Indigenous artillery gun passes high-altitude winter test in Sikkim

By Sandip Dighe

Pune: The month-long winter trials of the indigenously-developed 155mm/52 calibre Advanced Towed Artillery Gun System (ATAGS) have achieved the desired results, an official from the Defence Research and Development Organisation has said.

The weapon system is a joint effort by the DRDO and the private sector.

The trials were conducted by a group of scientists from the city-based Armament Research and Development Establishment (ARDE) and army officers at an elevation of 11,000 feet in Sikkim. “Scientists and soldiers tested the gun in extremely cold conditions. It delivered positive firing results even in -20 degree Celsius,” the DRDO official said. The official said the gun’s mobility, a crucial factor in high-altitude warfare, was favourable too.

“All mobility parameters were checked during the trials,” the official said. Last year, the gun’s desert trials were held from August 24 to September 7. Results from these trials were positive too.

The ATAGS has an all electric drive, which is better than traditional hydraulic drives of other towed guns. The electric drives of the ATAGS allows better control while opening and closing of the breech mechanism and while ramming the next round into the firing chamber.

Sources added that the gun is expected to become a part of the Indian Army by the year 2020.

HAL ups its defence offerings

The PSU has indigenously designed and developed a mini UAV of the eight kg class

Hindustan Aeronautics Limited (HAL) has developed a range of product offerings to address the various requirements of customers. Their portfolio includes fighter aircraft, trainer aircraft, transport aircraft, military helicopter and civil helicopters and their engines, avionics and accessories, which are both indigenously designed or manufactured under licence.

HAL also provides comprehensive product servicing, overhaul and upgrade services to customers, including life extensions, failure analysis, defect investigations and product improvements, which provide the company with an advantage.

This defence PSU has indigenously designed and developed a mini UAV of the eight kg class and intend to enter into the market of larger UAVs with the Rustom-II medium-altitude, long-endurance UAV, which they are jointly developing with the Aeronautical Development Establishment.

It has also begun the development of other new products including the Indian Multi Role Helicopter (IMRH) and commenced new business initiatives, including entry into the civil transport aircraft segment with the civil variant of the Dornier Do-228 aircraft. They are also manufacturing industrial marine gas turbines now.

It has become the largest defence PSU in terms of value of production in the Indian defence sector according to the MoD Annual Report 2016-17. Of the HAL’s order book of ₹68,500 crore, around 93 per cent
orders are from defence services. Until now, Defence Acquisition Council has cleared `820 billion capex for acquisitions which will raise HAL’s order book.

They also supply helicopters and aircrafts for the ambitious UDAN scheme to connect remote regions of country. In FY15-17, HAL’s revenues grew by a CAGR (compound annual growth rate) of 9 per cent, while net profits grew by CAGR of 62 per cent backed by strong government projects.
‘ F-16 jet production in India will be exclusive’

The plan to set up a F-16 jet production unit in India will be an “exclusive” proposition that will help the country in achieving its operational needs as well as the 'Make in India' initiative, according to American aerospace and defence major Lockheed Martin.

As India continues to shop around to add new fighter jets into its air force, Lockheed Martin has offered to relocate its entire production line to India. The company said it intends to create far more than an “assembly line” in India. “We plan to introduce two new words into the lexicon of international fighter aircraft manufacturing: 'India' and 'exclusive'.

F-16 production in India will be exclusive something that has never before been presented by any other fighter aircraft manufacturer, past or present,” Vivek Lall, vice president, Strategy and Business Development, Lockheed Martin told PTI in an interview.

“The F-16 gives the Indian industry a unique opportunity to be at the centre of the world's largest fighter aircraft ecosystem,” said Lall, who played a key role in some of the big ticket American military sales to India, including the General Atomics-built Guardian Predator Drones announced by the US last year. Responding to a question, Lall claimed the offer from Lockheed is cost advantageous for India.

How long must IAF wait for its new fighter?

By Shankar Roychowdhury

The PM himself pushed the deal through, seemingly oblivious of its tortured historical background.

