



教育部高等学校高职高专汽车类专业教学指导委员会规划教材

Architecture English

专业英语 (土建类)

夏虹 编著

山东大学出版社

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图书在版编目(CIP)数据

专业英语. 土建类/夏虹编著. —济南: 山东大学出版社, 2016. 8

ISBN 978-7-5607-5588-5

I. ①专… II. ①夏… III. ①土木工程—英语—高等职业教育—教材 IV. ①H31

中国版本图书馆 CIP 数据核字(2016)第 191725 号

责任策划 郑琳琳

责任编辑 郑琳琳

封面设计 牛 钧

出版发行: 山东大学出版社

社 址 山东省济南市山大南路 20 号

邮 编 250100

电 话 市场部(0531)88364466

经 销: 山东省新华书店

印 刷: 山东省英华印刷厂

规 格: 787 毫米×1092 毫米 1/16

17.75 印张 404 千字

版 次: 2016 年 8 月第 1 版

印 次: 2016 年 8 月第 1 次印刷

定 价: 39.00 元

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总序

进入新世纪以来,我国加快了转变经济发展方式的步伐,从而有力地推动着各领域的科学发展。随着科技创新能力的不断提高,科学技术的产业化进程日益加快,制造业不断优化结构,改善品种质量,并淘汰落后产能,汽车制造业尤其如此。《中华人民共和国国民经济和社会发展第十二个五年规划纲要》提出的培育发展新能源汽车等新兴产业的战略目标,就充分体现了这一点。

自2010年,中国汽车产销量已超过1800万辆,居全球首位,市场潜力巨大。中国汽车与装备制造业已进入了一个新的发展阶段。汽车工业的飞速发展带动了汽车与制造相关产业链的发展,为汽车及相关专业毕业生提供了广阔的就业空间和良好的发展前景。然而,老版本的汽车类教材已经不能满足汽车专业的教学需求,为广大汽车专业的师生提供一套新版教材成为当务之急。同时,为贯彻《教育部财政部关于实施国家示范性高等职业院校建设计划加快高等职业教育改革与发展的意见》(教高[2006]14号)和《教育部关于全面提高高等职业教育教学质量的若干意见》(教高[2006]16号)的精神,进一步推动职业教育由“重视规模发展”向“注重提高质量”的工作重心转变,适应我国现代汽车工业和职业教育发展的需要,教育部高等学校高职高专汽车类专业教学指导委员会决定在工学结合课程开发和教材建设方面进行探索,组织高校富有经验的教师和企业专家共同编写理论性和实践性相结合的汽车类专业教材。

教学质量是学校的生命线。提高教学质量,专业建设是龙头,课程建设是关键。高职教育的课程改革是一项长期的工作,它不是片面的课程内容的解析与重构,必须以人才培养模式创新为核心,以双师素质教师团队建设、实训条件建设、实训项目开发、教学方法改革、教学实施创新等一系列条件为支撑。多年来,在教育部高等学校高职高专汽车类专业教学指导委员会指导下,各高职高专院校进行了广泛的调研,以课程建设为抓手,以校企合作、工学结合为突破口,狠抓课程实施,在教材建设方面做出了高等职业教育的特色。

经过编者和主审的辛勤劳动,教育部高等学校高职高专汽车类专业教学指导委员会规划的第一批十七本教材已经陆续出版发行。这套教材在全国高职高专相关课程教学改革中发挥了积极的作用,受到了广大教材使用者的好评。



随着我国汽车工业的不断壮大,特别是新能源汽车和自动驾驶汽车的迅猛发展,传统的汽车工业正面临着环境和能源的双重压力与挑战,洁净能源、超低排放、先进材料及成型、超精低耗加工、建筑艺术及力学和基于大数据的全电子信息控制与监管等领域的新技术、新工艺,正在促使传统汽车制造发生变革。对此,根据高职高专教学和课程改革的需要,在总结第一批教材使用的基础上,我们将陆续出版涉及上述领域的第二批教材。希望教育部高等学校高职高专汽车类专业教学指导委员会的工作可以为各高职院校提供一些借鉴,并通过这套教材进一步推动各地的高职高专教学与课程改革。同时也希望业内专家和同仁对本套教材提出指导性和建设性意见,以便在教学实践中共同完善和提高。

