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Subject:	WEATHER MODIFICATION NOT CLIMATE CHANGE PDF FILE NO. 2
Date:	May 26, 2024 9:35:44 AM
Attachments:	WEATHER MODIFICATION PDF FILE NO. 2 MAY 22, 2024.pdf

ATTENTION: REGIONAL DISTRICT CHAIRMAN OF THE BOARD, ALL DIRECTORS, CAO, ETC.

Good Day

Please NOTE this is PDF File No. 2 - the Patent information contained in this file has been UPDATED to include missing years up to 2023.

This is for information purposes and I hope that the documentation will assist you with your search for the truth regarding this issue.

Respectfully submitted

Nora Maddocks
A very concerned senior citizen

WEATHER MODIFICATION TIMELINE AND MANIPULATION BY HUMANS

PDF FILE NO. 2

FILE NAME WEATHER MODIFICATION NEWSPAPER INDEX MAY 2024

WEATHER MODIFICATION NEWPAPER VAULT

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23. Weather Modification misinformation plagues WEF – Page 97-99

24. Weather Modification Technologies – Page 100-101

25. Weather Modification History Newspaper and Journal Vault - 1800's to present.

26. Mysterious Cloud covers over half of the world.

27 **May 14, 1980** Winnipeg tests of 1953 create a cloud of concern.

28. **March 2, 1980** - Portrays Possibility of Using Weather Warfare.

1979

29. **February 21, 1979** - Project Stormfury - NOAA

30. **1979** - Hurricane Rosa and Kerry.

31. **March 13, 1979** - Weather may be unnaturally severe because of unnatural modification.

32. **April 20, 1979** - Stormfury Australia - NOAA Team.

33. **April 20, 1979** - USSR May be developing TESLA theories to Control Climate.

34. **April 20, 1979** - List of participants in Stormfury Australia.

35. **October, 1979** - National Oceanic and Atmospheric Administration.

36. **November, 1979** - Seeding to modify hurricanes.

37 **December 10, 1979** - CIA's Manhattan tests on New Yorkers? Germ warfare?????? Drugs warfare????

1978

38. **February 2, 1978** - Weather in a can.

39. **February 9, 1978** - Jets 'may affect the weather'.

40. **May 1978** - 5 Aircraft fitted special equipment to allow them to seed budding hurricanes with silver oxide and dissipate high winds.

41. **July 2, 1978** - China to step up Weather Research.

42. **July 3, 1978** - USSR Secretly controlling climate.

43. **July 13, 1978 -** Weather Modification caution urged.

44. **September 7, 1978** - Hurricane seeding back on air.

45. **October 1978** – Weather Modification Advisory Board presents Report - Weather Control Efforts Advised.

46. **October 30, 1978** - Barium released in Alaska traced south.

47. **October 21, 1978** - NASA Creates Clouds over Alaska in conducting weather experiments.

48. **December 7, 1978** - Control Over Weather seems within 10 years.

1976

49. **June 10, 1976** - Weather Modification Excerpts page of Guidelines for Reporting and Conduct.

50. **October 30, 1976** – Canadian Law suit continues.....

1974

51. **1974** - Weird Science to make rain - Popular Science Monthly.

1973

52. 1973 – Weather Modification Next Weapon

1970

53. **1970** - In deflecting hurricanes "where do we aim them?"

54. **January 1969** - International implications of Weather Modification.

55. **April 1969** - Great Lakes snow production - Lake Erie

56. **April 1969** - Florida Cumulus Seeding project - seeding clouds grew explosively.

57. **April 1969** - Cloud Seeding in cumulus clouds, where isolated explosive growth can cause severe thunderstorms or even tornadoes.

58. **November 13, 1969** - Weather wars said possible "each side would try to send drought and flood-causing storms to disrupt the enemy."

59. **May/June 1969** Sunshine they have. How they increased rainfall in the targeted areas in the Santa Clara Valley.

60. **August, 10, 1969** - First Big Attempt to tame Hurricanes termed a success.

61. **August 19, 1969** - Seeding is success in taming hurricane Debbie

62. **November 13, 1969** - Weather wars said possible "each side would try to send drought and flood-causing storms to disrupt the enemy."

63. **November, 14, 1969** - Biologists predict disaster in Man's Abuse of Nature.

1968

64. **February, 13, 1968** - Super Planes exhaust particles may cause melting of Polar Ice.

65. **May 3, 1968** - AMS Weather Modification Conference "Large Scale Weather Modification."

66. **October 1968** - Bulleting of Atomic Science and rain making.

67. **November 20, 1968** - Cloud Seeder Battles Blizzards.

1967

68. **January 30, 1967** - NASA to study cloud strata experiment in Manitoba and Alaska. Launch 18 rockets total. 12 rockets release sodium vaports and timethyle aluminum over Manitoba.

69. **January 1967** - Outer Space Treaty provides in Article 9, that...

1966

70. **March 15, 1966** - Dust may spell man kinds doom.

71. Men in 16 Nations now tinkering ti the weather with serious ambitions - such as "modify major weather systems.

72. **September 1966** – Barium Release

1965

73. **June 26, 1965** - Operation "umbrella" bans artificial rain - Canada.

74. **August 1965** - Army Meteorologist resigns to head Weather Bureau unit.

75. **August 7, 1965** - Life was a big drizzle in parts of Quebec until the ladies of declared an all out war on rain making. Canada.

Interesting side Note: He came from Germany in 1949 under the "paper clip" agreement which enabled German scientists to continue their work. He is presently a member on the "Committee on Cloud Modification."?????

Could this all be part of the establishment of the New World Order and WEF?

1964

76. **March 28, 1964** - Not Cirrus-ly.

77. **June 15, 1964** - 178 farmers of Washington County and immediate area Operation rain will start tomorrow.

78. **October 1, 1964** - US Accused of "Arming" Weather .... "turn the weather into weapons more powerful than atomic bomb".... "US scientist to work out ways of changing the course of hurricanes.

79. **October 15, 1964** - The Federation of Saquenay Farmers Catholic Union intends to take court actions against those responsible for experiments which provoked excessive rainfall.....

1963

80. **October 1963** - Electronic Weather Control - Now we have the technical means to modify weather.

1959

81. **January 20, 1959** - It's possible control of weather next war weapon

82. **January 31, 1959** - Air Force gives village (Palm Springs) 2 choices - live with the Trails or move.

1958

83. **April 5, 1958** - Cloud seeding suspended by Soggy Ventura County "made notes of a series of heavy storms....

84. **September 15, 1988** State and others sued over flood damage to personal property and real estate during the Christmas-time flood of 1955.

85. **December 6, 1958** - Dark Sky Riders - Jet trails dim sun, Palm Springs gripes.

1956

86. **March 9, 1956** – Ulster Rainmaker flood suit on Supreme Court Calendar, "suffered great damage in same flood t hat of November 25, 1950. In that flood bridges and roads were damaged and the county sees to recover....

87. **September 10, 1956** - "Awful" Climate War foreseen. A member of the Atomic Energy Commission (AEC) predicts " that nations within a few

decades will achieve global climate control" raising the "awful" prospect of weather warfare.

Note: Here we are in 2024 and the United Nations and the WEF are using a false claim of Climate Change against us when they are using the CONTROL of the weather against us. Just as predicted above.

1955

88. **April 29, 1955** - Blames Air Force for floods. "The man who fathered the science of making rain said Thursday he believed armed forces experiment may have caused the disastrous Missouri Valley floors of June 1952." "We had been seeding for some time and the storms kept getting bigger and better". Please **READ** article for whole story - 2min read but important to understand how this can happen.

89. **March 30, 1955** - Farmers to buy more (55) rainfall in Saskatchewan.

90 There is **NO CLIMATE EMERGENCY**. Note: Our weather patterns are all man made- just look up in the sky at the numerous chemical trails.

91. **April 11, 2024** – US States lead in BLOCKING Feds/UN/WHO edict – weather warfare.

92. **March 15, 2022** – Aircraft "cloud seeding" was done over NorCal this am.

93. **April 13, 2024** – Really how stupid to they think we are?

WEATHER MODIFICATION UNITED STATES PATENTS 1891 TO 2023

0462795	July 16, 1891	Method of Producing Rain-Fall
0803180	Oct. 31, 1905	Means for Producing High Potential Electrical Discharge.
1103490	Aug. 6, 1913	Rain-Maker
1225521	Sept. 4, 1915	Protecting From Poisonous Gas In Warfare
1279823	Sept. 24, 1918	precipitation by Coalescence of Aqueous Particles Contained in the Atmosphere Process and Apparatus for Causing
1284982	Nov. 19, 1918	Process and Apparatus for Procuring and Stimulating rainfall.
1338343	Apr. 27, 1920	Process And Apparatus For The Production of Intense Artificial Clouds, Fogs, or Mists
1358084	Nov. 9, 1920	Method of Producing Fog-Screens
1619183	Mar. 1, 1927	Process of Producing Smoke Clouds From Moving Aircraft
1665267	Apr. 10, 1928	Process of Producing Artificial Fogs
1892132	Dec. 27, 1932	Atomizing Attachment For Airplane Engine Exhausts
1895765	Jan. 31, 1933	Artificial Production of Fog
1928963	Oct. 3, 1933	Electrical System And Method
1957075	May 1, 1934	Airplane Spray Equipment
1993316	Mar. 5, 1935	Apparatus for and Method of Producing Oil Fog
2052626	Sept. 1, 1936	Method of Dispelling Fog
2097581	Nov. 2, 1937	Electric Stream Generator – Referenced in 3990987
2068987	Nov. 2, 1937	Process of creating fog.
2173756	Sept. 19, 1939	Process of Producing Fog or Mist by Partial and Flameless Combustion
2160900	1939	Method of vapor cleaning

2257360	1941	Desensitized and pentaerythritol tetranitrate Explosives
2232728	1941	Method and composition for dispelling vapor
2352677-	July 4, 1944	Artificial Fog Production
2476171	July 18, 1945	Smoke Screen Generator
2409201	Oct. 15, 1946	Smoke Producing Mixture
2395827	1946	Airplane spray unit (US Dept Agr.)
2480967	Sept. 6, 1949	Aerial Discharge Device
2476171	1949	Smoke Screen Generator
2527230	Oct. 24, 1950	Method of Crystal Formation and Precipitation
2527231	Oct. 24, 1950	Method of Generating Silver Iodide Smoke
2570867	1951 (Gen. Electric)	Method of crystal formation and precipitation
2550324	April 24, 1951	Process For Controlling Weather
2582678	June 15, 1952	Material Disseminating Apparatus For Airplanes
2611992	Sept. 30, 1952	Engine Exhaust Operated Fluent Material Distributor
2614083	Oct. 14, 1952	Metal Chloride Screening Smoke Mixture
2591988	1952	Production of TI)2 pigments (DuPont)
2633455	Mar. 31, 1953	Smoke Generator
2688069	Aug. 31, 1954	Steam Generator – Referenced in 3990987
2721495	Oct. 25, 1955	Method And Apparatus For Detecting Minute Crystal Forming Particles Suspended in a Gaseous Atmosphere
2730402	Jan. 10, 1956	Controllable Dispersal Device
2903188	Apr. 2, 1956	Control of Tropical Cyclone Formation
2756097	July 24, 1956	Process for Weather Control
2801322	July 30, 1957	Decomposition Chamber for Monopropellant Fuel.
2835530	May 20, 1958	Process for the Condensation of Atmospheric

		Humidity and Dissolution of Fog
2871344	Jan. 27, 1959	Long Distance Communication System
2881335	Apr. 7, 1959	Generation of Electrical Fields HAARP –for recharging clouds.
2908442	Oct. 13, 1959	Method For Dispersing Natural Atmospheric Fogs And Clouds.
2903188	1959	Control of tropical cyclone formation.
2962450	Nov. 29, 1960	Fog Dispelling Composition
2963975	Dec. 13, 1960	Cloud Seeding Carbon Dioxide Bullet
3019989	Feb. 6, 1962	Atmospheric Space Charge Modification containers silver iodate, ammonium nitrate, mitrocellulose and nitrate esters.
2986360	May 30, 1962	Aerial Insecticide Dusting Device
3046168	July 24, 1962	Chemically Produced Colored Smokes
3044911	1962	Propellant system.
3056556	Oct. 2, 1962	Method of Artificially Influencing the Weather
3126155	Mar. 24, 1964	Silver Iodide Cloud Seeding Generator (Main commercial ingredient)
3127107	Mar. 31, 1964	Generation of Ice-Nucleating Crystals
3131131	Apr. 28, 1964	Electrostatic Mixing in Microbial Conversions
3140207	July 7, 1964	Pyrotechnic Composition.
3120459	1964	Composite incendiary powder containing metal Coated oxidizing salt.
3174150	Mar. 16, 1965	Self-Focusing Antenna System
3234357	Feb. 8, 1966	Electrically Heated Smoke Producing Device
3274035	Sept. 20, 1966	Metallic Composition For Production of Hygroscopic Smoke
3284005	Nov. 8, 1966	Weather Control by Artificial Means
3257801	1966	Pyrotechnic composition comprising of solid oxidizer oxidizer, boron and aluminum additive for binder.

3300721	Jan. 24, **1967**	Means For Communication Through a Layer of Ionized Gases = HAARP
3313487	April 11, 1967	Cloud Seeding Apparatus
3338476	Aug. 29, 1967	Heating Device For Use With Aerosol Containers
3375148	Mar. 26, 1968	Pyrotechnics Comprising Silver Iodate, Ammonium Nitrate, Nitrocellulose and Nitrate Esters
3378201	April 16, 1968	Method for Precipitating Atmospheric Water Masses
3410489	Nov. 12, 1968	Automatically Adjustable Airfoil Spray System With Pump
3418184	Dec. 24, 1968	Smoke Producing Propellant
3429507	Feb. 25, **1969**	Rainmaker
3432208	Nov. 7, 1967	Fluidized Particle Dispenser
3441214	April 29, 1969	Method And Apparatus For Seeding Clouds
3445844	May 20, 1969	Trapped Electromagnetic Radiation Communications System
3456880	July 22, 1969	Method Of Producing Precipitation From The Atmosphere
3430533	1969	Aircraft dispenser POD self sealing injection tubes.
3437502	1969	Titanium dioxide pigment coated with silica and aluminum (DuPont)
3518670	June 30, **1970**	Artificial Ion Cloud
3517512	June 30, 1970	Apparatus for Suppressing Contrails
3534906	Oct. 20, 1970	Control of Atmospheric Particles
3545677	Dec. 8, 1970	Method of Cloud Seeding
3564253	Feb. 16, **1971**	System And Method For Irradiation Of Planet Surface Areas
3587966	June 28, 1971	Freezing Nucleation
3595477	July 27, 1971	Fog Dispersing Method and Compositions
3601312	Aug. 24, 1971	Methods of Increasing The Likelihood of Precipitation By The Artificial Introduction Of Sea Water Vapor Into Atmosphere Winward Of An Air Lift Region

3608810	Sept. 28, 1971	Methods of Treating Atmospheric Conditions
3608820	Sept. 20, 1971	Treatment of Atmospheric Conditions by Intermittent Dispensing of Materials Therein
3613992	Oct. 19, 1971	Weather Modification Method
3630950	Dec. 28, 1971	Combustible Compositions For Generating Aerosols, Particularly Suitable For Cloud Modification And Weather Control And Aerosolization Process
3659785	Dec. 8, 1971	Weather Modification Utilizing Microencapsulated Material
3666176	Mar. 3, 1972	Solar Temperature Inversion Device
3677840	July 18, 1972	Pyrotechnics Comprising Oxide of Silver For Weather Modification Use
3690552	Sept. 12, 1972	Fog Dispersal
3722183	Mar. 27, 1973	Device For Clearing Impurities From The Atmosphere
USRE29142	May 22, 1973	Combustible compositions for generating aerosols, particularly suitable for cloud modification and weather control and aerosolization process
3748278	July 24, 1973	Process and Agents Having an Influence on the Weather
3751913	Aug. 14, 1973	Barium Release System
3769107	Oct. 30, 1973	Pyrotechnic Composition For Generating Lead-Based Smoke
3784099	Jan. 8, 1974	Air Pollution Control Method
3785557	Jan. 15, 1974	Cloud Seeding System
3788543	Jan. 29, 1974	Uniform Size Particle Generator
3795626	Mar. 5, 1974	Weather Modification Process
3802971	Apr. 9, 1974	Pyrotechnic Formulations for Weather Modification Comprising a Mixture of Iodates
3808595	Apr. 30, 1974	Chaff Dispensing System
3813875	June 4, 1974	Rocket Having Barium Release System to Create Ion Clouds In The Upper Atmosphere

3835059	Sept. 10, 1974	Methods of Generating Ice Nuclei Smoke Particles For Weather Modification And Apparatus Therefore
3835293	Sept. 10, 1974	Electrical Heating Apparatus For Generating Super Heated Vapors
3858805	Jan. 7, 1975	Ice Nucleation by Micas
3877642	Apr. 15, 1975	Freezing Nucleant
3882393	May 6, 1975	Communications System Utilizing Modulation of The Characteristic Polarization of The Ionosphere
3887580	June 3, 1975	Method of Crystallization of Water in Supercooled Clouds and Fogs and Reagent Useful in Said Method
3896993	July 29, 1975	Process For Local Modification of Fog And Clouds For Triggering Their Precipitation And For Hindering The Development of Hail-Producing Clouds
3899129	Aug. 12, 1975	Apparatus for generating ice nuclei smoke particles for weather modification
3899144	Oct. 28, 1975	Method of Controlling Weather
3940059	Feb. 24, 1976	Method For Fog Dispersion
3940060	Feb. 24, 1976	Vortex Ring Generator
399098	Nov. 9, 1976	Smoke generator
3992628	Nov. 16, 1976	Countermeasure system for laser radiation
3994437	Nov. 30, 1976	Broadcast dissemination of trace quantities of biologically active chemicals.
4042196	Aug. 16, 1977	Method and apparatus for triggering substantial change in the earths characteristics and measuring earths changes.
RE29142	Feb. 22, 1977	Combustible compositions for generating aerosols, particularly suitable for cloud modification and weather control and aerosolization process
4009828	Mar. 1 1977	Organic Nucleating Agent both warm and cold clouds.
4035726	July 12, 1977	Method of controlling and/or improving high-latitude and other communication or radio wave surveillance systems of partial control of radio wave, et al.
4096005	June 20, 1978	Pyrotechnic Cloud Seeding Composition

4744919	May 17, 1988	Method of dispersing particulate aerosol tracer
4766725	Aug. 30, 1988	Method of suppressing the formation of contrails and solution therefor
4829838	May 16, **1989**	Method and apparatus for the measurement of the size of particles entrained in a gas
4836086	June 6, 1989	Apparatus and method for the mixing and diffusion of warm and cold air for dissolving fog
4873928	Oct. 17, 1989	Nuclear-sized explosions without radiation
4948257	Aug. 14, **1990**	Laser optical measuring device and method for stabilizing fringe pattern spacing
1338343	Aug. 14, 1990	Process and Apparatus for the production of intense artificial Fog
4999637	Mar. 12, **1991**	Creation of artificial ionization clouds above the earth
5003186	Mar. 26, 1991	Stratospheric Welsbach seeding for reduction of global warming
5005355	Apr. 9, 1991	Method of suppressing the formation of contrails and solution therefor
5038664	Aug. 13, 1991	Method for producing a shell of relativistic particles at an altitude above the Earth's surface
5041760	Aug. 20, 1991	Method and apparatus for generating and utilizing a compound plasma configuration
5041834	Aug. 20, 1991	Artificial ionospheric mirror composed of a plasma layer that can be tilted Dimming the sun
5056357	Oct. 15, 1991	Acoustic method for measuring properties of a mobile medium
5059909	Oct. 22, 1991	Determination of particle size and electrical charge
5104069	Apr. 14, **1992**	Apparatus and method for ejecting matter from an aircraft.
5110502	May 5, 1992	Method of suppressing the formation of contrails and solution therefor
5156802	Oct. 20, 1992	Inspection of fuel particles with acoustics
5174498	Dec. 29, 1992	Cloud Seeding
5148173	Sept. 15, 1992	Millimeter wave screening cloud and method
5242820	Sept. 7, **1993**	Army Mycoplasma Patent Patent

5245290	Sept. 14, 1993	Device for determining the size and charge of colloidal particles by measuring the electroacoustic effect
5286979	Feb. 15, 1994	Process for absorbing ultraviolet radiation using dispersed melanin.
5296910	Mar. 22, 1994	Method and apparatus for particle analysis
5327222	July 5, 1994	Displacement information detecting apparatus
5357865	Oct. 25, 1994	Method of cloud seeding
5360162	Nov. 1, 1994	Method and composition for precipitation of atmospheric water
5383024	Jan. 17, 1995	Optical wet steam monitor
5425413	June 20, 1995	Method to hinder the formation and to break up overhead atmospheric inversions, enhance ground level air circulation and improve urban air quality
5434667	July 18, 1995	Characterization of particles by modulated dynamic light scattering
5436039	July 25, 1995	Artificial Snow in an Aggregate Form of Snow Granules
5441200	Aug. 15, 1995	Tropical cyclone disruption
5492274	Feb. 20, 1996	Method of and Means for Weather Modification
5546183	Aug, 13, 1996	LIDAR Droplet size monitor for in-flight measurement of aircraft engine exhause contrails, droplets and aerosols.
5556029	Sept. 17, 1996	Method of hydrometeor dissipation (clouds)
5628455	May 13, 1997	Method and apparatus for modication of supercooled fog.
5631414	May 20, 1997	Method and device for remote diagnostics of ocean-atmosphere system state
5639441	June 17, 1997	Methods for fine particle formation
5762298	June 9, 1998	Use of artificial satellites in Earth orbits adaptively to modify the effect that solar radiation would otherwise have on earth's weather.
5800481	Sept. 1, 1998	Thermal excitation of sensory resonances
5912396	June 15, 1999	System and method for remediation of selected atmospheric conditions
5922976	July 13, 1999	Method of measuring aerosol particles using an

		automated mobility classified aerosol detector.
5949001	Sept. 7, 1999	Method for aerodynamic particle size analysis
5984239	Nov. 16, 1999	Weather modification by artificial satellites
6025402	Feb. 15, 2000	Chemical composition for effectuating a reduction of visibility obscuration, and a detoxification of fumes and chemical fogs in spaces of fire origin
6030506	Feb. 29, 2000	Preparation of independently generated highly reactive chemical species
6034073	Mar. 7, 2000	Solvent detergent emulsions having antiviral activity
6045089	Apr. 4, 2000	Solar-powered airplane
6056203	May 2, 2000	Method and apparatus for modifying supercooled clouds
6315213B1	June 21, 2000	Method of modifying weather
6110590	Aug. 29, 2000	Synthetically spun silk nanofibers and a process for making the same
6263744	July 24, 2001	Automated mobility-classified-aerosol detector
6281972	Aug. 28, 2001	Method and apparatus for measuring particle-size distribution
0085296	Nov. 2, 2001	Hurricane and tornado control device
6315213	Nov. 13, 2001	Method of modifying weather
0009338	Jan. 24, 2002	Influencing Weather Patterns by way of Altering Surface or Subsurface Ocean Water Temperatures
0008155	Jan. 24, 2002	Method and System for Hurricane Control
6382526	May 7, 2002	Process and apparatus for the production of nanofibers
6408704	June 25, 2002	Aerodynamic particle size analysis method and apparatus.
6412416	July 2, 2002	Propellant-based aerosol generation devices and method
6520425	Feb. 18, 2003	Process and apparatus for the production of nanofibers
6539812	Apr. 1, 2003	System for measuring the flow rate of a gas by means of ultrasound
6553849	Apr. 29, 2003	Electrodynamic particle size analyzer
6569393	May 27, 2003	Method And Device For Cleaning The Atmosphere
0060994	Apr. 1, 2004	ethod for Influencing Atmospheric Formations

0074980	Apr. 22, 2004	Method and Device for Generating a Liquid Mist
0056705A1	Mar. 17, 2005	Weather Modification by Royal Rainmaking Technology
6890497	May 10, 2005	Method For Extracting And Sequestering Carbon Dioxide
2446250	Jan. 4, 2007	A dust or particle-based solar shield to counteract global warming
0056436	Mar. 15, 2007	Challenger to Natural Twisters, Technology
033448	Mar. 29, 2007	Production of Localized Artificial Rains in Polar Stratospheric Clouds, to Promote a Rain Wash in the CIO Gas, Reduce the Destruction of the Ozone Layer, and a Replacement Process in situ of the Stratospheric Ozone
0114298	May 24, 2007	Hurricane Abatement Method and System
0158449	July 12, 2007	Tropical Hurricane Control System
0215946	Sept. 20, 2007	Broadband Communications System via Reflection from Artificial Ionized Plasma Patterns in the Atmosphere
7965488	Nov. 9, 2007	Methods Of Removing Aerosols From The Atmosphere
8048309	Aug. 28, 2008	Seawater-Based Carbon Dioxide Disposal
0203328	Aug. 28, 2008	Outer Space Sun Screen for Reducing Global Warming
0072297	Sept. 24, 2008	Method for controlling hurricanes
7434524	Oct. 14, 2008	Machine to Get Rid of Hurricanes
8012453	Oct. 27, 2008	Carbon Sequestration And Production Of Hydrogen And Hydride
0008468	Jan. 8, 2009	How to Tame Hurricanes and Typhoons with Available Technology
7520237	April 21, 2009	Hurricane Prevention System and Method
0255999	Oct. 15, 2009	Production or Distribution of Radiative Forcing Elements
0290761	Nov. 26, 2009	Upper Troposphere and Lower Stratosphere Wind Direction, Speed, and Turbidity Monitoring using Digital Imaging and Motion Tracking
7645326	Jan. 12, 2010	RFID environmental manipulation
7655193	Feb. 2, 2010	Apparatus For Extracting And Sequestering Carbon Dioxide
0074390	Mar. 25, 2010	Method for Weather Modification and Vapor Generator for Weather Modification.

