War and Peace in Space

Regina Hagen

Regina Hagen works as a freelance technical translator. She is a member of the grassroots peace group 'Darmstädter Friedensforum', is on the Board of Directors of the Global Network Against Weapons and Nuclear Power in Space, and active in Abolition 2000, an international network to abolish nuclear weapons.

The origins of space technology

On October 3, 1942, the first successful rocket launch took place. The test was conducted at Peenemünde, northern Germany, where Freiherr Wernher von Braun, Captain Werner R. Dornberger, and Walter Riedl, the team's chief designer, cheered the flawless flight of an A4 ballistic missile, which is better known by the name 'V2'. Dornberger commented that this was the start of 'a new era in transportation: that of space travel' and added that 'our most urgent task can only be to rapidly perfect the rocket as a weapon.'[1] This event marked the first major development of a technology which has, ever since, been characterised by its military-civilian dual-use capability. It was the dream of rocket travel to the moon which originally fed the enthusiasm for rocketry in Germany and elsewhere in the world. But rockets were first used to bring death.

The 'V' in 'V2' stands for '*Vergeltung*', which means 'vengeance' in English. On September 7 and 8, 1944, the first V2 missiles were fired at London and Paris from mobile launch pads on the western front. In the following months, a total of 1,403 V2s showered down on London, the south of England, Antwerp, and Liège. Another model, the V1, a cruise missile, added to the destruction. Almost 13,000 people died as a consequence.

I discovered several facts which make the V2 particularly meaningful for me, a German born more than ten years after the Second World War ended. For one thing, after the British Air Force had bombed Peenemünde and destroyed many of its facilities, V2 construction was moved to Nordhausen in the middle of Germany, not so far from Darmstadt. Nordhausen and the Mittelwerk Dora gained a sad reputation for using concentration camp labour in an underground factory. The prisoners who had to produce the V2 were brought from Buchenwald and other camps. They lived and worked under conditions that made one survivor describe the place as 'the antechambers of hell.'[2] Half of the estimated sixty thousand prisoners who entered Dora did not leave it alive.[3]

Darmstadt is linked with V2 development in another way. In 1940, 238 scientists and engineers who worked at Peenemünde came from German universities – of these, 92 came from the Technical University of Darmstadt. Thus, scientists from our local university played a crucial role in making the V2 attacks possible. Hermann Steuding, for example, made fundamental discoveries in guidance theory which were important to ensure target precision for the bombings. His former Darmstadt colleague, Helmut Hoelzer, not only improved the guidance technology, but also built the first fully electronic analogous computer – a major breakthrough in calculating and simulating missile trajectories.[4]

One more fact also points to Darmstadt. As mentioned above, the Nazi military fired the first V2s against London and Paris on September 7 and 8, 1944. A few nights later, on September 11, 1944, the British launched an air campaign against Darmstadt. 700 explosive bombs and 300,000 incendiary bombs destroyed much of the town in a fire storm. More than twelve thousand people were killed in a single night.

The military race in space

'The Faustian deal between the rocketeers and the butchers who were their benefactors would forever haunt von Braun and some of his colleagues. And elaborate ways to rationalise the arrangement would be found in years to come.'[5] The main argument for their co-operation with the German military, put forward by the German rocket specialists, was that space science was too expensive for private corporations and government was the only sponsor that could be found. This continued after World War Two, only the rocketeers changed their masters. A few days before the German surrender in 1945, von Braun and many of his top staff surrendered to the United States military. Eventually, von Braun and approximately 120 of his colleagues were transferred to the Uinted States in the course of operations Overcast and Paperclip (and so were about 1,500 other scientists, engineers, research specialists, and managers who would then work for the United States war machine).

Along with these people, the US Army shipped 100 operable rockets, numerous rocket components, and tons of scientific documents from Germany to the United States. Thus, the V2 rocket became the foundation of the American space programme. Over several years, the V2 developed into the tactical nuclear missile, Redstone, (which was deployed in Germany in 1958), and into the Saturn V rocket that took the first men to the moon. The Soviets also transferred many scientists, rockets, parts, and documents to Russia during operation *Ossavakim*, and likewise used them to develop their own space capabilities.

