

王有成编著

NEW

新科技英语

ADVANCED ENGLISH OF
SCIENCE AND TECHNOLOGY

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of Science and Technology

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前言

《新科技英语》是英汉对照的科普读物，是为广大科技工作者、工程技术人员和大专院校理工科专业学生学习科技英语而编写的适用教材。读者浏览一下目录就能发现本书的40篇课文讲的都是饶有趣味的、知识性很强的科技话题，涉及的专业面很广，但并不高深，以适应广大读者的兴趣和需要。

本书课文体现了科技英语的特点：词汇切合各类专业科技文献的常用词汇、句型规范、篇章结构严谨、行文逻辑性强、风格朴实、脉络清晰。

读者可以从本书中获取很多科技知识，同时，更重要的是学习到科技英语的词汇、句型，提高阅读理解和用英语撰写科技文献的能力。英语水平较高的读者还可以学习到科技英语的翻译和写作技巧。课文的译文准确、语言练达。各篇课文后的词汇表和理解性提问帮助读者正确掌握课文中涉及的词汇（读音、词性和汉语释义）和课文重点内容。这对于从事科技工作和学习的读者尤其重要。总而言之，本书是学习科技英语难得的入门书。

北京理工大学计算机系战守义教授也对本书进行了审订，谨表谢意。

CONTENTS

目 录

Lesson one (第一课)	Is There Another Sphinx on the Mars? (1) 火星上有另一座狮身人面雕像吗?
Lesson Two (第二课)	Given Legs, Plants Could Run (8) 植物若有腿也能跑
Lesson Three (第三课)	The World of Biosphere- I (13) 生物圈 2 号
Lesson Four (第四课)	A Wonderful Movie Park (20) 奇妙的电影公园
Lesson Five (第五课)	What If A Person Was Isolated from Society? (25) 人若与社会隔绝会怎么样?
Lesson Six (第六课)	Animals' Intelligence (31) 动物的智能
Lesson Seven (第七课)	A New Science Tring to Copy the Marvels of Nature ... (40) 一门企图仿造自然界奇迹的新科学
Lesson Eight (第八课)	Trains on Magnetic Fields (49) 磁场上的列车
Lesson Nine (第九课)	Jet Engines and Their Inventors (55) 喷气式发动机及其发明者

Lesson Ten (第十课)	Ships—from the Primitive to the Modern (64) 从原始的船到现代的船
Lesson Eleven (第十一课)	The Submarine Tunnel across the English Channel (73) 横贯英吉利海峡的海底隧道
Lesson Twelve (第十二课)	Computerized Chess-Players (79) 计算机棋手
Lesson Thirteen (第十三课)	Computerized Supermarket Retail Business (87) 计算机化的超级市场零售业务
Lesson Fourteen (第十四课)	Personal Computers in Future Homes (92) 未来家庭中的个人计算机
Lesson Fifteen (第十五课)	Laser and Its Applications (98) 激光及其应用
Lesson Sixtee (第十六课)	Multimediu Information Superhighway (108) 多媒体信息高速公路
Lesson Seventeen (第十七课)	Computers in Education (118) 计算机教学
Lesson Eighteen (第十八课)	Setting Fire at Sea to Clear up Spilled Oil (127) 在海上放火以清除漏油
Lesson Nineteen (第十九课)	Science and Technology in the News (136) 科技新闻
Lesson Twenty (第二十课)	Disposal of Garbage and Sewage (149) 垃圾与废水的处理