本套教材在编写过程中,得到了教育部领导、行业专家、各高职高专院校和企业专家的支持,山东大学出版社对教材的出版给予了大力支持和帮助,在此一并致谢。

教育部高等学校高职高专汽车类专业
教 学 指 导 委 员 会
2012 年 2 月

前 言

本书是“教育部高等学校高职高专汽车类专业教学指导委员会”规划教材,是为适应高等职业教育汽车、建筑等专业对专业英语课程的基本要求而编写的。当前,工程技术专业的学生在学完大学英语课程之后,要想顺利地阅读本专业英文文献,尚存在不少困难。这主要是由于学生尚未掌握足够多的文献中的常用词汇及相关的科技英语技能所致。统计资料表明,在每一个专业的文献中,本专业最常用的科技术语大约只有几百个,而且它们在文献中重复出现的频率很高。因此,有针对性地通过大量文献阅读,扩充大约一千个与本专业密切相关的专业英语词汇后,便可以逐步自由阅读本专业文献。

本书旨在让学生进一步提高专业英语文献的阅读和翻译能力,并能以英语为工具获取专业所需信息。

本书内容包括五个部分:一是建筑历史知识。主要涉及著名古典和现代建筑实例、著名建筑师的生平和作品等。二是建筑设计的规范、过程和要求,城市规划与设计,未来建筑的展望等。三是建筑结构工程。这一部分主要是建筑结构设计的理论和技术。如:建筑设计过程、建筑结构信息处理、建筑结构计算机辅助设计、现代建筑结构材料和抗震结构的概念与设计等。四是建筑项目的概念、环境、类型和关键路径,建筑合同的类型,建筑纠纷的规避及处理,典型建筑管理案例。五是绿色建筑介绍。这一部分主要介绍了生命周期工程和绿色建筑的综合审视、绿色建筑以及个性化的室内环境调节、高效节能的可持续性建筑等。

本书资料翔实、取材得当、语言平实、词汇适度,既注意到专业术语翻译的准确性,又兼顾了英汉两种语言的差异性。每篇课文后均附有生词及疑难句的分析注释。同时,为每篇课文提供了参考译文,以方便读者课程学习之用。

本书由青岛理工大学夏虹编著。在编著过程中,得到青岛理工大学刘鹏、李会超、李燕超、楚雅杰和王文明等同学的大力支持和热情帮助,在此谨向他们致以诚挚的谢意。

本书在编写过程中,参考了部分文献,在此向文献的作者表示衷心感谢。

借此书付梓之际,编者向山东大学出版社和参与本书出版的工作人员表示诚挚的谢意。

由于编者水平有限,书中不妥之处在所难免,恳请读者批评指正。

编 者

2016年3月

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Unit 1 Travels in the History of Architecture

Unit 1-1 Egyptian and Architecture*

Ever since Herodotus, Egypt has represented a set of mysteries to be solved. No matter where one starts—the animal-headed gods, the picture writing, the burial customs—immediately one runs up against irreducible strangeness. Now, after thousands of Egyptian texts have been deciphered and read, tombs and temples of all sizes and types uncovered and explored, industrial installations and trade routes analyzed, construction methods and building histories pieced together, the civilization still carries a deep residue of strangeness.

In fact, monumental architecture in Egypt begins with a royal mortuary precinct that is a kind of city in itself. Djoser's tomb at Saqqara is the oldest monumental stone construction. His step pyramid, the first, consists of six platforms on top of each other, decreasing regularly in stages.^① The form derives from a traditional memorial in the form of a low mound of mud brick that looks like a windowless room or a smaller version of a single one of the Djoser steps. These were called mastabas by workers on nineteenth-century excavations, from the Arab word for bench. Probing of Djoser's pyramid has shown that it began as a mastaba and arrived at its present dimensions by several increments. Intermediate stages, intended as final to begin with, were ambitiously extended to arrive at the heroic mass we have now. The result seemed so remarkable that the architect's name was preserved and he acquired legendary status. Imhotep, also remembered as a mathematician and physician, was later deified, and through the link with medicine became confused with Aesculapius.

Djoser's complex is stone-built throughout, but some of the forms reproduce other kinds of construction. Outer walls, made of fine ashlar, resemble brick fortifications. A grandiose entrance gallery, whose columns imitate bundled reeds, was roofed in stone slabs carved to look like huge logs.^② Perhaps the most interesting feature of all is the Sed court, into which you emerge from the gallery. This is framed by delicate pavilions representing provinces of Egypt.