0127224	May 27, 2010	Atmospheric Injection of Reflective Aerosol for Mitigating Global Warming
7748662	July 6, 2010	Aerial Delivery System
0170958	July 8, 2010	Hurricane Mitigation by Combined Seeding with Condensation and Freezing Nuclei
0252648	Oct. 7, 2010	Climate Processor
0264230	Oct. 21, 2010	Severe Storm / Hurricane Modification Method and Apparatus
0282914	Nov. 11, 2010	Enhanced Aerial Delivery System
0005422	Jan. 13, 2011	Method and Apparatus for Cooling a Planet
0049257	Mar. 3, 2011	Method and Apparatus for Local Modification of Atmosphere
0101124	May 5, 2011	Hurricane Abatement System and Method
073650	June 23, 2011	Atmospheric Delivery System
0168797	July 14, 2011	Method of Weakening a Hurricane
0174892	July 21, 2011	Apparatus and Related Methods for Weather Modification by Electrical Processes in the Atmosphere
0198407	Aug. 18, 2011	Method and Apparatus to Break Up or Annihilate Typhoons, Tornadoes, Cyclones or Hurricanes
0204159	Aug. 25, 2011	Weather Management Using Space-Based Power System
0284649	Nov. 24, 2011	Apparatus and Method for the Mitigation of Rotating wind storms.
8079545	Dec. 20, 2011	Ground-based Manipulation and Control of Aerial Vehicles during nonflying operations
0024971	Feb. 2, 2012	Methods for Environmental Modification with Climate Control Materials and Coverings
8262314	Sept. 11, 2012	Method for Decreasing the Intensity and Frequency of Tropical Storms or Hurricanes
0117003	Oct. 5, 2012	Geoengineering Method Of Business Using Carbon Counterbalance Credits
0267444	Oct. 25, 2012	Artificial Freezing Apparatus and Freezing Method Therefor
0286096	Nov. 15, 2012	Aerial Delivery Devices, Systems and Methods

0008365	Jan. 10, 2013	System and Method for Decreasing the Intensity and Frequency of Tropical Storms or Hurricanes
0015260	Jan. 17, 2013	Concept and Model for Utilizing High-Frequency or Radar or Microwave Producing or Emitting Devices to Produce, Effect, Create or Induce Lightning or Lightspeed or visible to the nake eye electromagnetic pulse or pulses' acoustic or ultransonic electromagnetic pulse or pulses space enclosed or upon any object or madd, to be used solely or as part of a system, platform or device including weaponry and weather modification.
8373962	Feb. 12, 2013	Charged seed cloud as a method for increasing particle collisions and for scavenging airborne biological agents and other contaminants
0038063	Feb. 14, 2013	Apparatus and Method for Inhibiting the Formation of Tropical Cyclones
0043322	Feb. 21, 2013	Processes and Apparatus for Reducing the Intensity of Tropical Cyclones
8402736	Mar. 26, 2013	Method and Apparatus for Suppressing Aeroengine Contrails
8439278	May 14, 2013	Apparatus for Producing a Mass of Water Vapor, Apparatus for Producing, Moving, and Climbing a Mass of Water Vapor, and Method of Causing Artificial Stimulation of Rain
0175352	July 11, 2013	Method to Influence the Direction of Travel of Hurricanes
0186127	July 25, 2013	Ice Floater for Facilitating Ice-Freezing on Water Surface
0206912	Aug. 15, 2013	Moisture Dispersion(drought)
0055876	Feb. 27, 2014	Method for Controlling Land Surface Temperature using Stratospheric Airships and Reflector
0131471	May 15, 2014	Apparatus to Channel Large Air Masses for Climate Modification
0145002	May 29, 2014	System for Facilitating Cloud Formation and Cloud Precipitation
0224894	Aug. 14, 2014	Technique to Mitigate Storms Using Arrays of Wind Turbines
8825241	Sept. 2, 2014	Autonomous Wave-Powered substance Distribution Vessels for Fertilizing Plankton, Feeding Fish, and Sequestering Carbon from the Atmosphere
8944363	Feb. 3, 2015	Production or Distribution of Radiative Forcing Agents

0077737	Mar. 19, 2015	System and Methods for Monitoring an Environment
9002660	Apr. 7, 2015	Device and Method for Determining and Indicating Climate-Relevant Effects of a Contrail Produced by an Airplane
0230415	Aug. 20, 2015	Methods for Decreasing **Local** Temperature using High Albedo Materials
0337224	Nov. 26, 2015	Microwave Acceleration of Carbon Gasification Reactions
9311539	Apr. 12, **2016**	Aircraft Contrail Detection
9429348	Aug. 30, 2016	Method and Device for Producing Snow
9491911	Nov. 15, 2016	Method for Modifying Environmental Conditions with Ring Comprised of Magnetic Material.
9589473	Mar. 7, **2017**	Method and System for Automatically Displaying Flight Path, Seeding Path, and Weather Data
9715039	July 25, 2017	Apparatus and System for Smart Seeding within Cloud Formations
0217587	Aug. 3, 2017	Vehicles and Systems for Weather Modification
0303479	Oct. 26, 2017	Warm Cloud Catalyst, Preparation Method Therefor and Application Thereof
0006422	Jan. 4, **2018**	Methods for Disrupting Hurricane Activity
0006421	Jan. 4, 2018	Methods for Disrupting Tornadic Activity
9924640	Mar. 27, 2018	Modifying Sunlight Scatter in the Upper Atmosphere
0217119	Aug. 2, 2018	Process and Method for the Enhancement of Sequestering Atmospheric Carbon through Ocean Iron Fertilization, and Method for Calculating net Carbon Capture from said Process and Method
0189753	Jan. 29, **2019**	Fog-Generating Device Comprising a Reagent and Ignition Means
0203461	June 6, 2019	Airships for Weather Manipulation
0314249	June 11, 2019	Systems and Methods of Inducing Rainfall
0375900	Aug. 13, 2019	Rain Induced by Supercontinuum Laser Beams
0433408	Oct. 1, 2019	Methods for Affecting Spinning Atmospheric Phenomena
0435165	Oct. 8, 2019	Aircraft Electrically-Assisted Propulsion Control System
0364748	Dec. 5, 2019	Method and System for Expressing Airborne Cloud

		Seeding Line Considering Cloud Water
0187430	June 18, 2020	Helical Artificial Generator of Tornado, Hurricane, Yellow Dust, and Typhoon
0196539	June 25, 2020	Device for Seeding a Cloud Cell
0701871	July 7, 2020	Systems for Maintaining and/or Decreasing Water Temperature using High Albedo Materials
0233115	July 23, 2020	Method and System for Determining Cloud Seeding
WO148644A1	July 23, 2020	3d Reduced Graphene Oxide/Sio 2 Composite for Ice Nucleation
0261939	Aug. 20, 2020	Apparatus for Generating and Optically Characterizing an Aerosol
0101897	Sept 9, 2020	Artificial Rainmaking by High Power Laser Initiation Endothermic Reactions through Drone Aircraft
0288650	Sept. 17, 2020	Technology and Technique to Prevent, Diminish or Interfere with the Formation of Hurricanes on Earth from one or more Platforms in Space
0288651	Sept. 17, 2020	Methods for Cooling Water Temperature using High Albedo Materials
0315104	Oct. 8, 2020	Propagating Sound Through Bodies of Water, to Generate and Direct Wind, for the Purpose of Moderating and Affecting Weather Patterns.
0386970	Dec.10, 2020	Aerostatically Stabilized Atmospheric Reflector to Reduce Solar Irradiance
0888051	Jan. 12, 2021	Intelligent Systems for Weather Modification Programs
0037719	Feb. 11, 2021	Planetary Weather Modification System
0941705	Mar. 9, 2021	Hanson-Haber Aircraft Engine for the Production of Stratospheric Compounds and for the Creation of Atmospheric Reflectivity of Solar Radiation in the 555nm Range and to Increase Jet Engine Thrust and Fuel Economy through the Combustion of Ammonia and Ammonia By-Products
0063943	Apr. 8, 2021	Bacterial Preparations for Ice Nucleation
0153442	May 27, 2021	Systems and Methods for Rain Cloud Initiation
0163157	June 3, 2021	Artificial Ring, Solenoid System to Terraform

0235638	Aug. 5, 2021	Weather Management of Cyclonic Events
0152336	Aug. 8, 2021	Method of Cloud Seeding using Natural Ice Nucleating Agents
0285851	Sept. 16, 2021	System for Sampling and Analyzing Contrails Generated by an aircraft
0289720	Sept. 23, 2021	Systems and Methods for Producing Rain Clouds
0105881	Oct. 21, 2021	Process for Generating Marine Clouds and Ocean Microbubbles
0329922	Oct. 28, 2021	Compositions and Methods for Enhanced CO2 Capture and Storage
0329852	Oct. 28, 2021	Method for Preventing a Formation of, and/or for Dispersing, a Tropical Cyclone, and Arrangement.
0352856	Nov. 18, 2021	Aerial Electrostatic System for Weather Modification
0107294	Dec. 9, 2021	Wind Turbines for Marine Cloud Brightening Dispersion
2003028	Jan. 6, **2022**	Apparatus for Precipitation of Atmospheric Water
0065599	Mar. 3, 2022	Rocket for Artificial Rainfall using Ejection Hygroscopic Flare
1274534	Mar. 15, 2022	Artificial rain to **support water flooding** in **remote oil fields**
0113450	Apr. 14, 2022	Calculation Method of Total Artificial Precipitation in Seeding Area Compared to Non-Seeding Area
2094269	May 5, 2022	Reflective Hollow SRM Material and Methods
3994976	May 11, 2022	Apparatus for Electro-Spray Cloud Seeding
1330768	May 17, 2022	Systems and Methods for Producing Rain Clouds
0268505	Aug. 25, 2022	Method and Apparatus for Making Falling Snow
1086970	Sept. 9, 2022	Method of Geoengineering to Reduce Solar Radiation
0355925	Nov. 10, 2022	Aeronautical Car and Associated Features
0357482	Nov. 10, 2022	Method and System of Analyzing Ingredients of Artificial Rainfall for Verification of Cloud Seeding Effect
0050373	Feb. 16, **2023**	Electromagnetic System to Modify Weather

0075132	Mar. 9, 2023	System for moderating energy absorption at the Earths surface with a programable forcing network of Climate control panels.
0117390	Apr. 20, 2023	System and Method for Proactive and Reversible Mitigation of Storm/Hurricane/Typhoon/Cyclone
0126982	April 27, 2023	Method for Analyzing Effect of Hygroscopic Seeding Material Sprayed on Ground Aerosol Concentration Through Airborne Cloud Seeding Experiment.
0141493	May 11, 2023	Device for Unmanned Aerial Vehicle to Deploy a Rainfall **Catalytic Bomb**
0149876	May 18, 2023	Coated Chloride Salt Particles and Methods of Making and Using the Same

Debunking the climate change hoax

By Doug Brodie Joel Smalley May 222024

The indomitable Douglas Brodie argues that climate change is a politically motivated hoax designed to impose totalitarian control and redistribute wealth through flawed science and data manipulation.

He traces its origins to anti-capitalist ideologies and figures like Maurice Strong, criticizes the scientific basis for CO2-induced warming, and highlights manipulation by influential figures and organizations.

Doug contends that Net Zero policies are economically damaging and futile, urging skepticism towards the establishment and advocating for voting against mainstream political parties supporting climate policies.

Joel Smalley
Introduction

I am convinced that "climate change" is a hoax from many years of campaigning against it and from the establishment's globally-coordinated excesses of recent years which have confirmed it to be wantonly abusive, mendacious and conspiratorial in its dealings with the people.

This paper is my submission to The White Rose Writing Challenge 2024 on the theme of "The Green Cheat". Sorry Rosie, I've somewhat exceeded your word count guidance! Comprehensive debunking of the multi-faceted economy-wrecking climate change hoax is actually very difficult in a relatively short essay but here goes, with heavy reliance on word count-saving hyperlinks.

This paper aims to show that anyone who still believes in dangerous man-made CO2 global warming (aka "climate change") urgently needs to reassess their views before the dictatorial Net Zero oppressions and privations being inflicted on us under the pretence of "tackling climate change" become unacceptably onerous and destructive.

It exposes the blatant falsehoods of the establishment's climate change narrative and you don't have to be a science egghead to see through their "really very stupid" deceptions. You only need to open your mind to the sad reality that almost everything the duplicitous establishment and paid-for mainstream media have told us about "climate change" is a lie. The simple explanations and facts in this paper will then allow you to see through all of their outrageously false "climate change" propaganda and brainwashing.

I have given up trying to reason with closed-minded, electorate-betraying politicians. I am now reaching out to ordinary people, many perhaps lacking the capability to challenge what

is going on but becoming more and more suspicious that they are being horribly deceived and abused for ulterior political motives on "climate change" and other globalist machinations.

We mustn't allow the establishment's junk science, anti-humanity climate policies to lead us ever deeper into energy infrastructure ruination.

The origins of the "climate change" hoax

This exposes the seldom-mentioned anti-capitalism, anti-democracy and even anti-humanity origins of the scientifically corrupt, Malthusian, horribly politicised, horribly entrenched and ruthlessly enforced climate change hoax.

Concerns about the impact of humanity on the environment and planetary resources were raised long ago by Thomas Malthus (1766-1834). In recent times, various bad actors have weaponised these concerns for dark ulterior motives. One such was the late billionaire socialist Maurice Strong who set up the UN's Intergovernmental Panel on Climate Change (IPCC) in 1988 and its Earth Summit in 1992, origin of the Agenda 21 template for **authoritarian UN world governance and global wealth redistribution**. He is remembered for his infamous saying:

"Isn't the only hope for the planet that the industrialized civilizations collapse? Isn't it our responsibility to bring this about?" (qv)

The Machiavellian Strong set about creating a false problem based on false science, drawing on the 1979 Charney Report (since-debunked) which set the ball rolling on the conveniently abstruse hypothesis of man-made CO2 global warming. He set up a system of democracy-bypassing bureaucrats to get the developed countries to deindustrialise and make them pay, inspired by this Club of Rome statement:

"**The common enemy of humanity is man.** In searching for a new enemy to unite us, we came up with the idea that pollution, the threat of global warming, water shortages, famine and the like would fit the bill. ...The real enemy then is humanity itself."

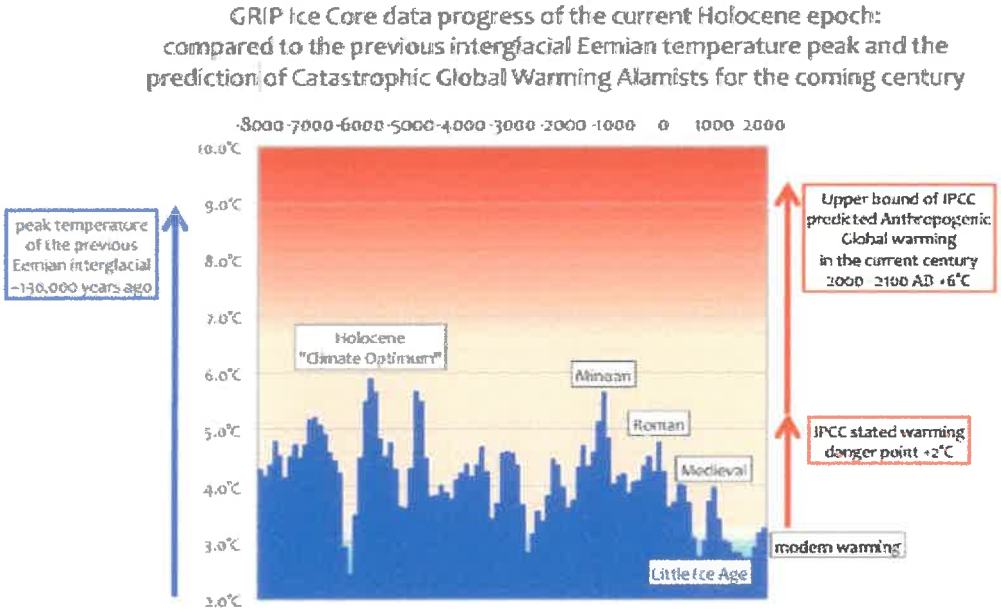
The UN IPCC's climate change skulduggery started in earnest in their 1995 report when lead author Ben Santer mendaciously claimed that global temperature data showed a "discernible human influence". For details see my angry 2019 post. Santer's claimed human influence has to this day never been reproduced and the establishment's never-proven man-made CO2 global warming hypothesis has been disproved by many studies, such as this. All we ever get from the UN is bluster, not proper science, with the UN Secretary General ranting **about "global boiling"** and the UN climate chief making an **unscientific** fool of himself by emoting that we only have two years to save the world.

Big Industry and Big Money enthusiastically joined the bandwagon to grab a share of the heavily-subsidised (at hard-pressed taxpayer expense) $multi-trillion climate change bonanza. The party was also joined by the unaccountable Davos World Economic Forum and multi-billionaires with unlimited budgets for propaganda, censorship and brainwashing

such as **Bill Gates, George Soros and the Rockefellers** who are **using the climate change hoax to manipulate public policy towards their own self-centred goals.**

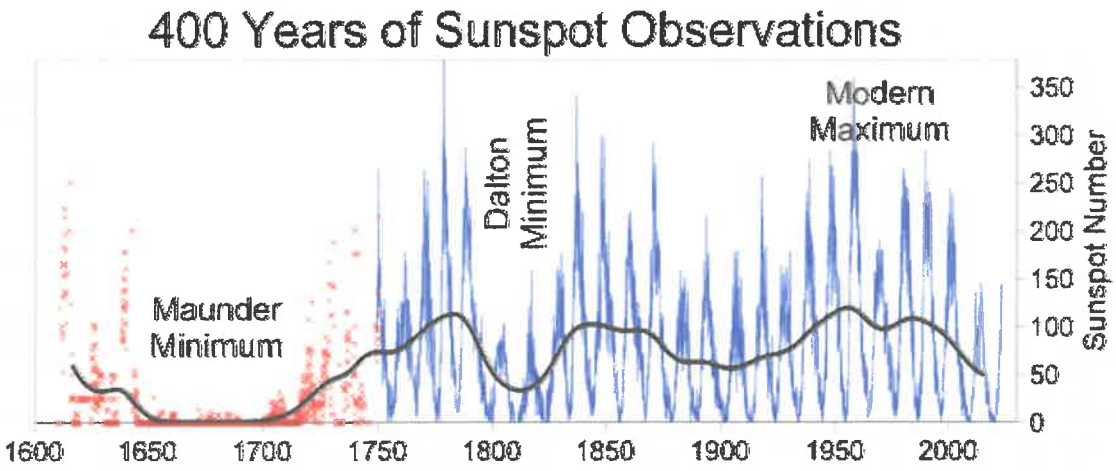
The proof that "climate change" is a hoax

The establishment brazenly asserts that man-made CO2 is the main "control knob" of global climate, an absurd assertion which is unsupported by empirical data and flies in the face of common sense. It is easily debunked by, inter alia, looking at the recent millennial global temperature changes shown in this reconstruction which I will show tally well with the historical record. Starting at ~6,000 years ago, it shows that temperatures were congenially warmer than now, which goes towards explaining why Orkney flourished so amazingly in these early times.



A subsequent period of cooling was followed by the Minoan Warm Period then the Roman Warm Period, when grapes were cultivated along Vine Lane in Newcastle (Hadrian's Wall). Was this warm period caused by a spike in atmospheric CO2 levels due to heavy Roman chariot activity?! No, this reconstruction shows that CO2 levels then were much lower than now. Whatever climatic influence led to these benign conditions, it gave way to the severe cold of the Dark Ages (with negligible change in CO2 levels) which led to massive European population migrations seeking better living conditions.

The Dark Ages gave way to the Medieval Warm Period when magnificent cathedrals were built all over Europe and Vikings settled in Greenland. These benign conditions in turn gave way to the Little Ice Age (~1300 to ~1800). It got so cold that ice fairs were held on the frozen River Thames and the Vikings were forced out of icebound Greenland. Modern science then started to advance and revealed that these cold periods coincided with periods of extremely low solar activity, e.g. the Maunder Minimum.



