地理专业英语文选

南京大学外文系公共英语教研室编

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前　言

在实现科学技术现代化的伟大事业中，外语是广大群众迫切需要掌握的工具之一，本书就是为了适应这种形势，帮助有关人员提高阅读地理专业英语书刊的能力而编写的。

使用本书的对象是具有一定英语基础知识的大学地理专业学生和从事地理工作的科技人员。

全书共四十课。由于普通自然地理是各门地理学的重要基础之一，有关词汇对地理工作者阅读各自领域内的英语书籍有广泛的意义，因此，这方面内容的选文占有较大的比例，其余主要属于人文地理和区域地理方面的知识，最后几课是地理学历史上的名篇和有关地理学最新研究方向的文章。

每课除正文外，附有词汇、词组和注释，以便读者自学。书后还附有参考译文，供读者在理解上遇到困难时查阅。

本书材料选自美英较新出版的大学教科书、参考书和有关专著，选材范围较广，词汇比较全面，文体也比较多样。

本书由我室霍义明、王承康和我校地理系丁登山同志合编。

由于编者的专业知识和语言水平的限制，本书难免有缺点和错误，希望读者提出宝贵的批评和改进意见。

南京大学外文系公共英语教研室

本书所用语法术语略语表

a. adjective	形容词
ad. adverb	副　词
conj. conjunction	连　词
n. noun	名　词
prep. preposition	介　词
pron. pronoun	代　词
v. verb	动　词

CONTENTS

1. LONGITUDE AND LATITUDE

The location of points on the earth's surface follows a system in which lengths of arc are measured along meridians and parallels①. Taking a selected meridian, or prime meridian, as a reference line②, arcs are measured eastward or westward to the desired points. Taking the equator as the starting line, arcs are measured north or south to the desired points.

The longitude of a place is the arc, measured in degrees, of a parallel between that place and the prime meridian③. (Figure 1). The prime meridian is almost universally accepted as the meridian that passes through the old Royal Observatory at Greenwich, near London, England, and it is often referred to as the Greenwich meridian. This meridian has the value 0° longitude. The longitude of any given point on the globe is measured eastward or westward from this meridian, whichever is the shorter arc④. Longitude may thus range from 0° to 180°, either east or west. It is commonly written in the following form: long. 77°03′41″W, which may be read "longitude 77 degrees, 3 minutes, 41 seconds west of Greenwich."

If only the longitude of a point is stated, we cannot tell its precise location because the same arc of measure applies to an entire meridian. For this reason, a meridian might be defined as a line representing all points having the same longitude⑤. This definition explains why we often use the expression "a meridian of longitude." You may at first be confused by the statement that longitude is measured along a parallel of latitude⑥, but

this becomes clear when you realize that to measure the arc between a point and the prime meridian⑦, it is necessary to follow a parallel eastward or westward⑧.

The actual length, in kilometers or miles, of a degree of longitude will depend on where it is measured⑨. At the equator the approximate length of one degree is computed by dividing the earth's circumference by 360°:

$$\frac{40{,}075\text{km}}{360°} = 111\text{km}$$

$$\frac{24{,}900\text{mi}}{360°} = 69\text{mi}$$

Because of the rapid convergence of the meridians northward or southward, this equivalent applies close to the equator⑩ only. It is also useful to know that the length of 1° of longitude is reduced to about one-half as much along the 60° parallels, or about $55^1/_2$ km ($34^1/_2$mi).

The latitude of a place is the arc, measured in degrees, of a meridian between that place and the equator. Latitude thus ranges from 0° at the equator to 90° north or south at the poles. The latitude of a place, written as lat. 34°10′31″N, may be read "latitude 34 degrees, 10 minutes, 31 seconds north." When both the latitude and longitude of a place are given, it is accurately and precisely located with respect to the geographic grid.

If the earth were a perfect sphere, the length of 1° of latitude (a one-degree arc of a meridian) would be a constant value everywhere on the earth. This length is almost the same as the length of a degree of longitude at the equator, so that the value of 111 km (69 mi) per degree may be used for ordinary purposes.