Lesson Twenty-one (第二十一课)	Air Pollution and Noise Pollution (159) 空气污染与噪声污染
Lesson Twenty-two (第二十二课)	Energy Resources and Their Utilization (168) 能源及其应用
Lesson Twenty-three (第二十三课)	Making A Motion Picture (180) 电影制作
Lesson Twenty-four (第二十四课)	An Astronomic Prodigy: Comet—Jupiter Collision ... (194) 天文奇观——彗星撞击木星
Lesson Twenty-five (第二十五课)	Tracing the Catastrophe that Killed Dinosaurs (205) 追溯那使恐龙灭绝的灾变
Lesson Twenty-six (第二十六课)	The Big Fix in the Outerspace (217) 在外层空间进行大修理
Lesson Twenty-seven (第二十七课)	The Earth—Our Mother Nature (226) 地球——我们的大自然母亲
Lesson Twenty-eight (第二十八课)	Antarctica—A Mysterious Land on Earth (236) 南极洲——地球上神秘的大陆
Lesson Twenty-nine (第二十九课)	The Solar System, Milky Way and Universe (248) 太阳系、银河系和宇宙
Lesson Thirty (第三十课)	The Birth of the Solar System (260) 太阳系的诞生
Lesson Thirty-one (第三十一课)	The Big Bang Hypothesis (268) 大爆炸假说

Lesson Thirty-two (第三十二课)	Intelligent Life in the Universe (280) 宇宙中的智慧生命
Lesson Thirty-three (第三十三课)	Observatories on the Moon (289) 月球上的天文台
Lesson Thirty-four (第三十四课)	Venturous Flights toward the Moon (299) 冒险飞向月球
Lesson Thirty-five (第三十五课)	Debates on the Origin of Mankind (312) 关于人类起源的争论
Lesson Thirty-six (第三十六课)	More and Better Foods and Medicines from Biotechnology ... (327) 生物技术带来更多更好的食品和药品
Lesson Thirty-seven (第三十七课)	The Heart, Heart Disease and Heart Surgery (337) 心脏、心脏疾病和心脏手术
Lesson Thirty-eight (第三十八课)	The Robot World (353) 机器人世界
Lesson Thirty-nine (第三十九课)	Intelligent Robots (364) 智能机器人
Lesson Forty (第四十课)	The Digital Computer and Its Applications (377) 数字式计算机及其应用

Lesson One

Is There Another Sphinx on the Mars?

The mysteries surrounding the Mars seem to continue puzzling scientists. The old fashion myths such as the Martian "canals", Martian life or even Martian intelligent life who excavated those "canals", had been fascinating until space exploration exposed them.

According to those myths, the presence of some water on Mars can be established by prominent and intriguing whitecaps that develop at the poles when each is having its winter and by the presence of an occasional white cloud, both of which reflect light as ordinary ice crystals do.

As spring advances in each hemisphere, the corresponding polar icecap appears to melt, completely disappearing as the Martian summer comes. Knowing precisely how much heat Mars receives from the sun, and by measuring the rate at which the polar icecaps shrink, an easy calculation shows that these caps must be just surface phenomena, more akin to a layer of frost than to heavy fields of snow and ice.

As the icecaps melt, a wave of plantlike life appears to proceed from the high latitudes toward the equator. The canals appear and darken, and darkish, sometimes reported as greenish, patches appear. Often the canals seem to double, and the oases grow in size and become a chocolate brown.

The darkening of the canals, of course, appeared to be visible evidence of the seasonal vegetation that sprang up along their broad, flat banks as the water advanced. It was all consistent with the idea that things began to grow when the polar water moved toward the equator. It was an intriguing and inspiring picture, indeed, but it fell before the advance of scientific knowledge about Mars; temperatures too cold, water virtually absent, little or no oxygen (plant life as we know it should produce more oxygen), and the atmosphere hopelessly thin.

Yet, striking seasonal changes do occur on Mars, and there is some scientific evidence to support the notion that the dark lines are indeed regions of vegetation. But what kinds of plants might grow under Martian conditions? Evidently, the color changes are caused by plants that do not grow by earth processes, but perhaps are related to our lichens, which are capable of prospering even in dry, barren, and frequently freezing soil.

The American space probe Mariner-4 passed at about 5,600 miles above the Mars' surface and snapped 22 pictures and then beamed first "close-up" photos back to the earth on

July 14, 1965. The Mariner-9 entered its orbit around the Mars in November, 1971. The Soviets launched Mars 2 and Mars 3 on May 19 and 28, 1971, which arrived in Mars orbit on November 27 and December 2 respectively. Pictures and information they sent back showed that the Mars' surface is heavily pock-marked with craters formed by the impact of asteroids and meteoroids. Nowhere in the photos was there any sign of water, nor was there a sign of "canal", but sign of active volcanic activities.

