

英语科普注释读物

天空世界

*The  
World  
Above*

上海译文出版社

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THE WORLD ABOVE

天 空 世 界

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## 注释者的话

《天空世界》(The World Above) 是美国出版的“分级丛书”第三级读物, 词汇量为三千。原作者是飞行员盖伊·麦奇 (Guy Murchie); 改写者是凯恩 (A. P. Kane)。从语言的角度看, 本书颇有独到之处。因为, 尽管它涉及航空天文学、航空气象学、空气动力学等学科, 专业词汇却只有两百多, 仅占全书单词数的百分之七; 其次, 它句型丰富, 不但有各种复合句, 而且有形形色色的非限定式从句 (或称复合结构)。由于句子是最基本的语言单位, 本书将有助于读者打好语言基础。

全书共十四章, 分三个单元。第一章到第三章为第一单元, 讲航空象航海一样, 要设法在飞行中测定所乘飞机的位置, 由此讲到利用恒星导航。第四章到第九章为第二单元, 作者把天空比作海洋, 畅谈大气中的风、云、雨、雪, 深入浅出地介绍航空气象。第十章到第十四章为第三单元, 讲人类如何实现飞行的愿望, 扼要地介绍了航空史和空气动力学, 最后讲到地球磁场。

作者采用第一人称的叙述方式, 畅谈他乘坐 C-54 型运输机飞渡大西洋的见闻。在五人机组中作者是领航员, 所以他谈到航空天文和航空气象时充满情趣。他说他比气象员更了解天气的真相, 因为他是亲眼看到、亲身经历风云变幻的。由于作者飞行经验丰富, 文笔流畅, 我们仿佛也随着飞机的翱翔, 一会儿悠闲地俯视白浪滔滔的云海, 一会儿又被带进电击雷轰、几乎机毁人亡的惊险场面。作者扩大了我们的眼界, 让我们知道平流层底下有比台风大几十倍的大旋风。至于瑰伟奇丽的北极光, 作者曾多次在它的照耀下飞行, 称赞它是天空的壮观。作者热情地歌颂了大自然的美, 还深入浅出地说明了这些自然现象的科学原理, 使本书成为一本良好

的科学普及读物。

可是，由于作者是资产阶级作家，有时难免暴露唯心主义的观点。例如在本书末尾处作者认为宇宙是上帝的物质表现，等等。

我们希望本书在学习英语和普及科学知识方面能起一些作用。在注释过程中我们曾得到有关专业工作者的帮助，在此表示感谢。由于我们水平有限，注释中难免有错误或不足之处，请读者批评指正。

林子清

一九七九年七月

# THE AIRPLANE FINDS ITS WAY

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## Chapter 1: The Vessel

*She*<sup>1</sup> was a large airplane, built for freight and comfort in flight. She was 94 feet long, with wide tail pieces *that could direct her nose up or down at the slightest touch of her controls*<sup>2</sup>. Her muscles and nerves were four and a half miles of steel cable and copper wire. Her brain was a set of instruments *tended by*<sup>3</sup> radio waves, magnetic force, and air pressure.

She was Number 896, one of the original C-54's, the famous airplanes designed especially for ocean transport. The C-54's were perhaps the most widely used weight-carrying airplanes to appear in the time since man first taught metal to fly.

On this night of the fifth of February she floated confidently through the black air. Her wings, made of a metal called duralumin, *were styled to cut through the sky at 240 miles an hour*<sup>4</sup>. Her total weight at this moment was 62,180 pounds. Of this, 6,200 pounds was freight *held down*<sup>5</sup> by rope and steel rods to the cabin floor. She had left *Newfoundland*<sup>6</sup> in the late afternoon, *bound for Prestwick*<sup>7</sup>, Scotland, 2,296 miles away.