To be precise, and to take into account the oblateness of

the earth, we must recognize that a degree of latitude changes slightly in length from equator to poles. The length of 1° of latitude at the equator is 110.6km (68.7 mi); at the poles it is 111.7 km (69.4 mi), or 1.1 km (0.7 mi) longer. One degree at the poles is 1 percent longer than at the equator[11]. The difference is by no means trivial and must be taken into account in the precise construction of large-scale maps. Figure 1 shows why the length of a degree of latitude is longer at the poles than at the equator. A circle, fitted to the curvature of the ellipse at the pole, is larger in radius than a circle fitted to the ellipse at the equator. It is obvious from the drawing that a 5° arc of the larger circle is longer than a 5° arc of the smaller circle. Thus the length of a degree of latitude changes continuously from a minimum value at the equator to a maximum value at the pole. Table 1 gives approximate values of length of degrees of latitude and longitude at 15° intervals from equator to pole.

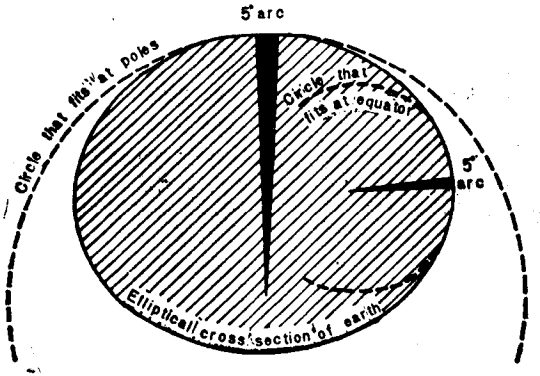

Figure 1 The length of a degree of latitude is slightly greater at the poles than at the equator

Table 1 Lengths of Degrees of Latitude and Longitude

	Length of 1° of latitude		Length of 1° of longitude	
Latitude degrees	km	(mi)	km	(mi)
0	110.57	(68.70)	111.32	(69.17)
15	110.64	(68.75)	107.55	(66.83)
30	110.85	(68.88)	96.49	(59.96)
45	111.13	(69.05)	78.85	(48.99)
60	111.42	(69.23)	55.80	(34.67)
75	111.62	(69.36)	28.90	(17.95)
90	111.70	(69.40)	00.00	(00.00)

词 汇

longitude ['lɔndʒitju:d] *n.* 经度
latitude ['lætitju:d] *n.* 纬度
location [ləu'keiʃən] *n.* 定位；测位
arc [ɑ:k] *n.* 弧
meridian [mə'ridiən] *n.* 子午线；子午圈
parallel ['pærəlel] *n.* 纬线；平行线
selected [si'lektid] *a.* 挑选出来的；精选的
prime [praim] *a.* 最初的；基本的
～ **meridian** 本初子午线
equator [i'kweitə] *n.* 赤道
universally [ˌju:ni'və:səli] *ad.* 普遍地
royal ['rɔiəl] *a.* 王的；王室的；[R-] (英国)皇家的
observatory [əb'zə:vətəri] *n.* 天文台
Greenwich ['grinidʒ] *n.* 格林威治
whichever [hwitʃ'evə] *pron.* 无论哪个
precise [pri'sais] *a.* 精确的，准确的
definition [ˌdefi'niʃən] *n.* 定义；解说
confuse [kən'fju:z] *v.* 混淆；把…混同
approximate [ə'prɔksimit] *a.* 近似的；大约的
compute [kəm'pju:t] *v.* 计算，估计
circumference [sə'kʌmfərəns] *n.* 圆周；圆周线
convergence [kən'və:dʒəns] *n.* 会聚；辐合
equivalent [i'kwivələnt] *n.* 等值；等量；相等物
accurately ['ækjuritli] *ad.* 准确地；精确地
geographic [dʒiə'græfik] *a.* 地理的；地区的
grid [grid] *n.* 格网；地图的坐标方

格

oblateness ['ɔbleitnis; əu'bleitnis] *n.* 扁圆形；扁率

trivial ['triviəl] *a.* 轻微的；不重要的

radius ['reidjəs] *n.* 半径

curvature ['kə:vətʃə] *n.* 弯曲；曲率

ellipse [i'lips] *n.* 椭圆

minimum ['miniməm] *n.* 最小量；极小值

maximum ['mæksiməm] *n.* 最大量；极大值

词　组

to take ... as 取…作为；把…看作

to be accepted as 被认为

to be referred to as 叫做；被看作是

to range from ... to ... 从…到…不等

either ... or 或…或；不是…就是

to apply to (＋名词)适合；适用于

to be defined as 定义为；…的定义是

at first 起先；最初

to depend on 依靠；取决于

to divide A by B A 被 B 除

because of 由于

close to (＋名词)接近于；在附近

to be reduced to (＋名词)简化为；减少到

as much 同样；同量

with respect to (＋名词)关于；对

so that 因此；为了

to take into account 考虑到；注意到；涉及

by no means 决不；并没有

注　释

① in which lengths of arc are measured along meridians and parallels: 这是介词 in ＋ which (关系代词)引导的定语从句，修饰 a system。