* Robert Harbison, *Travels in the History of Architecture*, London, UK: Reaktion Books Ltd., 2009, pp. 13-33.



Forms are flimsy, recalling slender wooden posts supporting tent roofs or thatch. Some are fluted and, in view of their refinement, were dated to the Greco-Roman period by early twentieth century investigators. These are dummy chapels of solid stone with no real enterable space. Crucial for the Sed festival ritual were boundary markers towards the end of the course. Holding appliances whose function is not well understood, the king ran between the markers, proving his vitality and reasserting the union of the two halves of Egypt under his rule.

Djoser set the pattern for royal burials of a walled mortuary complex centred on a pyramid. A few more stepped pyramids were built, and then came the idea of filling in the steps to make a single sheer slope. The earliest attempt to survive, the Bent Pyramid at Dashur, is one that went wrong. Too steep, it began to collapse, and attempts to shore it up resulted in a crooked profile. Soon after this time pyramids began to be accorded elaborate names. The first was called “Sneferu appears in glory”, and the famous triad at Giza was named “Horizon of Khufu” “Khafre is great” and “Menkaure is divine”.^③

Names convert the buildings into beings and make a confusion between the person and the tomb; the large looming shape becomes articulate. The names are like charms to be repeated over by the elect, and it is most unlikely that they were in common use. It is a contrary process from the kind of naming we know best, which aims at brevity above all.^④

At around the time that they pick up names, the pyramids pick up meanings. For now the primitive mound—associated with the lump of matter from which the world is born—has become a more diagrammatic figure, a picture of the sun’s rays spreading out and fertilizing the earth. This accompanies the growth of the solar cult and is clinched by the finishing touch on the masonry cone, a gilded granite capstone like a miniature pyramid.^⑤ The rays made solid in this way also provide a stair or route for the king to ascend back towards the sun, from the aspiring steps of Djoser’s pyramid towards a more conceptual image of ascent.

Speculation about how the pyramids got built, socially and physically, has also travelled in strange as well as rational paths. Engineers have argued plausibly that ramps for raising stones to the upper levels would have had to be more than a mile long and more time-consuming and difficult to construct than the pyramids themselves, and are thus unlikely to have been built. But contemporary illustrations of ramps survive. A system of shorter ramps, perhaps wrapping around the central core, is now favoured. The construction of the core has recently received greater attention. The largest pyramids have precisely laid ashlar cores; in later ones, rubble and brick are covered with a single layer of limestone to achieve a cheaper, quicker result, which looks like solid stone construction until the facing is robbed for later buildings.

Words and Phrases

Djoser

左塞尔, 古埃及第三王朝的法老

Saqqara

塞加拉, 又称“萨卡拉”

step pyramid

阶梯金字塔

mastaba	玛斯塔巴
Imhotep	伊姆霍太普, 阶梯金字塔的建筑师
Aesculapius	阿斯克勒庇俄斯, 医师
Greco-Roman	古希腊-罗马时期
Sneferu appears in glory	荣耀下的斯尼夫鲁
Horizon of Khufu	胡夫的地平线
Khafre is great	伟大的哈夫拉
Menkaure is divine	神圣的门卡乌拉

Notes

①His step pyramid, the first, consists of six platforms on top of each other, decreasing regularly in stages. 句中 decreasing regularly in stages 为现在分词短语作状语。全句可译为: 他的阶梯金字塔是历史上第一座金字塔, 由相互层叠的六块台石组成, 有规律地依次递减。

②A grandiose entrance gallery, whose columns imitate bundled reeds, was roofed in stone slabs carved to look like huge logs. 句中 whose columns imitate bundled reeds 是非限定性定语从句, 修饰 gallery。全句可译为: 一条宏伟的入口画廊, 画廊的柱子像是一捆捆芦苇, 屋顶的石板雕刻得看起来像巨大的原木。

③The first was called “Sneferu appears in glory”, and the famous triad at Giza was named “Horizon of Khufu” “Khafre is great” and “Menkaure is divine”. 注意句中不同的时态。全句可译为: 第一个被称为“荣耀下的斯尼夫鲁”; 吉萨著名的祖孙三代金字塔分别被命名为“胡夫的地平线”“伟大的哈夫拉”和“神圣的门卡乌拉”。