*We men of the crew sat at our stations*<sup>8</sup>, *writing words and*

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1. 飞机、船只等常以“she”代替。 2. 一按飞机的控制器就能使机头昂起或俯下的。这个定语从句修饰前面的 tail pieces (尾翼升降舵)。direct 作“引导”解。介词 at 表示“方法”、“原因”，意为“应……而……”。 3. 由……所操纵的。 4. 设计成能以每小时240英里的速度穿过天空。在这里 style 作“设计”解。介词 at 表示“速度”。 5. 被绑住的。 6. /'nju: fənd'lənd/ n. 纽芬兰 [加拿大一地区]。 7. 飞往普雷斯特威克的。这个形容词短语是状语，说明行动时主语的特征。Prestwick /'prestwik/ [苏格兰一城市]。 8. 我们全体航空人员坐在我们的岗位上。crew 是集体名词，用单数时表示一只飞机上的全体航空人员。

*figures into flight logs*<sup>9</sup>, occasionally dreaming or talking or laughing. We could not see the waves of the North Atlantic Ocean two miles below. There were thick clouds covering the sea and the sun was deep under the earth. In the western sky the moon moved slowly downward. And as the earth turned and the planets turned, the group of stars that form *the Milky Way*<sup>10</sup> moved on its course through the black universe of *which man knows neither the beginning nor the end*<sup>11</sup>.

“What are you doing up here? Why is that octant in your hand?”

*It could have been the wind asking*.<sup>12</sup> I was the navigator seated at my chart table in the airplane's cockpit, gazing into the darkness beyond the window. The wind was crying in long tones. “Why ... wh-h-y ... wh-wh-h-h-y-y?” It was a wind which had never existed before the airplane. *It sprang full born from the nose of the airplane*<sup>13</sup> and burst upon the duralumin skin, *spreading out backward over the engines*<sup>14</sup>. It was the invisible substance of *which the sky is made*<sup>15</sup> — not just air, not just wind, but a stuff which is part of the consciousness of flight.

“Why is that octant in your hand?”

Because I am the navigator.

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9. 把文字和数字写入飞行日志。这个分词短语表示陪衬动作。 10. 银河。  
11. 人类不知其始终的。这个定语从句修饰 universe, man 用单数形式、前面不加任何冠词时作“人类”解。 12. 可能是风问, 本句是强调结构, 相当于 *It could have been the wind that ask*. 强调的成分是原句 (*The wind could have asked*) 的主语 the wind. could 是虚拟语气, 表示委婉地说出自己的看法。 13. 它从机首向后劲吹, spring 原意是“涌现”、“发生”, full born 原意是“成熟”。(直译是: 它完全是从机首生成的。) 14. 擦过发动机向后展开。 15. 构成天空的, be made of: 由……所构成。



I hold the needle that will point our way through the cloud. I sing the song of the sky.

*While flying the ocean*<sup>16</sup>, I am the busiest of our crew of five. I *keep account of*<sup>17</sup> the airplane's position and track over the earth, of altitude and the passing cloud layers, of the amount of gasoline used. My flight log sometimes contains a great many items in a single hour. I work with wind, radio waves, sun and stars, with charts of many colors.

Frequently I talk with the pilot, who likes to know *where we are or how long before we will get to a certain place ahead*<sup>18</sup> or how much gasoline is left in our tanks. The pilot on this flight is *Captain Blake Cloud*<sup>19</sup>, *who sits up front in the driver's seat*<sup>20</sup>.

*Second in command is Gullerman Dropford, the co-pilot or first officer*<sup>21</sup>. I am third in command, followed by *Ernie Silvers, flight radio officer*<sup>22</sup>, and *Ignatz Wuziensi, flight engineer*<sup>23</sup>, who sleeps most of the time between his few duties *while in the air*<sup>24</sup>.

