. It is carried out and regulated by the openings in the leaves, known as *stomata*. Transpiration involves the release of excess water from the leaf's surface to the surrounding air.

4. *Propagation*. Plants having thick, fleshy leaves are usually propagated from leaf cuttings or from leaf petiole cuttings.

Plant leaves are most commonly used for identification and determination of an unknown plant. It is important for all horticulturalists to be familiar with the terminology used to separate one plant species from another.

Certain plants have modified leaves for specific purposes. They are used for:

1. *Protection*. Leaves become bud scales and are used to protect the tissue within the bud, like the willow.

2. *Food storage*. An example is the scale leaves of the onion.

3. *Water storage*. The fleshy leaves of the cacti and most succulents are able to store water.

4. *Trapping insects*. The Venus flytrap and other insectivorous plants have leaves capable of trapping insects.

The Flower The flower is divided into two separate types of organs, referred to as *accessory* and *essential*.

Accessory organs These are commonly called the *perianth*, and consist of:

1. The *calyx*, which is usually green in color and is composed of *sepals*, it is used to protect the interior flower parts.

2. The *corolla*, which is composed of *petals*. Their bright colors are used to attract the bees and insects needed for pollination and eventual seed formation. Terminology associated with the corolla includes the following:

1) *Regular*. All the petals are similar in size and shape, as in the rose.

2) *Irregular*. Some of the petals differ in size and appearance, as in the snapdragon.

3) *Apopetalous*. Each petal is separate from the other.

4) *Sympetalous*. All the petals of the flower are fused together.

Essential organs These are the flower parts necessary for the all-important pollination, and consist of:

1. The *stamens* or male parts. Each stamen consists of a filament or slender stalk which is topped by an *anther* or pollen sac. Within each anther are the *pollen grains*, which are liberated at just the right moment of time.

2. The *pistil* (carpel) or female parts. Each pistil consists of a *stigma* or tip, which receives the pollen grains. The *style* is that area of the pistil between the stigma and the ovary and consists of a slender stalk down which the pollen passes. The *ovary* is the basal