This is the (translated) transcript of a documentary film on weather experiments broadcast on Swiss Television in Sept. 2005 under the title:

"Power over the Weather"

The longing to wield power over the weather is as old as mankind, and just as old as this is the connection between weather and war. For centuries many people believed that battles cause rain to fall. [Jack Williams, Weather editor:] "There was the idea that cannon-fire could cause rainfall. Another theory said that soldiers in combat sweat profusely. Thus air-humidity would increase and it would start to rain." And in fact there is a connection between war and rain, because just like silver iodide smoke and dust above a battle-field represents a host of tiny seeds of condensation. Again and again the weather plays a major part in wars. Napoleon had prematurely to bring to an end his campaign in Russia in 1812 because of the onset of winter, and in 1941 the Japanese used a storm over the Pacific as a cover for their attack on Pearl Harbour. [Spencer Weart, Institute for the History of Physics:] "The military were always interested in the weather. Even in ancient times generals made a study of it. They not only looked for ways of predicting it, but also of changing it."

At the beginning of the atomic age a new way of viewing the world emerged. "At the start of the Cold War the question arose, whether one could make it snow permanently in Russia, according to the motto: they want a cold war, so let's give them one."

The wish to use the newly-won power brought about the first big experiment in weather manipulation. [Jack Williams:] "In the 'Cirrus Project' a hurricane was to be 'seeded' off the coast of Georgia. They flew into it with an aircraft and seeded it. When I read in the paper what they had done, I had the feeling these people are like children playing around with their chemistry set: let's mix these together and see what happens. Suddenly the hurricane altered course, devastated the coastline near the city of Savannah leaving behind it a trail of destruction." Within the space of no more than 24 hours on this day in October 1947, 1500 buildings were damaged or destroyed, 4000 people lost their homes, one person died. *Go the same day the US military declared the project secret,* in order to avert any legal challenges. Although scientists today assume that the 35 kilograms of dry ice deployed in Project Cirrus most likely had only a minor influence on the hurricane, the military's dream of weather manipulation had come a step closer to realization.

And this dream lives on. Throughout the world *research scientists and ingenious businessmen* are engaged in attempts to modify the weather. Perhaps one of the most unusual ideas on weather manipulation comes from a small company led by Peter Cordani. [Cordani:] "I will now demonstrate a special powder we have invented. Here is a bowl of water, symbolizing the moisture in a thunderstorm system. If you sprinkle the powder on it the water is immediately absorbed." The powder is highly absorbent. It can absorb 2000 times its own weight in water and bind it as a non-poisonous gel. When the fluid becomes firm its temperature rises from 10 to 15 degrees. Both these factors together have the effect of reducing the energy of the storm. But what happens to the gel as it falls to earth? "The gel dissolves immediately when it comes in contact with the seawater." To many people this product sounds too good to be true. Its inventor had it patented and tested straight away.

On 19th July 2001 Cordani had 4500 kgs of his powder scattered for the first time over clouds. According to observers the clouds simply disappeared from the radar screen. When the substance is introduced into a cloud it sucks up the water moisture contained in it. The gel-drops enriched with moisture then sink to the ground. The powder is to be scattered directly in the eye of a hurricane. According to its inventor it would absorb the moisture in the upper regions of the hurricane, release it again over the sea, thereby robbing the storm of the energy it gains through condensation. But as in the case of seeding clouds the effectiveness of 'dynage!' is *not scientifically proven.* [Jack Williams:] "Even if it works, hurricane experts of the NOAA Institute have calculated that a lot of this stuff would be needed to gain control of a medium-sized hurricane. 350 to 400 C5 transport aircraft would be required. Not even the Airforce has 400." In addition it would not be at all cheap to deploy the powder in large quantities. The material alone that would be needed to seed a single tornado would cost millions of dollars. And what if the experiment failed? It would not be the first time.

