

閱讀

1. 食品業的發展

原始機經：

古時候的人們不像現在每天都可以吃麵包，他們的食物保持不了很久。

不過中國發現可以用鹽來醃制食物用來長久保存，並且法國的某個人也發現了類似的方法，後來發現可以用鹽和冰來儲存食物。剛開始的時候罐頭剛發明，很多人不買賬，因為價格太貴了而且不好打開，要用工具打開（有題），之後美國還出現了蔬菜罐頭。

後來價格降低了，大家就接受了。

還記得有段說因為什麼，讓一個地方成為了 meat center。

後來，隨著鐵路的發展，很多外地的食物可以運到別的地方。因為鐵路的發達，南美大片草原開始種植麥子。不過後來因為種植麥子的太多了，導致物價下跌了，雖然破產的農民很多，但是結果是人們吃得起麵包了。此外交通運輸業對於食品發展也其他很重要，冰塊可以實現運輸了。

背景知識：（本題改寫自 Food in World History）

Before the nineteenth century, only the elite could enjoy white bread and meat on a daily basis. With the rise of industrial mass production, these and many other foods have come to be regarded as everyday staples in Western society. The factory system, designed to achieve mass production through mechanization, found ready application in the food processing industry. New methods of preservation, particularly canning and refrigeration, allowed such economies of scale that factories could produce enough to feed whole cities without spoilage or waste. Steam engines powered giant mills as well as ships and trains that carried industrial products across continents and oceans. In sheer quantities, the foods available to late nineteenth-century British and North American cities outstripped all previous supply systems in history.

Since ancient times, the Chinese had used salt on a large scale to preserve fish and soy sauce, and North Atlantic salt cod improved European diets in the sixteenth century, but the invention of canning by Nicolas Appert around 1809 brought food into the industrial age. The Parisian confectioner discovered how to prevent decay by boiling foods in sealed glass bottles. ■ The British quickly adapted the technique to sturdier tin cans, which soon became standard rations on board British Navy ships. ■ Consumer demand grew more slowly, because of both high initial costs and the lack of an efficient can opener — hammer and chisel were needed at first. ■ Nevertheless, by the 1830s, European and U.S. shops began stocking canned fish and meat, followed later by fruits and vegetables. ■

Mass production also depended on an efficient division of labor, particularly for the first meatpackers in the Midwestern United States. Founded in Cincinnati about 1830, this industry employed teams of specialized workers, each of whom performed a single, repetitive task, cutting away a ham or a side of bacon, until the hog vanished completely at the end of this "disassembly line." Frederick Law Olmsted observed: "No iron cog-wheels could work with more regular motion. Plump falls the hog upon the table, chop, chop; chop, chop; chop, chop, fall the cleavers. All is over." Once packed in barrels of brine, the

meat was shipped east by barge. At first, the industry was limited to the winter months, when freezing temperatures slowed the process of decay, but by the 1850s the arrival of railroads and ice harvesting had extended production year round. During the Civil War, access to hogs fattened on corn from Iowa and Nebraska allowed Chicago to replace Cincinnati as the meatpacking capital, "Porkopolis."

The marketing of grain likewise benefited from new forms of standardization made possible by the grain elevator, an enormous vertical warehouse, invented in 1842, with steam-powered conveyor belts that poured cereal in from the top and chutes below that dropped it into waiting ships or railroad cars. Gravity moved grain more efficiently than any stevedore could manage with burlap sacks, and Chicago's massive elevators dominated world markets by the late 1850s. Without the sacks, grains from individual farms were mixed indiscriminately, and the arbitrary dividing line between, say, first and second-class spring wheat often meant the difference between survival and bankruptcy for Midwestern farmers. Railroads stimulated production in other temperate regions as well; in the 1880s the vast pampas grasslands of Argentina were converted to agriculture, although farmers remained at the mercy of grain merchants such as Ernesto "the Octopus" Bunge. The global fall in wheat prices, which ruined countless growers, nevertheless provided cheap bread for factory workers.

At the same time, improved milling technology meant more refined foods. Traditional millstones had simply pulverized wheat, leaving behind bits of hull and oils that quickly went rancid. Hungarian roller-mills, pioneered in the 1840s, progressively removed the outer layers of the grain, yielding purer, whiter flour. Meanwhile, British engineers updated rice milling machinery, which encouraged the importation of unprocessed paddy rice instead of previously milled grain from Asia – an example of European industrialization causing de-industrialization elsewhere. Even chocolate milling was improved in 1828 with the Dutch invention of a press to remove excess cocoa butter, creating a smoother drinking chocolate and contributing later to mass-produced confectionery. Ordinary people could now buy former luxury foods, although white bread and rice were actually less nutritious than darker, whole-grain versions.

