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FEATURE: Christianity Develops Science
(Second in SERIES)

基督教发展了科学

VOICE: Professor, I have a question. The first verse of the Bible says God, quote, “created the heavens and the earth.”¹ Could God have created things *any way he wanted?* Or were there some *rules or restrictions* that limited his freedom to create?

教授，我有一个问题。圣经的第一节说上帝创造了天和地。上帝是不是只创造他想要的东西呢？还是有某些规则和拘束限制了他创造的自由呢？

PROF.: That’s one of several things we want to discuss today.

今天我们会讨论一些问题，而这正是其中的一个。

TAPE: THEME AND ANNOUNCEMENT

VOICE: Last week we began discussing a book called *The Soul of Science*. Its authors are chemist and historian of science Charles Thaxton, and science writer Nancy Pearcey.

上周我们开始讨论一本叫 《科学的灵魂》 的书。它的作者是化学家和科学历史学家查尔斯·萨斯顿和自然科技的作者南西·皮尔斯。

PROF.: Let’s resume our discussion with this passage. I quote, “The phrase ‘laws of nature’ is so familiar to the modern mind that we are generally unaware of its

¹ (Genesis 1:1; I Moses 1:1).

uniqueness.² People in pagan cultures who see nature as alive³ and moved by mysterious forces are not likely to develop the conviction that all natural occurrences are lawful and intelligible.”

让我们以这段文重新开始我们的讨论。“对于现在的思维来说‘自然规律’这个词是这样熟悉，以致于我们不认为在许多国家的人们还不认为自然是有规律，认为自然是活生生的并且被神秘力量牵引的异教徒们不可能发展所有自然的产生都有规律和容易了解的信条。”

VOICE: A friend of mine has been studying about one of the religions of the Orient. He frequently reads the word “inscrutable.” In other words, one Oriental religion says that many things are simply mysterious, and man ***should not attempt to understand them.***

我的一位朋友研究东方的一种宗教。他常常读到这个词“不可思议”。另一种说法就是一种东方宗教说许多东西绝对地神秘。人们不应该试着了解他们。

PROF.: That’s why, when the concept of natural law arose in Europe, it was a major change from anything that had gone before. The reason that people thought nature would have laws, was that many Europeans had studied the Bible. One historian elaborates, quote, “...the...Christian belief in a deity⁴ who was...[both] Creator and Law-giver rendered it valid.”⁵ End quote.

这就是为神秘。当自然规律的概念在欧洲兴起时，它是从前多没有的最主要的变化。人们认为自然存在规律的原因是许多欧洲人都研究圣经。一个历史学家详尽描述，“相信上帝是创造者和一切规律的源头的基督教徒认为这是有充份的依据的。”

² (We usually don't think of natural law as being an unusual idea; we don't realize that people in many countries don't think nature has laws).

³ (people who think or imagine that nature is alive).

⁴ (a god or God).

For example, seventeenth-century mathematician and philosopher Rene Descartes [re-NAY day-KART] wrote that mathematical laws ***were established by God*** in the same way that a king decrees laws.

例如，十七世纪数学家和哲学家雷尼·笛卡尔说到数学规律是由上帝建立，这与一个国王发布法令一样。

VOICE: That reminds me of the question I asked at the beginning of the program. When God created the heavens and the earth, could he have created things ***any way he wanted?*** Or did some natural laws already exist, restricting his freedom to create?

这提醒了我曾在节目一开始提出的问题。当上帝创造了天和地，祂是不是能按照自己的喜好创造祂所要的东西呢？或者是不是一些自然规律已经存在，从而限制了祂创造的自由呢？

PROF.: Thaxton and Pearcey explain Aristotle's answer, before they give the modern answer. Aristotle believed the scientist best understands a natural object by asking what it is for.

在萨斯顿和皮尔斯给出现代的答案之前，他们解释了亚里士多德的答案。亚里士多德相信科学家理解自然科学的最佳方式是先了解自然物体是有什么用处的。

VOICE: Its purpose, or its function.
是它的目的或是功能？

PROF.: Yes. They illustrate with a simple object, a saucepan.⁶ Quote, "...[O]nce we understand the purpose of the saucepan, we may then deduce by...logic many of

⁵ (made the idea of laws in nature, a logical thought).

⁶ (In cooking, a small pan [metal container] that sits on a stove. It holds sauce or a liquid, and heat from the stove cooks this liquid).

its properties – that its shape must be such that it can contain liquid, that it must not melt when heated, that it must not dissolve in certain liquids, and so on.”