② Taking a selected meridian, or prime meridian, as a reference line: 这是现在分词短语，作状语用，表示行为方式，修饰 are measured; or 是连接词，引导a selected meridian 的同义词组 prime meridian。

③ The longitude of a place is the arc, measured in degrees, of a parallel between that place and the prime meridian. 句中的 measured in degrees 是过去分词短语，作非限制性定语用，修饰 the arc，注意它把 the arc 与修饰 the arc 的介词短语 of a parallel ... the prime meridian 隔开了。

④ whichever is the shorter arc: 这是让步状语从句，句中的主谓语倒装。

⑤ representing all points having the same longitude: 这是现在分词短语，作定语用，修饰 a line; 其中的 having the same longitude 也是现在分词短语，作定语用，修饰 points。

⑥ that longitude is measured along a parellel of latitude: 这是同位语从句，说明 the statement 的内容。

⑦ to measure the arc between a point and the prime meridian: 这个不定式短语在句中用作目的状语。

⑧ it is necessary to follow a parellel eastward or westward: 句中的 it 是先行代词作形式主语，真正的主语是不定式短语 to follow ... or westward。

⑨ The actual length, in kilometers or miles, of a degree of ... where it is measured. 句中的介词短语 in kilometers or miles 是非限制性定语，修饰 the actual length, 注意它把 the actual 和修饰它的 of a degree of longitude 隔开了；where it is measured 是连接副词 where 引导的名词从句，作短语动词 depend on 的宾语。

⑩ close to the equator: 这是副词短语，用作地点状语，修饰 applies。

⑪ than at the equator: 在这个比较状语从句中省略了 that (指 one degree)。

2. ROTATION AND REVOLUTION OF THE EARTH

The spinning of the earth on its polar axis is termed rotation. In this study of earth-sun relationships we use the period of rotation, the mean solar day, consisting of 24 mean solar hours①. This day is the average time required for the earth to make one complete turn in respect to the sun.②

Direction of earth rotation can be determined by applying one of the following rules. *(a)* If we imagine ourselves to be looking③ down upon the north pole of the earth, the direction of turning is counterclockwise. *(b)* If we place a finger upon a point on a globe near the equator and push the finger eastward, it will cause the globe to rotate in the correct direction. This demonstrates a common expression, "eastward rotation of the earth". *(c)* Direction of earth rotation is opposite that④ of the apparent motion of the sun, moon, and stars. Because these bodies appear to travel westward across the sky the earth must be turning in an eastward direction.

The velocity of earth rotation, defined as rate of travel of a point on the earth's surface in a circular path due to rotation alone⑤, may easily be computed by dividing the length of parallel at the latitude of the point in question⑥ by 24, the approximate period of rotation. Thus at the equator, where the circumference is about 25,000 mi (40,000 km)⑦, the velocity of an object on the surface is about 1050 mi (1700 km) per hour. At the 60th parallel the velocity is half this amount, or about 525 mi (850 km) per hour. At the poles it is, of course, zero.

We are unaware of this motion because the rotation is at an almost perfectly constant rate.

Two important physical phenomena result from the decrease in rotational velocity with increase in latitude. First, there is a centrifugal force generated by the earth's turning which gives surface objects a faint tendency to fly off into space⑧. Because the force of gravity is 289 times greater than this centrifugal force at the equator, objects cannot leave the surface, but the practical effect is to reduce the weight of objects slightly. Near the equator, where the centrifugal force is strongest⑨, this effect is most marked. For example, an object which would weigh 289 pounds at the equator if the earth were not turning⑩ actually weighs 1 pound less. Another effect of the decreasing rotational velocity with increasing latitude is to cause objects in motion to be deflected slightly to the right or left of their paths.

The motion of the earth in its orbit around the sun is termed *revolution*. The period of revolution, or year, is the time required for the earth⑪ to complete one circuit around the sun. The year is, however, defined in different ways. For example, the time required for the earth to return to a given point in its orbit with reference to the fixed stars is called the sidereal year.

For earth-sun relationships we use the tropical year, which is the period of time from one vernal equinox to the next, and has a length of approximately $365^{1}/_{4}$ days. Every four years the extra one-fourth day difference between the tropical year and the calendar year of 365 days accumulates to nearly one whole day. By inserting a 29th day in February every leap year we are able to correct the calendar with respect to the tropical year. Further minor corrections are necessary to perfect this system.

