

समाचार पत्रों से चयित अंश Newspapers Clippings

दैनिक सामयिक अभिज्ञता सेवा
A daily Current Awareness Service

Vol. 43 No. 62 06 March 2018



रक्षा विज्ञान पुस्तकालय
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All Guns Blazing

By Sandeep Unnithan

A swadeshi howitzer gets off to a firing start. Its success may determine the scope of PPPs and 'Make in India' in producing military hardware

A Tata Power SED-made ATAGS 'G-1' 155 mm howitzer in firing trials in Pokhran

Successful field trials of an indigenous howitzer could give impetus to the domestic military hardware industry

Howitzers booming in Sikkim near the China border would normally be cause for alarm, especially after last year's tense 73-day standoff on the Doklam plateau. But last month, it was an occasion to celebrate. Two indigenously designed, developed and manufactured (IDDM) howitzers successfully concluded high-altitude trials at the army's firing ranges situated at 12,000 feet near the Tibetan plateau. The two gun prototypes, G1 and G2, shot hundreds of shells across the test range to meet consistency and accuracy trials. It hasn't been an easy process, the DRDO-designed and private sector-produced guns have had to fight for development funds and protect themselves against competition from imported platforms.

A breakthrough came last November when the DRDO got the defence ministry to agree to strike down the licensed production of 1,100 imported 155 mm/ 52 caliber artillery guns (155 is the width or bore of the barrel, 52 the multiple of the bore which gives the barrel length, in this case an 8-metre barrel) in favour of the ATAGS, short for Advanced Towed Artillery Gun System.

The DRDO has said that it had no objection to the army's import of 480 towed artillery guns, a \$1.8 billion contract for which France's Nexter and Israel's Elbit are in contest. But if the guns were licence-produced, as the original contract mandated, it would endanger ATAGS. "We are following the spiral development mode for ATAGS and we will meet all the GSQRs (General Staff Qualitative Requirements) of the imported guns the army is planning to procure," says DRDO chairman S. Christopher.

On February 1, just a day after the trials in Sikkim had proved that the guns could deploy and fire in near freezing temperatures and negotiate the sharp bends on the mountain roads, the DRDO boosted the programme by ordering six more guns worth Rs 60 crore from the manufacturers, Tata Power SED and Bharat Forge. The guns will be delivered to the army for trials by 2019.

But here's the catch. The Rs 20,000 crore, 1,100-howitzer order is in the distant future. Getting there would need more development support in the form of more prototypes and funding. Hence, in the interim, the DRDO and

private developers want the army to place orders for at least two regiments: 40 guns for Rs 900 crore to be split between its private producers. This order, developers say, will provide the impetus to create manufacturing depth in the country and two gun production lines ready to churn out 1,000 guns each by 2021. The army, on the other hand, wants the gun to meet all its requirements before it places the order. While acknowledging the gun's huge technological strides, the army points out that it has not yet fully met the DRDO's own services qualitative requirements (SQRs). ATAGS has to pass three main tests of weight, accuracy and the ability to fire multiple rounds in quick succession before it can be considered for even a regiment's worth of orders.

Developers argue that the DRDO's SQRs are actually a quantum jump over the army's parameters for the imported towed artillery guns. ATAGS is aiming for ranges of close to 60 km, nearly double that of the first Bofors guns. It has all-electric drive as opposed to hydraulic drive, which means it can work at high altitudes without fears of the hydraulic liquid freezing.

Team India

A cavernous shed on the outskirts of Karnataka's erstwhile gold mining district Kolar reverberates with the deep thrum of a diesel engine. Tata Power SED executives watch as the G1 prototype is put through its paces like a prized thoroughbred. The gun spins on its axis, making a black circle on the concrete floor. It then switches to electric drive—a battery operated 95 KW onboard motor to get into firing position, spread its trails and raise its barrel to a 45-degree angle.

“This gun is a true reflection of Team India,” says Rahul Chaudhry, CEO, Tata Power SED and chairman, Defence Innovators and Industry Association. “It is indigenous technology and a project in the true spirit of public-private partnership with a young team of the development agencies (ARDE, which is the DRDO's Armament Re-

The army accepts the gun is a huge technological stride, but points out it is yet to fully meet the DRDO's own qualitative requirements

search & Development Establishment, Tata Power SED and Bharat Forge) working together on a programme of national importance.”

