An Innovative Method of Weather Modification

Roberto Maglione, Cristian Sotgiu

Biometeorology and Space Medicine Institute, Ludes University, Lugano, Switzerland

This paper was presented at the VII International Conference on Cosmos and Biosphere: Cosmic Weather and Biological Process, October 1-6, 2007, Sudak, Crimea, Ukraine

Abstract

First experimental studies of cloud and fog seeding date back to 1919, where Altberg and colleagues at the Central Physical Observatory in Leningrad started experiments both with ice nucleation in supercooled water and with snowflakes growth; on lab fog production; and on cloud seeding with electrically charged sand. In 1934 the Dutch Veraart performed the first studies on seeding clouds with dry ice. Later on in the 1950s, Vonnegut performed the first experiments by seeding clouds with silver iodide with good results.

In the last decades, several operations aimed at producing precipitation, controlling hail damage, dispersing of supercooled fog and clouds over airports, and dispersing clouds cover over large areas were carried out by using chemical agents. Diverting hurricanes path was also performed. However, many often the results that were obtained were contrasting and also sometimes an inversion of the tendency in weather conditions was observed with period of intense drought in areas where rainmaking experiments were previously carried out.

In parallel, in the 1950s the Austrian scientist Wilhelm Reich started investigating and experimenting a new method of weather modification aimed at restoring the natural functioning of the atmosphere characterised by periodic cycles of rain and clear weather. The fundamental principle of this method, that was called *Cloudbusting*, is based on the presence in the atmosphere of a pulsatory cosmic energy (called orgone energy) postulated to be responsible for major atmospheric phenomena. An energy that presents many similarities with dark energy such as a very low density and a homogeneous distribution in the cosmos, filling all void spaces.

Acting on the energetic potential that characterizes a particular area of the atmosphere, pre-existing atmospheric conditions, whatever they are, can be changed: one can make rain or snow, dissolve clouds, divert the path of hurricanes, create winds and hence decrease temperatures, lower smog, eliminate drought, abate desertification, etc. No particular chemical additives or sophisticated methodologies are needed as instead required for the traditional weather modification techniques.

Between 1952 and 1957, Reich carried out in the United States numerous operations, mostly aimed at producing rain in area suffering the drought. In one case, he intervened to weaken and divert the path of the hurricane Edna, that was threatening the Maine, along the Atlantic Ocean. All the time he obtained the expected results.

In the post-reichian period, many scientists replicated the experiments and confirmed the results obtained by Reich both in North America, Europe, and Africa. Amongst them Blasband, Eden, Senf, and DeMeo stand out. They performed operations in the driest and most desertic areas of the planet, such as the desert of Arizona, Namibia, Eritrea, and Israel.

In 80% of the rainmaking operations rainfall was obtained with statistical significance or not predicted by the weather forecast, with a reduction of drought and desertification. In other cases they succeeded to produce snow in mountainous areas (for tourist purpose), to put out large summer fires and divert the path of the hurricane Doria (1967).

Cloudbusting methodology can be considered as a valid alternative to the currently-used technologies for weather modification, intended as the recovery of the natural functioning of the atmosphere, above all in atmospheric conditions where no pre-existing clouds are available for seeding.

Further theoretical and experimental studies by satellite, aimed at a general validation and a more accurate use of the technology, are needed.

Introduction

Cloud seeding is perhaps to date the most widespread method for weather modification. It includes rain production, hail damage control, fog and cloud dispersion. It implies the use of chemical agents such as dry ice or silver iodide and the seeding is generally performed by aircraft on convective clouds.

First experimental studies of cloud and fog seeding date back to 1919 where Altberg, Obolenskii and, few years later, Vitkevich and Veinberg started experiments at the Central Physical Observatory of Leningrad, Urss, both with ice nucleation in supercooled water and snowflake growth; experimental production of fog in the lab; and electrically charged sand as material for seeding [1-3]. However, the experiments with electrified ordinary sand failed to produce significant results. Later on, Krasikov experimented with stimulation by means of strongly hygroscopic calcium chloride, that was introduced both from the ground and from aircrafts. Also in these experiments the obtained results were of no practical significance.