While many issues of common interest and concern to both countries were discussed during French President Emmanuel Macron’s recent visit to India, it was clear from the outset that the primary focus would be on one over-arching background theme: India’s acquisition of the Dassault Rafale fighter jet the future medium multi-role combat aircraft for the gravely fighter-impoverished and equipment-undernourished Indian Air Force, desperately seeking a replacement for its aged MiG-21 fleet. It is with this in mind that soon after assuming office, one of the earliest decisive steps taken by Prime Minister Narendra Modi was to cut the Gordian knot and finalise the acquisition of an initial batch of 36 Rafale fighters for the Indian Air Force through direct negotiations with Dassault Aircraft Corporation. The PM himself pushed the deal through, seemingly oblivious of its tortured historical background. The case for early acquisition of such an aircraft had been dragging on since 2008, and the almost peremptory decision to acquire the Rafale was a bold, perhaps even reckless step, given the fraught, bitterly adversarial political environment in India.

The Russian MiG-21 was a sturdy, faithful warhorse which had seen the Indian Air Force through the Bangladesh war of 1971 and the Kargil conflict of 1999. But it had aged much beyond its service life, and was now regarded as a totally unforgiving “widow maker” for its tragic record of fatal accidents. The Indian Air Force had long decided that the MiG-21 had to be replaced at the earliest.

The process to select such an aircraft was begun by a team of test pilots of the Indian Air Force (and there are none better in the world) who flight-tested and technically evaluated six competing aircraft which had been lined up behind the starter’s tapes for the Indian Air Force sweepstakes. The participants were the Eurofighter Typhoon, Russia’s MiG-35, the Dassault Rafale from France, the Saab Viggen from Sweden and the F-16 Block-D Viper and F-18 from the United States, and the trophy was the glittering $10 billion
MMRCA (Medium-Multi Role Combat Aircraft) deal. Extensive flight testing and technical evaluations were conducted under the severe summer and winter operational conditions prevalent in the Indian environment. Two aircraft emerged as the winner and runner-up respectively — the Rafale, which was in service only in the “Armee de l’aire”, the official designation of the French Air Force; and the Eurofighter Typhoon, designed as a common fighter aircraft for Nato. The actual flying and technical evaluations by the IAF test pilots were all mere preliminaries — the hard core of the process were the commercial and contractual negotiations, especially the complex financial offsets, which are often the stumbling blocks in almost all such cases. This protracted process was applied to the Rafale as well, notwithstanding the operational urgency. In the event, the Rafale, hitherto an unfamiliar entity in India, was the surprise winner of the competition.

France has traditionally driven a hard bargain. The French have been expensive but dependable suppliers of world-class technology, which have been used by the Indian armed forces to great effect in all of India’s wars since Independence. These include the AMX-13 light tanks, which during the Sino-Indian border war of 1962 were airlifted to Chushul in Ladakh at a height of 14,232 feet; Mystere fighter-bombers in the India-Pakistan war of 1965 and the Mirage 2000 fighter-bombers, which sanitised the airspace over Kargil in 1999. Defence has never been a particularly important focus of successive governments in India, and defence procurement, no matter how urgent, has always been regarded as fodder for cynical political bargaining. Politicians of all parties have never hesitated to shoot off their mouths on military issues, which neither they nor their pretentiously-designated “high commands” have the slightest clue about. In this case, the political worthies have even said that the Rafale is “old technology”, which has not been effective in Libya or Sub-Saharan Africa, where these aircraft are operating in a ground support role with the French intervention forces in Mali and elsewhere. Others have sought the financial details of such contracts purely as political ammunition, ignoring the insistence of many multinational armament manufacturers on secrecy clauses in any contracts entered into.

Negotiations have been in progress for an extended period, but now appear to be in a deadlock. Meanwhile, fighter pilots of the Indian Air Force, as also of Indian naval aviation, some of the finest in the world, look anxiously skywards, hoping for manna from heaven to come their way in the form of a good fighting aircraft, while their opponents next door get copious transfusions of Chinese technology, some of which is said to be world-class, at vastly subsidised “friendship” prices.