④It is a contrary process from the kind of naming we know best, which aims at brevity above all. 句中 which 引导一个非限定性定语从句, 修饰 the kind of naming we know best。全句可译为: 这种过程与我们所熟知的以简洁为主的命名方式完全相反。

⑤This accompanies the growth of the solar cult and is clinched by the finishing touch on the masonry cone, a gilded granite capstone like a miniature pyramid. 句中 a gilded granite... 为同位语, 对主句进一步说明。全句可译为: 这伴随着对太阳崇拜的不断增长, 通过在砖石锥上的画龙点睛, 使镀金的花岗岩顶峰就像一个微型金字塔。

Exercises

1. Answer the following questions briefly.

(1) Whose tomb is the oldest monumental stone construction?

(2) Who is the designer of Djoser's step pyramid?

2. Fill in the blanks with the proper words in the passage.

Forms are _____, recalling slender wooden posts _____ tent roofs or thatch. Some are fluted and, in view of their _____, were dated to the Greco-Roman period by early twentieth century _____. These are dummy chapels of solid



stone with no real _____ space. Crucial for the Sed festival ritual were boundary markers _____ the end of the course. _____ appliances whose function is not well understood, the king ran between the markers, _____ his vitality and reasserting the union of the two _____ of Egypt under his rule.

3. Translate the following sentences into Chinese.

- (1) No matter where one starts—the animal-headed gods, the picture writing, the burial customs—immediately one runs up against irreducible strangeness.
- (2) His step pyramid, the first, consists of six platforms on top of each other, decreasing regularly in stages.
- (3) Imhotep, also remembered as a mathematician and physician, was later deified, and through the link with medicine became confused with Aesculapius.
- (4) Holding appliances whose function is not well understood, the king ran between the markers, proving his vitality and reasserting the union of the two halves of Egypt under his rule.
- (5) The first was called “Sneferu appears in glory”, and the famous triad at Giza was named “Horizon of Khufu” “Khafre is great” and “Menkaure is divine”.
- (6) The largest pyramids have precisely laid ashlar cores; in later ones, rubble and brick are covered with a single layer of limestone to achieve a cheaper, quicker result, which looks like solid stone construction until the facing is robbed for later buildings.

Unit 1-2 Gothic*

Where Gothic began is no mystery. It happened over a short period in a fairly small area in northern France. The process becomes mysterious only if you notice that each of the main components of the style had been around for a while without producing anything much like a Gothic outcome.^①

Definitions of Gothic put the emphasis in different places. Focillon, the great French art historian, believes in the rib as the generator, which demands the string-like respond, which in its turn seems to dematerialize the system of support and pushes one towards thinner fabric and finally to “walls” of glass. Ruskin, the Victorian genius who was also a skilled draughtsman, derives most of the story from the tracery and a shift towards viewing the opening rather than the frame as the essential element. The argument between those structural rationalists like Violletle-Duc—architect, theorist and violent restorer of medieval buildings—who see cathedrals as machines, and symbol hunters like Lethaby, who arrives via the English Arts and Crafts

* Robert Harbison, *Travels in the History of Architecture*, London, UK: Reaktion Books Ltd., 2009. pp.112-134.

movement and views all the parts as components of a visionary experience, has been going on a long time.^②

The visionaries seize on the fact that ribs have occasionally fallen out leaving the web intact and hold firm to argue that ribs are mainly pictorial, not functional, giving an idealized diagram of the forces at work in a masonry vault. The structural rationalists had already pulled off one of the most unlikely coups of interpretation imaginable. To take the great vessels of faith, among the most costly and functionally useless works of human-kind and turn them into precursors of nineteenth-century feats of engineering, the great skeletal sheds of railway stations or assembly plants, is a very daring transvaluation of values. Medieval men, of course, do not talk about structural function. Neither do they acknowledge that Gothic is, as it appears to us, something radically new. Abbot Suger, nearest to a single progenitor of the mode that we can find, seems bewitched by rich materials, not spatial configurations, perhaps because they are easier to point to and everyone can grasp them and some will object to them.