But 3 years after the Mariner mission, researchers in the Goddard Space Center discovered in 1975 the image of Sphinx on a Martian photo sent back by Mariner. At first, they did not attach importance to their discovery, and the photo was bought by a computer programmer from Federal Germany.

Experts in NASA found another Martian photo taken at different time, on which the image of Sphinx appeared blurred but remained visible.

These two photos taken from different perspective points and at different moments were put to sophisticated computerized image processing. The result was just unexpected: The nose and the necklace which had been thought to be the product of interference still existed; what was more surprising is the eyeballs present at the originally visible eyes and the teeth appearing in the half-open mouth.

Using computer techniques, they even calculated the size of the Sphinx——1.5 kilometer from hair to chin and 3.5 kilometer wide. A natural speculation was that only creatures of dramatically advanced civilization could have been able to make such a huge statue.

Thereafter, Russian scholar in Samara, Tchulin-Awenski, discovered a group of structures somewhere 7 kilometers from Sphinx on the photo——11 pyramids, of which 4 were big, 7 were small, eventually form a city.

All these happened 10 years ago. Since then, computer technology has dramatically advanced and is now able to perform more reliable and creditable analyses on those photos.

Using image analysis technique, scientists found 19 structures on the very site where 11 pyramids were previously found to exist, besides, there were roads and a strange-looking circular square. The size of those structures is very large, about 10 times that of the Great Pyramid in Giza, Egypt. The circular square was 1 kilometer across. What will be the use of such a huge square? Is it a launching site for spacecraft, or an accelerator site, or a commercial center in the city? These questions are quite puzzling. However, one thing is certain: this city was built many years ago and it is now inhabited by none.

It might well be that in the distant past, the Mars might be possessed of water, air and river, and thus harbored life which then became extinct or left the Mars and moved to the nearest planet, the earth, as there on the Mars remained little air, no water and extremely sharp temperature variance.

The process is long, in which Mars lost its air, rivers, oceans, and became a cold, barren desert. If this speculation is acceptable, then we can derive that these cities were destroyed millions of years ago. An opposite speculation says that these structures must have disap-

peared in 5,000 to 10,000 years, otherwise dust storm must have destroyed them, no matter what materials they were made of. Here is the rub. The photos show that some roads were intentionally built to avoid crossing craters. This is an evidence that those cities would not be very old.

All these are speculations to be testified. In fact, during recent years, many space probes were sent to the Mars for this mission. But strangely and unfortunately, two Soviet Mars Satellite I spacecrafts were out of contact, and the American Mars Surveyor spacecraft disappeared from the Mars orbit in 1993. The Soviets had launched 10 spacecrafts to Mars but none could have performed its mission. Only two of them landed on Mars, as well as two American space probes landed on it. Why? Is the failure the result from inferior space equipment? The answer seems negative. The atmosphere of Venus is much harsher than Mars'. The Soviets have launched 14 spacecrafts and the Americans, one, to Venus surface.

It may be certain that life on the Mars do not have any anti-satellite system to shoot down all those spacecrafts. The mystery may be resolved when more advanced space probes were sent to the Mars.