是的。他们以一个简单的物体 — 锅子来作说明。“...一旦我们知道锅子的用途，我们可以根据它的特性作逻辑推断 — 像它的形状必须能容纳液体，当它在加热后是不会被溶化或它不能被液体所溶解等等。”

VOICE: Did Aristotle think purpose was the only thing a person needs to know about an object?

亚里士多德是否认为：目的只是人唯一想要知道事情的理由？

PROF.: No, but from knowing an object’s purpose, he thought humans could reason everything else.

不，但是通过知道一个物体的用途目的，他想人类就可以举一反三地推算出其他所有的疑问。

The authors explain, quote, “Once the purpose of the object has been uncovered, in Aristotle’s view, the scientist...***does not need to make detailed observations of the object*** because, with its purpose in mind, ***he can deduce what its essential properties must be***, just as we deduced the properties of a saucepan.”

以亚里士多德的观点看，一旦知道了物体的用途，科学家不要对物体作详细的观察。因为在头脑中有了它的用途，他能推断它最基本的特性是什么，就像我们推断锅子的特性一样。

VOICE: So Aristotle ***would not observe*** an object, to see how it was built or how it worked?

因为亚里士多德不观察物体去了解它是怎么被建造或者它是怎样运作？

PROF.: No. He would *mentally imagine* what how something ought to be constructed. If he knew an object's purpose, he would invent something in his mind to fulfill that purpose – and then assume that nature had done it the way he had imagined.

不。他会心理上想象某个东西应该是这样被建造的。如果他知道了物体的用途，他会在头脑中想象发明某个东西去完成那用途 - 然后设想自然做的与他的想象一样。

VOICE: Are you saying the thought never crossed Aristotle's mind⁷ that nature might have had a smarter way to achieve that purpose?⁸

你是说亚里士多德从来没有想过自然会有一个更聪明的方法来达到目的吗？

PROF.: That's true. Thaxton and Pearcey continue, quote, "...Aristotelian science tended to stress rational intuition...or Forms followed by deduction, rather than observation and experiment." End quote.

是这样的。萨斯顿和皮尔斯继续解释说「...亚里士多德的科学试图强调合理的直觉...或叫演绎推论出的形象，而不是靠观察和实验得来的。」

Aristotle's ideas appealed to philosophers and theologians in some branches of Christianity. Thaxton and Pearcey continue, quote, "In the thirteenth century, Thomas Aquinas [ah-KWY-nus] adapted⁹ Aristotelian philosophy to Christian belief in a hybrid system of thought...¹⁰ [He] reinterpreted the Forms as God's purposes in nature, injected by God at creation. In the Christianized version, *the Forms became created powers* that act as God's lieutenants or vice-regents *to order nature*.¹¹ As a result, science

⁷ (He never thought this for even a moment).

⁸ (that nature might be smarter than he was, or that a God more intelligent than Aristotle could have created nature wisely).

⁹ (changed).

¹⁰ (a system of thought that combined ideas from Aristotle, from the Bible, and from other sources).

¹¹ (to arrange or shape nature).

continued to emphasize rational intuition... Experimental science had to await a shift away from Aristotelianism.”

亚里士多德的观点受到基督教某些派系，哲学家和思想家的欢迎。萨斯顿和皮尔斯继续说道「在十三世纪，汤马斯·阿奎那在继承了亚里士多德的基础上又结合圣经和其他方面的思想体系。他重新解释照神的形象所造的形体是上帝在自然界的杰作。从基督教版本的观点来看，这些形体成为上帝所造的能源，它们履行上帝的指令或成为上帝的副手来管理自然界。因此，科学继续不断地在强调合理的直觉，而实验科学是在亚里士多德的学说之后才有的。」

VOICE: Let's see if I understand. Aristotle thought God made Forms and made them his assistants to order nature. But he thought that these Forms had minds of their own – the way a vice-president¹² sometimes does something that his president does not like.

让我看看是否我理解你的意思。亚里士多德认为上帝造了些形体来帮助祂管理自然界。但是这些形体各有自己的思想和想法，他们充其量是上帝的副手但他们所做的不一定就跟上帝所作的一样，是吗？

PROF.: Yes. Following that same logic, some of Aristotle's followers thought God would **have to** make astronomical objects travel in **circles**. They hypothesized that God did not have the freedom to make them move in any other pattern.

是的。跟据同一种逻辑，有些亚里士多德的追随者认为上帝让天文物体在圆形的轨道上运行。他们假定上帝没有自由权利让它们以其他的模式运行。

VOICE: If I remember correctly, **Copernicus** was handicapped by having been taught that planets had to have circular orbits. That assumption slowed him down, so that it took him longer to learn that the planets' orbits are really **ellipses**.