Just six years ago, the ATAGS was nothing more than a mesh of CAD/CAM lines at the ARDE laboratory in Pune. The project was sanctioned by the defence ministry in September 2012. Four years later, in September 2016, two firing prototypes—Tata Power's G1 and Bharat Forge's G2—made their spectacular debuts. Both prototypes shot out shells to a distance of 47 km at the Pokhran test ranges in Rajasthan. This is the distance between New Delhi and Gurugram, a world record for their class of howitzers which usually fire a shell to around 40 km. In the thin air of the mountains, its designers say, the shells can easily achieve a 25 per cent range addition. The ATAGS is a feat of frugal engineering capabilities. It was developed for a modest project cost of Rs 282 crore, sanctioned to the DRDO in 2014 (for a comparison, India's moon mission, Chandrayaan-1, cost Rs 386 crore in 2011).

The stakes for all the key players in the ATAGS programme are enormous. For the DRDO, which has been severely criticised by the armed forces for delayed weapons development, it is a chance to deliver a worldclass system in a reasonable timeframe. The programme is also a litmus test for the government's flagging Make in India initiative—the reason it has found an enthusiastic proponent in defence minister Nirmala Sitharaman.

Structurally, the howitzer has changed very little in over a century. The principle remains the same—a shell is spun out through a grooved steel barrel in a high trajectory to fall on its target. The addition of modern electronics and computers—automated gun alignment and positioning systems, laser rangefinders and shells embedded with GPS systems—have made it the most cost-effective way to deliver ordnance over a 50 km range. A surface-to-surface missile like the Prithvi, for instance, costs Rs 10 crore.

A single 155 mm shell weighing 50 kg costs just Rs 10 lakh. The programme promises to be a large scale industrial multiplier and job creator. Tata Power SED alone has over 40 principal partners and over 220 supply chain vendors in this project. This is where ATAGS has made its mark. Over 80 per cent of the firm's G-1 prototype has been sourced locally (see graphic). A key indigenous breakthrough—a sophisticated high-strength barrel made by Bharat Forge using auto fretting technology—is used in both prototypes.

The howitzer borrows from the proven PPP model used in the only two Indian designed, developed and manufactured (IDDM) weapons systems—the Pinaka multi-barrel rocket launcher produced by L&T and Tata Power SED, and the Akash missile produced by DRDO, Bharat Dynamics Ltd and Bharat Electronics Ltd (BEL).

ATAGS, which could become a third such IDDM system, comes at a time when the army's howitzer arm is awash with new acquisitions after nearly three decades of sloth following the 1987 Bofors bribery scandal. The slowdown was surprising, given the decisive role they played during the 1999 Kargil War—even Pakistan army accounts admit that a majority of its 453 casualties were caused by Indian artillery. The role of artillery in any future Kargil-like conflict will continue to be vital. A classified section of the Lt Gen.

Shekatkar committee report submitted to the defence ministry in December 2016 believes all future wars will be fought in the rugged Himalayas where all of India's disputed boundaries with Pakistan and China are.

The Indian army's Field Artillery Rationalisation Programme (FARP), approved in 1999, aims to equip its 169 artillery regiments (one regiment has 18 guns) with over 3,000 155 mm howitzers—towed, tracked, self-propelled, wheeled and ultra-light—by 2025. This Rs 50,000 crore plan is still decades away from realisation, but recent developments suggest it may finally be on track. In 2016 and 2017, the army signed orders for 145 ultra-light howitzers from the US worth Rs 5,000 crore and 100 K-9 Vajra self-propelled 155 mm howitzers (howitzer-mounted tanks) from South Korea's Hanwha Techwin. These guns will be manufactured in India by Larsen & Toubro and delivered by 2022.

Another indigenous option has also opened up. Six prototypes of the Ordnance Factory Board's (OFB) 'Dhanush'—an Indian copy of the Bofors FH-77B howitzers, but with a 7-metre-long barrel—is under firing trials. If it passes, the OFB gets to manufacture for 19 regiments, a total of 414 guns. ATAGS's fight for development and funding comes amidst this onrush of what the army terms 'proven artillery systems'. At least some of the army's indifference can be explained in the fact that the service didn't ask for the gun to begin with. It was the DRDO which initiated the project in 2012 when it spotted an opportunity in the army's stalled howitzer programme—no guns being made indigenously and no imports coming.