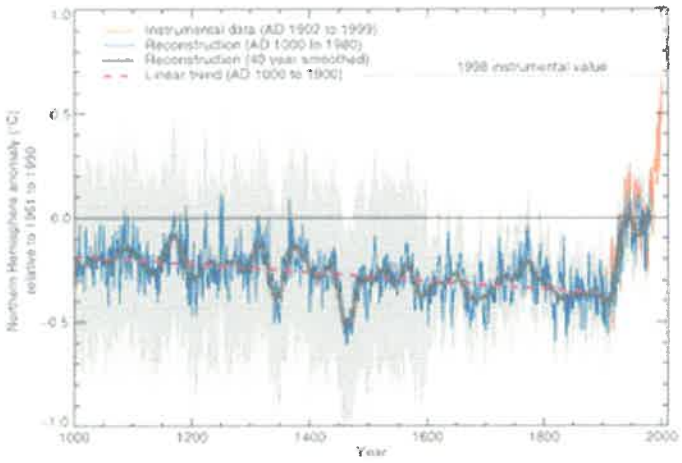
Solar activity started to increase some time before the mid-18th century start of the Industrial Revolution and the Little Ice Age gave way to gradual but fitful global warming. This led to the establishment's late-20th century play-acting alarm about global warming, which they pretended had been caused by man-made CO2 when it was clearly due to the strong solar activity of the Modern Maximum (see the Maunder graphic above), the strongest in centuries. The establishment shamelessly ignores this inconvenient science and brazenly spins the yarn that the global warming since the start of the Industrial Revolution has been mainly due to rising CO2 levels.

They never mention the reality that we are living in a CO2 famine relative to the earth's much greener, CO2-richer yet never "boiling" past. They even double-down by fearmongering about needing to **"sequester" CO2 from the atmosphere**.

The Climategate emails leaked in 2009 from the Climate Research Unit of the University of East Anglia, a key hub of UN IPCC climate science, showed how its climate scientists behaved as bought-and-paid-for establishment puppets, e.g. when **one of them gave the game away** by writing:

"We have to get rid of the Medieval Warm Period"

This led to the creation of the fake hockey stick graph of global temperatures which instead of reality depicted almost no change in 1,000 years then a sudden spike in the late 1900s. It was gleefully promoted by the duplicitous UN IPCC as it portrayed the late-20th century global warming as unprecedented and gave support to their CO2 "control knob" pretence. It took years of dogged investigation by a small band of climate realists, **hindered all the way by IPCC scientists** who refused to make public their data, to prove that the hockey stick graph was bogus, crafted from flawed data and statistical chicanery. The book The Hockey Stick Illusion details the deception.

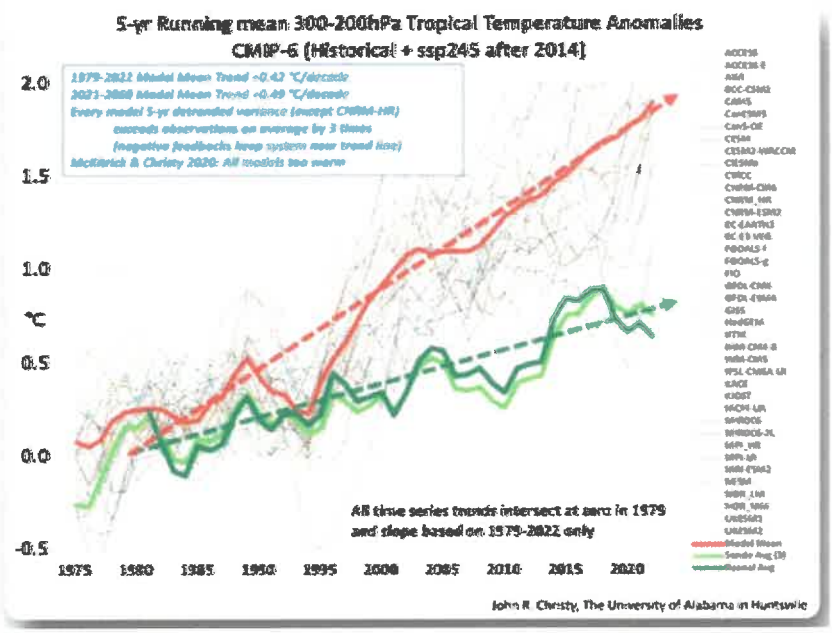


The establishment whitewashing of the Climategate scandal is now being re-enacted in the similarly-biased Hallett Inquiry into the scientific malfeasances of the Covid scandal, parallel examples of **establishment lying by omission** to take **us all for fools and paint dissenters** as "conspiracy theorists". Their coordinated moves to cancel, censor and even jail dissidents prove that they themselves are the conspirators.

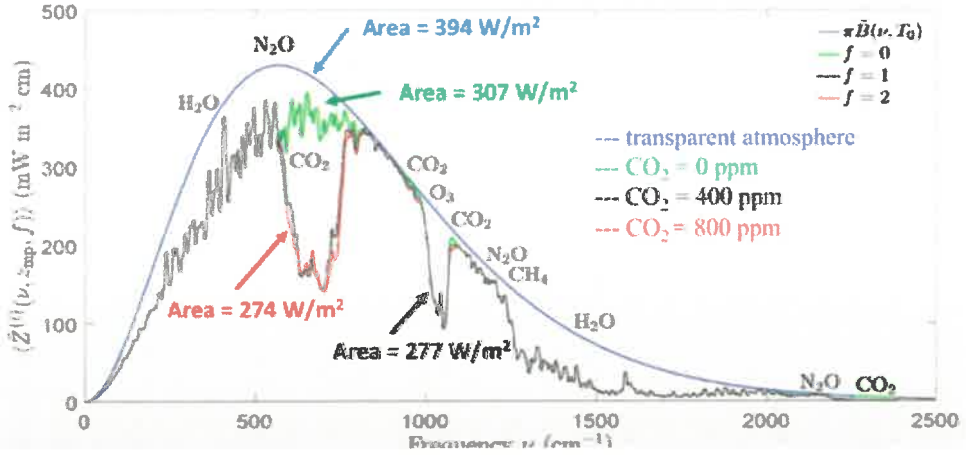
The pretence that rising levels of atmospheric CO2 lead to dangerous global warming is debunked by studies and reconstructions of what happened in the recent and long-ago past, as described in this paper. **These show that the increase in atmospheric CO2 follows the rise in global temperature rather than coming before it and causing it,** i.e. the **exact inverse** of the establishment's CO2 climate "control knob" pretence.

See also this paper and follow-up describing two hoax-busting spells of global cooling since the mid-1940s which happened despite ever-rising atmospheric CO2, the first in the 1960-70s so worrisome at the time as to cause a new ice age scare, plus a catalogue of "smoke and mirrors" obfuscations and deceptions in the establishment's mendacious climate change narrative.

Further evidence that CO2 global warming is a hoax is given by the abject failure of the establishment's computer climate models to give credible global temperature predictions. Here they are failing miserably in graphs of predictions versus observations in 2015 and even worse in 2022. Evidence is also given by the establishment's Chicken Licken predictions of climate-related catastrophes which have failed to come to pass, now going back 20 years and more. **Likewise, the establishment's make-believe "climate emergency" has been rebutted by the World Climate Declaration signed by thousands of independent scientists.**



The establishment's climate modelling failures are easily explained by the many studies, e.g. here, here and here, which show that the warming effect of CO2 is already "saturated" and that even a far-off doubling of the concentration of CO2 in the atmosphere (currently 420 ppm) **will have minimal impact on global temperatures**. The latter links to studies which show that "nitrogen" and methane likewise have minimal impact on climate. The establishment ignores all such inconvenient science and instead uses their own junk science as pretext to wage war on farming in pursuit of the dystopian goals of UN Agenda 2030 which no electorate has

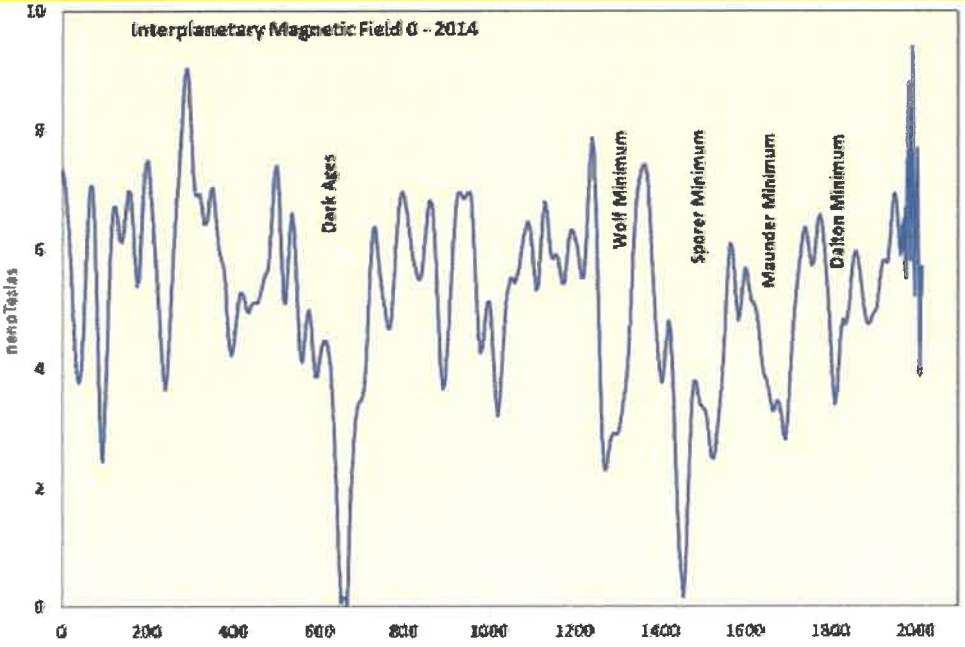


Few people realise that the UN IPCC is only mandated to study the risks of human, not natural influences on climate. They never admit this objectivity-wrecking restriction to the

general public. It allows them to pretend that rising atmospheric CO2 levels must be the problem because they disregard almost everything else! They ignore solar variations, planetary orbital and gravitational variations, solar/ocean-driven ENSO, PDO and AMO cycles and much more to pretend that greenhouse gases - emphasising man-made CO2 and not even mentioning water vapour, the most important greenhouse gas (qv) - and other "anthropogenic forcings" are the main drivers of climate.

The UN IPCC claims that atmospheric CO2 must be the main driver of climate because the change in Total Solar Irradiance (TSI) over the course of the 11-year solar cycle is very small. This is lying by omission because within the small TSI variation there are large variations in parts of the spectrum such as ultraviolet which affects the ozone layer which in turn affects global temperatures.

Variations in the sun's magnetic field strength are clearly a very important natural "control knob" of global climate. See how neatly this graphed reconstruction maps onto the ups and downs of global temperature over the past two millennia as reviewed above, with the strong late 20th century peak coinciding with the start of the establishment's climate change hoax.



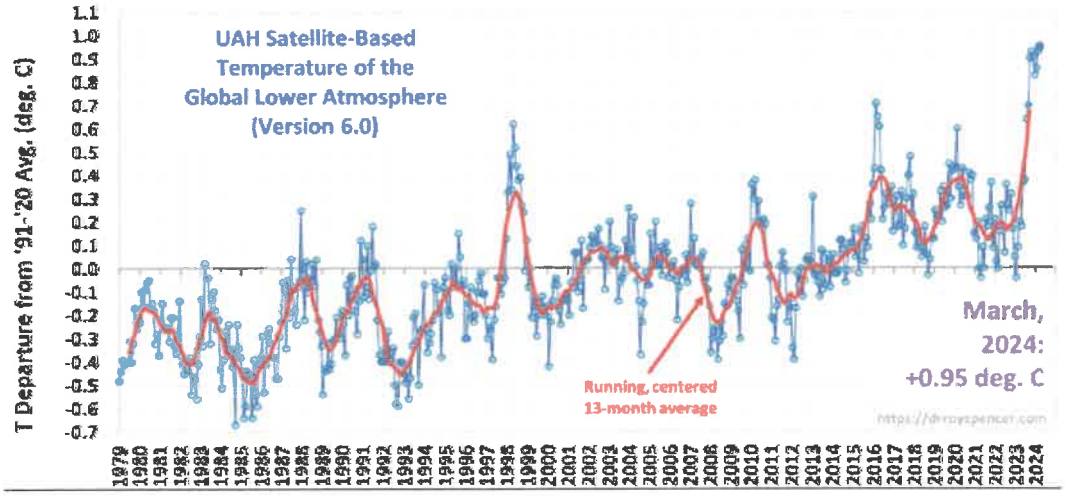
The solar wind magnetic field affects the Earth's climate by shielding us from incoming cosmic rays when it is strong, resulting in reduced cloud cover and higher global temperatures and vice versa when it is weak. This effect has been studied by independent scientists Svensmark and Shaviv and has strong observational backing. It is explained in this extract from the recent hoax-debunking documentary Climate: The Movie. The establishment simply ignores this inconvenient science.

Independent astrophysicist Dr Willie Soon has debunked the UN IPCC's obtuse stance on CO2 by analysing the rural temperature record (avoiding Urban Heat Island warming bias)

for the past 150 years and the corresponding changes in solar activity to reach the obvious conclusion that it's the sun, not CO2 that drives global temperatures. Former IPCC supporter Professor Fritz Vahrenholt reached the same conclusion a decade ago as documented in his book The Neglected Sun.

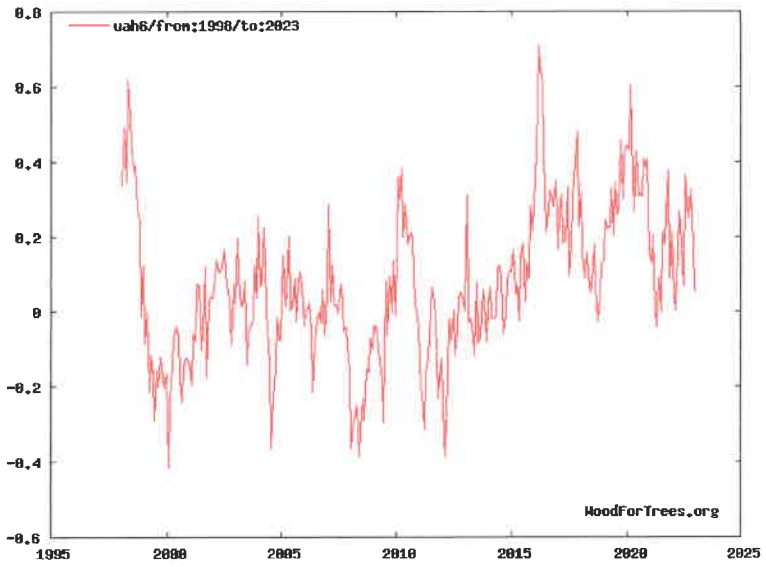
Another establishment climate change skulduggery is the never-justified retrospective adjustment of official temperature records, always in a direction to make global warming look worse. This post describes the adjustments made by the corrupt UK Met Office to their HadCRUT series, to the extent that "most of the warming since 2001 is the result of adjustments to the data". This post describes the shocking adjustments to US temperature records by increasing recent temperatures and reducing past temperatures. This cheating is exposed by the fact that the official US all-time high temperature records still stand in the dustbowl years of the 1930s when, as even the UN IPCC has conceded, **CO2 levels were too low to have caused such warming.**

The latest establishment climate change skulduggery concerns an event which they have hidden from the public by globally-coordinated censorship, namely the 2022 Hunga Tonga undersea volcanic eruption which injected massive quantities of water vapour, the most important greenhouse gas, high into the stratosphere. Global temperatures are now showing an unprecedented ~1°C spike unlike any past El Nino **(in modern measurements) which the establishment shamelessly claims is due to man-made CO2**. This is **clearly a lie**, not least because the UN IPCC's own (pseudo) science predicts CO2 global warming at a rate of at most 0.3°C per decade. **Paul Homewood easily debunks the baseless claim that 2023 was the hottest in 125,000 years.**



The establishment censorship of Hunga Tonga gives the game away. **They don't want to admit that water vapour is a much more potent greenhouse gas than CO2** and are reduced to spouting "global boiling" nonsense now that global temperatures have gone from benign flatlining from 1998 to 2023, with multiple ENSO transients along the way and looking very like the waning warm phase of the verboten-to-mention Atlantic Multidecadal

Oscillation (AMO), to all of a sudden breaching the UN's precious 1.5°C limit!



The futility of the Net Zero hoax

I have posted many times on the futility of the establishment's delusional and cruelly regressive "solution" to the non-problem of "climate change" to eliminate the global consumption of fossil fuels to reduce man-made CO2 emissions to "Net Zero", so I will keep this section short.

My prior posts giving detailed arguments against Net Zero include:

My Net Zero climate change broadside (early 2024)

My heretical epitaph (late 2023)

The undemocratic tyranny of Net Zero (early 2023)

My climate change Net Zero rant (2022)

The futility of Net Zero (2021)

Fossil fuel dependency shows that Net Zero is impossible (2020)

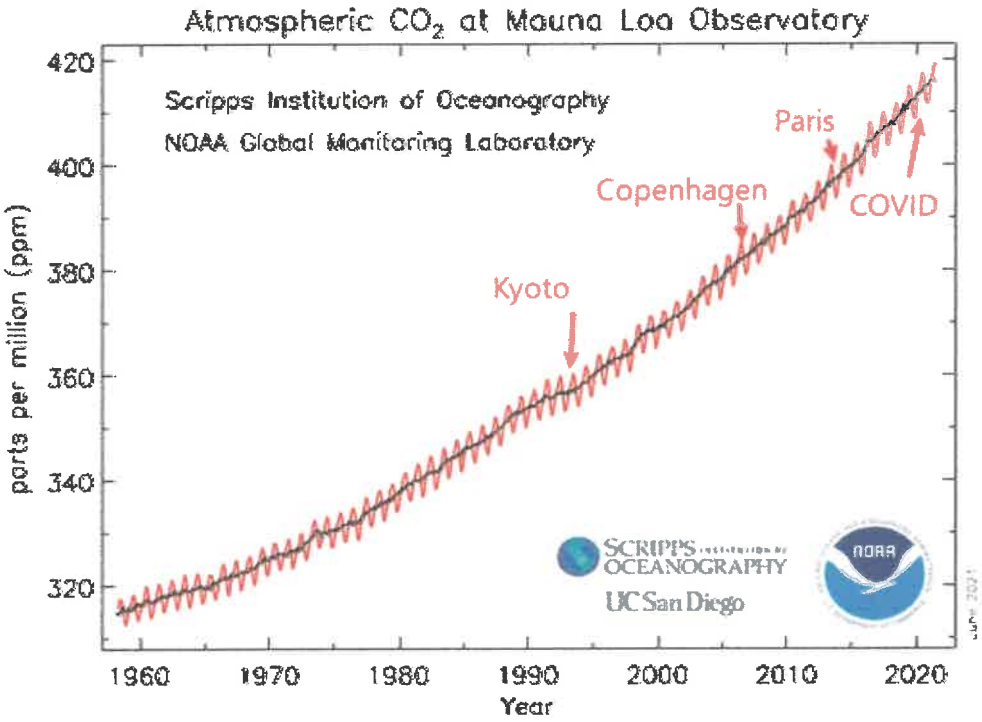
Why the Climate Change Act should be repealed (2015)

The reality that CO2 has negligible impact on climate means that all our efforts to reduce CO2 emissions have been pointless. The deployment, against the advice of a government Chief Scientific Advisor, of intermittent expensively-subsidised so-called renewables like wind turbines and solar panels which end up as toxic non-recyclable junk when they reach

the end of their short service lives should never have been embarked upon in the first place. This has been money straight down the drain, or rather money straight from the pockets of the general public into the coffers of Big Money. Equally misguided green hydrogen and "bonkers" carbon capture and storage are certain to be ruinously expensive. Such inappropriate technologies and the legally-obligated push for Net Zero are condemning the country to long-term economic decline.

A few final bullet points to sum up the insanity/malevolence of Net Zero. I have put such points to many parliamentary representatives over many years but they have always fobbed me off or not replied at all:

Atmospheric CO2 levels have been rising steeply for decades, uninfluenced by the various "landmark" climate agreements (or Covid global lockdowns) shown on this annotated Mauna Loa graph. There is no indication that decarbonisation efforts to date have had any effect on the rising trend or that intensified decarbonisation efforts could arrest it any time soon, far less turn it into steep decline.



The UK contributes just 1% of global CO2 emissions so irrespective of the disputed science of alleged man-made CO2 global warming, attempting to decarbonise unilaterally is pointless given that the hugely more populated non-Western world is not going to follow suit any time soon. Why are we pointlessly committing economic suicide?

The world as a whole is still around 84% dependent on fossil fuels, an unbridgeable chasm away from Net Zero. After 15 painful years of Climate Change Act/Net Zero striving, the UK

is still around 80% dependent on fossil fuels, clear proof that decarbonisation is going nowhere. The so-called global green energy transition is a going-nowhere fiction.

The UK government was told in a recent report commissioned by the Department of Energy that it has no hope of reaching its Net Zero targets (which has been obvious for many years) but is ploughing ahead regardless, a clear indication that the real purpose of Net Zero is

Trying to decarbonise the grid by relying on intermittent wind and solar power without the 24/7 balancing and back-up currently supplied by fossil fuels (the UK's last coal power station will be retired in October) will inevitably lead to prolonged blackouts and/or severe energy rationing. The UK Energy Secretary has no idea how to avoid this self-imposed disaster judging by her shockingly naive reply to recent questioning. Battery storage costing $multi-trillions is not an option. Allowing this disaster to unfold looks like a diabolical plan by the green blob to drag the economy down.

Attempts to persuade or coerce the public to adopt unwanted and pointless EVs and heat pumps are going nowhere other than leading to, inter alia, the ruination the car industry as made clear here, here, here and here. Again, this looks like part of a diabolical plan to "collapse industrialized civilizations", to paraphrase UN IPCC architect Maurice Strong.

Conclusions

I know that many people find the subject of "climate change" too arcane and daunting to challenge and that they prefer to opt for the comfortable assumption that the establishment authorities must be working for our best interests. I hope this paper shows that, to the contrary, the establishment and their puppet politicians are intent on causing us serious harm and that the evidence for this is clear.

The UK government recently rejected a petition to repeal the Climate Change Act 2008 and the Net Zero targets. Compare the clear-cut evidence given above with their mendacious, boilerplate response, including their cheating claim of having halved UK CO2 emissions when in the main they have only been offshored, at the cost of swathes of UK jobs. It is surely obvious that our politicians are lying and that their "really very stupid" climate change narrative has nothing to do with climate. It's all about imposing deep state totalitarian control over the people and global resources, all covertly planned out many decades ago.

All of the main UK political parties, Conservative, Labour, Lib Dem and SNP, often referred to collectively as the Uniparty, firmly back the climate change hoax and together disenfranchise the electorate on this and other globalist impositions. They are wilfully leading us into already well advanced deindustrialisation, "Absolute Zero" levels of privation and, without fossil fuels, pre-Industrial Revolution living conditions.

What a horrible mess! My forlorn suggestion for getting out of it is that people need to stop voting for the treasonous Uniparty. I am not advocating any particular challenger party but if the Uniparty were to get a very low number of votes they would have much reduced moral authority, which would at least be a start. If constituencies could somehow organise

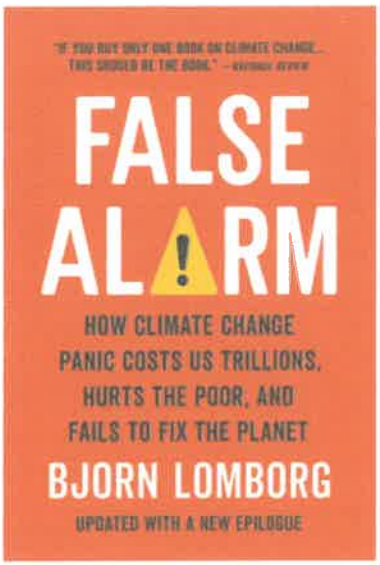
themselves to focus their votes on a single anti-Uniparty candidate they could avoid splitting their votes, a mimic in reverse of how the minority SNP separatists keep winning here in Scotland because the tribalist votes for the unionist Con/Lab/Lib parties get split.