We are all serving in this first regular overseas air-freight service *that the world has ever seen*<sup>25</sup>. We sense our

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16. = while we are flying the ocean. 17. 记录. 18. 我们在哪里或我们在到达前面某地之前还要多久. 连接副词 where 和 how 所引起的从句都是 know 的宾语. 19. 布莱克·克劳德机长. Blake Cloud /bleik klaud/. 20. 他端坐在前面驾驶员的座位上. 21. 第二把手是卡勒门·德洛福, 即副驾驶员或大副. 因为主语 Gullerman Dropford /'galəmən 'drɒpfəd/ 后面有同位语 "the co-pilot ...", 所以把表语 second in command 调到前面, 形成倒装. 22. 欧内·西尔弗, 也就是空勤报务员. Ernie silvers /'ɜ:nɪ 'sɪlvəz/. 23. 意格纳茨·乌申恩斯基, 也就是空勤机械师. Ignatz Wuziensi /'ɪɡ'nɑ:ts 'wuzi:'enski/. 24. = while he is in the air. 25. 世界上曾见到过的.

place in history as pioneers of a great age of air transport that will challenge time and space and weather and future dangers of extreme speed and altitude of which we have hardly yet begun to learn<sup>26</sup>.

I put the octant back into its case and glanced at the airspeed indicator. I adjusted the instruments in a way which had become familiar to me and figured our true airspeed. *This I entered in the flight log.*<sup>27</sup> Next I determined the rate at which we were using gasoline and recorded it in the log. Then I used my instruments to estimate our exact altitude. Finally, I *checked my compass against*<sup>28</sup> the pilot's compass.

You who have not yet flown the ocean *might suppose that a navigator is often worried about getting lost*<sup>29</sup>. This is not the truth. The navigator is *accustomed to*<sup>30</sup> finding his way through the sky. *His mind knows the fullness of its freedom bounded only by navigation's safety devices:*<sup>31</sup> the many instruments, four engines, three radios, the reserve of gasoline, the emergency equipment, and the self-confidence of five men.

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26. 我们几乎还没有开始了解的, learn of: 听到, 知道. 27. 我把它(空气速度)记入飞行日志. 本句是倒装句, this 指上文的 airspeed (空气速度, 简称空速), 它是 entered (把……记入)的宾语. 28. 根据……检查……. 介词 against 表示“对比”、“比较”. 29. 可能会猜想领航员常常担心迷航. 在这里 might 不是 may 的过去时, 而是用虚拟语气来表示婉转的口气, 因此, 宾语从句中的谓语动词 is worried 用一般现在时. 30. 习惯于(后接名词或动名词). 形容词 accustomed 用作表语时相当于 used. 31. 他知道仅仅在航空安全设备约束之下的航空自由的全部内容. 在这里 mind 作“理智”、“智力”解, its 指 navigation's.

## Chapter 2: The Way

*From where I sit here in the sky<sup>1</sup>, the world of waves and ships and men below seems somehow small. Yet human history tells us that this life up here sprang from that down there<sup>2</sup> — that centuries of toil and struggle had to pass before men discovered the simple secrets of the birds.*

Have you heard how the ancient *Arabs*<sup>3</sup> found their way for hundreds of miles across desert and sea? Do you know how the island dwellers in the South Seas sailed confidently over the entire *Pacific Ocean*<sup>4</sup>?

We who now *make our way*<sup>5</sup> so confidently across the sky realize *what a great debt we owe to these first navigators*<sup>6</sup>.

How did the Arab do it?

We will put ourselves in his place. We are on the desert — alone *but for*<sup>7</sup> a flock of sheep and goats moving across the sandy slopes. Our duty is to watch the flock. *Otherwise there is little to occupy our thoughts*<sup>8</sup> as the sun swings slowly over-head each day, leading her many star children on their nightly journey.

We hardly need to wonder that the familiar star *Alphecca*<sup>9</sup> passes always directly overhead, *for here near El*

1. 从我坐在天空中的这块地方。连接副词 *where* 引起的从句做介词 *from* 的宾语。整个介词短语作状语，修饰后面的 *seems small*。 2. 然而人类历史告诉我们，空中的生活产生于地面的生活。在 *that* 引起的宾语从句中 *up here* 和 *down there* 都是后置定语，分别修饰 *this life* 和 *that life* (*that* 后面的 *life* 被省略)。 3. /'æɪəbz/ *n.pl.* 阿拉伯人。 4. /pə'sɪfɪk 'əʊʃən/ 太平洋。 5. (我们) 飞行。 *make one's way*: 前进，行进。 6. 我们多么感激这些最初的航海家。 *owe debt to* ...: 欠……的债；应该向……付出。 *owe* 后面接直接宾语和间接宾语。 7. 倘没有，要不是。 8. 否则我们就几乎一无所思。 9. /ɑ:l'fɛkə:/ 北冕座 α 星，中名“贯索四”。