In the 1930s Veraart in Holland discovered that raindrops form more quickly when ice crystals are present in the clouds. He saw each seeded crystal artificially introduced into the cloud functions as a catalyst for the aggregation of ice or small drops, until snow crystals or raindrops have formed that are heavy enough to fall to the ground. Veraart carried out four successful experiments on cloud stimulation by seeding the clouds with dry ice and supercooled water, which remains in a liquid state even at temperatures lower than the freezing point.

In the 1950s Schaefer and Langmuir[4], in the Usa, and Nikandrov and Chuvaev[5, 6], in the Urss, carried out seeding tests with positive results on convective clouds aimed either at producing rain or suppressing thunderstorms.

A short time later, Vonnegut[7] replaced dry ice with certain iodine compounds and especially silver iodide, which has a similar crystalline structure, but is much cheaper, to seed clouds with results very close to those obtained with dry ice.

In the same period the Austrian scientist Wilhelm Reich conceived a method, called *Cloudbusting* to influence the conditions and the concentrations of a new form of atmospheric energy, that he wanted to name orgone. He found out that this energy could be responsible for the meteorological phenomena and climatic conditions. This assumption was based on the principle that the Earth's atmosphere, as well as the cosmos in general, is not empty but is filled with this orgone energy. It should be pointed out, however, that this assumption, fundamental for the development of this method, has not yet been accepted by current conventional physics, which largely bases its convictions on the principles of Einstein who postulated an empty universe devoid of energy[8]. However, orgone energy presents many similarities with dark energy, whose presence in the cosmos has been recently hypothesed by scientists observing the behavior of type-Ia supernovae. Dark energy, like orgone energy, is characterized by a very low density and a homogenous presence in the cosmos so as to fill all empty spaces.

Reich conceived of cloudbusting as a method of reestablishing natural atmospheric functions and rains within dry, arid or desert areas, something which requires a spontaneous motion of orgone energy with natural charge and discharge phases, and periodic cycles of precipitation and clear weather. It is essentially possible through intervention to beneficially influence, or negatively disrupt, the atmospheric phenomena which characterize the climate of a certain area, and which are dependent, to a greater or lesser extent on the interactions of orgone energy, oxygen, water vapor, rain, sun, and wind.

The method is based on the orgonomic potential law that establishes orgone energy flows from a lower to a higher potential (Fig. 1). Varying the energetic orgone potential of the atmosphere, through the use of an apparatus called cloudbuster, one can create the conditions to restore natural rains, to influence winds and lower the rate of atmospheric pollution, to eliminate fog and affect humidity, and to divert hurricanes.

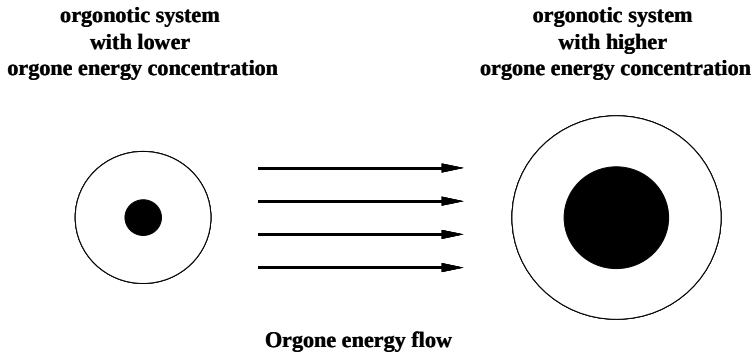

Figure 1 – Orgonomic potential law

Cloudbusting is different in substantial ways to traditional weather modification, and also presents numerous advantages over traditional methods. It does not require chemical substances to bring about changes in meteorological conditions. The technique can be applied under nearly any conditions, which is not possible with cloud seeding, as that always needs a cloud coverage with certain preexisting characteristics.

Experiments and Results

First systematic experiments of cloudbusting for the production or the prevention of rain were performed by Reich in the United States in the period from 1952 to 1957.

Many of these operations took place in Maine[9-13]. Others were performed near different cities along the Atlantic Coast[14], such as New York, Philadelphia, Washington, and Savannah. His most important and long-term experiment was carried out near Tucson, in the desert of Arizona[15].

On one occasion, he intervened to weaken hurricane Edna, which was threatening the coast of Maine, and successfully deflected its course out towards the Atlantic Ocean[16]. In a final case, he carried out an operation to delay the rain that was brewing over the whole area of Rangeley, to help realize a parade organized for the children of the area[17].