But the past is irrelevant, and its memories are insufficient now. Only the future is important, and India needs to get its act together, and quickly. Let there be no doubt — India continues to function in a two-and-a-half front threat situation, and there are no visible signs that the situation will wind down in the foreseeable future or that India’s involvement in its near abroad region is likely to end anytime soon. Weapons systems like the Rafale are urgently needed for our armed forces to confront all these situations. They will therefore have to be procured. Meanwhile, the contentious and contrarian “attack politics” at home are dragging the armed forces into venomous and increasingly personalised political mud-slinging. All these should not be relevant to the defence procurement process, but nevertheless are a ground reality which impose added caution in any defence negotiations with foreign commercial entities. The overall result, of course, is a long delay in the modernisation of our armed forces.

It seems the Indian Air Force will have to wait for an extended period before succour arrives. What then is the answer? Make in India?
Army says 68% of weapons outdated

China, Pakistan on spree of equipping armed forces: Army

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<th>Equipment Reality</th>
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| In a strong indictment of the inadequate budgetary allocation for the Army, Vice-Chief of Army Staff (VCOS) Lt. Gen. Sarath Chand told the parliamentary panel on defence that Budget 2018-19 has ‘dashed’ all hopes of modernisation of the force which is saddled with equipment of which more than two-third is ‘vintage’.

With the ongoing Doklam issue, China has become increasingly assertive and there has been a rise in patrolling and transgressions. To add to this the Army has been facing attempts from Pakistan to launch suicide attacks on camps in Kashmir. Recently the emergency in Maldives is also an area of concern.

The Army candidly shared that the possibility of a two-front war is a ‘reality’, and while both of India’s neighbours are on a spree of modernising their armed forces, India has not paid attention.

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<th>VINTAGE WEAPONS</th>
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<tr>
<td>Assault rifles: The army still uses the Indian Small Arms System rifles, which were inducted in 1988. For the past 30 years the Indian Army has been lugging this rifle around.</td>
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<td>Artillery: The modernisation program, has been stalled since the 1980s. The three projects, involving 155mm howitzers of 52 inch and 32 inch calibers. Some of these were supposed to be self-propelled, some towed and some a mix of both. An Israeli and French firm were shortlisted for the towed 155mm guns, but they are still pending clearance.</td>
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<td>Armored warfare: Presently the vintage Russian T-72s and BMP-1 and two combat vehicles are in use. The Army wanted at least 1,000 of the T-72s and 3,000 of the BMPs upgraded, which meant adding night vision capabilities, a new fire control system and better engines. But budgetary clearances were not given.</td>
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<tr>
<td>Helicopters: Presently the Army uses vintage French helicopters. But what is really needed is a twin-engine machine and they the Russian Kamov was zeroed in on. However, allegations of kickbacks in the deal stalled the process.</td>
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<tr>
<th>DEPENDENCY ON FOREIGN SUPPLIERS FOR MILITARY HARDWARE</th>
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<tr>
<td>₹2,40,814.22 cr</td>
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<td>Total value of 87 contracts signed during the last three years and current year (upto 30 November 2017).</td>
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<tr>
<td>₹1,16,522.89 cr</td>
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<td>Value of 19 contracts signed with Indian vendors.</td>
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<td>₹1,24,291.33 cr</td>
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<td>Value of contracts signed with 8 foreign vendors.</td>
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Major Defence equipment imported in the last 3 years and current year.

Russia: Rockets, simulator and component level repair facility for tanks.

Israel: Laser designation pods, radars, loops for aircraft, radars, weapons for garuds and missiles.

USA: Aircraft, helicopters, missiles, artillery guns and simulators.

France: Aircraft, ammunition, Bimodular Charge System (BMCS) high Zone Modules of artillery guns.
Taxman cometh for the military

By Dinakar Peri

Additional GST burden adds to woes of insufficient budgetary allocation

Reeling under an insufficient budgetary allocation for modernisation, the military has a new financial challenge: the Goods and Services Tax. A recent report of the Parliamentary Standing Committee on Defence says the tax will result in an additional burden of ₹5,000 crore on the Army alone.