Yours faithfully,

Douglas Brodie, Nairn, 22 May 2024

Lomborg, B. (2020). *False Alarm: How Climate Change Panic Costs Us Trillions, Hurts the Poor, and Fails to Fix the Planet*.

"False Alarm is a comprehensive analysis of the issues in climate change that represents a reasoned balance between the shrill voices demanding immediate change (without being aware of the practical issues involved) and those who see no problems at all with our current environmental situation."



FILE NAME WEATHER MODIFICATION COMPANY CANADA USES FOR WEATHER MODIFICATION MANIPULATION

Weather Modification, Inc

3802 20th Street North,

Fargo, ND 58102

http://www.weathermodification.com/meteorological-services.php

IF YOU DO NOT READ ANYTHING ELSE - READ THIS ARTICLE

Application of Technologies for Influencing the Weather in Contempoprary Geopolitical Situation

November 2022
Challenges to national defence in a contemporary geopolitical situation 2022(1): 129-134

DOI:10.47459/cndcgs.2022.15

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The article **discusses the use of technologies for influencing the weather by the main actors of international relations and the potential consequences of the use of these technologies on global security.** The authors showed that technologies for influencing the weather are currently being actively studied and legally applied in developed countries of the world (for example, in the USA, China, Russia and the United Arab Emirates) for precipitation management. However, the use of such systems for **military purposes can pose serious threats not only for countries using such technologies and their neighbors, but also on a global scale, especially since the consequences of using methods of influencing the weather are not well understood in the long term**. The authors believe that one of the ways to control the use of technologies for influencing weather on global level is the creation of a special international monitoring service, which will be responsible for coordinating research and the use of weather management technologies by states.

EXCEPT FROM ARTICLE

Quote : "Thus, it is clear that any methods of using technologies for influencing the

weather (both for civilian and military purposes) can seriously affect the balance of power of all the actors of international relations and create significant problems for regional and global security. This is because the overall process of weather change can be a continuous cycle of real-time weather interventions (actions and feedback) that can provide the desired weather behaviour.

The danger of using weather technologies also lies in the fact that to date, **their long-term consequences and impacts on the health of the population, the climate of the planet in general and individual regions have not been studied.** Since this term "climate" means a long-term weather regime , i.e. the average state of the atmosphere over a long period of time in a certain area, the long-term application of weather change technologies can become one of the significant causes of climate change on the planet. " End of quote.

https://www.researchgate.net/publication/365216760_Application_of_Technologies_for_Influencing_the_Weather_in_Contempoprary_Geopolitical_Situation#pf2Application of

Exposing The Darkness
Radiation poisoning in combination with Graphene Oxide causes cellular disruption, disorganization and death

Dr. Robert Young is widely recognized as one of the top research and clinical scientists in the World. Throughout his career, his research has been focused at the cellular level.

Dr. Robert Young: Graphene Oxide Is Causing Us To Become Human Cell Towers Radiation poisoning in combination with Graphene Oxide causes cellular disruption, disorganization and death.

WARNING

"Graphene is a **biosensor.** It means it can **receive** and **transmit.** So there is no shedding here. When **someone** has been **poisoned** with **Graphene,** they become a **human cell tower**, and they are **receiving radiation and omitting radiation** which **affects everyone else around them**..."

WATCH THE VIDEO - 3D GRAPHENE USED IN CLOUD SEEDING IN WEATHER MODIFICATION AND WAS USED IN THE COVID 19 JABS.
https://lionessofjudah.substack.com/p/dr-robert-young-graphene-oxide-is

Dr. Robert Young: Graphene Oxide Is Causing Us To Become Human Cell Towers "Radiation poisoning in combination with Graphene Oxide causes cellular disruption, disorganization and death"

"Graphene is a biosensor. It means it can receive and transmit. So there is no shedding here. When someone has been poisoned with Graphene, they become a human cell tower, and they are receiving radiation and omitting radiation which affects everyone else around them..."

Interview: Dr Robert Young – "Viruses Don't Exist" Explained, Nanotech Inside People is a Weapon

Dr. Robert Young is widely recognized as one of the top research and clinical scientists in the World. Throughout his career, his research has been focused at the cellular level. drrobertyoung.com

INVESTIGATE THE SUBSTANCES BEING SPRAYED INTO OUR AIRSPACE AND THEIR HEALTH IMPACTS.

https://www.change.org/p/investigate-the-substances-being-sprayed-into-our-airspace-and-their-health-impacts?utm_content=cl_sharecopy_37899243_en-CA%3A5&recruiter=1018458709&recruited_by_id=32ba3290-05be-11ea-8b47-db747977f1b9&utm_source=share_petition&utm_medium=copylink&utm_campaign=psf_combo_share_initial&utm_term=psf_combo_share_initial&share_bandit_exp=initial-37899243-en-CA

February 21, 2024 Why this petition mattersStarted by Kerry Monteith

I am a resident of Grande Prairie, AB, Canada. My community and I have noticed an increase in diseases such as multiple sclerosis, Parkinson's, Alzheimer's among us. We strongly believe that this could be linked to substances being sprayed into our airspace.

The World Health Organization states that air pollution is a major environmental risk to health and by reducing air pollution levels can reduce the burden of disease from stroke, heart disease, lung cancer, chronic and acute respiratory diseases (source: WHO). While we do not have direct evidence linking these substances to our health issues yet, we need transparency about what is being sprayed in our airspace.

We are calling on local authorities for an immediate investigation into what these substances are and how they might be affecting our health. This investigation should include rigorous testing of the airborne particles in question as well as comprehensive studies on their potential impacts on human health.

Our right to clean air should not be compromised. We deserve to know what we're breathing in every day so that we can take steps towards ensuring a healthier future for ourselves and generations to come.

Please sign this petition urging local authorities in Grande Prairie to investigate these concerns immediately!

https://www.change.org/p/investigate-the-substances-being-sprayed-into-our-airspace-and-their-health-impacts?utm_content=cl_sharecopy_37899243_en-CA%3A5&recruiter=1018458709&recruited_by_id=32ba3290-05be-11ea-8b47-db747977f1b9&utm_source=share_petition&utm_medium=copylink&utm_campaign=psf_combo_share_initial&utm_term=psf_combo_share_initial&share_bandit_exp=initial-37899243-en-CA

3D Graphene

Aluminum Suphide

Barium

Silver Oxide

Silver Iodide

Hydrogen Bromide

Sodium Chloride (CaCI)

Potatsium Iodide

Sulphur Dioxide (S02)

Dry Ice (CO2) (solid carbon dioxide)

Bismuth Tri-iodide (BiL3)

Liquids Propane (C3H8)

Magnesium

Hexachlorobenzene

Silver oxide

3D Graphene

Chaff

Silver Oxide crystal when exposed to sunlight the silver ion gets reduced to metal and the iodide ions are oxidized to iodine gas.

I am sure there are others chemicals used not on this list.

3D Graphene Oxide Nanoparticles for Cloud Seeding Patent US 2022/0002159 A1

US 20220002159A1

(19) **United States**

(12) **Patent Application Publication**

ZOU et al.

(10) **Pub. No.: US 2022/0002159 A1**

(43) **Pub. Date: Jan. 6, 2022**

(54) **3D REDUCED GRAPHENE OXIDE/SiO2 COMPOSITE FOR ICE NUCLEATION**

(71) Applicant: **Khalifa University of Science and Technology**, Abu Dhabi (AE)

(72) Inventors: **Linda ZOU**, Abu Dhabi (AE); **Haoran LIANG**, Abu Dhabi (AE)

(21) Appl. No.: **17/422,994**

(22) PCT Filed: **Jan. 14, 2020**

(86) PCT No.: **PCT/IB2020/050259**

§ 371 (c)(1)

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(51) **Int. Cl.**

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C01B 33/12 (2006.01)

(52) **U.S. Cl.**

CPC ***C01B 32/198*** (2017.08); *B32B 2038/0048* (2013.01); ***C01B 33/12*** (2013.01)

(57) **ABSTRACT**

The present invention provides for an ice nucleating particle for cloud seeding and other applications which can initiate ice nucleation at a temperature of −8° C. Further the ice nucleation particle number increased continuously and rapidly with the reducing of temperature. The ice nucleating particle in the present invention is a nanostructured porous composite of 3-dimensional reduced graphene oxide and silica dioxide nanoparticles (rGO/SiNs). The present invention also provides for a process for synthesizing the rGO/SiNs.

China's Weather Modification Technology Used In Canada 2021

What was once a conspiracy is now a new reality...

Opal A Roszell

China Clearing The Skies With Cloud Seeding

Altering Agriculture & Enhancing Contivertial Military Applications
For International Research Projects Now Expanding Into Antarctica

Weird Weather - Not a single cloud in the sky, literally.

We in Alberta are witnessing **Cloud Seeding — causing delayed budding of plants and many other environmental changes such as drought, flooding, hail, and different odd weather. Just** a few months back in Calgary, **there was a strange winter thunderstorm with lightning and thunder.**

What was once a conspiracy in 2018 is all too real in 2021. Let us look to the skies and see what's going on up there.

'Chemtrail' conspiracy theorists: The people who think governments control the weather.

Those white lines in the sky trailing behind jet planes are puffy plumes of water vapour? But online, some have twisted...

www.bbc.com

Dry Unusual Spring

The cloud seeding process results in enhanced evaporation rates of the "snow"/precipitation they induce. When the particles land on the ground, they are bound to the water particles in part.

The water gets absorbed into the ground by these heavier, denser particles that the water

molecules attach to. Rare winter thundersnow phenomenon hits Calgary (VIDEOS) | News After being **treated to mild weather throughout the day**, Calgarians were surprised by the **sudden onset of rain and hail**... dailyhive.com

A second round of thundersnow in Alberta, but conditions to improve. After spring-like double-digit temperatures and powerful winds — with a peak gust exceeding 160 km/h in Alberta...

www.theweathernetwork.com

Weather Modification 2021

It is apparent **weather modification is underway in Central Alberta, Canada.** Three full days, in the rainy season of spring, not a single cloud in the sky.

Five days ago or so, it **snowed round bizarre pellets**, darkly hung from clouds in the depths of the sky. Almost, a looming conspicuous shade of shadow with no silver lining. Yet to nothing but blue skies.

April 15, 2021

Cloud seeding is used in Alberta to **reduce the impact of hail during the stormy** summer months. Summer storms in Alberta have the potential of causing severe damage.

Cloud seeding helps reduce the costs associated with insurance premiums that rise as a result of these damages.

Humans have **engineered sophisticated weather modification systems**, which are currently being used by Countries internationally. I witnessed this first hand in Central Alberta, outside of hail season!

What are the long-term effects of Cloud Seeding, and what leverage does it give military applications?

Agriculture & Weather Modification

An important note to take is that weather modification will impact our agriculture industry in Central Alberta, whether we like it or not. It is happening as we speak. If the Earth does not have any clouds over here, it is not accumulating precipitation, resulting in droughts affecting our planet's health.

Worldwide Storms

Weather Worldwide has a range of severity. The rising water level, tropical storms, flooding, drought, lightning, plastic pollution, toxic chemicals pollution, other possible degradation to the planet could be caused by weather modification.

I am uncertain what those effects are for sure. I do know that too much industrial waste causes smog. Which I can imagine is not sustainable **simply by letting our tree population decrease alone is fundamentally destructive and unsustainable**.

Antarctic & China's Incognito Missions

Nevertheless, Antarctica may be the key question to whether humans are in a race to change the weather for discovery or exploration or even extraction. The unique location and challenges give China an edge over the rest of the world. **They are considering their broadening expansion in research in Antarctica.**

In this once unreachable continent, new resources and potential lay beneath the glacier ice. In the midst of the moment, China's moon excursion was cheered for during a Global Pandemic. Now **equipped with iceberg smashing technology, China leads a congregation of Countries collaborating to achieve something an average person wouldn't be privileged to know.**

This could be a movement towards globalization that we need to take into account. Asian cultures are true to be respected for overcoming so many challenges. If you have noticed: Asian cultures have devoted work ethics that are incomparable to Western cultures.

Be kind when considering Canada and China working together. This could be potentially the world's biggest transformation, with Asian cultures leading the way to once unreachable land.

Government Tax Increase

Are humans omitting too much C02? Or are we clear-cutting too many trees? **Of course, alternatively, our governments modify the climate and blame carbon emissions on us consumers, charging us tax on top of top taxes.**

The manufacturing companies produce the products we consume. Those companies should be paying the price because the consumer is manipulated into believing they need the products sold to them by distributors. Distribution to consumers has nothing to do with C02. If driving a vehicle is wrecking the plant or plastic bags, why are they legally allowed to produce them? **Is this a tactic to collaborate on a global union in the "Great Reset?"**

China & Canada's Relations

An example of politically **driven decisions that impact Canadian citizens is that the Canadian economy has a crashing service sector, which interests China.**

China's ambitious interest in failing service sectors is leveraging China's stronghold on countries like Canada, where the **service sectors are being devastated by the pandemic.** Interesting fact **China** seems driven to have a stake on the table in the **service sector globally**.

Chinese Training PLA Pilots In Alberta

With Chinese pilot training in Central Alberta and incognito troops in small farm towns in the countryside, we citizens are left to wonder.

Our natural rain is missing. A lot of our water comes from fresh rainwater. **With no clouds, what does that mean for our land underneath of it?** Will it be scorched by the sun?

I am now concerned about global weather and global disasters. I **understand that they do modify the temperature regularly.** We see beautiful weather, and campers will be lured to go camping while the congregation is a national threat.

The Death of Small Business in Canada

Humans are modifying the weather for several reasons. **Trudeau supports taxing for carbon omissions despite anonymously using this technology, interfering with nature in a way that affects agriculture and farming, property values, causing the genocide of our taxpaying citizen's livelihoods and small businesses slaughtered.**

Is weather modification playing a role in the inflation of goods and services across the board?

Is this tax revenue-generating the funds and means to expand **international government weather modification systems**? Leaving us with just the questions of tangible curiosity left unanswered.

We pay an incalculable cost to the government to change the climate knowing all the horrific, catastrophic reactions. Are people aware of this?

Alberta Hail Suppression Project

Hail Damage Mitigation 1996-Present Program Management & Personnel Aircraft for Cloud Seeding Weather Radar System...

www.weathermodification.com

International Observation

Satellites need clear skies for photography and mapping an opportunistic time for ground observation. Google maps use an integration of different strategies to get good visuals on street view.

Let's imagine for a second what the world would look like from the sky if there were no clouds. **Would this not enable our technology to map a geographical area much more accessible with direct sight to a satellite**. More so, you would understand the mountainous terrain better than people who do not have access to the planes and technology that performs the weather modification.

Mountain Views

With a clear vision of mountains that appear only in the clearest of clear days, I wonder what is causing this clarity. Just the other day, when it snowed, the hills were snow-covered.

Then the **snow receded right up to the peaks in one day**. It seems like only the natural snow is left, **so when this type of Cloud Seeding snow falls, it has evaporated rapidly.**

The snow is almost competed melted from the mountain tops as the days passed.

Planes & Frequencies

Now here is an exciting point, planes are not in the air flying much these days. Lately, many aircraft have been grounded. How many of you have ever dared to turn on your phone while in mid-flight after hearing numerous warnings not to?

Or had your phone on in a hospital despite the warning signs. The frequencies will interfere. **What will huge Haarp facilities do?** High-frequency Active Auroral Research Program — Wikipedia

The High-frequency Active Auroral Research Program (HAARP) was initiated as an **ionospheric research program jointly**... en.wikipedia.org.

China's Giant Ionosphere-Zapping Radar Is a Defense System Masquerading as Science.

The South China Morning Post recently **revealed plans for a new Chinese radar facility on the island of Hainan, China's...** www.popularmechanics.com.

We are rapidly expanding into the South China Sea. Could China be trying to play God with the weather? **China is building a robust system that can knock out communications systems, but some scientists believe it could...** www.scmp.com

Arctic Research in the National Interest

The United States possesses a wide array of Arctic research facilities operated by the federal government and research... www.wilsoncenter.org

The Countries Taking Advantage of Antarctica During the Pandemic.

While the West has scaled back operations in the Antarctic, Russia and China have pushed ahead. Antarctica may be the... www.theatlantic.com

Canada following China's Weather Modification

Alberta government, Stampede optimistic outdoor events will go forward this summer Amidst a backdrop of increased restrictions and cases of COVID-19 variants, the provincial government is optimistic... ca.news.yahoo.com

For years, China has been using this technology, advocating cloud seeding success before the 2008 Olympic Games. They cleared the skies of any unwanted moisture.

Training Chinese Pilots Could Be Changing Agriculture

I read an article the other day that mentions that Alberta has **300 good flight days a year for training Chinese Pilots** who are residing in a **decommissioned Canadian Armed Forces Barracks.**

Hundreds of Chinese pilots are stationed there. The truth is anyone from Alberta who has lived there for more than ten years always knows this, **"If you do not like the weather wait five minutes!"** Penhold Barracks Houses 100's of Chinese Pilots

With incognito Canadian troops "training" just west of the airbase occupied by **Chinese pilots in a demilitarized Canadian Army Barracks**, one is left to wonder if the weather is being modified to facilitate the Chinese or by the Chinese?

2020 Wet Year Challenging Farmers

Within Central Alberta, Canada's geographical location, it is concerning to think about what is going on in our air space? We do not get clear blue sky very often. How is this affecting agriculture?

Cost On Farmers

Well, the farmers **last year were drenched — the fields sloppy wet. Frog-filled and bright tropical green growth.** The only problem was nothing would dry. It was a bad year for farmers in central Alberta because this extra precipitation causes a significant increase in crop production and additional cost to farmers in general.

The market was inevitably flooded with hay, which resulted in a surplus of grains/hay/other feed production. All the farmers had too much grass and had no market for it as everyone who needed feed had it **— causing a surplus in agricultural products.**

Now the cost of a **square bale is $3.00**. Verses **the last year's price of $7.00 per bale**. That is a **$4.00 per bale difference** and caused hay to decrease in value as it ages and does not sell. So, on the one hand, it is good that they were able to crop high values of products, but now, because of poor relations within the distribution sector of agriculture, **the farmers are left struggling to self sell or distribute their goods. (farmers are farmers- marketing and sales are comparatively different**)

Property Values

Farmer's land values have dropped. At the same time, urban housing has skyrocketed, and so have acreages. As interesting as it sounds, the Chinese are buying up Saskatchewan land as well. Could this be? ***Note Nora : Chinese Nationals purchased my sister's 44 acre property in 2019 and it is still sitting vacant, it is position along a railway track.***

Could China be working with Canada to change the agriculture industry?

China is purchasing the once-good valued land for pennies from people in financial hardship caused by the weather modification that exists and is used constantly. Are there long-term effects? Well, of course.

With New Gear And Bases, China Is Beginning To Make A Play For Dominance In Antarctica

The Antarctic Treaty System has guided the stewardship of Antarctica for decades. But China is using a steady stream of... www.forbes.com

A Review of Cloud Modeling in Weather Modification

The numerical modeling of clouds has a history almost as long as the modern-day concepts of the seeding of clouds. The... journals.ametsoc.org

Routledge Handbook of Arctic Security

The Routledge Handbook of Arctic Security offers a comprehensive examination of security in the region, encompassing... books.google.ca

Recent progress in cloud physics research in China

A review of China cloud physics research during 2003-2006 is made in this paper. The studies on cloud field experiments... link.springer.com

FILE NAME Weather Modification Scientists advance cloud-seeding capabilities with nanotechnology

Weather Modification Scientists advance cloud-seeding capabilities with nanotechnology

https://www.technologyreview.com/2022/03/28/1048275/scientists-advance-cloud-seeding-capabilities-with-nanotechnology/

A decades old idea, with today's innovation, might be the answer to help drought-stricken countries and to fight climate change. March 28, 2022

Business Lab MIT Technolody Review Dr. Linda Zou, Professor of Civil and Environmental Engineeering, Khalita University of Science and Technology, In association with United Arab Emerites Pavilion Expo 2020. In partnership withUAE Pavilion Expo 2020 **Dubai**

Since the 1940s, scientists have studied ways to increase rainfall with the goal of increasing precipitation in arid and semi-arid climates. Today, that endeavor is making incredible leaps and bounds as scientists and engineers apply nanotechnology to improve the effectiveness of cloud seeding.

"The global water shortage has continuously intensified by rapid population growth and economic development around the world. Conventional water resources such as rivers, lakes, and groundwater have become very limited, which is driving scientists and engineers to look for alternative water resources," says Dr. Linda Zou, a professor of civil and environmental engineering at Khalifa University of Science and Technology.

Dr. Zou leads a groundbreaking research project using nanotechnology to develop cloud-seeding materials. Cloud seeding is a form of weather modification that mimics what naturally occurs in clouds but enhances the process by adding particles that can stimulate and accelerate the condensation process. However, Dr. Zou explains, "The cloud-seeding materials used today have been around for many decades. The information and techniques are out of date and their effectiveness is not well understood."

Cloud seeding has strict requirements. To be successful, scientists need the right air temperature, the right humidity, a surface that attracts water and keeps it, and then the correct size material to allow condensation to form on the particle.

"Through the advancement in nanotechnology and nanoscience, nowadays we are working to design and engineer cloud-seeding materials with optimal properties to ensure water vapor condensation will occur effectively and maximize the rainfall achieved," explains Dr. Zou.

related materials

UAE Research Program for Rain Enhancement Science
New UAE cloud seeding test in Texas shows 'promising results', The National News,

August 15, 2021

Full transcript

Laurel Ruma: From MIT Technology Review, I'm Laurel Ruma, and this is Business Lab. The show that helps business leaders make sense of new technologies coming out of the lab and into the market place.

Our topic today is cloud seeding to increase rainfall. Although cloud seeding has been around since the 1940s, climate change and population growth are driving scientists to take a closer look at the technology, which could offer a viable cost-effective supplement to existing water supplies, particularly in arid and semi-arid regions, like the United Arab Emirates.

To help advance the science, in 2015 the UAE government launched a new initiative, the UAE Research Program for Rain Enhancement Science. The aim is to get other innovative projects from scientists in the field of rain enhancement from all over the world, with the winning ideas obtaining a grant of $5 million to work and improve on concepts for a period of three years. Two words for you: nanoengineered materials.

My guest today is Dr. Linda Zou, who is a professor of civil and environmental engineering at Khalifa University of Science and Technology. Dr. Zou leads a groundbreaking research project using nanotechnology to develop cloud seeding materials.

She was awarded a grant by the UAE Research Program on rain enhancement science from 2016 to 2019. Dr. Zou's research interests include applying nanotechnology and membrane science to the development of low energy **and high efficiency novel desalination and water purification solutions. This podcast is produced in partnership with the UAE Pavilion Expo 2020 Dubai. Welcome, Dr. Zou.**

Dr. Zou: Thank you, Laurel.