At Chartres there is a marked increase in scale made more forceful by simplifying the internal elevation. The structural system is refined by eliminating the gallery, turning it into a skeleton of itself, the lower stage of a two-tier system of flying buttresses that are no longer heavy vanes of stone as at Laon, where they formed almost solid partitions. At Chartres they have become spidery frameworks pierced by little arcades, forecasting the next development at Reims and Amiens in which the buttress starts to resemble a fragile tracery, allowing the walls to do the same and matching them in the other dimension until every solid element partakes of the single striving after height and lightness.

While the nave and chancel walls are being dematerialized to admit light filtered through coloured glass, facades and portals are disappearing under sculptural multitudes that far outdo Romanesque schemes in complexity and extent.^③ The west front at Reims is said to contain more than 500 figures in rows of single personages just under life-size near the ground, mounted diagonally to the visitor because they follow the huge flanges of three exaggerated portals, some in the form of demi-figures, or compact scenes, or sets of rulers on little thrones which fit into the hollow of a moulding like left-over traces of the rich vegetable border that formerly filled this space.

On top of everything there is a carved back to the front at Reims. The reverse of the facade has been hollowed out in a series of niche-like openings, in each of which appears a single figure in the round. The effect is less three-dimensional than the other side of the facade, and more consistent, a regular honeycomb of spaces that respect the wall plane, only embellishing spandrels and borders of all the pointed openings with neatly carved leaves in low relief.

Amiens is not remembered for elaborate narratives, but for focus and consistency of architectural intention. The nave seems to strive for a single effect, exaggerated height, achieved by tall narrow proportions and vertical emphasis in stone details. Capitals are suppressed on piers of the arcade and eliminated entirely at the crossing. Transepts seem to



exist here to provide surprising vistas and change of direction; the symbolism of the cross has been forgotten. Oddly enough, the height of the nave is experienced most powerfully from within the aisle, where the view out is constricted without lessening the sense of a great jump upward.

The movement towards higher narrower proportions was very compelling, but it came to an abrupt end soon after the nave at Amiens, in Beauvais, whose choir was begun five years later in 1225. The nave never got built, so Beauvais' great height looks more freakish than if the building were complete. Its excesses have been compared to Mannerist exaggerations of Renaissance models: here the tightly spaced cage of flying buttresses finally resembles a complete other building somehow extruded in skeletal form by the fragile central mass. At Beauvais the designer was indeed pushing hard against the limits of structural possibility, and his high vaults collapsed 24 years after completion. In rebuilding the vault the number of bays and piers in the choir was doubled, keeping the original vertical proportions but thickening the density of the elevation considerably. ^④

From the beginning the creators of English Gothic had been more interested in rich and diverse spatial effects than in those rigorous structural demonstrations dear to the French. The "crazy" vault in St Hugh's choir at Lincoln is an early instance of breaking away from the rules, later pursued more emphatically. Interesting contests have been staged over where the great innovations of the fourteenth century sprang from, inspired by vanished royal masterpieces like St Stephen's Chapel, Westminster, or half-vanished ones like the Eleanor Crosses, which resembled pageant-architecture in their slimness and arbitrary placement.

By telling the whole story of Gothic through church architecture, of course, one loses something, as devotees of castles and burghers' town houses would hurry to point out. There is an even more serious omission. In England especially, cathedrals as they are now would hardly be recognizable by those who built them. ^⑤ Not only is lots of colour missing, but also in some real sense the heart has been ripped out of them with the disappearance of shrines to local saints.

Words and Phrases

Focillon	福西永, 法国艺术史家
Ruskin	拉斯金, 维多利亚人
Violletle-Duc	维奥拉勒·杜克, 建筑师、理论家
visionary n.	有远见卓识的人
Abbot Suger	埃伯特·絮热, 法国隐修院院长和摄政王
Chartres	沙特尔, 法国地名
Reims (Cathedral)	兰斯(大教堂)
Amiens (Cathedral)	亚眠(大教堂)
Beauvais (Cathedral)	博韦(大教堂)

choir <i>n.</i>	(教堂)唱诗楼
Renaissance	文艺复兴
St Hugh (Cathedral)	圣心(教堂)
St Stephen's Chapel	圣斯蒂芬教堂
Westminster	威斯敏斯特教堂
Eleanor Crosses	埃莉诺十字架