In this way there started a military race in space which continues to this very day. Nuclear-armed short, medium, and long range (intercontinental) ballistic missiles deployed on the ground, in planes, on ships, and on submarines have since dominated the military strategies of not only the United States, Russia and

China, but also those of France and Britain. Recently, India and Pakistan joined the elite nuclear weapons club.

Military use of space, however, has not been limited to providing the delivery of weapons of mass destruction. Today, space technology and satellites are used for a wide range of military purposes. This is highlighted in a text released by the Directorate of Public Affairs, Headquarters, United States Space Command, on March 24, 1999, and entitled US Space Command Supports Kosovo Operation:

> 'PETERSON AIR FORCE BASE, Colorado – US Space Command is providing substantial space support to the North Atlantic Treaty Organization (NATO) operation in Kosovo. A US Space Command Joint Space Support Team is in theatre to provide guidance to US and allied warfighters in Europe and to co-ordinate the optimal use of US space-based assets. Space operations increase the combat effectiveness of US and allied air, land, and sea forces through the control of satellites that provide ballistic missile warning, communications, weather, navigation, and imagery capabilities. Space assets also provide the means that help other services perform their missions.'[6]

What do satellites do?

- Infrared satellites (which are designed to 'see' thermal radiation) are used to recognise the launch of (ballistic) missiles – but also to detect the heat that is dissipated by the engines of hostile tanks, or temperature differences caused by submerging submarines.
- Communication satellites are needed to ensure the exchange of information; for command and control between other satellites, locally deployed troops, headquarters, military and political decision makers; and to provide media with the news which we then read in the next day's newspapers. Relay satellites downlink data rapidly to ground and other space stations. They function as a 'switchboard in the sky'.
- Weather satellites provide weather data which plays a crucial role in the planning of military missions. High-tech weapons are highly dependent on weather conditions due to the laser systems, sensors, and so on, which are employed.[7] It would be difficult, for example, to conduct a ground campaign when the soil is wet after heavy rain.
- Navigation satellites are part of the Global Positioning System owned and operated by the US Department of Defence (DoD). Precise navigation data allows the troops, ships, planes, and so on, to determine their exact location on the ground, on the sea, or in the air. Furthermore, it is also used to guide the so-called 'intelligent precision bombs', e.g. cruise missiles, to targets, even in bad weather.
- Geodetic satellites provide the data for self-guided cruise missiles and improve targeting precision.[8]
- Image and radar satellites are used for reconnaissance. Image satellites use cameras to distinguish objects on the ground which are as small as a quarter of a metre across. Radar satellites penetrate clouds, vegetation, and camouflage.
- Spy satellites intercept data, fax, and voice traffic all over the world. During

the Kosovo war, for example, they intercepted the conversations between top Serbian officials.[9]

All of these systems have a dual-use capability. They can be used for the military purposes listed above. At the same time, they can be used for a multitude of civilian purposes: weather forecasts, for disaster warning, navigation for merchant ships and trucks, communication by telephone and computer, imagery and radar information for environmental studies. Some of these technologies even play an important role in arms control. Many arms verification programmes (e.g. to reduce the number of nuclear-armed missiles, to verify the Chemical Weapons Convention, to verify compliance with international treaties, and so on) rely on data gained from space.

Ballistic missile defence

Although military space systems are used by many countries on a daily basis, they are hardly ever discussed in public. However, US plans to deploy a National Missile Defence system are now at the centre of public debate.