Words and Phrases

Sphinx	[ˈsfinks] <i>n.</i> 斯芬克斯 (狮身人面像)
puzzle	[ˈpʌzl] <i>n.</i> 谜, <i>vt.</i> 使人迷惑
Martian	[ˈmɑːʃjən] <i>n.</i> 火星 (假想的), <i>a.</i> 火星的
excavate	[ˈekskeɪt] <i>vt.</i> 开凿, 挖掘
expose	[iksˈpəʊz] <i>vt.</i> 揭露, 揭发, 揭穿
myth	[miθ] <i>n.</i> 神话
prominent	[ˈprɒmɪnənt] <i>a.</i> 显著的, 显眼的
intriguing	[ɪnˈtrɪɡɪŋ] <i>a.</i> 引起兴趣的, 有魅力的
hemisphere	[ˈhemɪsfɪə] <i>n.</i> 半球
corresponding	[ˌkɒrɪsˈpɒndɪŋ] <i>a.</i> 相当的, 对应的
shrink	[ʃrɪŋk] <i>vi.</i> 收缩, 皱缩, 变小, 减小
phenomena	[fɪˈnɒmɪnə] (复)
phenomenon	[fɪˈnɒmɪnən] (单) <i>n.</i> 现象
akin (to)	[əˈkɪn] <i>a.</i> 同类的 (只作表语)
proceed	[prəˈsiːd] <i>vi.</i> 继续进行
latitude	[ˈlætɪtʃud] <i>n.</i> 纬度
equator	[ɪˈkweɪtə] <i>n.</i> 赤道
oasis	[əuˈeɪsɪs] <i>n.</i> 绿洲
vegetation	[ˌvedʒɪˈteɪʃən] <i>n.</i> 植被
consistent (with)	[kənˈsɪstənt] <i>a.</i> 一致的, 一贯的
inspiring	[ɪnsˈpaɪərɪŋ] <i>a.</i> 振奋人心的, 鼓动的

striking	[ˈstraɪkɪŋ] <i>a.</i> 触目的, 惊人的
notion	[ˈnəʊʃən] <i>n.</i> 想法, 看法, 观点, 学说
evidently	[ˈeɪdɪəntli] <i>adv.</i> 明显地
lichen	[ˈlaɪkən] <i>n.</i> 地衣
prosper	[ˈprɒspə] <i>vi.</i> 繁荣昌盛, 茁壮成长
barren	[ˈbærən] <i>a.</i> 不毛的, 荒芜的
probe	[prəʊb] <i>vt.</i> 探测
snap pictures	<i>phr.</i> 抢拍照片
beam	[bi:m] <i>n.</i> (光) 束 <i>v.</i> 定向 (发出), (定向) 播送
pock	[pɒk] <i>n.</i> 麻点
crater	[ˈkreɪtə] <i>n.</i> 火山口, 陨石坑
impact	[ˈɪmpækt] <i>n.</i> [ɪmˈpækt] <i>vt.</i> 冲击, 碰撞
asteroid	[ˈæstərɔɪd] <i>n.</i> 火星及木星轨道间的小行星
meteoroid	[ˈmi:tjərɔɪd] <i>n.</i> 流星体, 陨星体
sign	[saɪn] <i>n.</i> 迹象
volcanic	[vɒlˈkænik] <i>a.</i> 火山的
mission	[ˈmɪʃən] <i>n.</i> 使命, 任务
attach importance to...	<i>phr.</i> 对...重视, 重视...
blur	[blə:] <i>vt.</i> 把...弄模糊
perspective point	[pəsˈpektɪv] <i>n.</i> <i>phr.</i> 透视点
sophisticated	[səˈfɪstɪkeɪtɪd] <i>a.</i> 高级的, 复杂的
image processing	<i>phr.</i> 图像处理
necklace	[ˈneklɪs] <i>n.</i> 项链
interference	[ˌɪntəˈfɪərəns] <i>n.</i> 干扰
speculation	[ˌspekjuˈleɪʃən] <i>n.</i> 推测, 猜想
pyramid	[ˈpɪrəmid] <i>n.</i> 金字塔
creditable	[ˈkreditəbl] <i>a.</i> 可信的
accelerator	[ækˈseləreɪtə] <i>n.</i> 加速器
be possessed of...	[pəˈzest] <i>phr.</i> 拥有..., 据有...
harbor	[ˈhɑ:bə] <i>vt.</i> 窝藏, 聚藏
variance	[ˈvɛəriəns] <i>n.</i> 变化, 变动
derive	[dɪˈraɪv] <i>vt.</i> 推导, 得出 (结论)
Here is the rub.	<i>phr.</i> 难就难在这里。
intentionally	[ɪnˈtenʃənli] <i>adv.</i> 故意地
avoid	[əˈvɔɪd] <i>vt.</i> 躲避, 避开
testify	[ˈtestɪfaɪ] <i>vt.</i> 验证, 证明, 证实
inferior	[ɪnˈfɪəriə] <i>a.</i> 劣的
resolve	[rɪˈzɒlv] <i>vt.</i> 解释 (疑难), 解决 (问题)
probe	[prəʊb] <i>vt.</i> 探查, <i>n.</i> 探测器, 探测飞船

