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高中學生英文課外讀物

*The Apollo 11 Moon Venture*

# 月球探險

王軼群選註

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## 編 者 的 話

- (一) 本書取材於國外英語報紙之特寫與專欄。本書為第一編，專載與太陽神十一號太空船登月有關之文章。嗣後將視內容分別以科學、文學、藝術以及生活情趣等輕鬆文章彙編成冊，賡續出版。
- (二) 本書各篇均在千字左右，原文過長者均經刪節。每段詞語詳加註釋。必要時並提示內容大意。另附以插圖及有關探月之幽默漫畫。
- (三) 本書係以高中在學同學與自修之青年朋友們為對象。暇時閱讀，非但可增進太空科學之常識，並可藉此擴大英語辭彙，而且可獲得不少樂趣。

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# Moonsuits Provide Shield As Tough As A Spacecraft

## 奇妙的太空裝

The *bulky moonsuits*① Neil A. Armstrong and Edwin E. Aldrin Jr. will wear on the lunar surface are as protective as a spaceship but weigh a few tons less.

①笨重的月球太空衣（太陽神十一號二位太空人所穿的月球太空衣像太空船一樣具有保護作用，但是重量却輕得多）。

The garments even have their own *water-cooled system*① to maintain *body temperatures*.②

①水冷系統。 ②體溫。

They are highly *restrictive*③, however. Armstrong and Aldrin won't be able to *romp*② in the *lunar dust*③

①約束性。 ②跌入，摔進。 ③月球塵。

While walking on the moon, the astronauts can't *shed*① any part of the *life-sustaining*② suit—*insulated*③ overcoat, heavy shoes, stiff gloves or *twin-visored helmets*.④ And, within a few hours they will become fatigued.

①脫落。 ②維持生命的。 ③絕緣的。 ④雙層面罩的頭盔。

*The suits were designed to meet a specific set of requirements, including:*①

①這種太空衣的設計是爲了適應以下這些要求。

—An artificial interior atmosphere of 100 per cent oxygen at 3.7 pounds *per square inch*.①

①人造內部大氣，含百分之百的氧氣。每平方吋達3.7磅。

—Adequate *mobility*① on the *barren*② rocky moon.

①機動性。 ②不生草木的；不毛的。

—And, *up to four hours operating time on the lunar surface*.①

①能在月球表面支持四小時的工作時間。

The moonsuit is *composed of*① 16 different *layers*② of material. Inside Apollo 11, the astronauts are cloaked in six of the layers but for survival on the *plus or minus 250 degree*③ moon surface they will add an insulated overcoat to protect them from *meteoroids*.④

①由…組成。 ②層（16層不同的物質）。 ③零上或零下250度（氣溫）。 ④隕星體。

“It's *roughly*① equivalent to a *deep sea diver's suit*,”② explained scientist-astronaut Don L. Lind. “You're very restricted in movement of the whole body.... *in dexterity of*③ the hands.

①粗略的。 ②深海潛水衣（裝）。 ③擅長於靈活運用（雙手）。但是身體的活動受到很大的約束（行動不便）。

The moonsuit tips the scales at 69 pounds, earth-weight, with all parts of the garment designed to protect the astronauts from *meteoroid particles*① traveling at speeds up to 64,000 miles an hour.



The two moveable visors provide protection from *micrometeoroids*② *solar ultraviolet*,③ *infrared*④ and visible light *radiation*.⑤

①隕星塵（微粒）。 ②微粒隕星塵。 ③太陽紫外線。 ④紅外線。 ⑤輻射。

The *pressure glove*① locks into the sleeve to *prevent leaks*② and is moulded specially for each astronaut from *casts*③ made of his hands. The "lunar overshoes" are composed of 21 different layers of insulating materials.

①防壓手套。 ②防漏 ③型（手套是照太空人的手的形狀大小而特製的，和袖子緊密縫合着）。

Inside the spacecraft, the suit can be *hooked to*① the *environmental control system*② by *hoses*.③ For the moonwalk the astronauts carry a 68-pound, four-hour life support *backpack*,④ plus a separate *emergency supply*⑤ of oxygen *good for*⑥ about 30 minutes.

①和……銜接。 ②環境控制系統。 ③管。 ④背包。 ⑤緊急供應。 ⑥適於；可支持；可用……。太空人在月球上漫步時，攜帶重68磅，維持四小時生命的背包，另外加上約可使用30分鐘的緊急氧氣箱。

Cooling is provided by circulation of water through a knitted undergarment with a network of *plastic tubes*① worn next to the body. The cooled undersuit is worn only for activity outside the spacecraft.