“The additional burden is due to new taxation laws in the GST, which has come into force in the past one year and has not been taken care of in the new Budget,” the Army informed the committee.

The Army told the panel that the capital allocation did not even cater to the payments for committed liabilities, or deals already contracted for.

The Indian Air Force, which is heavily dependent on imports, is facing a similar situation.

The IAF informed the committee that in 2016-17, it paid a custom duty of ₹943.62 crore, which went up to ₹1,614.28 crore in 2017-18.

“This amount was not even reimbursed to the Air Force. The estimated outgo for 2018-19 is ₹1,726.98 crore,” the committee was informed.

The funds allocated for committed liabilities is ₹33,100 crore against a projection of ₹72,482 crore.

The Navy too is affected by the new tax regime, though to a less extent than the Army and the IAF.

The Navy apprised the committee that in the revenue part, the tax burden due to the GST will go up from ₹427.28 crore last year to ₹800 crore this year.

“The committee, therefore, desire that reasonability be shown in the budget for the Army, by way of providing for the additional burden to the extent of ₹5,000 crore due to the changes in the taxation laws,” the panel said in its observations in the report tabled in the Parliament last week.

On the IAF’s deposition, the committee suggested that the Defence Ministry make appropriate allocation to address the issues of taxation in the Budget, keeping in mind the additional burden levied on the service.

Army: Chinese hackers targeting whatsapp

In the first warning of its kind to the countrymen, the Indian Army has asked people to be vigilant as the Chinese are hacking digital media, including WhatsApp and urged them to be alert with any numbers starting with +86.

Mobile users are also asked to regularly audit their social media groups and be on guard if any new unidentified number is trying to join the WhatsApp.
These sets of directives issued in a video titled “Be Alert, Be Cautious, Be Safe” released by the Army’s Directorate General Public Interface on Monday comes months after all the troops deployed on the Line of Actual Control (LAC) were ordered not to use Chinese made smart phones. This precautionary step was taken as the Chinese could locate the position of troops, the order said and listed more than 35 brand names to be avoided.

The latest caution to people at large through a tweet said “the Chinese use all kinds of platform to penetrate your digital world. WhatsApp groups are a new way of hacking into your system.”

The video said the hackers can steal all valuable data of the user and asked people to be exercise caution if any number starting with +86 appears in the WhatsApp group.

Issuing this advisory, the Army also asked users to conduct regular audits of their groups and in case if the SIM is changed it should be destroyed completely.

This step is also applicable in case the user goes in for a new mobile number, the tweet warning stipulated.

The advisory also said when opting for a new mobile number, the information should be immediately shared with the group administrator.

Moreover, the number of all the known contacts should be saved as a precaution and WhatsApp number of the old mobile number should be deleted.

The Government at regular intervals keeps issuing such advisories to the personnel of Armed forces, including the Army, Navy and IAF, regarding the perils of smart phones and refrain from mentioning deployment of personnel in social media.

However, this is the first time that the Army has given a general alert to people all over the country regarding the threat faced by Chinese hackers.
The new rules of war

By Sushma Ramachandran

Nations resort to retaliatory trade tariffs

War in the 21st century has metamorphosed into different arenas. From conventional warfare, it has moved to cyber wars, where attacks are made on the computer systems now running every country’s economy. US President Donald Trump has unleashed yet another type of battle on the global stage — trade wars. In a bid to play to his domestic constituency of blue-collar workers worried over factories closing and shifting to emerging economies, Mr Trump is imposing protectionist tariffs on critical industrial raw materials.

The aim ostensibly is to ensure that domestic industries thrive and create more jobs. His protectionist agenda began with refusing to participate in the proposed regional trade agreement, the Trans Pacific Partnership (TPP), which he felt was unfair to the US. He then sought renegotiation of the longstanding North American Free Trade Agreement (NAFTA) with Canada and Mexico. And now, finally, he has imposed tariffs of 25 and 10 per cent, respectively, on steel and aluminium imports, shortly after raising import duties on washing machines and solar panels.