Comprehension Questions

1. What did the old-fashion myths suggest about the Mars? What were their arguments?
2. How does space exploration expose those myths about the Mars?
3. With what speculations does the author explain the seasonal changes that occur on the Mars?
4. What conclusions on the Mars can be drawn after American and Soviet spacecrafts to the Mars provide ample information about the Mars?
5. How and why did some scientists suggest in 1975 that there might be a Sphinx on the Mars much larger than the one in Egypt?
6. What further discovery found on the photos induces mystery surrounding the Mars?
7. Describe the author's speculation about the Mars in the distant past.
8. What do you think about all those mysteries surrounding the Mars? Cite your arguments.
9. What do you think about the fact that most of the spacecrafts sent to Mars had lost? Did it occur by a curious coincidence? Cite your arguments.

[参考译文]

火星上有另一座狮身人面雕像吗?

有关火星的一些神秘现象似乎仍使科学家们困惑。过去流传的神话,譬如,火星上的“运河”,火星上的生命以及开凿那些“运河”的有智慧的生命,一直使人着迷,直到宇宙探索把它们揭穿。

根据这些神话,火星上有水。这可以从冬季来临时,火星的两个极地上出现的显眼的和引起人们兴趣的白色极冠和偶然出现的白云而得到证实;它们就像通常的冰晶那样反射阳光。

当春季来临某一半球时,这一半球上的冰冠便开始融化,而当夏季来到时,就完全消失了。精确地知道了火星从太阳那里接受多少热量,再测量极地冰冠收缩的速率,就可以很容易通过计算知道这些极冠必定是表面上的现象,更类似霜层而不是厚实的冰原。

随着冰冠的融化,像植物那样的生命之浪出现并从高纬度地区向赤道推进。“运河”出现并变黑,出现一些淡黑色的,有时报导说是浅绿色的地块。常常,这些运河似乎加宽一倍,绿洲面积变大而变成巧克力似的棕色。

当然,随着河水向前推进,绿色植被出现在它们宽阔、平坦的河岸上,运河的变黑看来就是这些季节性植被的可见的证据。有一种观点认为当极地的水向着赤道流动时,植物开始生长。所有这一切与这一观点完全吻合。这确实是一幅引起人们兴趣的、令人鼓舞的图画。但

是，随着有关火星的科学知识的进步，它也就被戳穿了：气温太低，水实际上不存在，只有很少甚至没有氧（就我们所知，植物生命应该产生更多的氧），大气层薄得可怜。

然而，在火星上显著的季节性变化确实存在。有些科学证据支持这样的想法，即那些黑线条确实是植被区。但是哪种植物可以在火星的条件下生长呢？明显地，颜色的变化是由那些不按照地球上的过程生长的植被造成的，但可能与我们的地衣有亲缘关系；地衣即使在干燥、荒芜和经常冻结的土壤里也能茁壮成长。

1965年7月14日，美国的宇宙探测飞船水手—4号经过火星表面上空约5600英里并抢拍了22张照片，然后于7月14日将首批特写镜头照片定向发回地球。1971年11月，水手—9号进入围绕火星的轨道。前苏联人于1971年5月19日和28日发射火星—2号和火星—3号，它们分别于11月27日和12月2日到达火星轨道。它们发回的图片 and 信息表明火星表面有密布的麻点——火星及木星间的小行星和流星体与火星碰撞而形成的陨石坑。在照片上没有发现任何水和“运河”的迹象，但却有活火山活动的迹象。