Laurel: You were one of the first scientists in the world to explore the use of nanotechnology in cloud seeding. Why are you interested in this type of research?

Dr. Zou: The cloud seeding materials used today have been around for many decades. The information and techniques are out of date and their effectiveness is not well understood. Through the advancement in nanotechnology and nanoscience, nowadays we are working to design and engineer cloud seeding materials with optimal properties to ensure water vapor condensation will occur effectively and maximize the rainfall achieved.

Laurel: Cloud seeding is a form of weather modification that mimics what naturally occurs in clouds but enhances the process by adding particles that can stimulate and accelerate the condensation process. Could you explain in more detail how cloud seeding works?

Dr. Zou: In the natural water cycle on the earth, the sun irradiates on the surface of our planet and the water on the surface is evaporated by the heat as the vapors. The tiny vapors

rise into the atmosphere without condensation nuclei, which are small particles. They remain as vapors in the air and move higher and further.

The natural occurring condensation nuclei are such as dust particles, volcano flash, or pollens. Unfortunately, such material is unpredictable, where and how much available. On the other hand, cloud seeding practice is to release artificial seeding materials as nuclei to initiate the water vapor in the cloud to condense into droplets and promote the formation of large droplets until they grow big enough to fall as rain.

The key factors of a successful cloud seeding operation include, first, identifying the suitable cloud for seeding. Second, having the efficient seeding material for water droplet formation.

Laurel: To successfully cloud seed, you need a number of things: the right air temperature, the right humidity, a surface that attracts water and keeps it, and then the correct size material to allow condensation to form on the particle. Is that correct?

Dr. Zou: Yes. Yes.

Laurel: Although cloud seeding has been around for decades, how does today's technology move it toward a greater success rate?

Dr. Zou: As we know, the global water shortage has continuously intensified by rapid population growth and economic development around the world. Conventional water resources such as rivers, lakes, and groundwater have become very limited, which is driving scientists and engineers to look for alternative water resources.

Atmospheric water is one such alternative resource. At the moment, all possible solutions that could resolve the water shortage issue should be examined carefully.

Nanotechnology can engineer material and design the material with well controlled size, shapes, and properties. So it has a huge possibility to improve its efficiency.

Laurel: Your research focuses on the cloud seeding material itself, specifically the nanomaterials as you mentioned, which is a more effective tool in generating rain from existing clouds. What are conventional cloud seeding materials, and then how does nanotechnology come into play?

Dr. Zou: The conventional cloud seeding materials include mostly hydroscopic salt mixture, which can change from salt crystals into water droplets at the right condition. The delivery of this salt is to vaporize them by ignition by a flare device. This salt vapor then will recondense as very small particles. Because the process is random and uncertain, the form and size of the particle cannot be controlled and most are probably too small to be effective cloud seeding materials.

The conventional cloud seeding material can only be activated at a very high relative humidity in atmosphere in the cloud, such as greater than 75% relative humidity. In my project, we have changed the surface of the material to make it more reactive so it can work

at a lower and wider relative humidity to make it more likely to happen.

To achieve this, we use the nanotechnology to deposit titanium dioxide nanoparticles as a shell layer and sodium chloride crystal core. This nanoengineered shell core structured material can be activated at much broader relative humidity conditions such as about 65%. Because the coated nanolayers are more hydrophilic and porous, the water can be absorbed easily and increase the local relative humidity of the crystals and increase the probability of forming water droplets. So it is a synergistic effect.

Laurel: You've also developed another kind of technology, ice nucleating particles. How do those compare to cloud seeding materials?

Dr. Zou: Yes. As you know, cold clouds with sub-zero temperatures are also present in the atmosphere. They are made of many super cooled water vapors, so although they are below zero, they remain as vapor. Once such cloud encounters the ice nucleation particles, they rapidly form a large number of ice crystals and bypass the liquid water phase. So they form super cool vapor and crystallize into ice particles.

Ice nucleation is important. It will initiate from the thin water layer formed on the surface of the ice nuclease, and the ice will grow rapidly at the expense of the water vapor in the cloud. We designed and fabricated a porous nanocomposite of 3D reduced graphite oxide and silica dioxide nanoparticles. This material can initiate ice nucleation followed by rapid growth starting from a temperature of minus 80 degrees. This temperature is much higher than most other known ice nucleate material. Often they require minus 25 degrees or even lower.

Laurel: This is very critical because the cloud seeding materials go very high up into the atmosphere where it is very cold, correct?

Dr. Zou: Yes. The higher you move up to the atmosphere, quickly moving into subzero and very cold.

Laurel: In the past, one of the challenges scientists encountered when researching cloud seeding was the lack of a simulation environment. You took this on as part of your research. What did you develop and how will it facilitate future research?

Dr. Zou: It is a challenge area and I have collaborated with the Cloud Microphysics Modeling International team. The innovation of my project is the characteristics data we obtained from the experiment. This data describing my new seeding materials property and their interactions in atmosphere. So we can use them as input to develop one-dimensional and three-dimensional modeling of precipitation enhancement caused by cloud seeding, and the results prove quite successful.

Laurel: Could you describe that weather chamber that you used in your experiments? What are the challenges with then deploying the material out in the real world?

Dr. Zou: The cloud chamber is a three-dimensional experimental environment. They vary in size. There's a small one, a medium one, and a large one. The small one could be 20 meters

and the large one could be like a building. I used an eight cubic meter chamber with controlled humidity and temperature. A device at the top of the chamber releases the seeding materials.

Immediately after the seeding is released, the electronic equipment, which are electronic optical cameras, will quickly take many, many photos to record the image while the seeding material's falling. Then we can later analyze at what stage the droplets formed and at what number and size of the droplets. We can do a spectrum analysis and to find out their vapor condensation, the droplet formation, and the size and the number of the droplets. Using this information is very good to compare the performance of different materials, and we did that extensively.

Laurel: Then in the real world where we don't have this controlled chamber, it's not quite as easy necessarily to measure that kind of success.

Dr. Zou: Yes, you are right. In the open environment, it's more challenging.

Laurel: Your research signifies a milestone toward achieving greater water security in the world. What kind of effect can cloud seeding potentially have on a country, like the UAE, which typically only records four inches of rain in a year?

Dr. Zou: Yeah. UAE is in the arid climate zone, and the government has already taken the initiative of this UAE research program for re-enhancement science. We call them UAEREP [United Arab Emirates Research Program for Rain Enhancement Science]. My research work has been supported in their first cycle and received excellent worldwide exposure.

Today, together with the National Center of Meteorology of the UAE, we can see the application of these new seeding materials in real operations very quickly across UAE to increase the rainfall.

Laurel: Back to your technology, you filed a patent on the cloud seeding material itself. What are you working on now, and what are you thinking about next?

Dr. Zou: Yeah. One patent is filed on the titanium dioxide, sodium chloride material for warm cloud seeding, and another patent is filed for porous graphite oxide, silica dioxide, nano compensated for cold cloud seeding.

At the moment, I'm working collaboratively on a project to evaluate the effects of these materials in the open air. A team of pilots is conducting an investigation by releasing the seeding materials and in real time capturing and analyzing them. It's very promising to know more about the effects of this seeding material.

On the other hand, I am also dedicated to the scale up of the production, reduce the cost, and the application of the materials. We are looking forward to moving the seeding materials from laboratory to the commercial venture for not only cloud seeding applications, but wider applications, such as different weather modification efforts, including agriculture or crop protection, hail, or storm suppression, and the artificial snow making at the ski resort. Yes,

such type of applications.

Laurel: Certainly, a number of possible commercial ventures. You are also pursuing funding initiatives at this point too, for your research. Is that correct?

Dr. Zou: We want to move the materials, as I mentioned, from laboratory already and scale up, so it has a chance of reaching the market and to reach many different parts of the world as well, because there are so many countries worldwide that practice weather modification.

Laurel: Dr. Zou, thank you so much for being with us here on the Business Lab. This has been an absolute, fantastic conversation.

Dr. Zou: Thank you for having me.

Laurel: That was Dr. Linda Zou, a professor of civil and environmental engineering at Khalifa University of Science and Technology, who I spoke with from Cambridge, Massachusetts, the home of MIT and MIT Technology Review, overlooking the Charles River.

That's it for this episode of Business Lab. I'm your host, Laurel Ruma. I'm the Director of Insights, the custom publishing division of MIT Technology Review. We were founded in 1899 at the Massachusetts Institute of Technology, and you can find us in print on the web and at events each year around the world. For more information about us and the show, please check out our website at technologyreview.com.

https://www.technologyreview.com/2022/03/28/1048275/scientists-advance-cloud-seeding-capabilities-with-nanotechnology/

#2

PURPOSEFUL WEATHER MODIFICATION ACTIVITIES IN CANADA: RESPONSES TO AN ENVIRONMENTAL TECHNIQUE

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PURPOSEFUL WEATHER MODIFICATION ACTIVITIES IN CANADA: RESPONSES TO AN ENVIRONMENTAL TECHNIQUE

G.R. Mcboyle

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The last decade has witnessed a growing awareness and concern for man-environment interactions, particularly western man's adopted role as master over natural processes. Belief in the need to protect the sanctity of the life-support system has promoted a considerable body of legislation to that end. Not only has there been innovation in terms of the contentof legislation, e.g., emission controls, but also innovation in the intent of legislation, as the traditional mode - of regulation after the fact — evolves into a new role which attempts to anticipate and control before the potentially undesirable event. In the reformulation of our attitudes to the environment, geographical knowledge has both much to offer and much to gain.

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Wiley Home Page

US MILITARY DISCUSSION ON BANNING CLOUD SEEDING THESE ARE THE TECHINQUES ALREADY USED BACK THEN! AND MANY MORE NOW!

Atmospheric Experimentation: Any act with the purpose of studying or modifying weather or climate, however small, using the following techniques:

Release of chemicals
Cloud Seeding
Sounding Rockets
Tracer Experiments
Modification of pollution sources
Alteration of Effluent Stacks
Jet Fuel Doping (Contrail-Induced Cirrus)
Use of Bunker Fuel (Ship Tracks)
Any other technique that results directly in cloud creation or control.
Electromagnetic or Sonic Energy
Ionospheric Heaters
Lasers
Cloud Ionizers
Resonance Technology
Any other technique that modifies
atmospheric rivers
jet streams
pressure zones
ionosphere

Any other technique that intentionally alters temperature, rainfall, cloud cover, or any other measureable change in climate or weather.
https://climateviewer.com/enmod/

US MILITARY DISCUSS FUTURE OF WEATHER WARFARE DESPITE ENMOD BAN - 1977

https://climateviewer.com/2013/11/16/us-military-discusses-future-of-weather-warfare-despite-enmod-ban/

Partial Nuclear Test Ban Treaty - OCTOBER 10, 1963
The Partial Test Ban Treaty (PTBT) is the abbreviated name of the 1963 Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water, which prohibited all test detonations of nuclear weapons except for those conducted underground. It is also abbreviated as the Limited Test Ban Treaty (LTBT) and Nuclear Test Ban Treaty (NTBT), though the latter may also refer to the Comprehensive Nuclear-Test-Ban Treaty (CTBT), which succeeded the PTBT for ratifying parties.

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Eyes in Outer Space 1959 - Cloud Seeding Hurricanes by Walt Disney
https://www.youtube.com/watch?v=HTta1V8BAoY

An Act To End Atmospheric Experimentation Without Notification

Desiring to effectively prohibit military or any other hostile use of environmental modification techniques in order to eliminate the dangers to mankind from such use, and recognizing the Environmental Modification Convention of 1976, it shall be law that any individual or organization shall give prior notice of intent to modify weather or climate in order to determine if such actions are hostile or result in monetary, environmental, or physical losses.

Further, this Act shall require the creation of a weather modification detection system consisting of sensors capable of determining the difference between inadvertent and intentional weather modification.

Create an International Registry of Atmospheric Experimentation (IREA) events:

Registry must be publicly available on a website as well has available in hard-copy. Registry should include: Intention (snowpack augmentation, rainfall enhancement, hail mitigation, etc), funding source(s), operator, area of effect, hours of operation, and duration of event.

Experimentation to ensure public notice, and liability should said Experimentation/modification cause monetary, environmental, or physical losses.

Verify the composition of our atmosphere (chemical, aerosol, gases, and electromagnetic activity) by creating both citizen-powered and government-sponsored sensor networks with data publicly available and displayed in real-time

Create an atmospheric sensor network for verification of the IREA by unifying worldwide weather data for easy transmission, dissemination, and processing.

Provide support for the creation of a citizen-powered sensor network to augment and/or validate the sensor network mandated by this Act.

Definition

Atmospheric Experimentation: Any act with the purpose of studying or modifying weather or climate, however small, using the following techniques:

Release of chemicals
Cloud Seeding
Sounding Rockets
Tracer Experiments
Modification of pollution sources
Alteration of Effluent Stacks
Jet Fuel Doping (Contrail-Induced Cirrus)
Use of Bunker Fuel (Ship Tracks)
Any other technique that results directly in cloud creation or control.
Electromagnetic or Sonic Energy
Ionospheric Heaters
Lasers

Cloud Ionizers
Resonance Technology
Any other technique that modifies
atmospheric rivers
jet streams
pressure zones
ionosphere
Any other technique that intentionally alters temperature, rainfall, cloud cover, or any other measureable change in climate or weather.
https://climateviewer.com/enmod/

FILE NAME WEATHER MODIFICATION Climate change mitigation through weather modification: cloud seeding as a global case study

WEATHER MODIFICATION CLIMATE CHANGE MITIGATION THROUGH CLOUDING SEEDING AS A GLOBAL CASE STUDY

Climate change mitigation through weather modification: cloud seeding as a global case study

Weather Modification Technology to Address Climate and Weather Impacts in 2023

During the Focused-Group Discussion (FGD) which was conducted at the Directorate General of Natural Resources Office in Jakarta on 14 February 2023, BMKG conveyed the possibility of an El Nino happening in 2023. Even though the forecasted El-Nino escalation will fall into the weak category, which has the possibility for less rainfall, Indonesia's climate and weather will be different from 2022. Several Indonesian regions may face drought during the dry season, which will have an effect on a number of sectors including agricultural production, the supply of raw water, and forest and land fires.

Several agencies present in the FGD responded to the forecasts made by the BMKG regarding their preparedness to deal with the climate and weather conditions in 2023. The National Research and Innovation Agency (BRIN), which took part in the FGD, prepared itself with technologies and human resources (HR) owned, including by utilizing Weather Modification Technology (TMC) to deal with the impacts of climate and extreme weather.

To maintain the availability of **water in irrigation and hydropower reservoirs**, BRIN has established communication with several reservoir managers, such as the Brantas DAS, Cascade Citarum, and Lake Toba reservoir managers, to conduct TMC operations to prepare for a water shortage in the 2023 dry season. The purpose of TMC is to **maximize the process of the rain on the clouds that developed around the reservoir.** It is anticipated that TMC-***induced rain will be more intense than rain that occurs naturally without TMC intervention.*** As a result, more water should be produced. TMC in a number of reservoirs will be conducted throughout the transitional period when the reservoir's capacity is still adequate and there are still potential clouds that are suitable for seeding.

atmospheric Rivers — flooding?

In the context of preventing and controlling land and forest fires, BRIN has

worked together with the Peat and Mangrove Restoration Agency (BRGM) to execute TMC activities with the purpose of wetting peatlands. The Ministry of Environment and Forestry and BRGM have been working together since 2021 to prevent land and forest fires. **This cooperation will proceed to anticipate the impacts of extreme climate and weather in 2023.**

The BMKG forecasted that the climate and weather in 2023 could affect drought in numerous areas, increasing the likelihood of forest and land fires (Karhutla). With its outstanding human resources and TMC, BRIN is prepared to play a role and support BNPB in its efforts to put an end to Karhutla in the event that events repercussions related to Karhutla worsen.

This is a description of BRIN's preparedness and participation plans in dealing with the effects **of extreme climate and weather in Indonesia in 2023.** BRIN is ready to collaborate with various agencies to implement TMC.

Additional information:

In addition to Weather Modification Technology, BRIN also intensively conducts research and innovation in the management of water resource, water treatment technology, and environmental quality monitoring technology.

Research and innovation in water resources management include conservation of water resources (protection of water sources, including surface, ground, and underground water), landscape conservation for improving the hydrological cycle's quality (increasing absorption and reducing surface water runoff); smart water management system or intelligent system for managing water resources using information technology, and continued with Decision Support System (DSS).

Water treatment technology includes wastewater treatment, clean water treatment, and drinking water or ready-to-drink water treatment. Environmental quality monitoring technology is developed online and in real-time. It has so far been widely utilized to keep track of the water quality in rivers, lakes, and effluents from Domestic Wastewater Management Installation (Abdul).

Jakarta, February 15, 2023
National Organizing Committee of the 10th World Water Forum
Email: secretariat@

https://wmo.int/events/cop-event-science-climate-action-pavilion/climate-change-mitigation-through-weather-modification-cloud-seeding-global-case-study

FILE NAME WEATHER MODIFICATION THE CATASTROPHIC CONSEQUENCES OF CLIMATE ENGINEERING

THE CATASTROPHIC CONSEQUENCES OF CLIMATE ENGINEERING WEATHER MODIFICATION

https://youtu.be/kyxmrwbTKoM

https://www.youtube.com/watch?v=kyxmrwbTKoM

Must view, THE DIMMING, the most comprehensive climate engineering documentary: https://youtu.be/rf78rEAJvhY

Geoengineering Watch Vs. The "Fact Checker", Lawsuit Filed: https://youtu.be/sMedYDBFGOI

The Catastrophic Consequences Of Climate Engineering: https://youtu.be/kyxmrwbTKoM

To see firsthand film footage of the climate engineering impact on our forests and its vanishing inhabitants, view the new series: "Into The Wild, With Dane Wigington": https://www.youtube.com/playlist?list=PLwfFtDFZDpwvtAJ2yrKO3idEKDP3miLq9

Geoengineering Watch has conducted our first ever high altitude particulate testing. Film footage of the flight and lab testing processes are featured in "The Dimming", a groundbreaking documentary that is currently in production. This is a new 12+ minute insight segment on the upcoming film. https://youtu.be/4x3z35HA6JQ

The latest and most effective GeoengineeringWatch.org awareness raising materials can be found at the links below:

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FILE NAME WEATHER MODIFICATION MANIPULATIONS GONE WRONG

WEATHER MODIFICATION MANIPULATIONS GONE WRONG

NOT CLIMATE CHANGE - NOT CO2 CAUSED!!!

NOT A CONSPIRACY THEORY -

https://rumble.com/v4q10kx-cloud-seeding-disaster-exposed-killing-dozens-edward-snowden-slams-congress.html

MORE VIDEOS

FINE OUT THE RISKS DUBIA, INDIA,

https://rumble.com/v4i7x7h-cloud-seeding-promoted-by-news-again.html?e9s=rel_v1_b

In this video, we delve into the world of weather modification and explore the technique of cloud seeding. From its potential to provide drought relief and increased water resources, to the ethical concerns and risks associated with manipulating natural processes, we take a comprehensive look at the pros and cons of this controversial practice. We also discuss the emergence of weather derivatives and the potential for financial incentives to influence the use of weather modification techniques. Whether you're curious about the science behind cloud seeding or want to learn more about the potential impacts of weather modification, this video has something for you.

https://rumble.com/v25yj3o-secrets-of-weather-modification-cloud-seeding-explained.html?e9s=rel_v1_b

Dodging silver bullets: how cloud seeding could go wrong

By Laura Kuhl | August 11, 2022

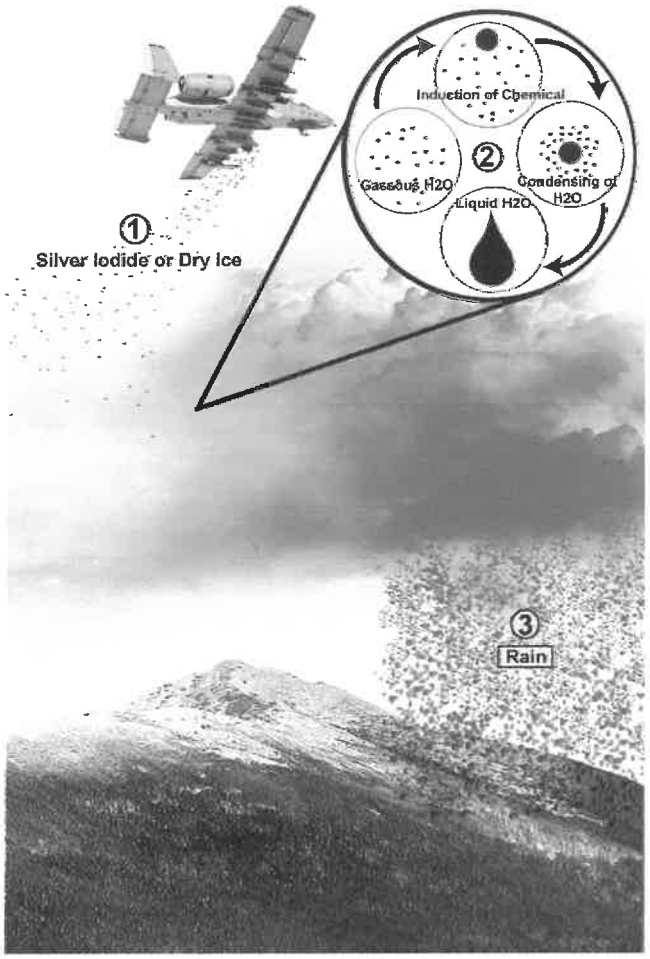
"We need more rain and we need it now. We need some divine intervention. That's why I'm asking Utahns of all faiths to join me in a weekend of prayer." —Utah Governor Spencer Cox

With water shortages in the American West continuing to worsen, policymakers are starting to recognize that incremental changes such as "avoiding long showers [and] fixing leaky faucets" will not be sufficient. During crises, "silver bullets"—promising but overly-simplistic technological solutions to complex problems—become increasingly appealing, despite the acknowledgement that no single technology or policy can address complex challenges like water shortages or climate change.

Cloud seeding is perhaps the ultimate silver bullet, in which literal silver in the form of silver iodide is infused into clouds, causing ice crystals to form and water to condense into rain or snow. Cloud seeding is a form of planned weather modification. Most commonly used to increase precipitation as a drought management technique, cloud seeding is also regularly used to clear fog in airports, fight forest fires, suppress hail, and even divert rainfall, as it was used, for example, during the 2008 Olympics in Beijing.

The promise of creating rain is highly appealing in the face of increasing water shortages and disruptions to water cycles exacerbated by climate change. While cloud seeding is not a new technology—the first experiments took place in the 1940s—it fell out of favor in the 1980s for being an "unacceptable ethical and environmental hazard." It is now back on the policy agenda as a climate adaptation strategy. Idaho, Utah, Colorado, Wyoming, and California have all expanded their cloud seeding operations in the past two years in response to the worsening drought. Despite its potential, the risks associated with cloud seeding are high, and there is significant danger that cloud seeding may do more harm than good.