①塑膠管。(貼身穿的內衣上縫着網狀的塑膠管。水冷系統就是靠水在這些管中的循環作用而供應。而冷卻的內衣祇供在太空艙外活動時才可穿。)

While narrating a film showing moonwalk activities planned for the astronauts, Lind pointed to the cuff of the suit and said: "They have to notice the **checklist**① on the cuff so they can remember the things they need to do...just **key words**② to **remind** them **of**③ the sequence of operations."

①(作業項目)核對單。 ②重要用語。 ③提醒他們作業的次序。

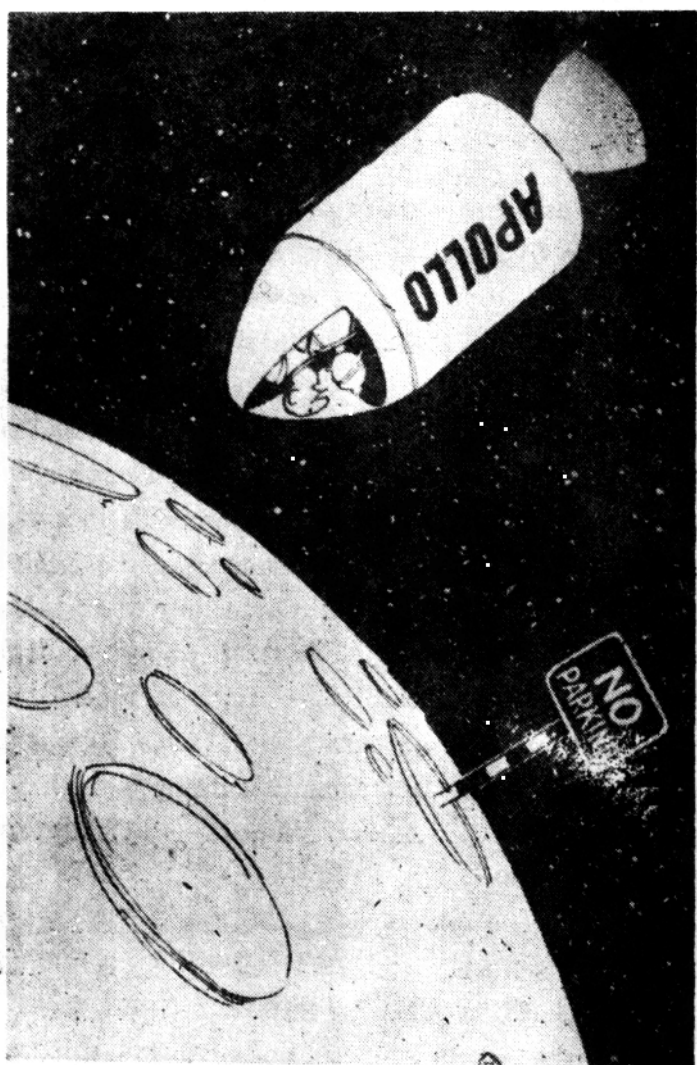
Lind stressed the limitations of the suit in which it isn't possible to bend much at the waist or lift the arms too far from the lunar surface where gravity is one sixth that on earth.

(這位科學家強調太空衣的有限功能。他說，穿着這種衣服不過份彎腰，也不可高舉雙手。因為月球上的地心引力祇及地球的六分之一。)

"The necessity for (special surface tools) is that the pressure of the suit itself **tends to tip you over**,"① Lind said. "You have a very high center of gravity and the suit wants to **assume** sort of a **tired ape position**."②

①很可能使你翻倒。 ②採取(作)疲乏猿猴的姿勢(狀)，即兩手兩肩向前傾。

But it may be possible for the astronauts to use the suit to rest.



圖一、太陽神

(路標)：不准停車

# The Machines Behind The Astronauts

## 載人探月的三種利器

These are the *man-to-the-moon*① machines on which the lives of the three Apollo 11 astronauts depend:

①從人類到月球的（機器，是太陽神十一號的三位太空人賴以往返或生存的）。

**COMMAND SHIP**①: valued at US\$55 million, the Apollo 11 Command Ship with its main engine and equipment section attached measures 33 feet high and 13 feet *in diameter*.② Its *cone-shaped cockpit*③ is 11 feet tall. Its hull is built primarily of *stainless steel*④ and *aluminium*.⑤ *Control panels*⑥ inside permit the *crew*⑦ to fire engines, check for *malfunctions*⑧ in spacecraft *subsystems*,⑨ compute their *flight path*⑩ and communicate with earth and astronauts in the *Lunar Module (LM) landing craft*.⑪

①指揮船。 ②直徑。 ③圓錐鼻形座艙。 ④不銹鋼。  
⑤鋁。 ⑥操縱儀表板。 ⑦機員（全體）。 ⑧作用失靈。  
⑨次級（備用）系統。 ⑩飛行航線。 ⑪登月小艇。

After the Apollo 1 *fire*⑫, the command ship was equipped with a *hatch*⑬ that can be opened in three seconds. Its electrical wiring—once exposed in

many places—is now behind *protective covers*③. Most *flammable material*④ was removed or substituted for with *flame-resistant hardware*⑤.