Mechanical refrigeration offered another critical breakthrough, allowing urban consumers greater access to fresh beef. Unlike pork, which took well to curing, beef became hard and tasteless when salted and dried. As a result, cattle in Argentina, Australia, and Texas were often slaughtered for their hides, with the meat left to rot. In 1867, cowboys opened the Chisholm Trail, driving Texas longhorns north to the railhead at Abilene, Kansas, for shipment to eastern markets. Yet live cattle transport had barely begun when George Hammond first shipped beef by railroad icebox; within a decade, refrigerated rail cars had become economical. Applying the same industrial techniques used for hogs, the Chicago meatpacking firms of Hammond, Swift, and Armour soon dominated the U.S. beef trade, underselling local butchers who tried to compete with freshly slaughtered beef. The packers also gained a major share of the British market because Australian and Argentine meat had to be frozen solid, and therefore fetched lower prices than North American chilled beef.

Industrial foods achieved widespread consumer acceptance through a commercial revolution of advertising and retailing. In the 1870s, Glasgow merchant, Thomas Lipton built a grocery store empire selling affordable canned goods, while the Atlantic and Pacific Tea Company opened "economy" stores in the United States. Brand names such as Lipton and A&P helped to bridge the growing divide between industrial manufacturers and ordinary consumers. By the turn of the century, H. J. Heinz was devising endless advertising gimmicks — ranging from miniature pickle pins to an Atlantic City pleasure pier — to increase sales of his "57 varieties" of canned foods. The National Biscuit Company likewise devoted a lavish promotional campaign to its "Uneeda" cracker. Competitors with equally silly brand names but without comparable advertising budgets failed to dent Nabisco's market share. Hence, the huge investments in factories and distribution required equally massive publicity to ensure demand for processed foods.

問題:

- 1) regarded = viewed
- 2) All helped to make food widely available in 19th Century EXCEPT?
→ more productive varieties of wheat were planted
- 3) **TWO Answers** in Paragraph 2 were reasons that consumer demand
→ canned food too expensive; not easy to open cans
- 4) Except
→ involvement of Iowa and Nebraska in Civil War
- 5) What can be inferred from Paragraph 3 about the meatpacking in Cincinnati during 1860s?
→ comparatively less access to livestock than Chicago
- 6) Like wise = Similarly
- 7) indiscriminately = randomly
- 8) Why the author gives the information "in the 1880s the vast grasslands of Argentina were converted to farm"?
→ explain the extent to which railroads contributed to massive grain production
- 9) What can be inferred from paragraph 4 that the use of burlap sacks had which of the decreasing advantage?
→ it make it possible to differentiate grains of various quality from different farms

10) According to paragraph 4, the global fall in wheat result of the worldwide decrease in the price of wheat?

→ bread became more widely available for everyday consumption

11) pioneered = initially developed

12) What is mentioned in paragraph 5 as an effect of improvements in milling technology?

→ the industrialization of rice processing in Asia

13) 插入題

Eventually as price came down and opening the containers became easier, canned food common place in family kitchens. ■ (Ans: D)

14) SUMMARY

A) Food distribution greatly improved due to improvement in shipping and the use of trains.

C) Canning and Refrigeration ensured that food could be adequately preserved and distributed widely without waste or spoilage.

E) The invention of the grain elevator and development in milling technology increase the effect of grain production.

2. 駱駝

原始機經：

撒哈拉沙漠的駱駝耐旱特別強，人失水12%就掛了，駱駝20%還沒事。為啥呢？大多数人以為是hump，其實不是，那裏是儲fat的，雖然fat代謝也產生水，但遠不及駱駝呼吸是排出的。主要的原因是：第一，它們失水後可以一次性大量飲水。其他動物會因blood 濃度急降，紅細胞漲破而死（詞彙題：rupture=break）但駱駝不會。第二，駱駝的體內溫度range特別大，耐高溫，耐冷，其他動物為了保持體溫恒定，在溫度高的時候會出汗，浪費很多水，脫水而死，而駱駝internal溫度可以很高，所以不出汗，保水。第三，駱駝腿長，離地面遠，防止過熱。Fat（詞彙題：uniformly = evenly）在皮下，隔熱。

其他出題點有：丟失的水分是在細胞外而不是細胞內，駱峰可以反射太陽輻射等。

考題

1. Which of the sentences below best express the essential information in the highlighted sentence in the passage? Incorrect choices change the meaning in important ways or leave out essential information.