The problem is the tariff hike may end up harming the US economy rather than the exporting countries. A similar spike in tariffs in 2002 during the tenure of President George Bush had the unintended effect of leading to a steep increase in steel and aluminium prices. This hurt many small businesses and even led to their closure. In other words, it led to job losses rather than job creation.

Besides, there has been a fundamental shift in the focus of that country’s economy from manufacturing to the services sector. The services sector now accounts for as much as 80 per cent of GDP, reducing the importance of the manufacturing sector.

Despite these factors, Trump has gone ahead with the new policy which is now likely to invite retaliation from affected countries. In other words, trade wars are on the horizon. The European Union is talking about high levies on orange juice and jeans while China could be mulling higher tariffs on soyabean. The actual impact of the higher levies should have been on Canada which is the biggest supplier of both metals to the US. But for the time being, these are not being imposed on imports from neighbours like Canada and Mexico, though there is no clarity if this concession is going to continue in the long run.

Clearly, retaliatory tariffs by other countries will lead to similar increases by the US. It is already raising concerns about trade barriers imposed by other countries with which there are trade deficits, of which the biggest is China. But India also has a trade deficit, though it may be tiny in comparison — $23 billion dollars as compared to $375 billion with China. Nonetheless, Trump has been vocal in recent days over high tariff barriers over here. Notably, he made a song and dance about the steep hike in import duties on Harley-Davidson motorcycles, an item that is exported in small quantities to this country.

It is evident, therefore, that India is willy-nilly set to be part of the trade wars. In the case of steel and aluminium exports to the US, this country has little role to play, given the fact that it only supplies about 2 per cent of that country’s requirements. But there are other products on which higher tariffs can hurt us.

At the same time, India can equally be accused of being protectionist as it has recently raised import duties on a range of goods in the electronics industry. Just like the ‘America First’ slogan of the current US administration, the Modi government too has its ‘Make in India’ policy. This has prompted a rise in import duties on a host of electronic goods components that may make many products more expensive for Indian consumers. Television producers, for instance, are threatening to shut down owing to high cost of some key components. So, India is not blameless in this competitive game of protectionism now being played out throughout the world.
It will now have to watch out as there are many other products on which increased tariffs by the US could impact India. This includes the biggest export sectors of gems and pharmaceuticals. For the time being, therefore, India would be well advised to join the countries that may seek to form a joint front against the US on its trade aggression. The EU and China, for instance, have much larger volumes of trade with the US and the stakes are very high for both of them. India is a smaller player, but even so, the US market is a critical one and it can ill afford to lose access to it owing to Trump’s protectionist drive.

What is also worrying is that there is an attempt to bypass the multilateral World Trade Organisation which was set up precisely to deal with such global trade disputes. The current increase in tariffs goes beyond the limits prescribed by the WTO. India is already involved in several disputes with the US at the trade body over its export promotions schemes as well as solar panel duties. This is apart from the fact that it has attracted the ire of most developed countries by rightly refusing to budge on issues relating to agriculture owing to the need to ensure the interests of Indian farmers are not sacrificed at the world body.

Thus despite the growing closeness in strategic ties between India and the US, there is a definite strain as far as trade issues are concerned. The trade war launched by the US is not directed at India right now, but frictions are growing over tariff and non-tariff barriers between both countries. The international battle to ensure that each country is able to provide enough jobs for its people is at the heart of this protectionist war. The fact is, however, that unless trade becomes freer, it will not be possible to ensure that industries become more viable and efficient, and hence are able to offer more jobs. Trade wars may do just the reverse by raising costs of products across the board and making businesses uncompetitive everywhere. These wars will not have a happy ending, as is the case with all global conflicts, so one can only hope a truce is achieved before the battle begins in right earnest.

**Nudge or nuke? Scientists work to prevent asteroid hit**

By Kabir Firaque

Scientists are looking at two possible ways to ward off the threat, if and when it comes. Either nudge the asteroid off its Earth-bound course, or blow it up before it strikes.