In the night of 15th August 1952 the RAF dispatched aircraft to the resort of Lynmouth on the south coast of England. *Unnoticed by the civilian population* the pilots seeded the clouds over the town several times with silver iodide.[1] It rained for 24 hours. Small streams turned into raging torrents and a tidal wave swept through the town. 35 people drowned and 420 lost their homes. Lynmouth was entirely washed away. The "Cumulus" weather experiment had failed. *Not until 50 years later were the hitherto secret Government documents made accessible to the public.* It emerged from these that tests were being carried out in the coastal region to see whether artificial rain could be used for military purposes.

[1] Silver iodide was first used in the Cirrus Project which began in February 1947.

But it was another ten years before the first big international dispute finally unleashed the anger which would pave the way to an end of the weather wars. Simon Hurst of the 'New York Times' proved that the US military had placed their trust in weather manipulation in the Vietnam War and in Laos. Since 1966 the Air Force had flown more than 2600 cloud-seeding missions and increased the monsoon rains. Under the code-name 'Popeye' these *secret operations* turned the roads into rivers of mud and prevented reinforcements from reaching the Vietcong. The missions concentrated on the Ho Chi Minh Trail, the main supply route of North Vietnam. [Spencer Wealth:] "They didn't change the weather for just a day or two, but increased the rainfall along the whole Ho Chi Minh Trail, in order to block the supply lines." Although there can be no absolute and final proof where the weather is concerned, reports indicate that the US military achieved what it wanted. The international outcry against such projects led to the UN General Assembly passing on 10.12.1976 Resolution 31.72, *outlawing the use of methods of weather manipulation for military purposes.* The weather wars were over, at least temporarily. Because even this Resolution did not prevent defence experts from continuing to experiment with the possibilities of weather manipulation. *Despite all the caution that is called for, the rainmakers are tirelessly continuing their work.* New methods are in the process of development.

What is perhaps the most promising idea comes from the realm of chaos theory. With the help of high-power computers mathematicians specializing in this branch of science simulate the path of a hurricane and hope soon to find *the Holy Grail.* They want to alter the course of a tornado. Up to 300,000 people die every year as a result of severe storms and the floods that follow. The damage caused worldwide since 1980 is estimated at around 1 trillion dollars. The quantity of energy generated by an average hurricane would be sufficient to supply the entire world with electricity at that point in time: 2 billion watts. A hurricane cannot yet be stopped, but one day maybe we will have it under control. This is precisely what Bob and Joan Simpson, both weather experts, tried to do back in 1962. Their project, carried out in conjunction with, among others, the Navy and the US Weather Agency, bore the title 'Stormfury'. "The basic thought behind 'Stormfury' was a pirouetting ballerina. She spins around her own axis by drawing her arms and legs close to her body. Thus arises what the physicist calls angular momentum: the rotational impulse. The eye of the hurricane draws the air in and upwards into the centre of the storm. This is a similar process. If you prevent a dancer from raising her arms, she cannot spin around in the same way." To achieve this a ring-shaped cloud is seeded into the eye of a hurricane and the energy-laden wall of the eye is replaced by an artificial one that is slower. "Thus the velocity is reduced by about 15%." But the experiment was risky. It forced the pilot to do exactly what he had been trained to avoid: to fly directly into the eye of the hurricane. [Hugh Willoughby, hurricane expert:] "When we are flying in a hurricane and are almost at the centre, we find ourselves in light to moderate turbulence. In a commercial aircraft the 'Fasten Seatbelts' warning would light up. Every 2-3 years a pilot flying through a hurricane finds himself in severe turbulence. This is when the ladies would start screaming." As a part of the project hurricanes were seeded over an eight-day period. After 4 days there was invariably a reduction in the storm's intensity. The Simpsons pursued their ambitious plan for almost 21 years. But in early 1980 the *political pressure* became so great that they had to bring their experiments to an end. So the search began for a new approach to the problem. Technical progress over the years that followed brought just that: The key to weather manipulation lies in improved forecasting, and great developments have taken place in this area.