"Human consequences." As early as 1965, the National Science Foundation called for urgent social science research into the impacts of weather modification, stating, "If the developing techniques of weather and climate modification are to be used intelligently, the human consequences of deliberate or inadvertent intervention need to be anticipated before they are upon us." But these issues continue to be under-explored. Compared to other forms of geoengineering that have received greater attention and generated more controversy—such as expanding research on solar geoengineering—policy discussions about the use (and misuse) of cloud seeding are lacking, even though it has been widely deployed.



Although "controlling the weather" sounds futuristic, cloud seeding has a long history going back to 1946, when General Electric research laboratories caused snow to fall near Mount Greylock in Massachusetts. Since 2000, the National Oceanic and Atmospheric Administration, which monitors cloud seeding operations in the United States, has recorded over 50 projects. These programs receive significant governmental funding. Utah, which has one of the largest cloud-seeding programs in the United States, spends up to $700,000 annually. (Bizarrely, given Utah's robust cloud seeding programs, the acting director of the state's Department of Natural Resource recently seemed to pitch cloud seeding as a new thing to try to save the Great Salt Lake.) China, India, the Russian Federation, Thailand, the United Arab Emirates, and the United States all have major ongoing research programs.

Policy frameworks regulating the use of cloud seeding exist but are incomplete. For example, each of the Western US states using cloud seeding to supplement natural snowpack has regulations on the appropriate time to conduct cloud seeding, as well as limits on when seeding can be done. These limits are meant to ensure that cloud seeding doesn't cause flooding. However, broader governance systems designed to address potential risks posed by cloud seeding are not in place.

Without significant engagement with potential risks and unintended consequences, cloud seeding is likely to lead to maladaptation, or "action taken ostensibly to avoid or reduce vulnerability to climate change that impacts adversely on, or increases the vulnerability of other systems, sectors or social groups."

"Empty promises." Cloud seeding is emblematic of techno-optimism, or the belief that technological solutions and ingenuity can solve complex issues—an attitude deeply embedded in American political culture. Despite enthusiasm for cloud seeding, the evidence of its effectiveness is at best mixed. In the words of the World Meteorological Organization Expert Team on Weather Modification, "sometimes desperate activities are based on empty promises rather than sound science."

In 2003, the National Academy of Sciences produced a study reporting a high degree of uncertainty regarding the efficacy of cloud seeding. Since then, numerous studies have been conducted, but the evidence is still inconclusive. A recent synthesis by the World Meteorological Organization concluded that increased precipitation ranged between zero and 20 percent, with the upper range representing conditions under which clouds were highly likely to form precipitation naturally. Particularly concerningly, it is widely acknowledged that cloud seeding is least likely to be effective during drought conditions, as clouds do not have moisture to release, and yet operations often continue during droughts, suggesting that the programs serve more of a political purpose than a climactic or meteorological one.

A new study based on an experiment in Idaho known as SNOWIE provided more promising results, but the authors emphasize that it is primarily through the long-term build-up of snowpack that cloud seeding can contribute to water management, and it is unlikely to work as a short-term solution. As the science of cloud seeding advances, the potential to demonstratively increase precipitation grows, but narrow discussions of the potential efficacy of the technology mask broader conversations about its long-term effectiveness.

Technological fixes can obscure deeper structural drivers of vulnerability like unsustainable water use and unequal distribution of access to water. Political and policy conversations about water use can conflict with strongly held values and beliefs. But unless such questions are front-and-center in policy debates, cloud seeding is likely to reinforce existing inequalities.

Evidence of the inability, or unwillingness of policymakers and the public to engage with these difficult questions is widespread. For example, real estate developers have proposed building at least four large surf lagoons in the Palm Springs desert region of California, despite persistent water shortages. Advocates argue that these "wave resorts" will replace golf courses that are even more water-intensive, but narratives of incremental improvements belie the need for transformational changes and illustrate the level of disconnect between current development patterns and the reality of water shortages.

While there are no simple solutions to water policy in the American West, significant policy changes are needed and current discussions about where and how to seed clouds don't tackle these complex challenges.

Redistributing risk. While cloud seeding is often described as "creating" rain, it can be more accurately described as moving rain from one location to another, and cloud seeding may simply redistribute risk. Cloud seeding condenses water that is already present in cloud formations. As such, some have argued that cloud seeding cannot impact hydrological cycles at a large scale. But the American Meteorological Society acknowledges that while there is currently no evidence of downwind impacts, these cannot be ruled out, and that "activities conducted for the benefit of some may have an undesirable impact on others."

Despite claims of only local impacts, cloud seeding is already being coordinated at a regional scale across the Colorado River Basin. If adopted widely, cloud seeding could be used politically to deprive certain regions of rainfall (for example as a weapon of war), or to claim water that would otherwise be more widely distributed. These concerns are not hypothetical: in 2020 China announced its "Sky River Plan" to divert water vapor from the Yangtze River basin to the Yellow River basin, a cloud seeding initiative that would cover an area half the size of India. This raises large governance questions about how to ethically divide water and who controls the sky. Without clear policies, including international policy to address transboundary cases, it is likely that the most powerful actors will benefit at the expense of others.

Certain uncertainties. Proponents claim that there is little to no evidence of environmental or health harms stemming from cloud seeding. However, silver iodide, the chemical most commonly used to seed clouds is known to be toxic and is regulated under the Clean Water Act as a hazardous substance. Some studies suggest that the amount of chemicals used is small and the silver iodide is not biochemically available, rendering it ecologically harmless. However, other studies highlight the potential harms from bioaccumulation, particularly for aquatic life. They show that while overall levels of silver iodide are relatively low, they have exceeded health standards in areas with repeated exposure.

Precipitation resulting from cloud seeding can also have unintended consequences. For example, a study in the United Arab Emirates demonstrated that cloud seeding operations led to an increase in urban flooding. A deathly blizzard in China and severe flooding in the United Kingdom have also been linked to cloud seeding.

More broadly, the uncertainties that are widely acknowledged in the science of cloud seeding mean that potential harms are not well-understood. The World Meteorological Organization adopted guidelines in 2017 advising members not to perform weather modification activities without considering the high levels of uncertainty in effectiveness and potential harms involved.

Silver bullets are appealing because they present simple solutions to complex problems, but only by embracing complexity can leaders around the world ensure that cloud seeding doesn't do more harm than good.

https://thebulletin.org/2022/08/dodging-silver-bullets-how-cloud-seeding-could-go-wrong/

FILE NAME WEATHER MODIFICATION PRIME EXAMPLE OF MISINFORMATION RE BRAZIL CATASTROPHE.

PRIME EXAMPLE OF MISINFORMATION BEING SPREAD DENYING USE OF WEATHER MODIFICATION AS THE CAUSE OF THE BRAZILIAN CATASTROPHE
My Rebuttal

Brazil's catastrophic weather spawns spate of conspiracy theories. The climate catastrophe that has struck southern Brazil, killing more than a hundred people and displacing nearly two million, has also spawned a spate of bizarre conspiracy theories, some involving jets' vapor trails and weather antennas in faraway Alaska.

As often happens at times of disaster and great uncertainty, several of these theories have gone viral on social media. "What's happening in Rio Grande do Sul is definitely not natural," one woman said on the platform known as X. "Let's open our eyes!" She blamed something called HAARP—the High-frequency Active Auroral Research Program—a US project that studies the ionosphere using huge antennas in Alaska

Nora's Note: Check the document supplied in these PDF files, from University of Alaska which totally falsifies the statements made in this article.

Other people have posted images of airplanes crisscrossing the skies over Brazil's hard-hit state of Rio Grande do Sul, saying the trails of condensation left by **jets contain toxic chemicals** as part of a secret and nefarious governmental program.

Nora's Note: These photos demonstrate the cloud seeding that was taking effect at the time of the flooding. As far as the chemicals being used and sprayed into our atmosphere via aircraft as cloud seeding, you determine whether these chemicals are helpful or harmful to human health and the long term health of our atmosphere and environment.

3D Graphene
Aluminum Suphide
Barium
Silver Oxide
Silver Iodide
Hydrogen Bromide
Sodium Chloride (CaCI)
Potatsium Iodide
Sulphur Dioxide (S02)
Dry Ice (CO2) (solid carbon dioxide)
Bismuth Tri-iodide (BiL3)
Liquids Propane (C3H8)
Magnesium
Hexachlorobenzene
Silver oxide
3D Graphene
Chaff
Silver Oxide crystal when exposed to sunlight the silver ion gets reduced to metal and the iodide ions are oxidized to iodine gas.

I am sure there are others chemicals used not on this list.

Taken together, the theories paint an ominous picture that somehow denies climate change while blaming governments and scientific institutions that supposedly are orchestrating "planned tragedies" for murky motives.

Nora's Notes: Whatever their reason, the cloud seeding was done and the horrific flooding may have been what is termed by the scientific community as "unintentional consequences" not different than the term "collateral damage" during war time.

These theories ignore the overwhelming scientific consensus that climate change is almost certainly behind a global increase in extreme weather events.

Nora's Notes: There are over 2,000 Nobel Lauriates and highly qualified and recognized scientist around the globe who signed a Declaration stating there is no climate change emergency. The Declaration reads "To believe the outcome of a climate model is to believe what the model makers have put in. This is precisely the problem of today's climate discussion to which climate models are central. Climate science has degenerated into a discussion based on beliefs, NOT on SOUND SELF-CRITICAL SCIENCE. Should not we free ourselves fr om the naive belief in immature climate models?" Why are they being dismissed????

What scientists say

Carlos Nobre, who heads Brazil's National Institute of Science and Technology for Climate Change (INCT), listed what scientists believe is behind the disastrous rainfalls of late: a low-pressure system has been blocked by a high-pressure system in the center-west and southeast of the country, causing cold fronts to linger over the region even as water vapor coming flowing in from the Amazon contributed to historic levels of rainfall.

Nora's Notes: No one is disputing that a low pressure system did what he described. BUT the missing part is that this low pressure system was a direct result of the CLOUD SEEDING, weather modification manipulation process being implemented over portions of Brazil.

Global warming aggravated this situation, Nobre said, adding, "The warmer atmosphere can store much more water vapor, fueling more frequent and intense episodes of rainfall that lead to disasters like this."

Nora's Note: Of interest here, a very important fact. Scientist have determined that JET fuel produces thousands of tons of CO2 in our atmosphere every DAY. Since CO2 does not dissipate at the HIGH ALTITUDES that JETS TRAVEL in, the CO2 remains and forms a blanket. That blanket causes the environment to heat up. Would someone other than myself please point this out to everyone? It seems to be a well kept secret. Since the United Nations and WEF are so concerned about CO2 in our atmosphere, tell them to get rid of their JETS and have their DAVOS meetings via Zoom rather than contaminating our atmosphere.

Brazil's government agrees: President Luiz Inacio Lula da Silva has declared the tragedy an "alert" for the planet.

In contrast, his predecessor—**far-right** president Jair Bolsonaro—weakened environmental enforcement and played down the impact of climate change.

Nora's Note: Notice the description of the former President as "Far-right" because he disagreed with the so-called government scientist in Brazil regarding the reality of climate change.

A recent survey by the Quaest polling institute, however, found that virtually all Brazilians believe climate change is at least partly responsible for the disaster in Rio Grande do Sul.

Nora's Note: Claiming that virtually all Brazilians have been brainwashed by the propaganda?

'No physical sense' Still, conspiracy theories that might once have been brushed aside have gained

new life amid the enormous environmental disaster hitting the region.

Nora's Note: It is not that "conspiracy theory" is gaining hold, it is the fact that the "truth" is being exposed.

Social media users are sharing theories discredited years ago in the United States that link extreme weather to "chemtrails" from jets and an alleged covert program at the HAARP project.

Nora's Notes: Please read these two PDF files and I am sure you will determine the above statement to be absolutely mis-information at it's best. These chemtrails are NOT from commercial JETS which this article tries to infer that it is the belief of the people. We know better. Also be sure to look at the "Journal Vault" documentation provided in this PDF file.

One claim is that the government uses jets to spread toxic chemicals which are then activated by the powerful antennas in Alaska, altering the climate and provoking weather disasters. Yet the process behind jets' "chemtrails" has long been understood: jet engines leave visible trails of condensed water vapor—plus small amounts of soot and pollutants.

Nora's Notes: The author's understanding of this issue leaves a lot to be desired. The author does not seem to know the difference between con trails and chem trails and obviously has not done her homework regarding the chem trail aspect of the issue. The author of this article really believes she is back in the 50's, 60's and 70's where citizens were totally unaware that all of this was going on. Example in the 60's/70's weather modification manipulation was used in Cuba on the sugar cane fields and in Vietnam, Cambodia and Laos. Documentation included in the two PDF files provided.

And the HAARP project, originally funded in part by the US military, is now operated by the University of Alaska, Fairbanks, where scientists use the antennas for high-power radio transmissions to study the ionosphere, with no ability to manipulate weather.

Nobre, like many other scientists, says the theories about HAARP "make absolutely no physical sense."

Nora's Notes: The author of this article either is not knowledgeable regarding HAARP or is deliberately misleading the reader. Once again, HAARP installations are all over the world, documentation provided in these two PDF files.

"There's no way an instrument in the ionosphere could make weather events more extreme," he said. 'What is true' Raquel Recuero, who specializes in social communications at the Federal University of Pelotas in Rio Grande do Sul, said the conspiracy theories were likely being spread by organized groups "in search of an audience, monetization and influence."

Nora's Note: The research is being done by people like myself. Even at 85 years of age, I still am of sound mind and body and have the computer knowledge to do research and compile the evidence regarding the use of Weather Modification manipulations and the fact governments can use it against their own people. Warnings have been given by Presidents, etc. of that very fact. Again documentation supplied as evidence in these two PDF files which I have presented for consideration.

Such theories find fertile ground when people are desperate for explanations—however unlikely—for some deeply worrying phenomenon.

The ideas take root, she added, when they are melded with issues of importance to people, like "political and religious discourse."

But she said that while they tend to reinforce conservative and extremist beliefs, they can't be linked to

a single political movement.

Nora's Notes: My motivation for researching this very subject had nothing to do with political concerns or movements. I am concerned for my children, my grand children and my great grand children and ALL future generations. That is my motivation. The Leftist like to label anyone who disagrees with any of their philosophy as "far-right", "conspiracy theorists", "extremist beliefs", tending to "political and religious discourse", and the use of any other derogatory descriptive name or word they can dream up. ONLY when a person has run out of excuses and cannot defend the issues do they revert to this type of behaviour.

Recuero said people's trust in fundamental pillars of democracy is being undercut by these attacks on governmental authorities, scientists and the press, all of them accused of manipulating the truth.

Nora's Note: As the author stated the "fundamental pillars of democracy is being undercut" by articles such as her own which intentionally spreads misinformation to the public. People are not stupid, they see through their rhetoric (the art of effective or persuasive speaking or writing, especially the use of figures of speech and other compositional techniques.)

The challenge, she said, is to raise public awareness about what is happening, and help people understand "what is true and what is false."

Nora's Note: It is evident that the author's problem is finding the truth, anyone can find the truth if they take the time to do the research. I understand the younger generation is busy raising their families and trying to put a roof over their heads and food on the table, so I have the time to do it for them and wish to share the information with them.

https://phys.org/news/2024-05-brazil-catastrophic-weather-spawns-spate.html© 2024 AFP

FILE NAME DUBAI Cloud seeding in the United Arab Emirates DID IT CAUSE THE FLOODING APRIL 2024

Cloud seeding in the United Arab Emirates

Personal NOTE: Could it be???? Human-amplified climate change is causing extreme rainfall events to become more frequent and more intense, according to the U.S. government's Fifth National Climate Assessment.

Cloud seeding in the United Arab Emirates is a weather modification technique used by the government to address water challenges in the country. Cloud seeding is also referred to as man made precipitation and artificial rain making.[1] The United Arab Emirates is one of the first countries in the Persian Gulf region to use cloud seeding technology. **UAE scientists use cloud seeding technology to supplement the country's water insecurity, which stems from the extremely hot climate.**[2] They use weather radars to continuously monitor the atmosphere of the country.[3] Forecasters and scientists have estimated that cloud seeding operations can enhance rainfall by as much as 30-35% percent in a clear atmosphere, and up to 10-15% in a more humid atmosphere.[4] **This practice has caused concerns regarding the impact on the environment because it is difficult to predict the long-term global implications.[5]**

Cloud seeding rains in Dubai[citation needed]

Climate needs

The UAE has an **arid climate with less than 100mm per year of rainfall**, a **high evaporation rate of surface water and a low groundwater recharge rate**. Rainfall in the UAE has been fluctuating over the last few decades in winter season between December and March.

The climate of the UAE is a very dry region aside from the coast and the border of the UAE and Oman, where there is high humidity.[6] The **UAE is located in a dust hotspot** that contributes to the arid climate.[7] There is little to no rainfall, due to frontal systems from the west and northwest, which yields few inches of rainfall per year.[6][5] This lack of rainfall has scientists and the government worried about water security in the future.[5]

Due to industrialization and population growth, the demand for water has rapidly increased.[7] Current resources are being depleted and scarcity issues are

arising.[8][6] As a result, the **UAE is looking to cloud seeding technologies to increase water security as well as renewability** to combat water and food scarcity that may arise.[8][9]

History

Scientists have been experimenting with **cloud seeding technology since the 1940s**.[10] The cloud-seeding program in the **UAE was initiated in the late 1990s**, as one of the first Middle Eastern countries to utilize this technique.[11] In 2005, the UAE launched the UAE Prize for Excellence in Advancing the Science and Practice of Weather Modification in collaboration with the World Meteorological Organization[12] (WMO). **In 2010, cloud seeding began as a project by weather authorities to create artificial rain**.[13] The project, which began in **July 2010 and cost $11 million USD, succeeded in creating rain storms in the Dubai and Abu Dhabi deserts**.[14]

Government involvement

The UAE government developed a research program called the UAE Research Program for Rain Enhancement Science (UAEREP) in 2015.[11][7] It allows scientists and researchers to pitch their potential solutions and conduct research to improve the accuracy of cloud seeding technology.[15] After pitching research proposals, scientists are awarded grants through the UAEREP.[7] Among its key goals are advancing the science, technology, and implementation of rain enhancement and encouraging additional investments in research funding and research partnerships to advance the field, **increasing rainfall and ensuring water security globally**.[16] By early **2001**, the UAEREP was conducting research projects in cooperation with the National Center for Atmospheric Research (NCAR) in the U.S., the Witwatersrand University in South Africa, the National Aeronautics and Space Agency (NASA) in the U.S.[17]

The Program for **Rain Enhancement Science is an initiative of the United Arab Emirates** Ministry of Presidential Affairs. It is overseen by the UAE National Center of Meteorology & Seismology[18] (NCMS) based in Abu Dhabi.[19]

In **2014**, a total of **187 missions** was sent to **seed clouds in the UAE** with each aircraft taking about three hours to target five to six clouds at a cost of $3,000 per operation.[20] In 2017, the UAE had 214 missions,[21] and in 2018, it had 184 missions, and 247 missions were launched in 2019.[11] Tests of new technologies were done in **2020 with partners in the United States to test the use of**

nanomaterials for seeding.[22]

Technology

Beechcraft King Air C90 used for cloud seeding operations

The augmentation of rainfall considers both the ground-based and airborne processes that occur in different rain cloud types (but generally focused on convective clouds). The UAE utilizes operational aircraft-based and drone-controlled hygroscopic cloud seeding as opposed to conventional randomized aircraft seeding, as it does not take into consideration the varying properties of rain clouds, especially present in dusty and arid regions like the UAE.[7] Since 2021, **the devices have been equipped with a payload of electric-charge emission instruments** and customized sensors that fly at low altitudes and **deliver an electric charge to air molecules**.[23] Hygroscopic cloud seeding uses natural salts such as potassium chloride and sodium chloride that pre-exist in the atmosphere with **hygroscopic flares**. By introducing Hygroscopic particles, it enhances the natural rain particles which begins a collision-coalescence process.[7]

At present, the UAE mostly cloud seeds in the eastern mountains on the border to Oman to raise levels in aquifers and reservoirs.[24] The country has **75 networked automatic weather stations distributed across the country UAE,** 7 air quality stations, a Doppler weather radar network of five stationary and one mobile radar, and six Beechcraft King Air C90 aircraft distributed across the country for cloud seeding operations.[24]

Environmental impact

Flooding

It is predicted that climate change will lead to higher temperatures, increased humidity and a greater risk of flooding in parts of the Gulf region. These issues could be worsened in nations like the UAE which do not have adequate drainage infrastructure to manage heavy rainfall.[25]

A flooded street in Dubai in 2020 during the cloud seeding rains[citation needed]

Cloud seeding activities conducted **in 2019** by the UAE National Center of Meteorology (NCM) as part of the **UAE Research Program for Rain Enhancement Science were carried out prior to floods in Dubai in 2019**. **Although the NCM has linked heavier rainfall to cloud seeding operations, they assert it was not the cause of the flooding.** Commercial and residential areas were severely impacted

and pumps were needed to remove excess water due to inadequate drainage systems because drainage systems could not handle the volume of water.[26] The UAE planned to invest 500 million dirhams ($136.1 million) on flood protection and transport infrastructure after severe storms in 2020.[27]

Sharjah, one of the most populous cities in the UAE, has experienced repetitive urban flooding during the rainy season over the last three decades. **Possible additional increased rainfall intensity due to cloud seeding would require additional investment in the city's drainage systems to mitigate flood risk**.[28]

April 2024 floods

Experts are doubtful that cloud seeding played a role in the UAE's April 2024 floods, suggesting that the heavy rainfall was more likely caused by anthropogenic climate change.[29][30][31]

This section is an excerpt from 2024 Persian Gulf floods § Cloud seeding allegations.[edit]

In the aftermath of the floods, some news outlets quoted **specialist meteorologist Ahmed Habib linking the heavy downpours to the UAE's cloud seeding program**.[32] Due to the arid desert climate and high temperatures, cloud seeding has been used previously in the United Arab Emirates in order to combat water scarcity.[33]

Dismissing the allegations, Omar Al Yazeedi, the deputy director-general of the UAE's National Centre of Meteorology (NCM), said the institution "did not conduct any seeding operations **during** this event".[34] Other news commentators have also dismissed the link to cloud seeding, stating that the technology marginally increases rainfall and that the UAE's cloud seeding program is localised to the eastern part of the country, away from densely populated metropolitan areas; other experts, such as the Royal Meteorological Society, stated that cloud seeding would only have a minimal effect,[35] with others even stating that the focus on cloud seeding is "misleading".[36][37]

Scientists from the University of Reading, whose cloud seeding program is used by the UAE, denied that cloud seeding was to blame for the heavy rainfall, given that the large-scale weather pattern was predicted in advance and was too large to be influenced by cloud seeding. They added that the effects of cloud seeding are typically short-lived, lasting for a few hours.[38]

Atmospheric aerosols

Cloud seeding missions require firing salts and silver iodide crystals into the atmosphere.[39] **The increased concentration of particulate matter, or micro-pollutants, increases risk for respiratory illnesses**.[citation needed] In 2017, a study was conducted before and after cloud seeding missions, **which recorded an increase of particulate matter, correlating to the months of active artificial rain**.[1] Researchers attribute this to **left over silver iodine crystals that were not dispersed in the rain during the cloud seeding months**.[1] A study was conducted called the UAE Unified Aerosol Experiment (UAE2) to assess the progress and effectiveness of cloud seeding specifically in the UAE.[7] Researchers found a **significant increase in rainfall trends in areas with cloud seeding**.[7] More recently, **over 20 regions in the UAE that participated in cloud seeding experiments have a higher concentration of particulate matter.**[5][1] The overall environmental impact of cloud seeding is difficult measure due to the **inability to perform controlled experiments along with the difficulty in direct tracing.**[5]

See also

- Cloud seeding
- United Arab Emirates
- Environmental issues in the United Arab Emirates
- Arabian Desert
- Abu Dhabi
- Dubai Electricity and Water Authority
- Sharjah Electricity and Water Authority
- Particulates

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WEATHER MODIFICATION BILL GATES FUNDING GEOENGINEERING TO BLOCK THE SUN

A few important observations about this highly controvertial much watch CNBC story.