①發射。 ②(太空) 艙。 ③保護罩(或蓋)。 ④可燃性物質。 ⑤防火金屬。

Its main 20,500 pound-*thrust*① engine must *kick* Apollo 11 *into* and *out of*② moon orbit and make *course corrections*③ *en route to*④ and from earth.

①衝力。 ②(把太陽神十一號) 射入或射出月球軌道。 ③糾正航線。 ④(飛往或飛出地球的) 途中。

**LUNAR MODULE:** built at a cost of US\$41 million, the *spidery*① four-legged Lunar Module (LM) will take Neil Armstrong and Edwin Aldrin Jr. from the orbiting Command Ship to the moon's surface. It consists of two sections—a *descent stage*② with legs and the *braking rocket*③ that will lower the spacemen to the moon and an *ascent stage*④ that houses the astronauts and contains the engine used to blast off from the surface back up to the Command Ship.

①蜘蛛狀。 ②下降階段。 ③剎車火箭。 ④上昇階段。

Standing upright, it is 23 feet tall. The *vehicle*① has been plagued with problems during its development, all of which officials say are solved. Troubles occurred with the LM's main engines, *rendezvous devices*② designed to guide it from the moon to the orbiting Command Ship, and a *reserve*

*guidance system*③. Parts had to be shaved and modified to keep it from being *overweight*.④ After the Apollo 11 tragedy, many changes were also made in LM materials and wiring to make the spacecraft more *fireproof*.⑤

①載具。 ②會合裝置。 ③保留導航系統。 ④超重。  
⑤防火的。

**SATURN 5 ROCKET**①: Standing 363 feet high with the Apollo spaceship on top, each Saturn 5 man-to-the-moon rocket costs US\$185 million. It is the most powerful rocket ever launched, able to *hurl* the 50-ton Apollo spaceship *to*② the moon or put a 125-ton *payload*③ into *earth orbit*.④ Engineers perfecting the three-stage rocket had problems eliminating *up-and-down oscillations*.⑤ These were so severe on the Saturn 5's second unmanned test flight that, had astronauts been aboard, they might have not been able to see normally or move switches because of the *vibrations*.⑥ These and other problems were resolved, however, and the three manned Saturn 5 launches have been successful.

①農神五號火箭。 ②拋向。 ③酬載量。 ④地球軌道。  
⑤上下振盪。 ⑥振動。

# Inhuman Brains Behind Man's Greatest Triumph

## 性能優異的電腦

THE Apollo 11 *mission*① has been a triumph of human genius and courage—but *inhuman brains*② have *played a major part in ensuring*③ its success.

①任務。另有 *venture* 冒險的說法。均指太陽神十一號的探月飛行與登陸等全部過程。②非人的腦。表電腦（*computer*，電子計算機。電腦為俗稱）。③在確保此次任務成功方面負起重要工作或任務（原意為扮演要角）。

Throughout the nine-day mission, computers hundreds of thousands of miles away have been receiving, *assessing*①, and making *critical decisions*② *based upon*③ the millions of pieces of information which have *streamed back*④ to them from the spacecraft.

①研判。②重要的決定。③以…為根據。④流回（因電腦所發回的資料，每秒鐘數以萬計，川流不息）。

Data for the moon landing was processed by an *IBM*① computer 240,000 miles away, in Houston, Texas, as Astronaut Armstrong *edged* the Lunar Module *towards the lunar surface*②; the same *electronic brain*③ calculated the *thrust and course*④ needed to get the ascent stage of the Lunar Module off the moon and into a *rendezvous orbit*⑤

with the *Command Module*⑥

①International Business Machine 之略，美國國際商業機器股份有限公司，在臺北設有分公司。②向月球面漸漸移近。③電腦。④航線。⑤會合軌道。⑥指揮艙。

The human team running the mission, in fact, would be lost without the *constantly changing*① stream of *decision-data*② supplied by the unbelievably fast, tireless, computers, which, besides supplying facts about the progress of the mission, also supply a constant *check*③ of the whole *earth-based tracking network*.④ Another *facet*⑤ of the IBM operation is the constant data it supplies earth-based doctors on the astronauts' *physical condition*.⑥

①不斷改變中的。②決定（太空船和登月小艇）操作的資料。（data 爲 datum 之複數形）③檢校，查對。④設在地面的追蹤站（網）。⑤方面。⑥身體狀況，健康情形。





圖二、妻：「當你登陸月球時，家裡的汽車、洗碗機、電視機全壞了，我無法修理。」  
（工具箱）：美國工藝。