如果我没记错，哥白尼发现宇宙行星的轨道是椭圆形之前是受到这思想的影响。他被教导所有的行星是必须在一个圆形轨道上运行的。这项假定拖延了哥白尼对宇宙的轨道运行正确的发现，因此，他花了较长的时间才证实行星的轨道真的是椭圆形的。

PROF.: Yes. Thaxton and Pearcey explain, quote, “...[T]he Aristotelian concept of Forms...appeared to limit God’s creative activity, ... -- as though God’s hand were restrained by some inherent necessity in the structure of things.”

Other theologians developed a philosophy known as voluntarism.¹³

Voluntarism placed no limitations on God’s power.

萨斯顿和皮尔斯在书中解释道，「亚里士多德的物种的概念，显得限制了上帝的创造力，...仿佛上帝在创造万物时手受到事物的结构上某些固有的需要的约束。」

其他的一些思想家则发展了一种被称为任意主义的哲学。任意主义认为上帝的能力是不受任何限制的。

VOICE: Pioneer astronomer Johannes Kepler [yoh-HAN-us KEP-ler] must have been a voluntarist. He said he was discovering the patterns God had created into the skies. Kepler said, quote, “I think Your thoughts after You, oh my God.”

天文学家的先驱者Johannes Kepler，他一定是一位任意主义者，因为他说，他发现上帝在天空中创造的图案模式是按照神自己的想法，并且不受任何限制去创作的。Kepler曾经说过，「我的上帝，我知道你是用你自己的方法主宰整个宇宙的。」

PROF.: That’s right. Thaxton and Pearcey add, quote, “One of the most important consequences of voluntarist theology for science is that it helped to inspire...an

¹² (assistant to the president).

¹³ (the doctrine that God could will or choose anything he wanted).

experimental methodology. For if God created freely rather than by logical necessity, ...we have to go out and look, to observe and experiment.

“As Barbour [BAR-bur] puts it: ‘The world is orderly and dependable because God is trustworthy and not capricious; but the details of the world must be found by observation...because God is free and did not have to create any particular kind of universe’.” ¹⁴

萨斯顿和皮尔斯补充道，「对于科学，任意主义的理论中其中最重要的后果就是它有助于启发实验方法学。如果上帝的自由创造是跟逻辑需要的，...那我们就应该出去看一看和观察一下，并且亲自做实验。

正像巴伯（Barbour）所说的：『世界是有序的和相互依存的，因为上帝是可信的和不是变化无常的；但是只有通过观察才能深入了解世界的细节... 因为上帝是自由的，并且能以任何方式创造任何一种类型的宇宙。』」

VOICE: I’ve heard that Christians fought Copernicus’s ideas because they preferred that the Earth should be the center of our solar system, with the sun revolving around it. Supposedly Christians thought that if the Earth was not at the center, *man would be less important.*

我还曾经听说在中世纪的一些基督徒， 他们与哥白尼的思想相对抗， 因为当时许多人认为地球应该是太阳系的中心，太阳是绕着地球转的。据称这些基督徒认为如果地球不是处于中心的位置，那人类会是较不重要了。

PROF.: Whoever told you that, needs to read Thaxton and Pearcey. They state, quote, “Modern historians often write as though Copernican theory represented a grave threat to the Christian view of human significance. Copernicus *demoted*

¹⁴ (He was not limited to making just one kind of universe; he could make it any way he wanted).

mankind,¹⁵ it is said, from his exalted place on the center stage of the universe. For example, ...historian John Herman Randall [HER-man RAN-dal] writes that the Copernican revolution [quote] ‘swept man out of his proud position as the central figure and end¹⁶ of the universe, and made him a tiny speck on a third-rate planet revolving about a tenth-rate sun drifting in an endless cosmic ocean’.”

告诉你那的无论谁需要读萨斯顿和皮尔斯补的书。他们陈述，「现代的历史学家经常写道，哥白尼理论在基督徒对于人类的重要性的观点上造成一种严重的威胁。哥白尼学说低估了人类在宇宙中的一个重要的位置。举个例子，像历史学家 John Herman Randall 写道，『哥白尼的革命抹去了人类在宇宙中心极自豪的位置。他们认为他们只是第三类行星上的一点，而这第三类行星是围绕着在无尽的宇宙海洋中漂移的第十类的太阳旋转的。』」

VOICE: Yes, I’ve read similar statements. Do you mean they’re not true?