"ATAGS is a promising system, but not a fully proven concept yet. It is still five years away from entering service," says Lt Gen. P. Ravi Shankar, former director-general, artillery. Even the OFB-made Bofors copy, the Dhanush, he points out, has its share of problems, which is why it has been in trials for over three years now.

The army has flagged several issues in ATAGS, which is why they say they are not ordering the gun yet. The gun weighs 20 tonnes, nearly 70 per cent over its 12-tonne weight limit. The weight restrictions are because most bridges in the mountainous forward areas are designed to bear 18-tonne loads. On the plains, too, the added weight can lead to mobility issues because the army's 6x6 artillery towing trucks are designed for 12-tonne guns. Inducting ATAGS in its present form would mean more investments in heavier trucks. The imported towed artillery pieces, they point out, weigh only 15 tonnes. The weight issue, the army points out, flows from the DRDO increasing the gun chamber's capacity—where the shell is actually ignited—from 22 litres to 25 litres. A larger chamber meant higher pressure and thus greater range but it increased the weight. It is also yet to demonstrate sustained firing "like an automatic rifle", an army officer says. "What we now have is the gun firing in single shot mode, like a bolt-action rifle."

Once ATAGS meets the DRDO requirements, it will begin a lengthy series of user trials under the MoD's WE (weapons and equipment) directorate, which will be followed by a certification by the Director General Quality and Assurance and, finally, a maintenance and evaluation of the system by the army's EME (Corps of Electronics and Mechanical Engineers). The entire process has to be done serially and not parallelly, a reason why the army feels the ATAGS will take several more years for induction.

The developers say they plan to shave two more tonnes off the gun to bring its weight down to 18 tonnes. Besides, they say, the four-wheeled ATAGS is far more stable than the two-wheeled imported guns. The gun's advanced capabilities like the six-round automated magazine, which can fire a six-round burst in 30 seconds, are still under development and will come in subsequent prototypes. A case of not wanting to jump the gun.

ATAGS is a feat of frugal engineering capabilities. Both prototypes shot out shells to a distance of 47 km at the Pokhran range, a world record for their class of howitzers.

दुनिया की चौथी सबसे ताकतवर है



भारतीय सेना

ग्लोबल फायरपावर सूची 2017 में दुनिया की सबसे ताकतवर शीर्ष पांच सेनाओं में भारतीय सेना भी शामिल हो चुकी है। सूची में शामिल 133 देशों में भारत चौथे पायदान पर है। हमसे आगे सिर्फ अमेरिका, रूस और चीन ही हैं। इस सूचकांक को तैयार करने के लिए पचास मानकों को शामिल किया गया। इनमें सैन्य संसाधन, प्राकृतिक संसाधन, उद्योग और भौगोलिक स्थिति और उपलब्ध मानव संसाधन प्रमुख हैं। सूची में देशों की परमाणु ताकत को नहीं गिना गया है लेकिन परमाणु हथियारों की क्षमता को अंक जरूर दिए गए हैं।

भारत बनाम चीन

भारत और चीन इस सूचकांक में अपने सर्वाधिक सैनिकों की संख्या के दम पर हैं। कुल सैनिकों की संख्या के मामले में भारत चीन को पीछे छोड़ता है। भारत के पास कुल 42,07,250 सैनिक हैं जबकि चीन के पास 37,12,500 ही हैं। हालांकि सक्रिय सैनिकों की संख्या के मामले में चीन आगे है। उसके पास 22.60 लाख ऐसे सैनिक हैं जबकि भारत का यह आंकड़ा 13,62,500 टहरता है। भारत के पास रिजर्व सैनिक 28,44,750 हैं, वहीं चीन के पास सिर्फ 14,52,500 ही हैं। रक्षा बजट के मामले में भारत चीन के कहीं पीछे छूटता दिखता है। सूचकांक के मुताबिक भारत के रक्षा बजट से तीन गुना चीन सेना पर खर्च करता है।



भारत बनाम पाकिस्तान

रक्षा के सभी क्षेत्रों में भारत अपने पश्चिमी पड़ोसी से मीलों आगे है। केवल कुछ मामलों में ही पाकिस्तान को बढ़त हासिल है। इनमें लड़ाकू हेलीकॉप्टरों की संख्या, स्वचालित आर्टिलरी और जलमार्ग विस्तार।