In its orbit the earth moves in such a direction that if we

imagine ourselves in space, looking down upon the earth and sun so as to see the north pole of the earth, the earth is traveling counterclockwise around the sun⑫. This is the same direction of turning as the earth's rotation.

词　汇

rotation [rəu'teiʃən] *n.* 自转；旋转
revolution [ˌrevə'luːʃən] *n.* 公转；旋转
spinning ['spiniŋ] *n.* 旋转
polar ['pəulə] *a.* 地极的
axis ['æksis] *n.* 轴
relationship [ri'leiʃənʃip] *n.* 相互关系
mean [miːn] *a.* 平均的；中间的
solar ['səulə] *a.* 太阳的
　～ **day** 太阳日
　～ **hour** 太阳时
apply [ə'plai] *v.* 应用
counterclockwise ['kauntə'klɔkwaiz] *a., ad.* 逆时针方向的(地)
rotate [rəu'teit] *v.* 旋转
demonstrate ['demənstreit] *v.* 表明；证明
apparent [ə'pærənt] *a.* 明显的；显而易见的
velocity [vi'lɔsiti] *n.* 速度；速率
circular ['səːkjulə] *a.* 圆形的；循环的
phenomena [fi'nɔminə] *n.* 现象 (phenomenon [fi'nɔminən] 的复数)
unaware ['ʌnə'wɛə] *a.* 没觉察到的；不注意的
centrifugal [sen'trifjugəl] *a.* 离心的
generate ['dʒenəreit] *v.* 发生；产生
faint [feint] *a.* 微弱的；不明显的
tendency ['tendənsi] *n.* 趋势；倾向
deflect [di'flekt] *v.* (使)偏斜
orbit ['ɔːbit] *n.* 运行轨道
sidereal [sai'diəriəl] *a.* (时间)根据恒星测定的
　～ **year** 恒星年 (365日6.179分8.97秒)
tropical ['trɔpikəl] *a.* (位于)热带的
　～ **year** 回归年(365日 5时48分46秒)
vernal ['vəːnl] *a.* 春天的；春天发生的
equinox ['iːkwinɔks] *n.* 二分点
　vernal ～ 春分(点)
extra ['ekstrə] *a.* 额外的；外加的
calendar ['kælində] *n.* 历法；历书
　～ **year** 历年
accumulate [ə'kjuːmjuleit] *v.* 积聚
insert [in'səːt] *v.* 插入
leap [liːp] *n.* 跳跃
　～ **year** 闰年
minor ['mainə] *a.* 较小的

词　组

to consist of 由…组成
in respect to (＋名词) 相对于；关于
to appear to (＋不定式)看来象是；仿佛
due to (＋名词)由于
in question 上述的(那个)；正被讨论的
to be unaware of 不知道；没有觉察到
to result from 由于；由…引起
to fly off 飞离
with reference to (＋名词) 以…为基准；参照
such ... that 这样…以致
so as to (＋不定式)以便；为了；致使
the same ... as 和…一样的

注　释

① In this study of earth-sun relationships ... consisting of 24 mean solar hours. 句中的 the mean solar day 是 the period of rotation 的同位语；consisting of 24 mean solar hours 是现在分词短语，作定语用，修饰 the period。

② This day is the average time required for the earth to make one complete turn in respect to the sun. 句中的 required for ... the sun 是过去分词短语，作定语用，修饰 the average time；短语中的 for the earth 是不定式短语 to make one ... the sun 的逻辑主语。

③ to be looking: 这是不定式的进行形式，表示谓语动词 imagine 进行之时，它表示的动作也正在进行。

④ that: 指 direction，以避免与前面的 direction 重复。

⑤ defined as rate of travel of a point on the earth's surface in a circular path due to rotation alone: 这是过去分词短语，作非限制性定语用，修饰 the velocity of earth rotation；其中介词短语 of a point on the earth's surface 和 in a circular path 都是名词 travel 的定语。

⑥ in question: 这个介词短语在句中作定语用，修饰 the point。

⑦ where the circumference is about 25,000 mi (40,000 km): 这是关系副词 where 引导的非限制性定语从句，修饰 the equator.

⑧ generated by the earth's turning which gives surface objects a faint tendency to fly off into space: 这是过去分词短语，作定语用，修饰 a centrifugal force；注意这个短语中还包含了一个修饰 the earth's turning 的定语从句 which gives ... into space。

⑨ strongest: 这个形容词最高级前没有加 the，是因为它在句中作表语，也不与其它的 centrifugal force 作具体的比较。