Notes

①The process becomes mysterious only if you notice that each of the main components of the style had been around for a while without producing anything much like a Gothic outcome. 句中 that each of... 是 only if 引导的条件状语从句中的宾语从句。全句可译为:只有当你注意到哥特式的每一个主要组成部分的风格已经存在了一段时间,却没有产生任何类似哥特式的效果时,这个过程才会变得神秘。

②The argument between those structural rationalists like Violletle-Duc—architect, theorist and violent restorer of medieval buildings—who see cathedrals as machines, and symbol hunters like Lethaby, who arrives via the English Arts and Crafts movement and views all the parts as components of a visionary experience, has been going on a long time. 句中 who see... 和 who arrives... 是两个定语从句,分别修饰结构理性主义者和莱瑟比。全句可译为:把教堂看作机器的结构理性主义者(如维奥拉勒·杜克——建筑师、理论家和中世纪建筑的狂热恢复者)与符号涉猎者(如莱瑟比——参加过英国工艺美术运动并将所有零件都看成一次有卓识经历的组成部分)之间的争论已经持续了很长时间。

③While the nave and chancel walls are being dematerialized to admit light filtered through coloured glass, facades and portals are disappearing under sculptural multitudes that far outdo Romanesque schemes in complexity and extent. 句中 while 引导一时间状语从句; that far outdo... 是定语从句。全句可译为:当教堂中殿和圣坛的墙逐渐褪质,从而使光线可以透过彩色玻璃时,在复杂程度上远远超越罗马式方案的众多人物雕塑的外立面墙和门廊正在消失。

④In rebuilding the vault the number of bays and piers in the choir was doubled, keeping the original vertical proportions but thickening the density of the elevation considerably. 句中现在分词短语 keeping the original... 作状语。全句可译为:在拱顶的重建过程中,唱诗楼桥墩和支柱的数量增加了1倍,保持了原有的垂直比例,但是显著增加了高层的密度。

⑤In England especially, cathedrals as they are now would hardly be recognizable by those who built them. 句中 as they are now 为定语从句,修饰 cathedrals。全句可译为:尤其是在英国,现在的教堂很难被它们当初的建造者认出来。

Exercises

1. Fill in the blanks with the proper words in the passage.

(1) To take the great vessels of faith, _____ the most costly and functionally



_____ works of human-kind and turn them _____ precursors of nineteenth-century feats of engineering, the great skeletal sheds of railway stations or _____ plants, is a very daring transvaluation of values. Medieval men, of course, do not talk about structural function. _____ do they acknowledge that Gothic is, as it appears to us, something radically new. Abbot Suger, nearest to a single _____ of the mode that we can find, seems _____ by rich materials, not spatial configurations, perhaps because they are easier to point to and everyone can _____ them and some will _____ to them.

- (2) At Chartres they have become _____ frameworks pierced by little arcades, _____ the next development at Reims and Amiens _____ which the buttress starts to resemble a fragile tracery, allowing the walls to do the same and _____ them in the other dimension until every solid element partakes of the single _____ after height and lightness.

2. Translate the following sentences into Chinese.

- (1) Ruskin, the Victorian genius who was also a skilled draughtsman, derives most of the story from the tracery and a shift towards viewing the opening rather than the frame as the essential element.
- (2) To take the great vessels of faith, among the most costly and functionally useless works of human-kind and turn them into precursors of nineteenth-century feats of engineering, the great skeletal sheds of railway stations or assembly plants, is a very daring transvaluation of values.
- (3) At Chartres they have become spidery frameworks pierced by little arcades, forecasting the next development at Reims and Amiens in which the buttress starts to resemble a fragile tracery, allowing the walls to do the same and matching them in the other dimension until every solid element partakes of the single striving after height and lightness.
- (4) The west front at Reims is said to contain more than 500 figures in rows of single personages just under life-size near the ground, mounted diagonally to the visitor because they follow the huge flanges of three exaggerated portals, some in the form of demi-figures, 'or compact scenes, or sets of rulers on little thrones which fit into the hollow of a moulding like left-over traces of the rich vegetable border that formerly filled this space.
- (5) Oddly enough, the height of the nave is experienced most powerfully from within the aisle, where the view out is constricted without lessening the sense of a great jump upward.
- (6) Its excesses have been compared to Mannerist exaggerations of Renaissance models; here the tightly spaced cage of flying buttresses finally resembles a complete other building somehow extruded in skeletal form by the fragile central mass.