दूसरे पायदान की ओर चीन

भारत का सबसे बड़ा प्रतिद्वंद्वी देश चीन ग्लोबल फायरपावर सूचकांक में अभी तीसरे पायदान पर है, लेकिन जिस तरह से अपनी रक्षा तैयारियों में जुटा है उससे जल्द ही दूसरे स्थान पर विराजमान हो जाएगा। रूस दूसरे स्थान पर है लेकिन चीन के पास रूस से ज्यादा लड़ाकू विमान और जलपोत हैं। हालांकि सेवारत टैकों के मामले में यह रूस से पिछड़ जाता है।

सशक्त भारत

मानव संसाधन 61.6 करोड़ उपलब्ध मानव संसाधन 42.07 लाख कुल सेना 48.96 करोड़ सेवा के लिए उपयुक्त 13.62 लाख सक्रिय सैनिक 2.29 करोड़ सैन्य आयु तक पहुंच रहे लोग 28.44 लाख रिजर्व सैनिक	वायुसेना 676 लड़ाकू विमान 809 हमलावर विमान 323 ट्रेनर विमान 2102 कुल विमान 666 हेलीकॉप्टर 16 हमलावर हेलीकॉप्टर थलसेना 6704 सशस्त्र लड़ाकू वाहन 290 स्वचालित आर्टिलरी 857 यातायात विमान 323 ट्रेनर विमान 4426 लड़ाकू टैंक 7414 ढो कर ले जाने वाली आर्टिलरी 292 रॉकेट प्रोजेक्टर्स	प्रचालन तंत्र 51.3 करोड़ श्रम शक्ति 340 मर्वेट नेवी क्षमता 7 प्रमुख पत्तन-बंदरगाह 33.2 लाख किमी सड़कें 63,974 किमी रेलवे 346 सेवायोग्य एयरपोर्ट	वित्तीय स्थिति 51 अरब डॉलर : रक्षा बजट 5.07 खरब डॉलर : विदेशी कर्ज
नौसेना 11 विध्वंसक 14 फ्रिगेट 295 कुल क्षमता 139 गश्ती यान 6 माइन वारफेयर वेसेल्स 23 कोरवेटीस 15 पनडुब्बी 3 विमान वाहक युद्धपोत	प्राकृतिक संसाधन 7.67 लाख बैरल प्रतिदिन पेट्रोलियम उत्पादन 35.10 लाख बैरल प्रतिदिन खपत 5.67 अरब बैरल पेट्रोलियम भंडार		

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hindustantimes hindustantimes.com

Tue, 06 March, 2018

No quality issue with Chinese parts for home-made artillery gun: Govt

New Delhi: The government on Monday said there was “no adverse observation” regarding the quality of Chinese parts supplied as German made by a Delhi-based firm for the homemade Dhanush artillery gun.

The firm is facing a probe by the Central Bureau of Investigation (CBI).

Responding to a question in Rajya Sabha on the supply of “fake Chinese parts” for the guns, minister of state for defence Subhash Bhamre said the state-run Ordnance Factory Board (OFB) had suspended business dealings with M/s Sidh Sales Syndicate that had supplied the bearings to Jabalpur based Gun Carriage Factory (GCF) for the indigenous gun.

“There is no adverse observation regarding the quality of bearings,” Bhamre said.

The CBI had booked the firm, along with unidentified GCF officials, last July for selling fake Chinese spare parts for the guns -- the Indian version of the Bofors that performed exceedingly well in the 1999 Kargil war.

The probe agency registered an FIR for cheating and forgery against unknown officials of GCF, accusing them of a criminal conspiracy with Sidh Sales Syndicate.

The junior defence minister said an anonymous complaint was lodged in a case of procurement of six wire race roller bearings purchased from the firm by GCF for fitting on the 155mm 45-calibre Dhanush gun.

The army plans to buy 114 guns in the first phase and eventually induct 414 systems at a cost of over ₹4,500 crore.

“As per the purchase order, these bearings were to be sourced from M/s CRB, Germany. Preliminary investigation has revealed that the bearings supplied by M/s Sidh Sales Syndicate, Delhi, were manufactured by a Chinese firm and not by M/s CRB, Germany,” Bhamre said.

The OFB has referred the case to the CBI for a detailed enquiry as recommended by the board’s chief vigilance officer, he said.