*Ala it has always been so*<sup>10</sup>. The wise old men all tell of it. In fact, when we were many days' journey south on the desert, faithful Alphecca always shows us the way to El Ala. Similarly *Alpheratz*<sup>11</sup> points straight down on *Mount Sinai*<sup>12</sup> and *Markab on the great southland of Sheba*<sup>13</sup>. Each star is a light *showing the way to its own part of creation*<sup>14</sup>.

We Arabs, like most others in this early time, *do not think of places in relation to the earth, but rather to the paths of the sun, the stars, and the wind*<sup>15</sup>. Our world is *the fullness of Arabia*<sup>16</sup> with seas and mountains and cooler countries far to the north and hotter countries to the south. If any of us ever saw a map, it had no lines of latitude or longitude, but it may have included star paths or perhaps arrows showing the big winds.

*For on land and at sea in the ancient days it was the winds that told direction almost as much as the sun and the stars*<sup>17</sup>. The winds usually *did not shift with the hours*<sup>18</sup> and could therefore be used as reasonably steady indications of di-

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10. 因为这个靠近阿拉的地方情况向来如此。EL 是阿拉伯文的冠词。for 是并列连词，表示推论的理由。11. /ɑ:l'ferəts/ 仙女座 α 星，中名“壁宿二”。12. 西奈山[在埃及的西奈半岛上]。Sinai /'sainiai/ 13. 而马克卜则直指宽广的南大陆沙卜。这个分句省略了谓语动词 points straight. Markab /'ma:rkəb/: 飞马座 α 星，中名“室宿一”。Sheba /'ʃi:bə/, Sheba 前面的介词 of 表示同位。14. 显示它本身部分的创造作用。这个分词短语作定语，修饰 light. 15. 不从地球的角度来考虑位置，而却从太阳、恒星和风的道路来考虑。think of: 考虑。in relation to: 关于，根据。副词 rather 在这里作“相反地”解。16. 幅员比阿拉伯更广大。Arabia /ə'reibjə/ n. 阿拉伯半岛[亚洲]。17. 因为，古代在陆地和海上，正是风几乎和太阳及恒星一样指明方向。at sea 相当于 on the sea (在海上)。“it was ... that ...”是强调结构。在这里，强调的是原来的简单句 (the winds told direction) 的主语。关系代词 that 的先行词是 it, as much as: 差不多，几乎等于。18. 不随时间转移。hours 用复数时作“时间”解。

rection.

The stars gave the Arabs only latitude — distance north or south — *because latitude was the one thing in the motion of most stars that was constant.*<sup>19</sup> The Arabs discovered that one star alone *seemed to stand always in the same direction:*<sup>20</sup> a certain low star in the north. They learned that the sun was somewhat trustworthy if one studied her wanderings with the seasons. As for the moon, they soon realized that *it was capable of almost anything.*<sup>21</sup>

As Arab navigation science grew with the centuries, one of its greatest advances came when Arab seamen first built boats big enough to leave the coasts and sail *the Sea of Oman*<sup>22</sup> to the Indian Ocean.<sup>23</sup> *It was then that they charted the rising and setting points of 15 stars, chosen for distribution at almost equal intervals around the horizon.*<sup>24</sup> These were added to the true north and south to form the 32 points of the compass known today.