Plans to defend against ballistic missiles (Ballistic Missile Defence, BMD) are almost as old as the history of ballistic missile warfare. The German V2 attacks on allied cities came as quite a shock. The US began conducting research on ballistic missile defence shortly after World War Two, even though they did not face a missile threat to their own territory at that time. Since then, the US has spent over US$ 120 billion on missile defence, but has not yet been able to develop a reliable system.[10] The US developed, constructed, and deployed a missile defence system, Safeguard, which was designed to protect missile silos in North Dakota. It began operation on October 1, 1975, and was shut down again on January 27, 1976 – it was obvious that the concept wouldn't work. The system had cost US$ 23.1 billion in today's money, which amounts to US$ 194 million for each day it was in operation.[11]

The Anti-Ballistic Missile Treaty signed by the United States and the Soviet Union entered into force in 1972 and was amended in 1974. In the Treaty, both sides agreed not to try to defend the whole of their national territory against missile attacks. A maximum of 100 defence missiles are allowed. The US built Safeguard. The Soviet Union chose to deploy a missile defence system around Moscow, which remains in place today.

In the logic of the nuclear age, this deal makes sense. If one side had the ability to defend against missiles, the other would feel encouraged to increase the number of their offensive forces. By limiting the defence capability, both countries knew that their defence could be overwhelmed by a massive attack. Consequently, each side kept the capability to conduct a retaliatory strike in case it was attacked first. This means that neither of the two would dare to attack the other – the concept of Mutually Assured Destruction or MAD was put into place to prevent a nuclear war.

This philosophy is still prevalent today. Therefore, current US plans to build a nationwide system to defend against ballistic missiles (National Missile

Defence or NMD) provoke just as much outrage as did Ronald Reagan's Star Wars plans in the 1980s.

Not only would National Missile Defence mean a violation of the ABM Treaty, but it would likely also lead to a new arms race and destabilisation. China, for example, has only 20 intercontinental ballistic missiles (ICBMs) in its arsenals. National Missile Defence would be designed to defend against two dozen incoming ICBMs in its third stage. If the US decided to deploy, China would almost certainly increase the number of its offensive weapons. India, in turn, would feel threatened by this offensive potential and also speed up development of its own missiles. As a consequence, Pakistan would feel forced to do the same. This domino-effect is just one example of the type of reactions to be expected if National Missile Defence becomes a reality.

In addition to the destabilisation, critics point out that the intended National Missile Defence system could easily be overcome. The easiest way to attack US territory despite ballistic missile defence would be either to launch a short-range missile from a ship close to the coastline, or to transport a nuclear weapon by truck and to explode it in a major city. But even if ICBMs were chosen to attack US territory, simple decoy balloons (similar to children's toy balloons) could be released together with the real warhead. The image sensors of the defending interceptor (the so-called kill vehicle) could hardly discriminate between the warhead and the decoy balloons. If the balloons are slightly heated, or the warhead is cooled down, even the kill vehicle's infrared sensors could not identify the difference between the warhead and the balloons. Therefore, each object released in the atmosphere would have to be dealt with as if it were an actual warhead – and the National Missile Defence system would soon be overwhelmed.[12]

National Missile Defence depends heavily on space-based satellite systems. On the ground, existing early-warning radars would have to be upgraded, and new X-band radars would have to be built. To make National Missile Defence work for the whole of the territory of the United States, early warning, and therefore radar, bases would be needed all over the world. Currently, planned radar sites are located in Alaska, on the US East and West coast, in Greenland, in Great Britain, and eventually in South Korea.

Protest runs high in Europe. On top of the concerns about a new arms race and the violation of the ABM Treaty, people in Greenland and Britain are worried that they might be the target of an attack if National Missile Defence systems are deployed in their countries.

The US has so far conducted three tests of the kill vehicle, two of which have failed. A total of 19 tests are planned up to 2005 when National Missile Defence was originally scheduled for deployment. Military experts, however, have made it clear that the schedule cannot be kept for technical reasons.