The firm supplied two bearings each on three different dates in April, May, and August of 2014 after submitting documents to GCF that showed the bearings were made by German firm CRB Antriebstechnik.

The CBI said that the bearings provided had 'Made in Germany' embossed on them, and even though tests conducted on them failed, the parts were accepted after assurances made by Sidh Sales that it would provide free service if the bearings did not perform well.

It later emerged that the German company did not manufacture the bearings and the parts supplied were bought from Sino United Industries based in China's Henan province.



Tue, 06 March, 2018

China building helipads in Doklam not threat to India: Sitharaman

New Delhi: China has been building helipads and trenches in Doklam but these are not a threat to India, Union Defence Minister Nirmala Sitharaman said on Monday.

She said that China has been undertaking these construction activities to maintain its troops during the winter and that the troop strengths of both sides have been reduced after the two-and-half-month-long stand-off that ended in August 2017. "Post disengagement from the face-off in 2017, troops of both the sides have re-deployed themselves away from their respective positions at the face-off site.

The strengths of both the sides have been reduced," Sitharaman told the Rajya Sabha in a written reply. "In order to maintain these troops during the winter, the People's Liberation Army (PLA) has undertaken construction of some infrastructure, including sentry posts, trenches and helipads," she added.

She said the Indian government regularly takes up the issues pertaining to the Line of Actual Control (LAC) with the Chinese side through established mechanisms, including Border Personnel Meetings, Flag Meetings, meetings of Working Mechanism for Consultation and Coordination on India-China Border Affairs, as well as through diplomatic channels.

In a separate reply, Minister of State for Defence Subhash Bhamre told the Upper House of Parliament that "situations arise on the ground" with PLA due to the varying perceptions of LAC by the two sides. "There is no commonly delineated Line of Actual Control (LAC) in the border areas between India and China.

From time to time, on account of differences in the perception of LAC, situations have arisen on the ground that could have been avoided if we had a common perception of LAC," Bhamre said.



Tue, 06 March, 2018

China hikes military budget by 8.1%

By Atul Aneja

Prime Minister Li says Beijing will target a GDP growth of 6.5% this year and lift 10 million from poverty

China on Monday vowed to target a growth rate of around 6.5% in 2018 that would lift 10 million people out of poverty — in tune with establishing a strong military force.

Presenting his work report — a stocktaking of achievements of the past five years as well as the unveiling of a development road map for another year — Prime Minister Li Keqiang told lawmakers

assembled at an annual session of National People's Congress (NPC) that China intended to raise its Gross Domestic Product (GDP) by around 6.5%. Unemployment rate would be cut to below 5.5%.

Steady increase

He highlighted that Beijing will raise its defence budget by a hefty 8.1% over the previous year, signalling the country's intent to build world class armed forces. The total amount of spending would be \$175 billion, Xinhua reported, citing a report available to the media ahead of Monday's NPC opening.

China has been steadily increasing its military spending, dovetailed to its economic rise. From a budget of \$132 billion in 2014, spending rose by 10%, 7.6% and 7% respectively in the following years.

Mr. Li stressed that China would focus on building strong naval and air defences, bolstered by the infusion of high technology, derived through greater collaboration between domestic military and civilian industry.

China has already inducted the fifth generation J-20 stealth fighters in its arsenal. There have been media reports that China could be building a third aircraft carrier, using a nuclear-powered engine.

Amid concerns about a spiralling trade war with the United States, Mr. Li said China's national security environment was undergoing fundamental changes.

He added that China's aspiration to build world-class armed forces would cover "all aspects of military training and war preparedness", so that "national sovereignty, security and development interests" could be firmly safeguarded.

Cutting troop numbers

Mr. Li underscored that China had fulfilled its earlier goal of cutting troop numbers by 3,00,000, as part of a road map to build a modern technology driven military force. He stressed that major advances had been recorded in developing military technology and equipment with the help of greater civilian-military industrial integration.

Mr. Li also underscored that during the phase of modernisation, the military must fully observe the leadership of President Xi Jinping and the Party.

Under Mr. Xi, who is also the General Secretary of the CPC and head of the apex Central Military Commission (CMC), the People's Liberation Army (PLA) has already transformed itself into a strong, world-class military force that has proven its mettle in safeguarding China's maritime rights, combating terrorism and ensuring social stability.