In all the experiments, Reich obtained the intended results. These were evaluated on the basis of the official weather forecast for the day of the experiment. To strengthen the obtained results, an operation was only scheduled when the weather forecast had predicted no rainfall for at least two successive days. In more complex operations, such as those fighting droughts along the Atlantic coast and in the desert of Arizona, or to divert the course of hurricane Edna, the official precipitation data supplied by the US Weather Bureau was consulted.

In the following decades experiments were replicated worldwide by independent scientists such as Eden, Blasband, Senf, and DeMeo. The work of these scientists was aimed above all to check the reliability of the method when used to produce rain in the most arid and harshest deserts of the world such as the Sahara[18], and the Kalahari[19], in Africa, and the Arizona[20], in the Usa. In other cases they succeeded to produce snow for tourist purpose, to put out large summer fires and divert the path of the hurricane Doria (1967)[21].

In these last years many experiments were performed worldwide. Amongst these we find the Desert Greening Project that was carried out by DeMeo in November 1991 to bring rain in Israel and Greece[22]. The operations were started on 15th November and concluded on 24th November. In Israel the rain started to fall on 27th November. Persistent rain was also registered in Lebanon, Cyprus and Turkey. The mountains of Turkey, Cyprus, Syria and Lebanon registered unexpected and abundant snow. Jerusalem registered a record of 16 inches of snow while in Amman in Jordan 24 inches fell. Much snow fell even on some parts of the Negev desert, which can be found against the Sahara. The enormous quantity of water that fell on the countryside in the following weeks created numerous small lakes while Lake Kinneret (Sea of Galilee) threatened to overflow. The agriculture benefited from this abundant rain and a higher production was recorded the following year. The abundance of fruit and vegetables was so high that in a few months the prices on the Israeli market had dropped by 14.3%, which caused a record drop of 0.4% in the cost of living, after 23 years. Figure 2 reports one of the rain-producing apparatus at work on the shore of Lake Kinneret. From the picture it can be seen the increased height of the water level in early February 1992 as compared to the condition in late November 1991 as a consequence of the abundant rain.

Figure 2 – Desert Greening Project (Israel and Greece). Rain-producing apparatus at work on the shore of Lake Kinneret (Sea of Galilee), Tiberius, on 17th November 1991 (left). The photo (right) shows lake Kinneret in early February 1992, after some months of good rain.

In the Green Sea Eritrea 5-year Project (1994-1998)[18], carried out by DeMeo to produce rain in Eritrea, rains were so abundant, both in the Country and in the surrounding areas, after 30 years of drought, that artificial lakes formed in the desert, near the Aswan's dam, that was not documented before. As a consequence of the large amount of rain fallen over Eritrea in that period, the government observed a dramatic reduction of the expenses in food import from about 100 million of US dollars to around 40 million per year.

Recently Senf and Abdellaziz planned a long-term project (the El-Hauoita Project) in the desert of Algeria to green and restore the area located in the Laghouat region for agriculture purpose[23]. Operations started in 2004 with the aim to gradually increase the humidity, and then to produce rain to turn and restore the land. They obtained a very good response from the atmosphere and after few months from the beginning of the operations a good humidity increase was observed all over the area (Fig. 3). This was followed by a gradual restoring of the desertic land that was gradually turned into a fertile and cultivable land with courgette, French bean, fig, orange, and apple plants (Fig. 4).

Figure 3 – El-Haouita Project (Algeria). Desertic land after few months from the start of the operations.

Figure 4 – El-Haouita Project (Algeria). Vegetable cultivation after two years from the start of the operations.

Discussion

The application of cloud seeding to produce large clouds to increase precipitation is above all limited to convective (cumulus) type clouds, even though some studies on cloud modeling reported in the literature pointed out the possibility of stimulating the formation of embedded convective clouds in stratiform clouds[24-26]. The scientific basis are founded on the hypothesis either that natural cloud precipitating efficiency, intended as the percentage of condensated water within a cloud system that reaches the ground as precipitation, can be increased (static seeding) or that cloud development can be induced to produce bigger, and more productive clouds (dynamic seeding). Clouds development might be enhanced through the release of latent heat by ice-phase cloud seeding to promote substantial cloud growth in some marginal clouds. With cumulus clouds, it has been observed in-cloud temperature increases of a few tenths of a degree centigrade can sometimes cause significant increases in cloud growth, as a consequence of more cloud buoyancy and uplifting. However, even though dynamic seeding can produce sometimes large percentage effects from individual cumulus clouds, the overall impact on regional and seasonal precipitation is pretty limited. Further cloud seeding can, in certain cases, promote or intensify the development of more convective clouds so as to create multicell cloud complexes. However, this phenomenon does not occur many often and the understanding of the linkages is not clear yet.