Rather than try to defend against any threat, the United States should push along with disarmament efforts. Further reductions of nuclear arsenals, both in the US and in Russia, and eventually also in all the other nuclear-weapon countries, would certainly lower the danger of an accidental ICBM launch. Perceived threats in other countries – the US usually lists North Korea and Iran as potential attackers – would be remedied much more easily by negotiating a moratorium on the further development, testing, and deployment of ballistic missiles.[14]

Waging war in space, or the ultimate high ground

National Missile Defence is bad enough. But it is just part of a larger picture. 'A recent Senate report argued that … the Defence Department needs to start focusing on space as "the strategic high ground from which to project power". That means developing lasers or 'kinetic energy rods' or other weapons that could be used to attack enemy spacecraft or missiles or even ground targets like bridges and buildings.'[15]

This is nothing new. Two years ago, I listened to a presentation from a public relations officer with the US Air Force. She works for the 21st Space Wing at the Peterson Air Force Base in Colorado Springs, which 'is a part of the United States Space Command under Air Force Space Command'.[16]

The script for the presentation read: 'The 21st Space Wing has two very important space operation missions – missile warning and space control. … The space surveillance aspect of the space control mission allows the US to maintain and dominate the 'high ground'. … Space control is evolving into space superiority to ensure the safe and free use of space by our forces and allies. … The control of air and space is critical because it allows all US forces freedom from attack and freedom to attack. … We cannot allow space to be controlled by our adversaries. … Team 21, first place in space. Dominating the high ground!'[17]

This is in full conformity with the overall space policy of the US military. 'Space has often been referred to as 'the high ground', in the sense of giving its occupier a dominating view (and prospective control) of a potential battlefield.'[18] 'Space forces play an increasingly important role in prosecuting modern warfare. They provide global and battlefield surveillance, ballistic missile warning, precise navigation, secure communications, weather, and intelligence information. Space assets facilitate effective command and control and enhance the joint utilisation of our land, sea, and air forces.'[19]

In its publication 'Vision for 2020', the US Space Command sets the stage for military engagement in space. Its motto is: 'US Space Command – dominating the space dimension of military operations to protect US interests and investment. Integrating Space Forces into warfighting capabilities across the full spectrum of conflict.'[20]

The Space Command draws historical parallels: 'Historically, military forces have evolved to protect national interests and investments – both military and economic. During the rise of sea commerce, nations built navies to protect and enhance their commercial interests. During the westward expansion of the continental United States, military outposts and the cavalry emerged to protect our wagon trains, settlements, and railroads. As air power developed, its primary purpose was to support and enhance land and sea operations. However, over time, air power evolved into a separate and equal medium of warfare. The emergence of space power follows both of these models. Over the past several decades, space power has primarily supported land, sea, and air operations, strategically and operationally. During the early portion of the 21st century, space power will also evolve into a separate and equal medium of warfare. Likewise, space forces will emerge to protect military and commercial national interests and investment in the space medium due to their increasing importance.'[21]

There is no doubt that, in addition to supporting Earth-based armed forces, the protection of commercial space activities – telecommunication and remote sensing satellites, industrial enterprises who want to 'mine the sky', visions for space-based colonies, and so on – serves as a justification to enforce US dominance in space. 'The political, economic, technological, and military trends hold significant implications for USSPACECOM. An increased dependence upon space capabilities may lead to increased vulnerabilities. As space systems become lucrative military targets, there will be a critical need to control the space medium to ensure US dominance on the future battlefields. … Control of Space is the ability to assure access to space, freedom of operations within the space medium, and an ability to deny others the use of space, if required. … Global Engagement is the application of precision force from, to, and through space.'[22]

Star Wars

In 1997, the US Space Command finalised its Long Range Plan (LRP). The plan 'captures in one place a comprehensive roadmap for achieving our vision for 2020. … It is our roadmap to prepare ourselves to not only do today's job in military space better, but to plan for 2020's challenges'.[23] The Long Range Plan repeats the importance of protecting national assets, to counter '… the nation's dependence on space capabilities in the 21st Century which rivals its dependence on electricity and oil in the 19th and 20th Centuries. Electricity and oil were critical parts of the industrial revolution; space capabilities (e.g. communications, positioning and timing, imaging, earth resource monitoring, and weather) are emerging as vital to the information revolution. … US interests and investments in space must be fully protected to ensure our nation's freedom of action in space.'[24] And industry responds to military demands. On its large poster 'Revolutionising Airpower for the 21st Century'[25], Boeing presents the Airborne Laser (ABL), a joint project of the US Air Force, Boeing, TRW (formerly Thompson Ramo Wooldridge) and Lockheed Martin. In the section 'The Threat is Real and Growing', the poster lists seemingly dangerous proliferators like Romania, Bulgaria, and the Slovak Republic. The publication is not a leftover from the Cold War – it was published in 1997.