But Mr. Li did not refer to the CPC's recommendation made more than a week ago that the Chinese presidency should not be limited to two consecutive terms, allowing Mr. Xi to remain President indefinitely. Mr. Li said that besides lifting 10 million people out of poverty — as part of eradicating it by 2020 — 2.8 million poor people from rural areas would be shifted to urban settlements.

'Made in China 2025'

He pointed out that the new budgetary allocations were in tune with China's transition to a innovation-based, high-quality economy that would leverage Artificial Intelligence, Big Data and Internet of Things to produce world-class products under the 'Made in- China 2025' plan.

On the international plane, Mr. Li said that China stood for sustainable globalisation and opposed protectionism. He said China should step up the building of a Free Trade Area Asia-Pacific trade bloc.

Tue, 06 March, 2018

U.S. aircraft carrier to arrive in Vietnam for historic visit

U.S. military ties with Vietnam have deepened since 2016, when former President Barack Obama lifted the decades-old embargo on U.S. arms sales to the country as part of his Asia pivot, reports CNN.

A US Navy aircraft carrier will set anchor in Vietnam on Monday, for the first time since the end of the Vietnam War more than four decades ago, the media reported.

The four-day visit by the USS Carl Vinson and its contingent of 5,000 sailors and aviators has been deemed as a historic opportunity to enhance the budding friendship that has emerged between the two former foes, reports CNN.

The 95,000-tonne carrier is expected to anchor two nautical miles off the port of Da Nang, which was a key battleground during the war that ended in 1975.

Cultural exchanges, including culinary and sporting activities, will take place between some of the U.S. military personnel on board and their Vietnamese counterparts.

Some U.S. sailors will also visit a centre for victims of Agent Orange, the toxic chemical compound used by the U.S. during the conflict to destroy jungle and forest.

U.S. military ties with Vietnam have deepened since 2016, when former President Barack Obama lifted the decades-old embargo on U.S. arms sales to the country as part of his Asia pivot, reports CNN.

Under President Donald Trump, military cooperation with Hanoi has continued.

Despite pulling the U.S. out of the Trans-Pacific Partnership, a regional trade deal that Vietnam was a key part of, Mr. Trump has maintained strong ties with Hanoi.

In November 2017, Mr. Trump visited Vietnam as part of his inaugural Asia trip aimed at reassuring allies that the U.S. was still committed to the region, and in January, Defence Secretary Jim Mattis also visited, laying the groundwork for this week's visit by the USS Carl Vinson.

Mon, 05 March, 2018

Nothing existed before Big Bang: Stephen Hawking

The Big Bang theory proposes that a tiny speck of matter and energy began to grow, bringing about the birth of our universe about the universe billions of years ago.

There was absolutely nothing before the Big Bang, according to British physicist Stephen Hawking, who explained what happened prior to the existence of our universe.

The Big Bang theory proposes that a tiny speck of matter and energy began to grow, bringing about the birth of our universe about the universe billions of years ago.

However, scientists are intrigued by what was there before the "explosion" when there was supposed to be nothing.

"There was nothing around before the Big, Big Bang," Hawking said.

His theory is based on the assumption that the universe has no boundaries.

"The boundary condition of the universe ... is that it has no boundary," Hawking told physicist Neil deGrasse Tyson at the "Star Talk" show aired on National Geographic Channel.

The Big Bang theory holds that the universe in retrospective can shrink to the size of an extremely small “subatomic ball” known as the singularity.

According to Hawking, the laws of physics and time cease to function inside that tiny particle of heat and energy.

The ordinary real time as we know now shrinks infinitely as the universe becomes ever smaller but never reaches a definable starting point.

Hawking argued that before the Big Bang real ordinary time was replaced by imaginary time and was in a bent form, state run news agency Xinhua reported.

“It was always reaching closer to nothing but didn’t become nothing,” said Hawking.

To help people better understand the abstract and confusing state, the physicist drew an analogy between the distorted time with Ancient Greek philosopher Euclid’s theory of space-time, a closed surface without end.

“One can regard imaginary and real time beginning at the South Pole. There is nothing south of the South Pole, so there was nothing around before the Big Bang,” Hawking said.

“There was never a Big Bang that produced something from nothing. It just seemed that way from mankind’s perspective,” Hawking said.

He said that a lot of what we believe is derived from a human-centric perspective, which might limit the scope of human knowledge of the world.