The Arab compass points, of course, had Arab names and were associated with certain winds *so that ships could be steered at angles relative to the wind*<sup>25</sup> when the stars or the sun were out of sight. The Arabs could recognize each different wind by its individual and seasonal quali-

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19. 因为纬度是大多数永恒不变的恒星在自行中的一种情况。20. 似乎一直停留在同一个方向。seemed to stand 是表示行为的复合谓语，相当于 seemingly stood。21. 它几乎什么事情都做得出来。在这里，capable 的原义是“做得出（坏事）的”，意思是说月亮不循正轨，变化多端。22. 阿曼海。Oman /əu'mɑ:n/ n. 阿曼【阿拉伯海岸的一个国家】。23. 印度洋。24. 就是在那个时候，他们把十五颗恒星的升起点和落下点绘入海图，这些起落点是为了使它们在地平圈四周几乎等距离分布而选定的。本句是强调结构，强调时间状语 then。It 是形式主语，连词 that 引起的是主语从句。分词短语“chosen…”作定语，修饰 points。25. 因此船只能与风向成多种角度行驶。relative to: 与……有关系的，与……相关的。

ties of dryness or dampness and by its temperature and swiftness.

Another early navigation device much used by ancient sailors was the shore-sighting bird. The bird's vision in flight gave man one of his first means of obtaining his direction at sea in stormy weather. Indeed, many land birds in cages were taken along on ocean voyages as a matter of custom. *When in doubt*<sup>26</sup> about the direction of the nearest coast, the navigator could release a bird and *watch it circle for altitude*.<sup>27</sup> *If it then flew in a definite direction it could be assumed*<sup>28</sup> that the bird had seen land that way. If it did not find land, a bird which could not rest on the sea *would have no choice but to return to the ship*.<sup>29</sup>

The South Sea Islanders grew up close to the sea and ate and slept *with its sound and smell in their ears and noses*.<sup>30</sup> *It was only natural that they would be masters of ocean navigation*.<sup>31</sup>

One need not be surprised to learn that these men *regarded a third of the earth's surface as their private lake*<sup>32</sup> across which they could go in any direction and at any time. But it may be a surprise to many that the first of

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26. = when he was in doubt. 27. 看它往高处盘旋, watch 后面是“代词 + 不定式”式的复合宾语。 28. 条件从句中的谓语动词用过去时态, 主句的谓语动词用“should (would, could, might) + 动词原形”, 这种句子表示与现在事实相反的假设情况(虚拟语气)。 29. 除回船外别无其他选择, but 在此是介词, 后接不定式(不定式的 to 可以省去)。 30. 他们听着海的声音, 闻着海的气味, 介词 with 引起的是“名词 + 介词短语”式的复合结构, 修饰前面几个谓语动词, 表示伴随情况。 31. 他们很自然将成为海洋航行的主人, 先行词 it 是形式主语, 连词 that 引起的从句是真正的主语, 副词 only 在这里作“很”、“极”解。 32. 把地球表面的三分之一看作他们私人的湖泊, regard... as...: 把……看作……。

their tools of navigation was the wave. To the islander the wave was like a tool, *for it was studied and measured to a degree not to be exceeded anywhere until the latter days of ocean science*<sup>33</sup>. Just as we use radio today, so did the South Sea navigator a thousand years ago use the ocean wave.<sup>34</sup> He did not merely steer by the angle of the wave, but he observed the whole pattern *it made around an island*<sup>35</sup>.

The South Sea people who advanced this particular study to its greatest perfection were the *Marshall Islanders*<sup>36</sup>, who inhabit one of the more northeasterly groups of islands *fought over*<sup>37</sup> in World War Two. These navigators made detailed charts out of the ribs of palm leaves to form a meaningful framework indicating winds, swell systems, and the points where swells meet. Shells were placed on these charts to represent islands; sticks showed how far offshore the palm trees could be seen.

*The full importance of all these discoveries of wind and wave is almost impossible for modern man to appreciate until he flies over a group of islands in one of the calmer seas, knowing in advance just what to look for.*<sup>38</sup> The great primary swells