The camels of the Sahara and Arabian deserts are so well adapted to their environment that they can survive high temperatures for more than two weeks without drinking water.

2. The word "rupture" in the passage is closest in meaning to
break

3. According to paragraph 1, what happens when water enters a camel's bloodstream?

The camel's tissues become rehydrated.

4. The word "Relatively" in the passage is closest in meaning to

Comparatively

5. Paragraph 2 mentions all of the following as characteristics of camels EXCEPT:

They can lose most of the water within their cells during dehydration without harm.

6. According to paragraph 3, each of the following is a fact about camels that helps them conserve water EXCEPT:

They do not lose water through their skin.

7. uniformly = evenly

8. What can be inferred from paragraph 4 about camel fat?

Even when they are dehydrated, camels cannot rely on the water that is produced by metabolizing the fat in their humps.

9. fluctuate = vary

10. In paragraph 5, why does the author mention that common methods of keeping body temperature from rising also result in water loss?

To explain why most mammals, unlike camels, would not be able to survive in a hot, dry environment

11. According to paragraph 6, why is it beneficial for camels to store most of their fat in the hump?

The fat in the hump helps to insulate the camel from the Sun's heat.

12. According to paragraph 6, camels' ability to tolerate a significant increase in their internal temperature allows them to

save up to five liters of water per day

13. The metabolism of fat does produce water, but the small amount of water produced is less than the amount of water vapor lost breathing in and out to get the oxygen needed to metabolize the fat. ■ **So the hump is not for water, but then the question remains, why is the fat stored in a hump?** Fat is an excellent insulator, and if it were uniformly distributed under the surface of the skin, the camel would be unable to lose heat efficiently through its surface.