[Ross Hoffman, hurricane expert:] "There are a number of weather centres around the world, which use global forecasting models. There the most varied data is collected. This includes signals from weather balloons, observations from aircraft, measurements from satellites. Satellites not only send pictures of clouds, they also measure the temperature and moisture in the atmosphere. And on the ground they measure, for example, temperature and wind-velocity over the ocean surface." Through easy access to these vast quantities of data climate researchers around the world can take stock of the weather situation at any time. But supposing this information were to be used not only to predict the weather, but also to manipulate it? Meteorologist Ross Hoffman works at the Institute for Atmospheric Research in Massachusetts. *He steers hurricanes.* His special field is calculation of weather. With high-power computers he varies the models of past hurricanes. With the help of this data he can estimate what minor change will bring about a reaction in the behaviour of the storm. He adds these quantities to the model. Then he observes whether the minor change brings about a major one.

"We looked more closely at Hurricane Iniki, which raged on Hawaii in 1992, and Hurricane Andrew, which devastated Florida. In our first experiment we tried to simulate these storms and predict their development. As a rule, we manage this quite well, because there is enough data about these hurricanes. Then we look for *conditions which might weaken the storm or alter its position, and which are highly sensitive in their reaction to the smallest changes.* Situations in which small changes can later have major effects."

The idea that the tiniest changes in a multi-layered system can have major effects is the central concept of chaos theory. "One thing makes weather forecasting so difficult: The weather system is chaotic, the tiniest inaccuracies in our observations can very quickly lead to big inaccuracies." Is it possible that the gentle fluttering of a butterfly's wing causes a minor air turbulence which could lead several weeks later to the building up of a tornado? To make visible the exact sequence of steps leading from the butterfly's wing to the tornado is the great ambition of chaos theory.

"We play through a number of different changes: in wind, temperature, water. The greatest success was when we

steered Hurricane Iniki, and *it really went exactly where we wanted it to go."*

But even if Hoffman could say precisely what tiny change would be needed to direct the hurricane on to a new path, he would still have to find out how this change could be realized in practice. [Kerry Emanuel, Professor of Meteorology:] "Hurricanes get their energy from evaporated seawater. We all know this from experience: you climb out of the swimming-pool and shiver even on a warm day, especially when it's windy. Because the evaporation of water on the skin draws warmth away from the body. This is exactly what happens with a hurricane: the wind causes the water to evaporate and draws warmth out of the ocean. The water vapour condenses to a cloud in the wall of the eye of the hurricane. The stronger the wind, the more the water evaporates, and the stronger the storm becomes. We think it is possible to intervene at precisely this point so as to ensure that the water evaporates more slowly." This might be the very change that Ross Hoffman needs. "Our idea is to cover the water-surface with a substance that is only one molecule thick and slows down the evaporation of the water. Benjamin Franklin discovered that a teaspoonful of olive oil can spread over an entire lake. If you had a substance with the thickness of only one molecule, a tiny bit would reach very far. The question is, whether we can find something that does not break up in these high wind velocities." An effective protective layer would have to resist the extreme winds for at least six hours. "The ideal effect would be if the hurricane were to reach the land 24 hours sooner and then weaken. They quickly subside when they touch the land because no air moisture is rising there. We can make this happen artificially."

Even if this idea sounds brilliant, the right polymer still has to be found. But neither fundamental doubts nor the enormous cost deter inventors and scientists from trying to achieve a breakthrough in weather manipulation. *"Weather manipulation is unavoidable.* The latest successes are irresistible. They give one the impression: *anything can be achieved,* provided one applies a bit of energy in the right place. *One can only hope that it is done with the right motives,* and comes to a satisfactory conclusion. If we do this with big gaps in between, say in one case in a thousand, the weather system will never change: you shoot the *one* bear that wants to do you harm, you don't go with your guns loaded into the woods and shoot *all* the bears." . Parallels to the beginning of the nuclear age cannot be dismissed out of hand. Today the question arises, as it did then: if you have possibilities of this kind, is it permissible to use them? And is there any way at all of preventing them from being used?