1. If Bill Gates fund this cloud seeding project to instantly cool the entire plant, what is the reason humanity needs to spend tens of billions of dollars poisoning the plant mining materials for green energy devices.

2. What is worse for humanity, allowing the planets temperature cycle to increase two degrees a century or to eliminate the blue sky for everyone by spraying chemicals from planes for all to breathe? Bill Gates is proposing a plan to cause massive drought and famime.

3. Conservatives and conservationists were ridiculed as conspiracy theorists by the media for introducing or passing bills to prohibit planes from spraying chemicals, and just a few months later, we see this without any apology.

WATCH VIDEO HERE: https://ifunny.co/video/cnbc-bill-gates-highly-controversial-geoengineering-plan-to-block-out-BQ1UrDrRB

How Bill Gates-funded solar geoengineering could help stop global warming

As fires in the Amazon rainforest prompt renewed global outcry over climate change, Bill Gates is backing the first high-altitude experiment of one radical approach to help. It's called solar geoengineering, and it would create a massive chemical cloud around the whole planet, cooling the surface. It could eradicate blue sky and cause massive shifts in weather patterns that could cause famine and drought. It's also cheap, and the technology is not far off today.

Nora's notes: On the one hand he wants to block out the sun to cool off the earth. Without the sun our vegitation will not grow. Humans will not survive without the necessary elements which the sun bestows upon humans. Vitamin D as an example.

On the other hand he wants to cut down 780 million trees which consume CO2, ban fossil fuels, and more. What really is his goal here.

Is his plan to be the lord and king of the food supply by making all our food artificial as he is doing with our beef? Only heand his rich buddies gets richer???? How much money is enough??? To him greed has taken over, pride has taken over, he wants complete control. HE DOES NOT CARE ABOUT THE ENVIRONMENT HE ONLY CARE ABOUT HIS GREED AND NEED FOR POWER TO BOOST HE GIANT EGO.

HEN WILL CANADIANS WAKE UP???

https://www.cnbc.com/video/2019/09/07/how-bill-gates-funded-solar-geoengineering-could-help-cool-the-planet.html

FILE NAME WEATHER MODIFICATION A Bill Gates Venture Aims To Spray Dust Into The Atmosphere To Block The Sun

Forbes Business Energy

Editors' Pick Jan 11, **2021,**08:43am EST

A Bill Gates Venture Aims To Spray Dust Into The Atmosphere To Block The Sun. What Could Go Wrong?

I cover energy, security, Europe, Russia/Eurasia & the Middle EastMicrosoft's MSFT -0.2% billionaire founder **Bill Gates is financially backing the development of sun-dimming technology** that would potentially reflect sunlight out of Earth's atmosphere, triggering a global cooling effect. The Stratospheric Controlled Perturbation Experiment (SCoPEx), launched by Harvard University scientists, **aims to examine this solution by spraying non-toxic calcium carbonate (CaCO3) dust into the atmosphere — a sun-reflecting aerosol that may offset the effects of global warming.**

Widespread research into the efficacy of solar geoengineering has been **stalled for years due to controversy. Opponents believe such science comes with unpredictable risks,** including **extreme shifts in weather** patterns not dissimilar to warming trends we are already witnessing. Environmentalists similarly fear that a dramatic shift in mitigation strategy will be treated as a green light to continue emitting greenhouse gases with little to no changes in current consumption and production patterns.

SCoPEx will take a small step in its early research this June near the town of Kiruna, Sweden, where the Swedish Space Corporation has agreed to help launch a balloon carrying scientific equipment 12 miles (20 km) high. The launch will not release any stratospheric aerosols. Rather, it will serve as a test to maneuver the balloon and examine communications and operational systems. **If successful, this could be a step towards a second experimental stage that would release a small amount of CaCO3 dust into the atmosphere.**

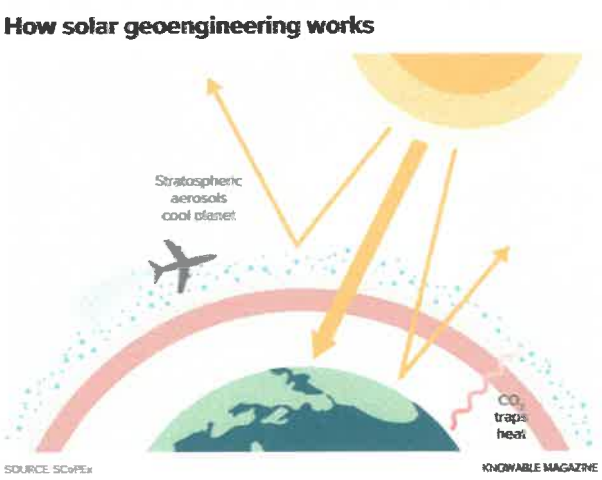
https://www.forbes.com/sites/arielcohen/2021/01/11/bill-gates-backed-climate-solution-gains-traction-but-concerns-linger/?sh=4e843e67793b

News from the Columbia Climate School

Climate

Solar Geoengineering To Cool the Planet: Is It Worth the Risks?

Renée Cho April 24, 2024



When I first wrote about geoengineering in 2012, it was considered far-fetched at best, and crazy by most. But 12 years later, while there is still controversy and considerable resistance to deploying it, respectable scientists and institutions are pushing for more research into geoengineering—the deliberate and large-scale intervention in our climate system to moderate global warming. Most of the current attention is focused on solar geoengineering, a strategy that involves reflecting sunlight away from Earth to cool the Earth. How much do we know about it and its risks? And where should we take it from here?

Why the growing support for solar geoengineering research?

For many years, all geoengineering research was discouraged by many scientists and experts for fear it would provide an excuse not to cut emissions. Some right-wing politicians such as Newt Gingrich promoted it as a way to reduce global warming without having to cut emissions. Geoengineering research is also controversial because there were and still are many uncertainties about its potential effects on the climate system and ecosystems.

Nevertheless, James Hansen, director of the Program on Climate Science, Awareness and Solutions at Columbia's Climate School, who first warned Congress about climate change risks in 1988, and a group of over 60 scientists are calling for more research into solar geoengineering. In addition, the US National Academy of Sciences, the Environmental Defense Fund, the Natural Resources Defense Council and the Union of Concerned Scientists all support solar geoengineering research. A 2023 White House report also expressed strong support for the research.

Experts say support for research is growing because humanity is not doing enough fast enough to

reduce carbon emissions to forestall severe and worsening climate impacts. Due to air quality regulations, a decrease in the sulfur dioxide aerosol emissions from coal plants and shipping that helped shield Earth from solar radiation has resulted in the world warming faster than was previously projected, according to a new study by Hansen and colleagues. They project that warming will surpass 1.5°C by the end of this decade and 2°C by 2050, which could result in disastrous climate impacts.

The potentially catastrophic climate impacts and the possibility of passing climate tipping points, such as thawing of the Arctic permafrost or the dieback of the Amazon rainforest, could necessitate the use of what were once unthinkable strategies.

In an open letter, more than 110 scientists said that because of these serious risks, and the possibility of some desperate country one day resorting to solar geoengineering, it needs to be rigorously studied as soon as possible, with both benefits and drawbacks clearly assessed.

Most research into solar geoengineering strategies is currently focused on stratospheric aerosol injection (SAI, also called solar radiation management or SRM) and marine cloud brightening; other strategies include cirrus cloud thinning and the use of mirrors or sunshades.

Solar aerosol injection

After Mount Pinatubo in the Philippines erupted in 1991, sending 20 million tons of sulfur dioxide into the stratosphere, the Earth cooled by 0.5° C. When sulfur dioxide enters the atmosphere, it reacts with water vapor to form droplets—aerosols that reflect sunlight away from Earth. SAI would recreate Pinatubo's effect by shooting sulfur dioxide into the stratosphere to temporarily block sunlight.

Harvard's Solar Geoengineering Research Program claims SAI could lower sea surface temperatures, which would decrease the risks of coral bleaching, slow the movement of species towards cooler areas and reduce sea ice loss and glacier melt. Results would be quick and buy humans more time to cut carbon emissions and transition to renewable energy.

But unlike CO2 removal, a multifaceted geoengineering strategy that has more acceptance, solar geoengineering does not reduce CO2 in the atmosphere. It would do nothing to address ocean acidification, which harms marine ecosystems, because the ocean absorbs 25% of the CO2 humans emit, altering its chemistry. Moreover, an abrupt use of SAI may not be effective enough to fully remedy changes caused by a warming deep ocean, such as the slowing of the Atlantic meridional overturning, according to a recent study. Other problems caused by a warming deep ocean, including altered weather patterns, sea level rise and weakened currents, would also persist.

The uncertain impacts of SAI

Because there is no international governance for solar geoengineering, there is strong opposition to large-scale deployment of SAI. Almost all solar geoengineering research has been done with computer modeling, so no one knows exactly what might happen if it were deployed on a planetary scale. Those against advancing SAI research are worried about its potential and uncertain impacts on the climate and ecosystems that modeling has revealed. Studies show that SAI could weaken the stratospheric ozone layer, alter precipitation patterns and affect agriculture, ecosystem services, marine life and air quality. Moreover, the impacts and risks would vary by how and where it is deployed, the climate, ecosystems and the population. Apart from deployment variations, small changes in other variables, such as the size of the aerosol droplets, their chemical reactivity and the speed of their reactions with ozone can also produce different results.

For example, NOAA, Cornell and Indiana University studied a number of deployment strategies by using

a model that varied the amount of sulfur dioxide injected into the stratosphere and also where it was injected. The results showed decreased surface temperatures but also a reduction of ozone over Antarctica and impacts on large-scale circulation patterns and regional weather. Twelve other models projected that if enough SAI were deployed to offset the warming of quadrupled CO2, parts of the tropics could have 5% to 7% less rainfall each year compared to preindustrial times, which could damage crops and rainforests. One model indicated that SAI deployed over the Indian Ocean to increase precipitation over the drought-stricken Sahel in North Africa would end up pushing the drought to countries in East Africa. And a 2022 study found that SAI could shift malaria from highland areas in East Africa to lowland areas in South Asia and sub-Saharan Africa as they became cooler.

According to Gernot Wagner, co-founder of Harvard's Solar Geoengineering Research Program and currently a climate economist at Columbia, the most important and determinative modeling variables are how high up in the stratosphere and where specifically SAI is deployed. Wagner said that if only one hemisphere is cooled, you get "crazy results" such as turning off the Indian monsoon. "The science has more or less coalesced around the idea that you want to be [deployed] somewhere between plus and minus 15 degrees from the equator. And wherever you are around the equator, you want to do the same north as you do south," he said. "It doesn't matter which longitude because it will spread globally. By and large, the hundreds of climate models agree that [if SAI is deployed this way] you have more or less a uniform global effect. That means that most of the stuff that we can measure—temperatures, water availability, extreme temperature, extreme precipitation—gets closer to pre-industrial levels with solar geoengineering than without."

Wagner cited a Harvard paper that modeled a version of solar geoengineering with a slow ramp-up to halve warming. "When modeled in admittedly this idealized fashion, solar geoengineering seems to have these frankly surprising net benefits. The benefits dwarfed the costs by so much," he said. "It is encouraging in a way that leads me to believe it is worth it to continue doing research."

What would SAI deployment take?

In 2011, David Keith, Harvard's Solar Geoengineering Research Program co-founder who is now at the University of Chicago, and atmospheric scientist Ken Caldeira estimated that to reverse 10% of the warming caused by a doubling of CO2 levels compared to the pre-industrial era, several hundred thousand tons of sulfur dioxide would have to be injected annually over a decade. To significantly slow warming or reverse it, SAI would require millions of tons of sulfuric dioxide each year. Currently only a few research planes can operate at the necessary altitude because the atmosphere is so thin, and in addition, they are not capable of carrying that many tons of sulfur dioxide. This means that a new fleet of high-altitude planes designed specifically for the purpose would have to be built; creating this fleet could take a decade or more. Once the planes are built, SAI could cost $18 billion per degree of cooling each year.

While that sounds like a lot of money, Wagner said the cost is minuscule compared to the potential social benefits. But because the benefits exceed the costs by so much, which would normally lead us to conclude we should go headlong into SAI, a cost-benefit analysis is not the right criterion for making decisions about SAI. Rather, he said, "It's about weighing the risks of unmitigated climate change—the world we are heading towards—against the risks of a world that also considers solar geoengineering."

"But even if the risks are large, even if the climate uncertainties are so large as to dwarf everything else, since it seems to be true that solar geoengineering gets us closer to pre-industrial levels of global average temperatures, it should also help us mitigate and understand those risks and uncertainties," said Wagner.

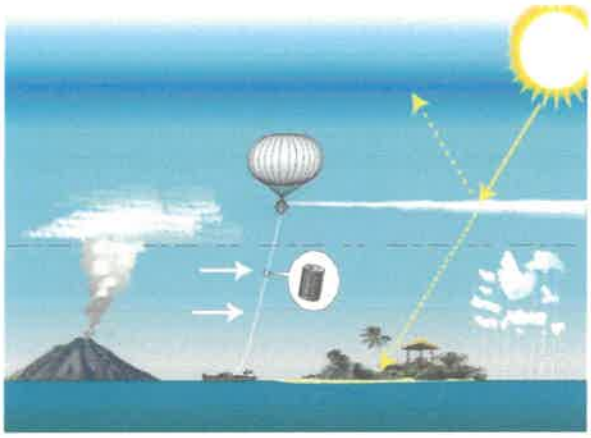
Once begun, SAI would have to continue for a few decades if we manage to cut our emissions, or

perhaps centuries or millennia if we don't. But if SAI were stopped suddenly, the planet could experience termination shock—when temperatures rebound to the levels they would have reached without SAI. Because SAI would not reduce greenhouse gas emissions but only mask their warming effect, emissions would continue to build up in the atmosphere. Right now, the planet is warming gradually. Sudden warming would be catastrophic because ecosystems and humans would have less time to adapt. And the faster the climate is changed, the greater the risk of unforeseen impacts. Natural disasters, terrorist attacks or political aggression could all potentially precipitate termination shock.

Small SAI experiments

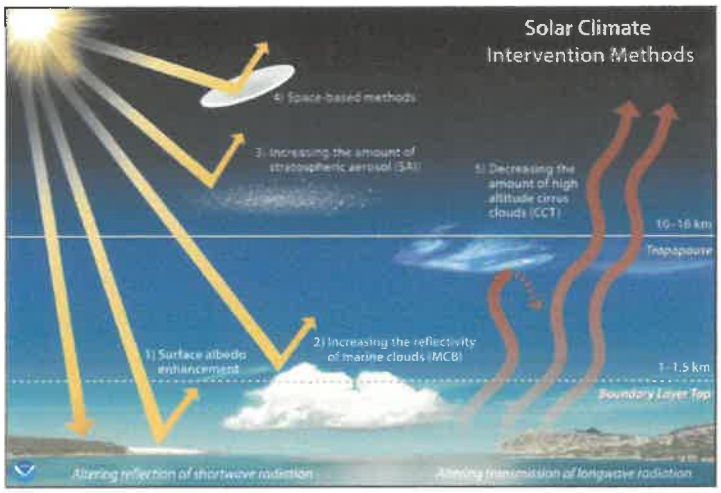
Small field SAI experiments that enable researchers to better understand aerosol behavior, chemical reactions, monitoring capabilities and how ozone is affected, are increasing.

In 2021, Harvard planned a small field trial that would have been the first experiment done in the stratosphere. The Stratospheric Controlled Perturbation Experiment (SCoPEx) would have launched a self-propelled balloon into the sky, releasing half a kilogram of sulfate—which is found naturally in nature—and then monitoring how the particles dispersed and how much sunlight was reflected off them. The test launch in Sweden was cancelled because of objections from the local Sami Indigenous people and environmental groups who feared that SAI "entails risks of catastrophic consequences."



UK researchers launched several balloons in 2021 and 2022. The 2022 launch of a high-altitude weather balloon released a few hundred grams of sulfur dioxide into the stratosphere, with the goal of testing the balloon system.

Meanwhile, Make Sunsets, a startup company, says that as of April, it has launched 64 balloons and offset the warming of 32,785 metric tons of CO2 "for a year." It sells "cooling credits" for $10, each of which, it claims, will offset the warming effect of one ton of CO2 for a year. In 2023, Make Sunsets conducted two unauthorized launches that released sulfur dioxide in Mexico, which resulted in the Mexican government stating it would ban solar geoengineering.



Marine cloud brightening

Marine cloud brightening (MCB) would spread sea salt aerosols into the atmosphere to create stratocumulus clouds that reflect the sunlight. Sea salt aerosols are highly reflective, attract water molecules and keep clouds in the sky longer than normal. While salt aerosols occur naturally as winds whip them up from the ocean, MCB would generate them from a floating barge and send them into the atmosphere. By its very nature, MCB would be localized. Some scientists claim using MCB over just 5% of the world's oceans could offset the impacts of global warming.

The Great Barrier Reef Foundation has been researching MCB as the reef experiences its fifth mass bleaching in eight years. The reef is at the greatest risk of bleaching when the weather is hot and there are few clouds. Researchers employed a sea salt sprayer on a barge that sucked up seawater, atomized it and shot microscopic sea salt crystals into the sky. The modeling research found that the sprayers would need to operate for weeks to months, cooling the waters gradually.

Recently, a group of atmospheric scientists proposed an MCB research program including modeling, lab studies and field experiments. University of Washington researchers, who are also running an MCB project, estimate it will be a decade before they know enough to try MCB at large enough scale to cool the planet.

Uncertainties about MCB

Large-scale MCB that could offset serious climate impacts, however, might also alter climate and weather patterns. A researcher from UC Santa Barbara found that while MCB could quickly lower temperatures, it would also suppress ENSO, the El Niño-Southern Oscillation, which affects global weather patterns. MCB could cause the La Niña phase of ENSO to persist, which would make the southern US hotter and drier and increase Atlantic hurricane activity. The research suggested that MCB could also increase warming in Indonesia and Northern Australia.

Because of uncertainty about MCB's effects, 101 countries as Parties to the London Convention and Protocol—international treaties that regulate the dumping of wastes at sea—signed a statement saying that marine geoengineering activities other than scientific research should be deferred.

Other solar geoengineering strategies

Cirrus cloud thinning

High-altitude cirrus clouds are composed of ice crystals and thus reflect sunlight, but also result in warming because they trap the heat that radiates from Earth's surface. Cirrus-cloud thinning involves spraying particles of silver iodide into the clouds at altitudes of 4,500 to 9,000 meters. This serves to enlarge the ice crystals in the cirrus clouds so that they fall out of the atmosphere. The fewer and thinner cirrus clouds that remain would trap less radiation from Earth. The risks of cirrus cloud thinning are not yet fully understood, and some researchers are concerned that it could affect regional and seasonal precipitation.

Sunshades

Some scientists are researching the possibility of sending a giant sunshade to a point between Earth and the sun to block solar radiation. An MIT group is exploring creating a shade of "space bubbles," while University of Hawaii researchers are considering tying an enormous solar shield to an asteroid. Israeli researchers are designing a small prototype of a group of sunshades that would not completely block the sun but diffuse it. Others have proposed similar strategies in the past. But French scientist Susanne Baur, who studies solar radiation modification, says that the sunshade strategy would be too expensive, too easily damaged by space rocks and take too long to implement.

The need for geoengineering governance

There is no international, national or state framework that currently governs geoengineering. As a result, one worrisome future scenario is that climate impacts in a particularly vulnerable country will be so severe that it resorts to deploying SAI on its own before the world is ready for it. This could cause political instability or provoke retribution from other countries that suffer its effects. Another possible scenario is that an individual or a startup decides to experiment with geoengineering on their own. Today in the U.S., anyone who wants to shoot aerosols into the sky simply needs to fill out a one-page form for the Commerce Department and NOAA 10 days beforehand.

It is critical for the world community to establish an international governance structure for solar geoengineering. But because this is such a daunting and complex undertaking, many countries, organizations and scientists object to even allowing the research to progress.

In 2010, a global de facto moratorium on large-scale geoengineering, including solar geoengineering, was put in place. Recently a motion to convene a research group to study the potential applications, risks and ethical considerations of solar geoengineering was voted down by delegates at the U.N. Environment Assembly. The panel would have comprised experts from the UNEP and international scientific organizations. Because the motion might have undermined the existing moratorium, however, the African, Pacific, and Latin American countries, which are more vulnerable to climate impacts, blocked it. In 2022, 500 scientists from around the world signed a call for an International Non-Use Agreement on Solar Geoengineering, stipulating no public funding, no outdoor experiments, no patents, no deployment and no support in international organizations.

Wagner believes that a moratorium on solar geoengineering deployment is necessary, but that research should continue. "Basically, you say no deployment above a certain size, and you give permission for research to proceed up to that point," he said. To ensure these guidelines are followed, high-level formal, legal, regulatory governance agreements to guide solar geoengineering research would be needed. Wagner would also like to see a solar geoengineering organization with a massively funded research program that tries to answer the important questions in a rational way, and that makes the research transparent to inform policy choices that should ultimately be made by democratically elected leaders.

"Looking at climate radiative forcing impacts in a semi-rational fashion ought to lead you to conclude that a modicum of solar geoengineering should be part of the climate policy portfolio, because it does help take the edge off unmitigated climate change," Wagner said. The portfolio should "include cutting CO2 emissions in the first place, as well as adaptation." But, he added, "SAI technology is not going to be the sole savior here. That is absolutely clear."

https://news.climate.columbia.edu/2024/04/24/solar-geoengineering-to-cool-the-planet-is-it-worth-the-risks/

HAARP artificial airglow may be widely visible in Alaska

Rod Boyce
907-474-7185
Nov. 2, 2023

Alaskans and visitors may be able to see an artificial airglow in the sky created by the High-frequency Active Auroral Research Program during a four-day research campaign that starts Saturday.

Scientists from the University of Alaska Fairbanks, Cornell University, University of Colorado Denver, University of Florida and Georgia Institute of Technology will conduct a variety of experiments at the UAF-operated research site.

HAARP antenna array

UAF/GI photo by JR Ancheta

HAARP's Ionospheric Research Instrument is a phased array of 180 high-frequency antennas spread across 33 acres.

The experiments will focus on the ionosphere, the region of the atmosphere between about 30 and 350 miles above the Earth's surface.

Scientists will investigate ionosphere mechanisms that cause optical emissions. They'll also try to understand whether certain plasma waves — gas so hot that electrons get knocked off atoms — amplify other very low frequency waves. And they'll investigate how satellites can use plasma waves in the ionosphere for collision detection and avoidance.