聽力

1. 兒童文學之父

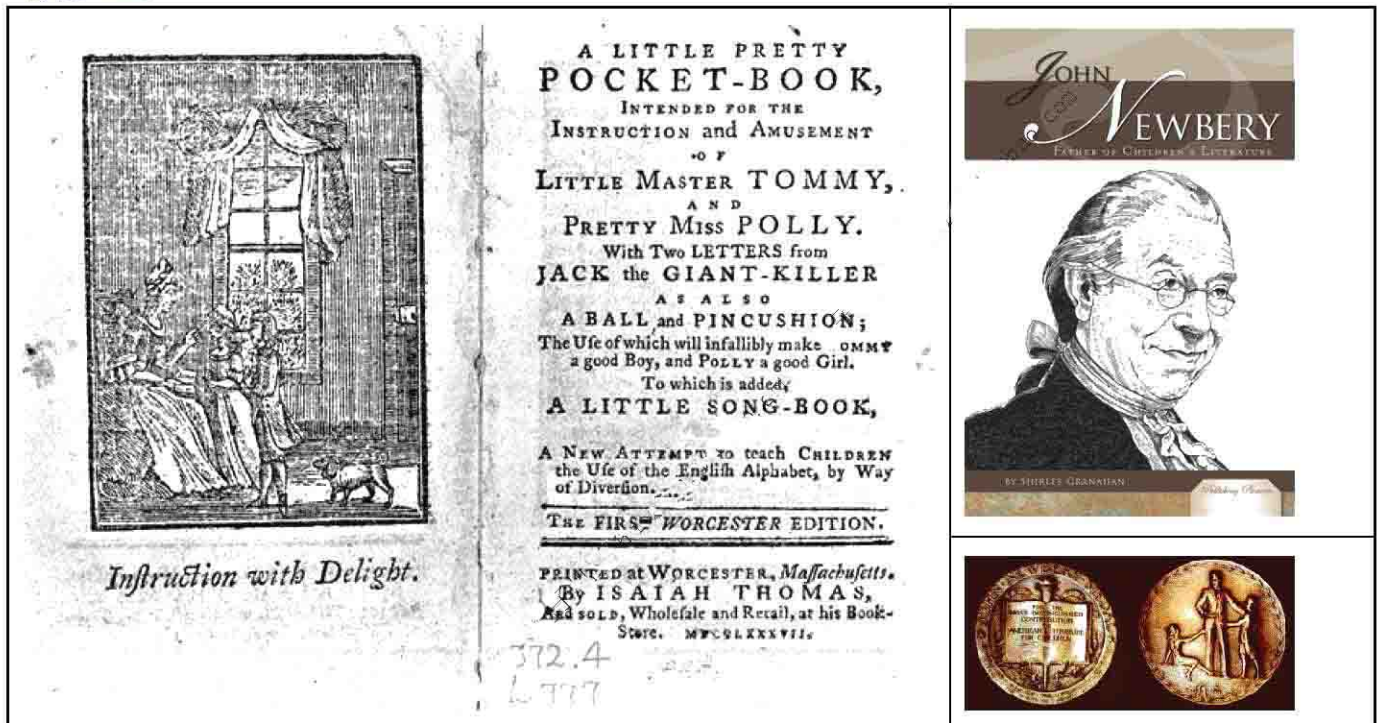
原始機經：

女學生找教授問一個自己想知道的問題，就是第一本兒童書是什麼。教授說每個人都是書的作者呀，因為那時候都是口頭傳沒 write down，所以實際上每個人都把自己的內容加到了故事裡（有題）。但是真正的第一本這類書作者是 JW。

女生說這名字聽起來很熟悉啊。

老師說對他還跟什麼 medal 有關，還寫了神馬特別暢銷的書後面不記得了

背景知識：



Newbery 是美國現代童書的始祖，被譽為美國兒童文學之父。有別於為成人而寫，他的作品為適合兒童閱讀的書籍發展，注入了一股新的動力。雖然現在，他當時出版的書都已經絕版了，即使是摹寫本，現存也沒多少，但美國圖書館協會每年頒發 Newbery Medal，使 Newbery 的聲名依舊。

題目：

- (1) 主旨題：學生為什麼找教授（答案：詢問教授課程討論到她不熟悉的主題）
- (2) 題目：為何教授不討論兒童文學的歷史背景？（答案：課程內已經提到很多了）
- (3) 教授的意指：每個人對兒童文學都有貢獻（答案：過去都是靠口傳，人人都算是作者，而非不具名）
- (4) 教授暗指：關於 John Newbery（答案：不僅是個作家，還很會行銷）
- (5) 為什麼學生說：JW，這名字聽起來熟悉啊...（答案：她以前可能看過他的作品）