In parallel, the understanding of the suppression or amelioration of severe storms as well as the suppression of hailstorms, hurricanes, tornadoes, and lightning is not as well theoretically grounded and developed as that for precipitation increases.

Cloudbusting does not imply neither the use of chemical agents, such as cloud seeding does, nor the supply or injection of any traditional form of energy in the atmosphere. The positive and statistically significant results obtained up to now from field experiments have confirmed that new and perhaps unknown phenomena are to be assumed as basic functioning principles of cloudbusting.

Since generally the building-up and the evolution of a cloud system takes place during or sometimes after the end of an operation aimed at producing rain it is to be supposed that the

formation of the cloud system, even in conditions where no clouds are available in the atmosphere, should be addressed both to the rain-producing apparatus and the procedure used. Therefore it is to be supposed that a new mechanism should be at work in the formation of the cloud system, that sometimes can extend up to some hundreds kilometers. A mechanism that might be based on the variation of the potentials of the (orgone) energy present in the atmosphere, as speculated by Reich, due to a particular new form of events linkage and phenomena to date still unknown.

Therefore this new technology still needs of further theoretical and satellite-monitored field studies to accurately investigate the functioning principles and the evolution of the phenomena behind when the apparatus is at work. And, from the beginning of the operation until to the full development of the precipitation, monitoring the behavior of and finding a relationship between winds and cloud systems formation, atmospheric pressure and temperature structure, and the amount of moisture available are needed in order to make clearer and more effective the use of this technology.

Conclusion

The cloudbusting technology can be used to restore the natural functioning of the atmosphere characterized by periodic cycles of rain and clear weather. Hence it can be utilized to create winds, produce rain and snow, as well as divert hurricane. It may be considered as a valid alternative to the currently-used technologies for weather modification above all in atmospheric conditions where no pre-existing clouds are available for seeding.

Its effectiveness has been proved over the years by field experiments and rain was obtained even in the most arid and harshest deserts of the world reducing desertification advancement and gradually restoring the land above all for agriculture purposes.

Further theoretical studies and field experiments monitored by satellite, aimed at a general validation of the cloud system build-up and evolution, and for a more accurate use of the device, are required.

Acknowledgment

The authors would like to thank Bernd Senf and Madjid Abdellaziz for the permission to use the material related to the El-Haouita Project. They also wish to thank James DeMeo for his suggestions in writing this paper.

References

1. Zikeev NT, Doumani GA, Weather Modification in the Soviet Union, 1946-1966. Library of Congress, Washington, 1967
2. Borovikov AM, Gaivoronskii LI, Zak EG, Kostarev VV, Mazin IP, Minervin VE, Khrgian AK , Shmeter SM, *Cloud Physics*, Israel Program for Scientific Translations, Jerusalem, 1963
3. Veinberg BP, The Theory of Precipitation of Clouds by Seeding with Electrified Sand, Zhurnal Russkogo Fiziko-Khimicheskogo Obshchestva, Vol 6, no 5-6, 1925