The HAARP Project

Similar questions surround a project in which scientists of the US military are also involved. Officially its aim is research into communications, but around the world more and more people are insisting that it has to do with weather manipulation. Dr Bernard Eastlund is a plasma physicist and has worked for the US Atomic Energy Commission in the field of nuclear fusion. He is an inventor and owner of three patents on the subject of weather control. His special field: new methods of energy transfer. For this reason he was also asked by the Atlantic Richfield Oil Company (ARCO) for help with an unusual problem. "In 1984 ARCO asked me to find a use for their gas reserves in North Alaska. 644 billion cubic metres of gas." With this the American electrical supply network could be kept going for a whole year, but the gigantic reserve of gas is so remote, that no economically viable means of transport could be found.

[Nick Begich, author, and critic of HAARP project:] "Dr. Eastlund agreed to find a use for the gas and turn it into money. First he would change it into electricity and then into radio waves." [Eastlund:] "I suggested the gas should be converted into electricity, and this could be fed into a large field of closed-circuit aerial masts, which would influence the ionosphere in various ways. Eastlund's invention, for which he was granted a patent in 1987, has the name HAARP. [Begich:] "Incredible speculations were rife in connection with the project." The forest of masts may-look quite insignificant, but it has a gigantic potential. With HAARP you can generate huge amounts of energy of *up to 3 million watts, and beat up the ionosphere with it.* This layer of the atmosphere begins around 100 kilometres above the earth's surface. Its charged particles fulfil an important task. They reflect and absorb dangerous particles that are flung from the sun out into space. Without the ionosphere life on earth would gradually be extinguished.

According to Eastlund's plan, the energy won from the gas would be projected out into the ionosphere, which would function like a vast radio aerial. The *US military* also recognized its value for communications research, and *commissioned ARCO with the construction of the installation.* [Eastlund:] "It is a very good centre for research. Very small compared with the size of the field of aerials I had proposed, but the first stage of something that can become a lot bigger." Even now it is the biggest ionosphere heater in the world. With it a surface of a square kilometre in the ionosphere can be brought to a *temperature of 28,000 degrees centigrade.* "It is a closed-circuit installation, and therefore controllable. You send the waves wherever you want to." [Nick Begich:] "They found out that any amount of heat can be generated when you send the radio waves upwards and bunch them together. The effect of the heat is to raise the ionosphere over an area of around 30 miles' diameter, together with the air streams and the jetstream contained in it. The idea of shifting the jetstream is phenomenal. Who would ever have imagined that human beings could do such a thing? The only problem is: we *still don't control the system well enough."* The long-term effects are not known. *"A change h e r e leads to a catastrophe t h e r e".* All kinds of speculations have arisen on the question of HAARP. An article that appeared in 'Scientific American' in 2000 said that in Alaska an unusual shift of air masses in the jetstream had driven cold air southwards and *had led to a tornado forming in Honda.* Could HAARP, just like other weather

programmes, be used for military purposes? [Begich:] "Imagine an army 100,000 strong and enemy troops. If you could create floods or rain, terrible weather conditions for weeks or months on end: the ability to fight would be greatly diminished."

Even now the US Navy is using the ionosphere as an aerial so that by means of radio waves they can track down other countries' *submarines in the sea,* which would be beyond the range of conventional radar. In addition HAARP can *identify and destroy enemy missiles.* [Begich:] "This is the direction that warfare will take in the 21st century." HAARP's potential role as a secret weapon of war was not realized for a long time. Many countries have meanwhile protested against its deployment because it is obviously in breach of the ENMOD Convention, which forbids the use of environmental modification in warfare. [Begich:] "The last three defense secretaries called for the agreement to be revoked. Since 1970 much effort had been put into preparing the treaty, and it was ratified by Congress in 1978. It must not be interfered with." Throughout the controversies the scientists working with HAARP have always insisted that the aerial mast installation is only used for purposes of research and that it docs not provide nearly enough energy to influence the weather. But the field is soon to be doubled in size; and meanwhile Eastlund has withdrawn from the project.