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33. 因为，直至有了海洋科学的近代，对它的研究和测量达到了一个其他任何地方都未超过的程度。不定式短语 *not to be exceeded* 作定语，修饰 *a degree*。34. 正象我们今天使用无线电波一样，一千年前的南海航行家的确利用了海浪。(just) *as* 引起的从句是方式状语从句，当这个从句放在前面时，主句前面加副词 *so* 与 *as* 遥相呼应。如果这个从句放在主句之后，主句前面就不能加 *so*。主句中加助动词 *did* 以示强调。35. 它(海浪)在岛四周所构成的(图案)。这是一个省略了关系代词 *that* 的定语从句。36. /'mɑ:ʃəl 'aɪləndz/ 马绍尔群岛[西太平洋]的居民。37. 被攻克的。38. 几乎直到现代人在某一个比较平静的海洋上飞过一群岛屿，并且预先知道他们所要找寻的东西的时候，他们才可能意识到关于风和浪的所有这些发现极其重要。“*The full importance of...is almost impossible for modern man to appreciate ...*”相当于“*It is almost impossible for modern man to appreciate the full importance of ...*”，*for* 引起的“名词+不定式”式的复合结构是真正的主语。*until* 引起的时间状语从句修饰 *is almost impossible*，*what to look for* 相当于 *what he should look for*，它是 *knowing* 的宾语。

are almost always quite visible *as seen thus from the air*.<sup>39</sup> *Their lines are revealed in moving shades of green and blue according to the changing angle between surface and the light*.<sup>40</sup> The lines of water moving in a contrary direction, *the eddy beam*,<sup>41</sup> also may be seen. If you look carefully you can usually sight the fainter echo swells in gentle weather. To recognize all of this from a sailing canoe on the surface a thousand years ago was a navigational exercise *of the highest order*.<sup>42</sup>

The South Sea Islanders naturally used *much more than*<sup>43</sup> wind or waves for a compass. In the middle of the ocean the sky was for them compass, clock, and map. Time by the sky clock was highly developed in the South Seas, for the navigators had long recorded the stars' custom of rising earlier each night (by about four minutes in our modern way of measuring).

Distance was more difficult to measure, for it was determined by human effort, not merely by the earth or the heavens. The Islander had no word for distance. Time and direction were his important measurement. A certain island was not 450 miles away, but five days' sail toward a certain star.

Shore-sighting birds, however, were used in navigation by the Pacific islanders. The island navigators kept the frigate bird for this purpose, for this sea bird does

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39. 象从天空所看到的那样。这是一个省略的方式状语从句。未经省略的句子是: *as they are seen thus from the air*. 40. 它们(涌浪)的波纹随着海面 and 光线之间的角度变化而显露出忽蓝忽绿的色彩。shade 意为“(色彩的)浓淡”。*according to*: 按照; 随着……的不同(而不同)。41. 涡流波纹。这个词组是前面 “*the lines of water*…” 的同位语。42. 最高级的。43. 远远不止……。



not normally rest on the water but flies to the nearest land.

Undersea creatures and fish can also indicate the presence of land, since the numerous types found near the coast rarely *venture out*<sup>44</sup> with the oceanic kinds. Even land-smelling animals were used as a tool in navigating the seas. It is known that *the Tahitians*<sup>45</sup> carried pigs for this purpose, because the keen nose of the sea-weary pig would sometimes show excitement at approaching land long before it was visible even to a flying bird.

The color and temperature of the sea also gives the navigator important information. Blue water is salty, warm and deep. Green water is cool, thin with river and often shallow. In warm climates it means that land is near.

Of course, most of the great early discoveries of navigation *have been lost to human memory by now*.<sup>46</sup> And in the course of centuries, these discoveries had to be made many times because they were forgotten many times before they were finally recorded.

Throughout the centuries discovery remained a matter of chance and luck. Nothing was done to direct all of the separate efforts. But in the fifteenth century *Prince Henry the Navigator of Portugal*<sup>47</sup> attempted to organize discovery *on a month-to-month basis*.<sup>48</sup> The results of his efforts *led directly to the first Mediterranean-to-India*

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44. 冒险游出。 45. /tə'hi:fənz/ n.pl. 塔希提岛[大洋洲]人。 46. 现在已经从人类的记忆中消失了。 be lost to: 为……所不及。 by now: 此刻已经。 47. 葡萄牙的航海家亨利王子(1394—1460)。 portugal /'pɔ:tjuəgəl/. 48. 在连续几个月的基础上。