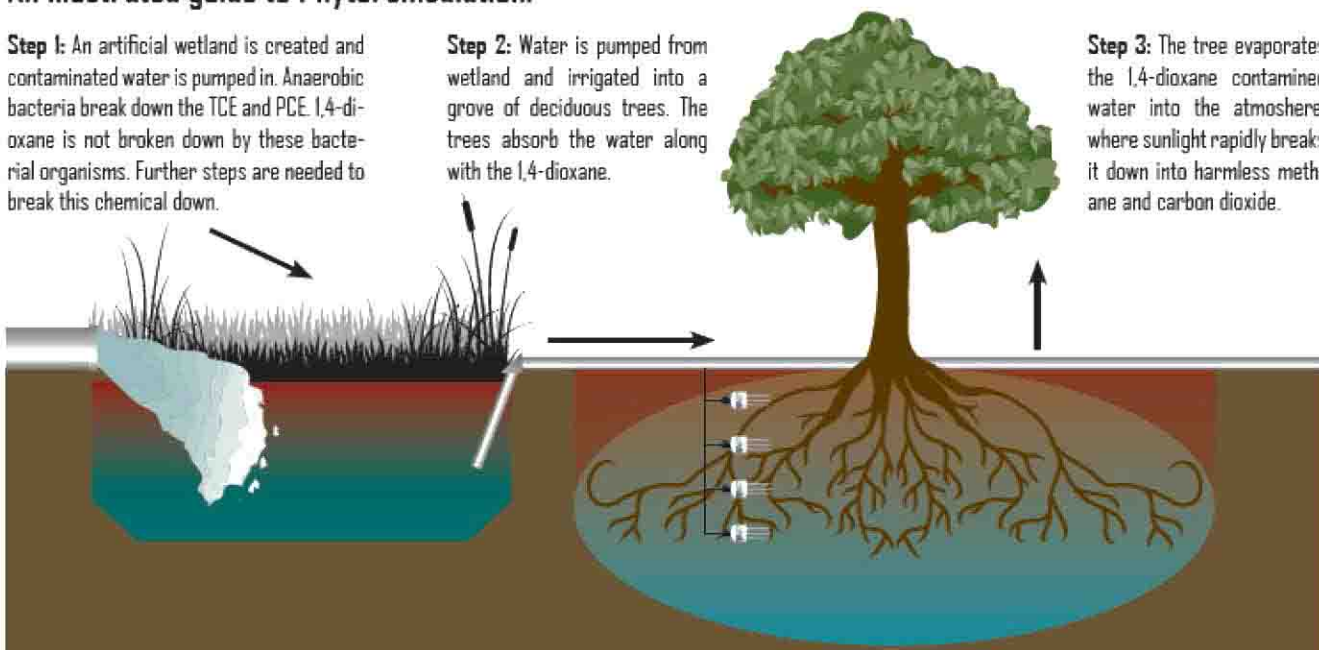
3. 植物吸收污染物

An illustrated guide to Phytoremediation:

Step 1: An artificial wetland is created and contaminated water is pumped in. Anaerobic bacteria break down the TCE and PCE. 1,4-dioxane is not broken down by these bacterial organisms. Further steps are needed to break this chemical down.

Step 2: Water is pumped from wetland and irrigated into a grove of deciduous trees. The trees absorb the water along with the 1,4-dioxane.

Step 3: The tree evaporates the 1,4-dioxane contaminated water into the atmosphere, where sunlight rapidly breaks it down into harmless methane and carbon dioxide.



原始機經：

老師說現在有個新法子能治理污染—植物修復技術 Phytoremediation (有主旨題，教授從哪方面討論植物修復技術。答案：治理污染)，但是太新了你們書上都沒有，就是用植物吸收，吸收完了污染都進植物的莖葉了，有些會儲存在植物裡，有些會轉換成較無害的物質 (有題，污染在經過植物修復處理後會如何？答案：轉換成較無害的物質。*參考上圖 Step 3)

。還開玩笑說，當然這樣的植物就不能吃了，但是可以做別的用途，比如樹可以造紙、建房子等等 (有題，問提這個幹什麼。答案：使用後的植物用途)。

然後還說了美國維吉尼亞州的一個例子，說選好了植物就能減少污染，但污染源太深的話，植物無法吸收，另外這法子見效慢，得幾個 growing season 呢 (有雙選題，答案：1. 要中度污染以下的地方才可使用；2. 要幾個 growing season 才有效)。

然後一個男的問，書上寫的化學方法也能治理。

但是教授相當不以為然說，哼~這個法子是好 (諷刺語氣) 要是你們喜歡喝 chemical soup 就用這個法子去吧 (有重聽題，答案：教授覺得是 bad idea)。

背景知識：TPO5 閱讀 Minerals and Plants

4. 心理學：介紹三種心理學觀察方法

(1) 觀察日常人群，適用於觀察日常行為。舉例子說在餐廳看學生說話，什麼情況下，陌生人坐在旁邊會交談，性別、坐多遠等等因素，但提到控制座位距離有困難，也無法真正瞭解原因 (有題，教授覺得這種方法如何。答案：很難確認可能的 explanation)

(2) 實驗室觀察能 control 實驗變數，就是說觀察者把被觀察的領進來，然後找藉口比如拿東西跑出去，隔著鏡子偷偷看，還可以比如把椅子挪近挪遠來改變觀察變數。舉例子說椅子離著 1m 遠時說話就比 2m 遠多 (有題，為什麼提到實驗室的椅子。答案：較容易控制)。



(3) 自己參與到被觀察者生活中去觀察。比如有個什麼什麼人假裝成學生，跟大家一塊上下課什麼的，但是說這種方法更適合人類學研究，在心裡學研究中不能很好的保持觀察者的獨立性（有題，教授對這種觀察方法的態度。答案：很難保持客觀）。

後來還說，無論哪種研究方法都要先 define 那個你研究的 term，說到這三種觀察研究的困難處（主旨題）。

然後舉例子說，比如定義什麼叫做 cooperation。舉例說一個小孩給另外一個小孩玩具玩，邀請他一起玩或者說話，哪個行為叫做 cooperation（有重聽題，答案：要謹慎定義所觀察的行為）。

5. 為什麼晚上的天空是黑色的？奧伯斯詭論（Olber's Paradox）

原始機經：

教授一開始說天文學中，有一些宇宙的基本假說（主旨題，為什麼教授要討論奧伯斯詭論。答案：宇宙的基本假說）。why the night sky is black？這就是奧伯斯詭論。