The Eglin Air Force Base

Also on this base in Florida weapons research experts of the Air Force together with specialists in nano-particles are carrying out experiments in weather manipulation. [J. Gregory Glenn, Air Force explosives expert:] "We are an explosives laboratory and are developing the next generation of explosive substances for the Air Force. Special atomic warheads, air pressure bombs, a whole range of different munitions. The obvious goal is to destroy things and hold the enemy back. Our job and the mission of the Air Force is to win wars and destroy things. Right?" When he speaks here of destruction, Glenn has something unusual in mind. "In 1999 a tornado swept across Oklahoma City and Norman. The damage was estimated at around 1.3 billion dollars. Many people died. I thought: why do we we always have to let this happen to us? Why don't we defend ourselves?" Why shouldn't it be possible to destroy a tornado, interrupt its flow of energy and thus disperse it? "Our first calculations showed us that a huge amount of energy would be needed. We wouldn't be in a position to disturb the rotational field to a sufficient extent." Glenn started to study the development of tornados in more detail. He came upon scientists who believe that lightning flashes are responsible for these whirlwinds and supply them with energy. "We think that the development of a tornado and its duration are influenced by the lightning flash. If we could prevent or interrupt the phase when these factors bring about the storm, if we could in some way stop or weaken it, maybe we could prevent a tornado from forming." In order to interrupt the process at its beginning, Glenn imagines a seeding of the inner region of the whirlwind with microscopically small particles. He considers using flue ash, a valuable bi-product of the incineration industry. As opposed to silver iodide with which clouds are seeded to make it rain, these minute insulators would not cause rain. "We avoid the final phase in tornado-formation and make a short-circuit."

While experts like Glenn are applying their knowledge in the field of nanotechnology against tornados, other scientists are turning their attention to a still greater challenge for climate research: global warming. Anyone who has experienced the power of a tornado will know how destructive it can be. And weather experts predict that worse is yet to come. In the American state of Oklahoma *the number of tornados has risen by 400% since 1945.* While global warming has now come to be seen as a catastrophic phenomenon, scientists 100 years ago could only see it as beneficial. "It was proposed more coal should be mined. Through the burning of more fosssil fuels the planet could be wanned up and agriculture could be extended further northwards. There would be more food for the growing population. Entirely positive!"

But the idea of changing the Arctic into a green garden through burning fossil fuels did not last long. [Spencer Weart:] "In the mid-fifties it looked as though, with the atomic bomb and chemical pollutants, we would more likely be turning green gardens into deserts. We no longer saw ourselves surrounded by a lush green that could hardly be checked in its growth, but rather as a potential risk to nature whose survival we must fight for by all possible means." Signs of global warming can be seen everywhere. "The present consensus - I stress: a consensus with which nearly all scientists, even the eternal sceptics, agree - is that the earth will grow distinctly warmer over the next 100 years. This change will not be a steady, continuous one. Somewhere in the next 100 years there will be a sudden jolt in the system."

The great challenge of the coming years would be to contain the effects of the environmental damage that has occurred so far. No wonder there are many geo-technical projects aimed at solving this problem. One model, for example, envisages the spraying of large quantities of special dust into the upper layer of the earth's atmosphere in imitation of a mighty volcanic eruption. When a volcano erupts it discharges ash particles into the atmosphere. These particles reflect the sunlight and prevent it from reaching the earth. In this way there would be a rapid cooling of the earth's surface. [David Keith, Carnegie-Mellon University:] "We saw how quickly the earth cooled within a year, after the eruption of Pinatubo. Since 1965 it has been proposed that one should scatter dust in the stratosphere in order to cool down our planet. This would be no solution to global warming, but it shows that there is a continuous attempt to