我也曾经读过类似的观点。那你认为这样的观点是否正确呢？

PROF.: Yes, I mean they’re not true.

After reading many of the writings from Copernicus’s lifetime, Thaxton and Pearcey summarize, quote, “...[I]n medieval cosmology ***the center of the universe was not a place of special significance.*** Quite the contrary, it was the locus¹⁷ of evil. At the very center of the universe was Hell...”¹⁸

我认为它们是不正确的。

¹⁵ (moved the human race downward, to a less important place).
¹⁶ (purpose).
¹⁷ (location, place, home).
¹⁸ (Gehenna; the lake of fire where people who have not accepted God’s forgiveness, will be punished forever).

在看完许多有关于哥白尼生平的书籍之后，萨斯顿和皮尔斯曾写道，「在中古的天文学中，宇宙的中心不是个特别重要的位置。相反地，它是罪恶之处，在宇宙最中心的地方就是地狱...」

VOICE: Amazing!

那真是太精彩了！

PROF.: They continue, quote, “In this scheme of things, humanity’s central location was no compliment, nor was its loss a demotion.¹⁹ ...In medieval cosmology, human significance was rooted not in the earth’s central location but in the regard God shows toward it.”

萨斯顿和皮尔斯继续说道，「根据这些观点，人类是宇宙中心的说法并不完全正确。相反地，人类不是宇宙中心也并没有降低了人类的重要性。...在中古的天文学里人类的重要性并不是确立在地球中心的位置，而是上帝对世人的一种态度。」

VOICE: So the people who say that Christians disliked Copernicus, because Copernicus made humans less important, are confused?

因此，许多人被困惑而常说基督徒不喜欢哥白尼学说，是因为哥白尼学说使人类变得较不重要了？

PROF.: Either confused, or reading too much anti-religious propaganda. For whatever reason, they are wrong.

是困惑或者是读太多反宗教性的宣传。 无论出于什么原因，他们是错误的。

VOICE: We’ve covered several ideas today. To make sure I understood them, let’s review the main points.

¹⁹ (Saying humanity was in the center of the universe was no praise, and saying it was not at the center was not a lowering of man’s importance).

We learned that medieval churchmen did not oppose Copernicus because they wanted to believe that the Earth was the geographic center of the universe. After hearing that idea for years, I was shocked to hear that they considered the center of the universe the very worst place – the place of punishment, Hell.

我们今天谈到了几个想法。为了让我们确实的明白和了解，我们重复这些论点。

我们获悉中世纪教会的领袖们没有反对哥白尼，因为他们想相信地球是整个宇宙的中心。听了这个想法多年，我很惊讶地听到他们认为宇宙的中心是最坏的地方，是刑罚之地，是地狱。

PROF.: Right. So learning that Earth was not the center of the universe was not an insult to the human race. A key quotation to remember here is, quote, “In medieval cosmology, human significance was rooted not in the earth’s central location but in the regard God shows toward it.” End quote.

What else did you learn today?

是的。因此，认为地球不是宇宙中心并非是小看人类。要记住这个很关键的引文，“在中古的天文学中，人类的重要性不是确立在地球的中心位置，而是上帝对于人类的一种态度。”

除此之外，你今天还学会了什么？

VOICE: I remember learning that the ancients thought the universe had to be created with certain characteristics. For example, Aristototele hypothesized that objects in the heavens would have to move in circular paths.

But scholars discovered that the Bible says God has unlimited power and wisdom. Therefore, he could have created in any way he wanted.

我们今天学了许多宝贵的功课。我记得学了古代人以为宇宙是必须按某些特征而被创造的。例如，Aristototele 推测在天上的物体必须是在圆形的路径上移动。

但是学者们却发现圣经记载上帝有无限的力量和智慧。 所以，祂可能在任何情况下创造了祂所要的。

PROF.: Right. Christianity inspired scholars to begin observing and experimenting with nature, to see how God had made the universe.

So, people who believed the Bible, laid the foundations for modern science. Johannes Kepler, Sir Isaac Newton, Michael Faraday and hundreds of other scientists of the past and present, were and are followers of Jesus Christ.

是的。基督教启发学者开始观察和试验自然界，看看上帝是如何造宇宙的。

因此，相信圣经的人，拟定了现代科学的基础。 Johannes Kepler，艾萨克·牛顿爵士、迈克尔·法拉第 Michael Faraday 和其他数百位过去和现在的科学家，都是耶稣基督的追随者。

TAPE: THEME AND ANNOUNCEMENT

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