One of the major threats to intelligent life, Stephen Hawking once warned, is the high probability of an asteroid colliding with inhabited planets. Bracing for that eventuality on Earth, scientists are looking at two possible ways to ward off the threat, if and when it comes. Either nudge the asteroid off its Earthbound course, or blow it up before it strikes. The question is which is the better option. Two new studies have sought to assess the practicability of the two approaches. American scientists have designed a conceptual spacecraft that
can either deflect an asteroid by nudging it, or carry a nuclear device to the object. They would prefer deflection with a battering ram, they have stressed, but their evaluation of the spacecraft’s capabilities has indicated that only the nuclear option — detonation to deflect the object — would be viable against a large asteroid within a limited response time.

Russian scientists, meanwhile, have made toy asteroids, blasted them with a laser pulse, and then estimated the size of the nuclear explosion that would be required to blow up an actual asteroid. A big one calls for a big one: to eliminate a rocky asteroid 200 m wide, the bomb needs to deliver the energy equivalent of 3 megatonnes of TNT. For comparison, that is 200 times the TNT equivalent of Little Boy (15 kilotonnes), the atomic bomb that exploded in Hiroshima in 1945.

“We’re also looking into the possibility of deflecting an asteroid without destroying it and hope for international engagement,” study co-author Vladimir Yufa of the Moscow Institute of Physics and Technology (MIPT) said in a statement.

MIPT, which provided The Indian Express with the materials of the study, collaborated with the Russian Federal Nuclear Centre and the State Atomic Energy Corporation. The other study too involved government institutions, including NASA and Lawrence Livermore National Laboratory (LLNL). The paper by the Russians appears in the Journal of Experimental and Theoretical Physics; the one by the Americans in Acta Astronautica.

**Hammer** - Short for Hypervelocity Asteroid Mitigation Mission for Emergency Response vehicle, HAMMER is a 9-m-tall, 8.8-tonne spacecraft designed to serve as either a kinetic impactor — essentially a battering ram — or as a transport vehicle for a nuclear device. Nudging an asteroid is the preferred option because blasting it entails the risk of fragments crashing into Earth.

The US team evaluated how effective HAMMER would be in nudging away the asteroid Bennu, 500 m wide and weighing 79 billion kg, which has a 1-in-2,700 chance of striking Earth on September 25, 2135. If it does, the energy released would be equivalent to 1,200 megatonnes, or 80,000 times the energy of the Hiroshima bomb.

If launched from the Delta IV Heavy rocket (the world’s second highest-capacity launch vehicle) 10 years before impact, it would take between 34 and 53 launches of the rocket, each carrying a single HAMMER impactor, to make a Bennu-class asteroid miss Earth. If launched 25 years in advance, it would still need seven to 11 launches. The paper concluded that using a single HAMMER spacecraft as a battering ram would prove inadequate for deflecting an object like Bennu.

“The nuclear option is the only viable option for launches 10-25 years before impact,” LLNL astrophysicist Kirsten Howley, one of the study authors, told The Indian Express by email. “If the object were smaller (say 100 m) or the time to impact were greater (say 100 years), a kinetic impactor may provide a better result.”

**Armageddon** - In the 1998 film Armageddon, a team led by Bruce Willis drills a hole into an Earthbound asteroid and buries a bomb in it. In a statement, LLNL ruled out that approach. In the nuclear option it proposes, the explosive is detonated some distance from the asteroid. This will flood one side of the asteroid with X-rays, vaporising a layer of the surface. As the vaporised material is ejected, it would propel the asteroid away, like a rocket.

For the Russian team, on the other hand, the nuclear option is to blow the asteroid into pieces, most of which will miss the Earth or burn up in the atmosphere.

The paper takes a leaf straight out of Armageddon’s book. Describing the destruction of miniature “asteroids” with lasers, the MIPT statement says: “In some of the experiments, the laser was targeted at a cavity made in the miniature asteroids ahead of time. By exploiting the cavity, the researchers spent less energy. Similarly, the effect of a buried nuclear bomb is expected to be more pronounced.”

In manufacturing artificial asteroids, the team adjusted their physical properties and chemical composition, which corresponded to that of stony meteorites. Imitation asteroids of various shapes were made, among them spherical, ellipsoidal, and cubical.