manipulate the earth by simple means." One of these simple means is also *the condensation trails of jet aircraft,* so a number of experts believe.[2] Others want to fertilize the oceans with iron, thereby increasing the phytoplankton. *This* could then absorb larger quantities of carbon dioxide and sink to the seabed, thus preventing global warming. [Weart:] "These pioneers are promising us an ice age." Another simple solution involves the best carbon dioxide destroyer on earth: the trees. In a similar way to the oceans, they can also store up carbon dioxide. They filter it out of the air and bind it into their cell structure. [Keith:] "Carbon in a plant occurs in different forms. Lignin is a compound which decomposes in the earth very slowly. If you raise the lignin content by means of genetic technology, the plant can absorb more carbon." The idea of genetically modified trees may seem uncanny, but many scientists believe that *radical solutions are necessary to deal effectively with* global warming.

Failing this, research could find itself with a still more difficult task: *to make the planet that is closest to us habitable.* Some people are already working at this problem. [Chris McKay, Nasa scientist:] "We are looking around in our solar system. Mars is a good candidate." The idea of transforming Mars, changing its weather and creating almost out of nothing an atmosphere similar to ours, is not so far-fetched. "The problem is: *in order to live oo Mars, it would first need to be warmed up. We know how is is achieved.* We are experiencing it on the earth. Here it is certainly not a good idea, but on Mars it would be important. It would be conceivable to pump into the Mars atmosphere the kind of greenhouse gases we blow into our own atmosphere. Our calculations show that one would have to warm up Mars by 20 degrees centigrade with greenhouse gases. Once we had done that everything else would be straightforward."

The polar caps on Mars contain gigantic quantities of frozen carbon dioxide and water, the fundamental building bricks of life. If the water bound up in the polar regions were to melt, huge seas would be created. For Nasa researchers like Chris McKay the idea that human beings will one day live on Mars is not a dream, but *sheer necessity.* But would the different nations be able to work together on a project of this magnitude and would we have the right in the first place to change Mars according to our wishes and needs?

"Ought we to do it, assuming we can? A good comparison is resuscitation. You walk along the road and someone falls over. You revive him and he lives on. You haven't created a human life, but you have brought someone back to life again. This is a *fitting metaphor for Mars.* Others may see it differently, and *imagine perhaps that we have no right to alter the universe,* that there is a sign over everything saying: Don't Touch! But personally I think that the value of a life counts for more. The universe must not be conserved, but made green. And *we are the gardeners."* But if we are gardeners, shouldn't we begin in our own garden? "Seen from a *higher level, we must intervene in climatic events.* There are too many people, and the effect of this is so great *that we cannot possibly leave the earth to its own devices.* We have no other option." "Whether we like it or not, *we have changed the atmosphere.* We have to live with this. *We must act now."*

Fertilizing the seas, sending radio waves into the atmosphere, covering the ocean surface with polymers, steering tornados. None of these sound far-fetched any longer, and yet there remains a central question *whose answer could lead to a golden age or into total destruction and the end of our species.* If one day we control the weather: what will we do with it?

(Production: Discovery Channel; author: Josh Rosen; German adaptation: Ute Rennig)

Translator's Note:

This article appeared in *Symptomatologische Illustrationen,* an Anthroposophical magazine published by W. Lochmann in Basel/Switzerland..

Herr Lochmann concluded his introductory words with the following quote from a lecture given by Rudolf Steiner on 6th Oct. 1917 (GA 177):

"From our time onwards the elementary beings of birth and death are becoming *the servants of technology, industry, of the commercial activity of man ... [They* are] *hostile towards all that the human being seeks and desires here on earth as his welfare and his well-being."*

... and with words spoken by Baronet Moses Montefiore at an international council of leading world politicians in Cracow in around 1880:

"What nonsense you are speaking! So long as we do not have the press of the entire world in our hands, all that you do is in vain. We must influence the newspapers everywhere in order to *deceive and befog* the peoples of the world." (Quoted in: Karl Heise - *Entente-Freemasonry and World War,* p. 35)

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[2] This is obviously a reference to 'Chemtrails', which officially do not exist, but by means of which according to secret plans global warming is to be stopped, but which will in fact (or in addition) ruin everyone's health.