The Space Based Laser

Development of a Space Based Laser (SBL) seems to be a logical step further. At the 1998 National Space Symposium in Colorado Springs, TRW proudly announced that, together with Boeing, it had won a study contract 'to define concepts for a Space-Based Laser Readiness Demonstrator (SBLRD). Funded by the Ballistic Missile Defence Organisation, the contract follows more than 15 years of TRW work developing technologies for BMDO-sponsored space-based laser initiatives. … SBLRD is intended to demonstrate the technical feasibility of using a space-based laser system to intercept and destroy theatre ballistic missiles in their boost phase.'[26] (The boost phase is of particular interest for any ballistic missile defence as engaging targets over enemy territory would release all debris – be it conventional, biological, chemical, or nuclear – close to the launch area, i.e. over enemy territory.) It should not be ignored, however, that the Space Based Laser could also be used offensively, for example, to destroy bridges, military equipment, or other militarily sensitive facilities.

In all these plans, however, the military are confronted by a major problem. Space-based weapons like the Space Based Laser need huge amounts of energy. Therefore, in its 13 volume publication *New World Vistas*, the US Air Force states: 'Power limitations … currently make large space-based radars and space-based weapons relatively unfeasible. … A natural technology to enable high power is nuclear power in space.'[27]

Possible action on a local level

Thus far, it is the United States which has mostly been cited here as an example. This is for two reasons. The US is most advanced with respect to technology, and therefore with plans for further militarisation and the positioning of weapons in space. On the positive side, it is usually easiest to obtain information in the United States, as their information policy is more open than that of other countries. Currently, the US is undoubtedly at the technological forefront and pushing new developments. However, the situation must also be carefully observed in other countries. France and Germany, for example, signed a memorandum of understanding in June 2000 to co-operate in the deployment of a military satellite system.[28] According to the plans, France will contribute its optical reconnaissance satellite Horus while Germany contracted a private company to develop the radar satellite SAR-Lupe.[29]

In Europe, though space is mostly considered to be a field for commerce, science, and research, even here it often implies production for war, not for social needs. Military space technology devours huge amounts of money. This is money that can be spent only once: for war from space, or for improvements in a country's infrastructure; for deployment of military satellites, or for better education; for National Missile Defence, or for the protection of the environment; for military reconnaissance, or for social welfare. This is true everywhere – in the United States, in Europe, in Russia, in Asia, Africa and Latin America.

Public events to educate people about space are organised on a regular basis in many towns. Often it is the national space agencies which sponsor these events. It should be clear from what has gone before that we ought not to leave all this work of public information to those who unquestioningly praise space flight and space technology, and only talk about the fascination of space. It is our duty also to learn about the negative aspects of the use of space, and to pass this information on to others, and to let our governments know that we oppose the militarisation of space and the positioning of weapons there.