4. Langmuir I, Analysis of the Effects of Periodic Seeding of the Atmosphere with Silver Iodide, in *The Collected Works of Irving Langmuir*, Vol. 11, Cloud Nucleation, Pergamon Press, New York, 1961
5. Chuvaev AP, Conditions Favorable for the Artificial Stimulations of Precipitation, Meteorologya i Gidrologya, no 11, 1956
6. Chuvaev AP, Modern Possibilities of Preventing Storm and Hail, Trudy GGO, no 74, 1957
7. Schaefer VJ, Silver and Lead Iodides as Ice Crystals Nuclei, J Met , Vol 11, no 5, 1954
8. Maglione R, *Wilhelm Reich and the Healing of Atmospheres: Modern Techniques for the Abatement of Desertification*, Natural Energy Works, Ashland, Oregon (USA) 2007
9. Reich W, *OROP Rangeley, August 1-2, 1952*, CORE, Vol VI, no 1-4, Orgone Institute Press, Maine (USA), July 1954
10. Reich W, *OROP Ellsworth, July 5-6, 1953*, CORE, Vol VI, no 1-4, Orgone Institute Press, Maine (USA), March 1955
11. Reich W, *OROP Orgonon, July 23, 1953*, CORE, Vol VI, no 1-4, Orgone Institute Press, Maine (USA), July 1954
12. Reich W, *OROP Boston, September 2, 1953*, CORE, Vol VI, no 1-4, Orgone Institute Press, Maine (USA), July 1954
13. Reich W, *OROP Galactic Stream, Hancock, October 22, 1953*, CORE, Vol VI, no 1-4, Orgone Institute Press, Maine (USA), July 1954
14. Reich W, *OROP Drought Atlantic Coast - Summer 1954*, CORE, Vol VII, no 1-2, Orgone Institute Press, Maine (USA), July 1954
15. Reich W, *Expedition OROP Desert Ea. DOR Clouds Over the USA*, CORE, Vol VII, no 1-2, Orgone Institute Press, Maine (USA), March 1955. See also Reich W, *Report of OROP Desert Ea Survey of Tucson Area. September 18, 1955*, CORE, Vol VII, no 3-4, Orgone Institute Press, Maine (Usa), December 1955; and Reich W, *Contact with Space*, Core Pilot Press, Rangeley (USA), 1957
16. Reich W, *OROP Hurricane Edna*, CORE, Vol VII, no 1-2, Orgone Institute Press, Maine (USA), March 1955
17. Reich W, *OROP Children's Parade, August 8-9, 1953*, CORE, Vol VI, no 1-4, Orgone Institute Press, Maine (USA), July 1954
18. DeMeo J, Green Sea Eritrea: a 5-year Desert-Greening CORE Project in the SE African-Sahel, Pulse of the Planet, Vol 5, Natural Energy Works, Ashland, Oregon (USA), 2002. See also the following website www.orgonelab.org
19. DeMeo J, *Research Reports & Observations. OROP Namibia 1992-1993*, Pulse of the Planet, Vol 4, Natural Energy Works, Ashland, Oregon (USA), Summer 1993. See also Senf B, *Die Wiederentdeckung des Lebendigen. Erforschung der Lebensenergie Durch Reich, Schauberger, Lakhovsky, u.a.*, Omega Verlag, Frankfurt, 1996
20. Blasband R, DeMeo J, *CORE Progress Report 21*, Journal of Orgonomy, Vol 23, no 2, Orgonomic Publications Inc, New York, November 1989. See also DeMeo J, *CORE Progress Report 22. OROP Arizona 1989: Part II*, Journal of Orgonomy, Vol 24, no 1, Orgonomic Publications Inc, New York, May 1990; and DeMeo J, *CORE Progress Report 23. OROP Arizona 1989: Part III*, Journal of Orgonomy, Vol 24, no 2, Orgonomic Publications Inc, New York, November 1990; and DeMeo J, *OROP Arizona 1989: a Cloudbusting Experiment to Bring Rains in the Desert Southwest*, Pulse of the Planet, Vol 3, Natural Energy Works, El Cerrito (USA), Summer 1991
21. Blasband RA, *OROP Hurricane Doria*, Journal of Orgonomy, Vol 6, no 1, Orgonomic Publications Inc, New York, May 1972
22. DeMeo J, *CORE Progress Report 30: The Desert Greening Project in Israel 1991-1992*, Journal of Orgonomy, Vol 26, no 2, Orgonomic Publications Inc, New York, Fall/Winter 1992. Also in DeMeo J, *OROP Israel 1991-1992. A Cloudbusting Experiment to Restore Wintertime Rains to Israel and the Eastern Mediterranean During an Extended Period of Drought*, Pulse of the Planet, Vol 4, Natural Energy Works, Ashland, Oregon (USA), 1993
23. For further information on the El-Haouita Project see the following website www.desert-greening.com
24. Committees on Weather Modification and Climate and Weather Change of the Irrigation and Drainage Division, American Society of Civil Engineers, *Guidelines for Cloud Seeding to Augment Precipitation*, Published by ASCE, New York, 1995
25. Braham RR, *Precipitation Enhancement - A Scientific Challenge*, Meteorological Monographs, 21, AMS, Boston (USA), 1986
26. Dennis AS, *Weather Modification by Cloud Seeding*, International Geophysics Series, 24, Academic Press, New York (USA), 1980