但是在水手号完成任务三年之后，1975年，Goddard空间中心的研究人员在一张水手号发回的火星照片上发现了狮身人面像。开始，他们并不重视他们的发现，而那张照片被一位来自前联邦德国的计算机程序员买走了。

美国国家航空与宇航管理局的专家们发现了另一张在不同时间拍摄的火星照片，在这张照片上的狮身人面像看起来模糊但仍能看得见。

这两张从不同的透视点和不同的瞬间拍摄的照片被送去进行复杂的计算机图像处理。其结果真是出乎意料：那被认为是由于干扰造成的鼻子和项链仍然历历在目；更令人惊奇的是那对在原来就看得见的眼睛里的眼球和那半张开的嘴里的牙齿。

利用计算机技术，他们甚至计算出了狮身人面像的大小——从头发到下颏是1.5公里，宽3.5公里。一种很自然的猜测是：只有高度文明的生物才可能建造出这样一种巨大的雕塑。

在此之后，在Samara的一位俄罗斯学者Tchulin-Awenski发现，在照片上离狮身人面像7公里的地方有一组建筑物——11座金字塔，其中4座是大型的，7座是小型的，最后，它们形成了一座城市。

所有这些发现都是10年前发生的。从那以后，计算机技术已大大地提高，现在可以对那些照片进行更可靠、最可信的分析了。

利用图像分析技术，在那先前发现11座金字塔的地方，科学家们又发现了19座建筑物，除此以外，还有道路和一个看上去很奇怪的圆形广场。那些建筑物群的规模很大，大约是埃及的Giza大金字塔的10倍。圆形广场直径1公里。这么巨大的一个广场有什么用途呢？它是不是一处宇宙飞船发射基地？还是一个加速器的场地，抑或是这座城市的商业中心？这些问题令人费解。但是，有一件事是肯定的：这座城市是许多年以前建成的，而现在无人居住。

在遥远的过去，火星很可能拥有水、空气和江河，并且孕育着生命。当火星只剩下很少的空气，没有水，而且温度变化极大时，这些生命于是灭绝或离开火星到最近的星球——地球上。

火星失去了它的空气、江河、海洋，最后变成了一个寒冷、不毛的荒漠，这个过程是很漫长的。如果这一推测是可以接受的，那么我们可以得出结论：这些城市是几百万年前被毁灭的。一个相反的推测说，这些建筑物一定是在5000到1万年以内消失的，否则，无论它们是用什么材料建造的，尘暴一定会毁灭它们。难就难在这里。那些照片表明在一些道路修建

过程中，人为地避开穿越陨石坑。这是那些城市并不十分古老的一个证据。

所有这些推测都需要证实。事实上，在最近几年来，许多宇宙飞船已被送上火星以完成这一使命。但令人感到奇怪和不幸的是，两艘前苏联的火卫1宇宙飞船都失去联系，而美国的火星探测器号宇宙飞船则于1993年从火星轨道上消失。前苏联人已向火星发射了10艘宇宙飞船，但没有一艘完成使命。它们中只有两艘在火星上着陆，也只有两艘美国空间探测飞船在它上面着陆。为什么？难道失败是因为宇航设备质量低劣造成的？答案似乎是否定的。金星的大气层比火星的恶劣得多，前苏联已发射了14艘，美国发射了1艘宇宙飞船到金星地面上去。

可以肯定的是，火星上的生命没有任何反卫星系统会击落那些宇宙飞船。当更先进的宇宙探测器被送向火星时，这一神秘的现象将得以澄清。

Lesson Two

Given Legs, Plants Could Run

In the dense, vast forest, a plant, feeling a sharp sting as an insect bites it, immediately signals its partners nearby to guard against the aggressor.

In the vast desert, a plant called “inhabitant” is attacked by a predator. Immediately, it shoots a spout of venom as a defence action against the enemy. A tropical insectivorous plant feels that it has digested its prey it caught, opens its “mouth” and waits for another delicious food—an insect flying nearby.