為什麼這是一個 Paradox？因為宇宙是無限大，而且星星均勻分佈，那麼我們在夜晚從地球望向太空時，無論往那個方向，那個縫隙看，應該都會看到星星，所以夜晚的天空應該是無限明亮的才對。就像我們從遠處看森林一樣，森林裡，

樹木是錯開生長的，但是層層疊疊，當我們從遠處看時，前排的縫隙之間，會有後排的樹木，以致於我們從遠處看到的森林，是一大片綠色。（有題，為什麼教授提到森林。描述支持奧伯斯詭論的觀點）。

但是，晚上天是黑的沒那麼多星星，奧伯斯認為是因為雲和大氣等等吸收星光，導致星星傳過來就不亮了。（有題，奧伯斯對詭論的解釋。答案：星光被雲和大氣吸收，無法到達地球）



接著提到了這個假設的前提（有三選題，哪些假設基於奧伯斯詭論。答案：(1) 比較遠的星星，看起來比較不亮；(2) 雲和大氣會吸收星光；(3) 宇宙無限大）。

有學生問：星星應該是有限的呀。

老師說：因為星星特別多，所以可以當做無限多了。然後是另外一種解釋這個 paradox 的是說，後來人們發現宇宙 universe was infinitely old，然後星星有的特別遠，估計它發出的光傳了這麼久還沒到地球（有題，教授如何解釋 why the night sky is black？答案：not all the light from stars would have reached us—light takes time travel）

背景知識：奧伯斯謬論

當有人問你：「晚上天空為什麼是黑色的？」多數人都會認為，是因為太陽下山了，所以晚上沒有陽光，當然是黑色的。但是，有人會反駁，晚上也有很多星星應該會照亮天空，所以晚上也應該是明亮的才對。

關於這個問題，古時候的天文學家也討論過。從最早十六世紀，有系統的探討黑夜問題的天文學

家，提出星星三大運動定律的克卜勒（Kepler, 1571-1630），他說，只要宇宙是有限的，那麼夜晚一定會是黑色的。到西元 1826 年天文學家奧伯斯提出的夜黑問題，又被稱為奧伯斯謬論（Olber's Paradox）。一直到二十世紀，因為科技、儀器的發達，對於晚上天空是黑色的探討終於有比較明確的解釋。

夜黑問題是建立在幾個背景假說之下的：

- (1) 宇宙無限大。
- (2) 星星均於分佈在宇宙中。
- (3) 星星都會發光。
- (4) 越遠的星星，看起來越暗。

基於這些假說之下，我們可以推論，因為宇宙是無限大，而且星星均勻分佈，那麼我們在夜晚從地球望向太空時，無論往那個方向，那個縫細看，應該都會看到星星，所以夜晚的天空應該是無限明亮的才對。就像我們從遠處看森林一樣，森林裡，樹木是錯開生長的，但是層層疊疊，當我們從遠處看時，前排的縫細之間，會有後排的樹木，以致於我們從遠處看到的森林，是一大片的綠色。

這樣推論出來的結果，卻跟我們實際上的情況不同，原因是什麼？

奧伯斯針對此，提出兩個問題：

宇宙的體積跟星星的數目到底有有限或無限？

星星在宇宙中，為何不會因為萬有引力而聚集在一起？

他推理，如果宇宙無限，則星星也是無限的，如此一來夜晚天空應該要是明亮的，但實際情況卻相反，因此宇宙應該是有限的。而若宇宙是有限的，星星也會是有限的，那麼照理來說星星應該會受到萬有引力影響而吸引到一塊，不會分佈在宇宙中，所以宇宙是無限的。奧伯斯的推論前後造成的矛盾，才被稱為奧伯斯謬論（Olber's Paradox）。

而目前，科學家的研究可以完整解釋夜黑問題的有下列幾項：

- (1) 哈伯（Hubble）利用星系間的紅位移效應，或者稱為都卜勒效應知道，宇宙正在膨脹當中，可以推論宇宙是有限的。
- (2) 因為紅位移效應，減低了遠方星系的亮度。
- (3) 宇宙膨脹會造成背景輻射，因為背景輻射的不均勻分佈，成為星系分佈重要指標，我們知道星系在宇宙中的分佈也是不均勻的。

這是目前較被接受的解釋，不過雖然我們肉眼看到的夜晚是黑的，利用其他波段照射夜晚天空的結果，可是一片明亮的呢！