A longer version of this article is available at www.russfound.org

References

1 Frank H. Winter, *Rockets into Space*, Frontiers of Space Series, Harvard University Press, Cambridge, Mass.1990, p. 50.
2 William E. Burrows, *The New Ocean. The Story of the First Space Age*, Random House, Modern Library Paperback Edition, New York, p. 103.
3 ibid, p. 104.
4 Michael J. Neufeld, *Die Rakete und das Reich. Wernher von Braun, Peenemünde und der Beginn des Raketenzeitalters*, Henschel Verlag, 1999, p 125f. English edition, *The Rocket and the Reich* published in New York, 1995.
5 William E. Burrows, op.cit., p. 79.
6 See http://www.spacecom.af.mil/usspace.
7 Jürgen Scheffran, Wer den Weltraum beherrscht, beherrscht die Erde, in: *Wissenschaft und Frieden* 2/1994.
8 ibid.
9 Richard J. Newman, The New Space Race. The Pentagon envisions a war in the heavens, but can it defend the ultimate high ground? in: *U.S. News & World Report*, November 8, 1999, p. 30f.
10 Stephen W. Young, *Pushing the Limits. The Decision on National Missile Defence*, Coalition to Reduce Nuclear Dangers and Council for a Livable World Education Fund, April 2000, p 27. The booklet is online at http://www.clw.org.
11 ibid., p. 46.
12 For details, see Andrew M. Sessler et.al., Countermeasures. A Technical Evaluation of the Operational Effectiveness of the Planned US National Missile Defence System, Union of Concerned Scientists and MIT Security Studies Program, April 2000
13 FAS = Federation of American Scientists; for more information see http://www.fas.org.
14 Jürgen Scheffran, International Control of Ballistic Missiles, in: *ECAAR Network News*, Vol. 12, Number 2, August 2000
15 Richard J. Newman, op.cit.
16 Script for overhead presentation given by a public relations officer of the 21st Space Wing at Peterson Air Force Base in Colorado Springs, Colorado/USA, on April 9, 1998.
17 ibid.
18 Department of Defence, Space Program. An Executive Overview for FY 1998 – 2003, March 1997; http://www.fas.org/spp/military/program/sp97/index.html
19 National Military Strategy of the United States of America, 1995; as quoted in Space Program, op.cit.
20 United States Space Command, Vision for 2020. Peterson Air Force Base, 2nd Printing, August 1997
21 ibid.
22 ibid.

23 US Space Command, Long Range Plan. Implementing USSPACECOM Vision for 2020, printed March 1998; posted on the Internet at http://131.15.144.52/usspace/LRP/intro.htm
24 ibid.
25 Boeing/Team ABL, 'Revolutionising Airpower for the 21st Century', Seattle, WA/USA, printed April 1997
26 TRW, 'TRW-led Team SBL Awarded $10 Million Space Laser Contract', company press release dated March 17, 1998; http://www.businesswire.com/trw/bw.031798.htm
27 For more details, see Karl Grossman, *The Wrong Stuff. The Space Program's Nuclear Threat to Our Planet*, Common Courage Press, 1997. See also the website of the Global Network Against Weapons and Nuclear Power in Space, http://www.space4peace.org.
28 Hans-Hagen Bremer, Berlin und Paris demonstrieren Einigkeit, in: *Frankfurter Rundschau*, June 10, 2000.
29 OHB System-Team, SAR-Lupe. Brochure distributed at the international air and space fair ILA 2000 which took place in Berlin in May 2000.

In defence of the Anti-Ballistic Missile Treaty

This Appeal to prevent a New Arms Race on Earth and in Outer Space was launched in Gottingen, Germany in November 2000 by the Global Network against Weapons and Nuclear Power in Space. It will be presented to the UN General Assembly in Autumn 2001.

'The deployment of missile defence systems by the USA and the militarisation of outer space pose a threat to peace and international security, and increase the danger of a new arms race on earth and in space.

In order to prevent a new arms race and to open the way for negotiations, we demand a test freeze for ballistic missiles, missile defence systems, and space weapons.

The Anti-Ballistic Missile (ABM) Treaty of 1972 between the USA and Russia is fundamental to international stability. It must be preserved and extended to all nations. Ballistic missiles and nuclear weapons must be disarmed. The development, testing and deployment of weapons in space must be prohibited by a space convention.

We call for a space free of any weapons and the abolition of nuclear weapons.'

Endorsements can be forwarded to the Russell Foundation or sent to:

- International Network of Engineers and Scientists (INES), Gutenbergstrasse 31, 44139 Dortmund, Germany (Tel: (49) 231 / 575 52 02, Fax: 57 52 10, INES_NAT@t-online.de
- IPPNW/PSR – UN Office 777 UN Plaza, Suite 6M, New York, NY 10017, USA (Tel: (1) 646 / 865-1883, Fax: 865 -1884, www.psr.org)