Behaviors like these are nothing strange at all in animal world. But these behaviors observed in plant world are only a small portion of amazing behaviors scientists discovered among plants in the green kingdom.

Plant behavior, a phenomenon surprises scientists. In the past, people thought only animals could perform complex behaviors. But now scientists observe that except running around, the plants can do just about anything animals can do, can effectively, sometimes even rapidly, react to any stimulus. Insectivorous plants and some touch-sensitive plants are the examples found earlier.

Recently, scientists discovered unexpectedly that when their leaves are bitten by insects, plants release chemical substances almost similar to the neurohormone endorphine released by animals to inhibit pain. In the body of an animal, this hormone helps transform a substance called arachidonic acid into prostaglandin. Inside plants, this hormone helps transform linolenic (a substance in plant analogous to arachidonic acid in animals) into jasmone acid, a substance with characteristics similar to prostaglandin.

These chemical reactions to pain and injury in both animals and plants are so similar that spraying aspirin solution on plant tissues can mitigate those reactions just as it does on human body.

Just as prostaglandin can help human body resist attacks from microbes, jasmone acid can induce leaves to make an enzyme called proteinase inhibitor. This enzyme can cause poor digestion to the insect which has eaten the leaves. It can also help leaves produce a substance called biliflavin which can induce a sham feeling in the insect that it has eaten enough, and the insect leaves.

Plants can communicate with their neighbors. When attacked and injured, many plants

will release volatile jasmone acid, a scent signal which can reach plants nearby and actuates their defence system before the insect bites them. This signal may be an overdue reaction but is surely beneficial to other plants around it.

Some performances by plants are just thrilling, for example, the tendrils of some plants show off an ability to grope and feel and grasp when they touch some object. Cells in the tendril contract (perhaps because salt and then water contained in the cell are lost through the cell wall), meanwhile, other cells expand. As a result, tendrils demonstrate behaviors like twining around and attaching itself to something.

Speeds are not exclusive for animals. A fungus called "water jade mould" (strictly speaking, it is not a plant) shoots off its spores into the sky at an initial zero speed to a speed of 45 miles an hour within the first several millimeters, using a hydraulic propulsion system. This phenomenon represents the second greatest acceleration ever measured in Nature.

In Nature, many insects can spout venom to defense themselves when attacked. Similarly, plants can eject venom to drive out small bugs eating their leaves. This function is called spray gun defence. A plant grown in Mexico is famous for this function. Veins that criss-cross the leaves and stalks form a net of tubes full of high pressure irritating liquid. Once an insect bites one of the tubes the venom ejects to at most 5 feet away. These tubes are highly elastic and are constantly pressed and squeezed by ambient water-conveying tissues.

Plants do not have muscles. Why can they eject? Suppose that a branch is tied to a tank. With elasticity, it slowly but surely will return to its original state and elevates the tank. This function comes from not only elasticity, but also sensor system and reaction system. These systems can help the plant to adjust pressure of water and their growth. Just for their analogue to muscles of animals, plants appear strong and powerful.

Words and Phrases

sting	[stiŋ] <i>n. vt. vi.</i> 刺, 叮, 刺痛, 刺伤
predator	['predətə] <i>n.</i> 捕食者
spout	[spaut] <i>vt. vi. n.</i> 喷出, 喷射, 喷流
venom	['venəm] <i>n.</i> 毒液
insectivorous	[,insek'tivərəs] <i>a.</i> 食虫的
digest	[dai'dʒest] <i>vt.</i> 消化
phenomenon	[fi'nɒminən],
phenomena	[fi'nɒminə] (复) <i>n.</i> 自然界的现象
stimulus	['stimjʊləs],
stimuli	['stimjulai] (复) <i>n.</i> 刺激
sensitive	['sensitiv] <i>a.</i> 敏感的, 灵敏的
endorphine	[in'dɔ:fin] <i>n.</i> 内啡呔