Each day, the airglow could be visible up to 300 hundred miles from the HAARP facility in Gakona. The site lies about 200 miles northeast of Anchorage and 230 miles southeast of Fairbanks, or about 300 to 350 kilometers.

HAARP creates airglow by exciting electrons in Earth's ionosphere, similar to how solar energy creates natural aurora, with on and off pulses of high-frequency radio transmissions. HAARP's Ionospheric Research Instrument, a phased array of 180 high-frequency antennas spread across 33 acres, can radiate 3.6 megawatts into the upper atmosphere and ionosphere.

The airglow, if visible, will appear as a faint red or possibly green patch. Because of the way the human eye operates, the airglow might be easier to see when looking just to the side.

Airglow elevation and angle chart

Image courtesy HAARP

This chart shows the approximate elevation angle per distance from HAARP a person will need to be at to observe the

airglow.

HAARP will create an airglow at a specific point in the sky. The angle of visibility for anyone wanting to look for it will depend on a person's distance from HAARP.

HAARP transmission frequencies will vary but will occur between 2.8 and 10 megahertz. Actual transmit days and times are highly variable based on real-time ionospheric and/or geomagnetic conditions.

Additional information about the research campaign will be available on the HAARP website.

The National Science Foundation in 2021 awarded the UAF Geophysical Institute a five-year, $9.3 million grant to establish the Subauroral Geophysical Observatory at HAARP. The observatory explores Earth's upper atmosphere and geospace environment.

The grant has supported several HAARP research campaigns, including this one. It also helped fund the return to HAARP of the Polar Aeronomy and Radio Science Summer School, which hosted more than 50 researchers in August.

The Air Force originally developed and owned HAARP but transferred the research instruments to UAF in August 2015. UAF operates the site under an agreement with the Air Force.

Pilots flying in the Gulkana area are asked to check with the Federal Aviation Administration for temporary flight restriction details.

https://www.uaf.edu/news/haarp-to-produce-artificial-airglow-that-may-be-widely-visible-in-alaska.php

Extreme weather and misinformation plague world order, warns WEF report

The World Economic Forum highlights that many **anticipate more effects** of climate change

Extreme weather is thought to be the biggest threat to the **global economy in 2024**, according to the World Economic Forum (WEF)'s latest risk report, while misinformation has emerged as a key threat to global order over the coming years.

Published on January 10 ahead of this week's Davos conference, the WEF's Global Risk Report 2024, presents the findings of its annual risk survey where it sounds out responses of over 1400 global risks experts, policymakers and business leaders. It offers an analysis of global risks over one-, two- and 10-year horizons.

Climate change biggest risk over next decade

Two thirds of the respondents to the Global Risks Perception Survey 2023-2024 find that "extreme weather" as the biggest risk in 2024 following the hottest summer on record last year and ahead of the warming phase of the El Niño cycle likely to persist until May this year.

Four separate environmental risks, including extreme weather, biodiversity loss and natural resource shortages, top the World Economic Forum's (WEF's) Global Risks Report 2024 — an analysis of global economic risks over one-, two- and 10-year horizons — as many anticipate the effects of climate change to become more severe. **Nora's Note: WEF have the ability to predict these global risk due to the fact that they have Weather Modification at their whim to cause drought, flooding, lack of sunshine, hurricanes, tornadoes, cyclones, all the elements necessary to destroy our ability to grow our own food and devastate our farmers. They have to speed up this approach due to the fact their target date for takeover is 2025.**

But the understanding of environmental risks differs between generations, and between those in the private- and public-sectors, the report highlights. Younger respondents deem these risks to be of greater concern in the near term than older respondents, the survey finds. Additionally, it finds that those working in **the private sector** are more likely to think environmental risks will "materialise over a longer time frame" than their counterparts in the government or the third sector.

"This dissonance ... among key decision-makers implies sub-optimal alignment and decision-making," the report says, which would in turn increase the risk of "missing key moments of intervention".

Meanwhile, the risk of misinformation and disinformation has risen to become the biggest concern over a two-year timeframe. "No longer requiring a niche skill set, easy-to-use interfaces to large-scale artificial intelligence (AI) models have already enabled an explosion

in falsified information and so-called 'synthetic' content," the report says.

Despite efforts from governments and regulators, "there is a risk that some governments will act too slowly, facing a trade-off between preventing misinformation and protecting free speech, while repressive governments could use enhanced regulatory control to erode human rights," the report adds. **Nora's note: Here is where United Nations WEF panic sets in. Too many people are becoming aware of the truth of the matter so ONLY MANNER WEF can retain a hold on their propaganda is to shut down free speech as they want TOTAL CONTROL OF every aspect of the populations life, even our thought processes.**

The report also notes that as this year is **set to be the biggest election year ever**, the "widespread use of misinformation and disinformation, and tools to disseminate it, may undermine the legitimacy of newly elected governments". **Nora's Note: With the change in governments, especially our federal 2025 and the BC provincial in October 2024, their "puppets" will no longer be in elected seats of power and the WEF will lose its momentum in reaching their target goal by 2050. WEF goal is to obtain complete control of all nations of the worldby 2025. WEF had to speed up the number of disasters they are perpretating trying to convince the average joe that it is climate change.**

"An unstable global order characterised by polarising narratives and insecurity, the worsening impacts of extreme weather and economic uncertainty are causing accelerating risks — including misinformation and disinformation — to propagate," said Saadia Zahidi, managing director of WEF, in a statement. **Nora's Notes: No credit given to the intelligence of the population's understanding of what the WEF and United Nations are really doing to the population of the world. The WEF wants free speech to be abolished so people cannot be made aware of the truth of the situation we find ourselves in today.**

"World leaders must come together to address short-term crises as well as lay the groundwork for a more resilient, sustainable, inclusive future." **Nora's note: This is the Dephi Technique being used against the people, which is cause the problem (Use of Weather Modiciation by WEF) then come as the savior with a method to cure the ailments of our climate. Deceit at it best showing.**

Like misinformation, "interstate armed conflict" has also emerged as a key short-term risk in the minds of many, as the world finds itself grappling with wars in Europe and the Middle East.

Elsewhere, concerns over inflation are understood to become less significant in the future as they are now. The WEF report places inflation as the seventh-biggest risk among respondents over the next two years, yet it drops to 32nd over the next decade. **Nora's notes, it drops to 32nd because people will own nothing and be happy, which I doubt they will be happy as they will be slaves of the elite. They will be confined to 15 minute walks and jailed in places that they helped built not knowing what they were**

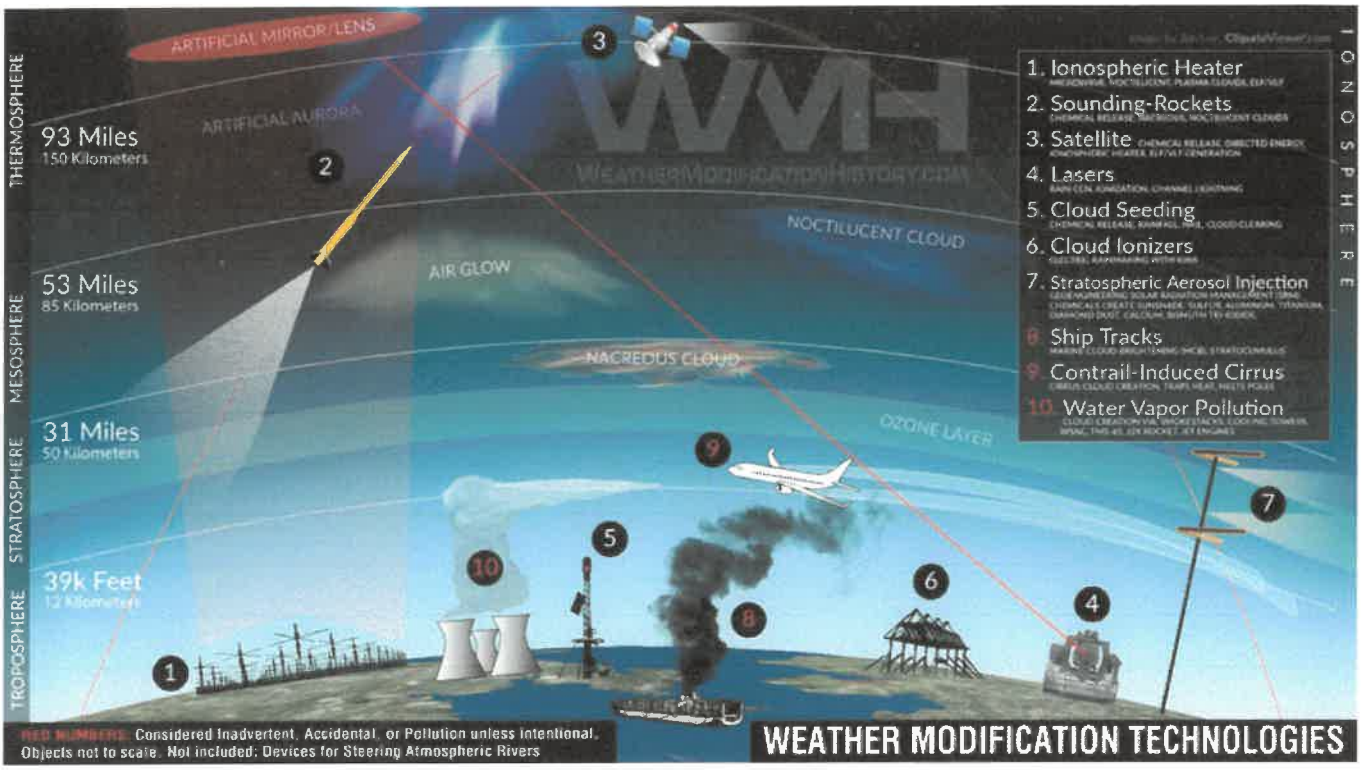
doing, trusting their governments.

"Most economic risks fall rapidly in comparative rankings of risk perception over the next decade," it says with the risk of "economic downturn" dropping from ninth biggest risk in the short-term to 28th in the long-term.

https://www.fdiintelligence.com/content/news/extreme-weather-and-misinformation-plague-world-order-warns-wef-report-83345

#3

WEATHER MODIFICATION TECHNOLOGIES.



https://climateviewer.com/2017/11/07/ten-technologies-to-own-the-weather-today/

Speculation on the internet abounds on the subject of weather control. With the recent flop of the 100+ million dollar Geostorm movie, many are searching for answers to the question "Is someone controlling the weather?" The answer is unequivocally yes. We will now explore ten weather modification technologies in use today and explain how each could be used as a weapon of war.

"It lays the predicate and foundation for the development of a weather satellite that will permit man to determine the world's cloud layer and ultimately to control the weather; and he who controls the weather will control the world" - Vice President Johnson at Southwest Texas State University (1962) [1]

"In his subcommittee's detailed summary statement Johnson proclaimed that our very future depended on being the ones who first seized ownership of space. "Control of space means control of the world," Johnson declared.

"From space, the masters of infinity would have the power to control the earth's weather, to cause drought and flood, to change the tides and raise the levels of the sea, to divert the gulf stream and change temperate climates to frigid." Johnson continued: "In essence, the Soviet Union has appraised control of space as a goal of such consequence that achievement of such control has been made a first aim of national policy. [In contrast], our decisions, more often than not, have been made within the framework of the Government's annual budget.

#3

Against this view, we now have on record the appraisal of leaders in the field of science, respected men of unquestioned competence, whose valuation of what control of outer space means renders irrelevant the bookkeeping concerns of fiscal officers." - Vice President Johnson [2][3]

President Johnson would go on to authorize weather warfare over Vietnam.

Operation Popeye first came to public light in March 1971, when reporter Jack Anderson published a story [4] based on a secret 1967 memo [5] from the Joint Chiefs of Staff to President Johnson. The memo read:

ACTIONS: "LAOS OPERATIONS – Continue as at present plus Operation POP EYE to reduce the trafficability along infiltration routes" & AUTHORITIES/POLICY CHANGE: "Authorization required to implement operational phase of weather modification process previously successfully tested and evaluated in same area". (US Senate, Subcommittee on Oceans and International Environment; 26 July 1972; p. 5). [6]

#4

The World's Most Comprehensive Geoengineering and Weather Control Timeline

Welcome to the Weather Modification History Geoengineering and Weather Modification Timeline. Each event in this timeline contains descriptions, quotes, images, videos, and MLA formatted references archived by Jim Lee and is divided into three main categories:

Geoengineering: Also known as Climate Engineering or Climate Intervention, Geoengineering is the inadvertent (unintentional or "accidental") or intentional attempt by humans to control the temperature of the world and/or modify nature on massive scales to achieve a desired result (such as melting the arctic or to solve The Dust Bowl).

Weather Modification: Is the inadvertent or intentional attempt by humans to control rainfall, hail, lightning, cyclones, and any other tropospheric weather phenomenon.

Space Weather Modification: Is the inadvertent or intentional attempt by humans to alter our upper atmosphere (ionosphere, mesosphere) through chemical releases and injection of high powered electromagnetic radiation (like ionospheric heaters, lasers, and charged particle beams).

This timeline, while far from being complete, covers over 150 years of attempts to control our climate and weather. Some timeline entries cover large patterns while others are very specific to a single event, statement, or publication. **If you find any errors, omissions, or would like to see something included in this timeline please feel free to contact Jim Lee via email at jim@climateviewer.com.**

(4/5)

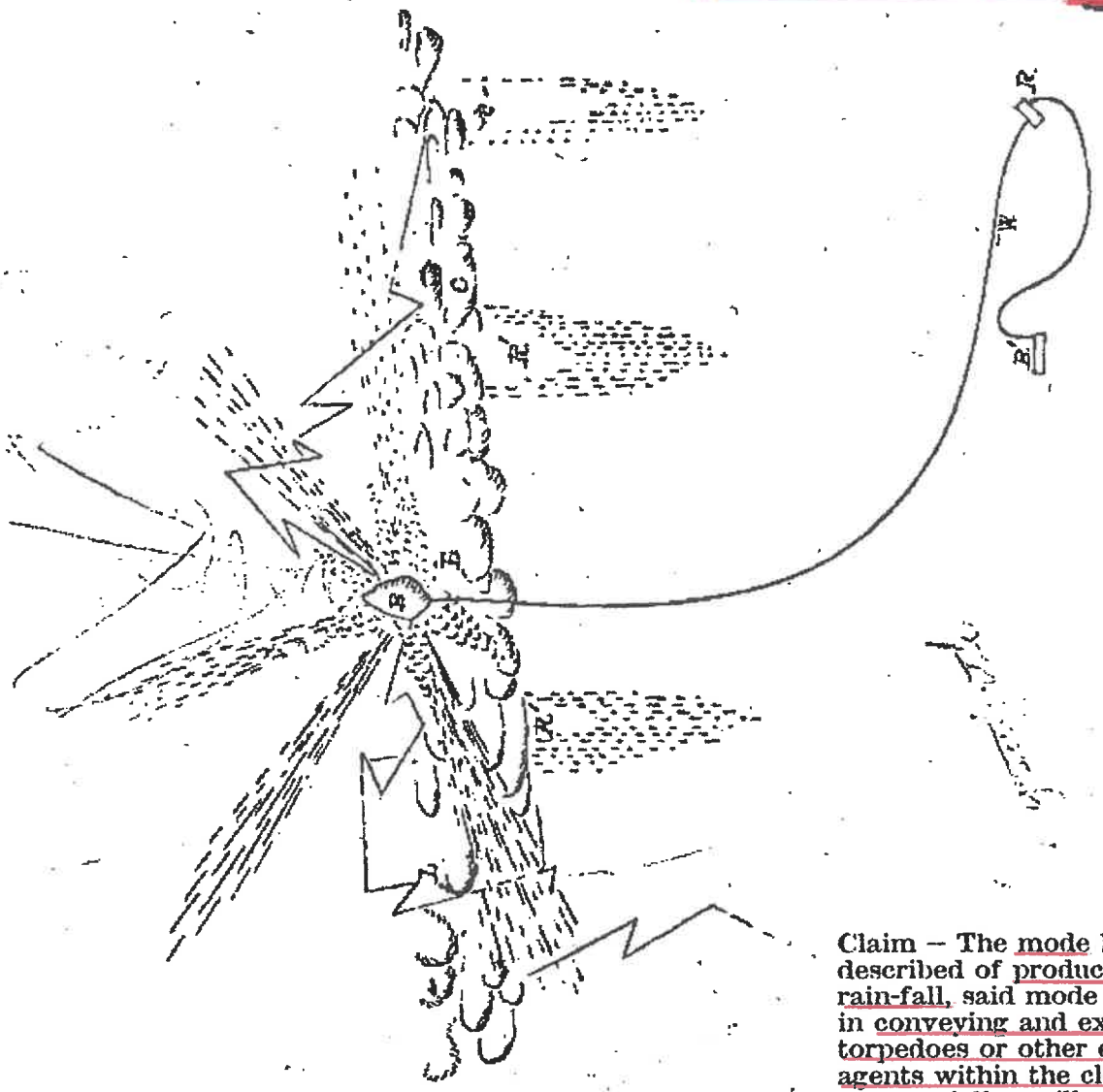
1980

(No Model.)

D. RUGGLES.

Method of Precipitating Rain Falls.

No. 230,067. Patented July 13, 1880.



FIGURE

Claim — The mode herein described of producing rain-fall, said mode consisting in conveying and exploding torpedoes or other explosive agents within the cloud-realm, substantially as illustrated.

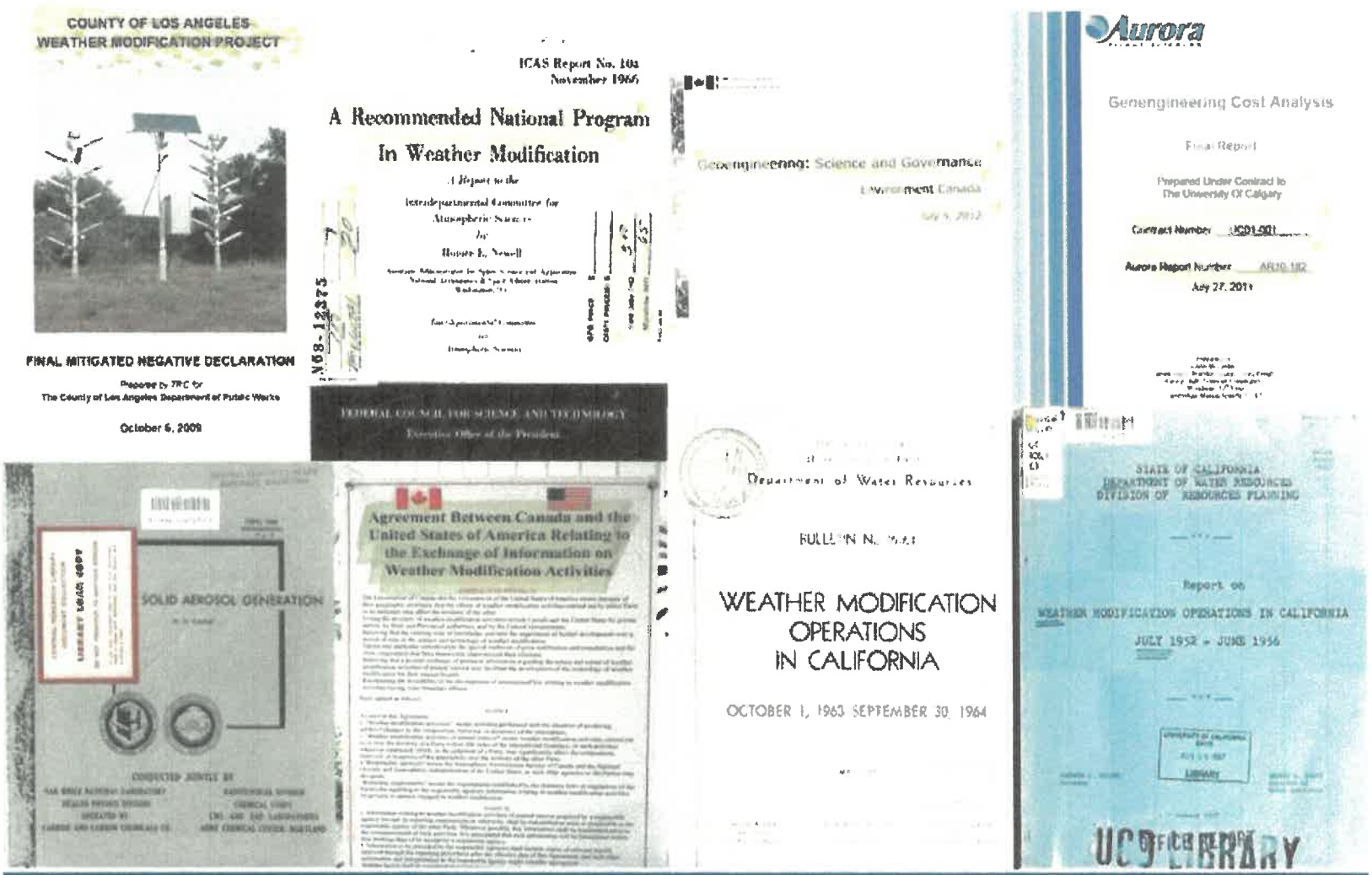
Witnesses:
J. F. Thos. Lang
G. H. Thos. Lang

Inventor.
Daniel Ruggles
by Munn & Co

7. METHOD OF PRECIPITATING RAIN-FALLS. DANIEL RUGGLES, Fredericksburg, Va. Filed June 7, 1880. (No model.)

Claim.—The mode herein described of producing rain-fall, said mode consisting in conveying and exploding torpedoes or other explosive agents within the cloud-realm, substantially as illustrated.

103


COUNTY OF LOS ANGELES
WEATHER MODIFICATION PROJECT
FINAL MITIGATED NEGATIVE DECLARATION
Prepared by JRC for
The County of Los Angeles Department of Public Works
October 6, 2009
ICAS Report No. 103
November 1965
A Recommended National Program
In Weather Modification
Geoengineering: Science and Governance
Environment Canada
Aurora
Geoengineering Cost Analysis
Final Report
Prepared Under Contract to
The University Of Calgary
July 27, 2011
FEDERAL COUNCIL FOR SCIENCE AND TECHNOLOGY
Executive Office of the President
SOLID AEROSOL GENERATION
Agreement Between Canada and the United States of America Relating to the Exchange of Information on Weather Modification Activities
Department of Water Resources
BULLETIN No.
WEATHER MODIFICATION
OPERATIONS
IN CALIFORNIA
OCTOBER 1, 1963 SEPTEMBER 30, 1964
STATE OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
DIVISION OF RESOURCES PLANNING
Report on
WEATHER MODIFICATION OPERATIONS IN CALIFORNIA
JULY 1952 - JUNE 1956
Library
UCD LIBRARY

NEED PROOF?

#8

"Everybody Talks About the Weather, But Nobody Does Anything About It."

DOMENIC MARRAMA

Welcome to the Weather Modification History Newspaper & Journal Vault. Each newspaper was gathered from various sources and painstakingly recreated as a single, downloadeable image by Domenic Marrama.

These articles illustrate the lengthy history of atmospheric experimentation as reported by journalists in local and national newspapers, magazines, and scientific and military journals. As you move through this volume you will notice fewer and fewer entries, which leads us to believe either their is less interest in the topic of weather modification or an intentional lack of coverage.

The Weather Modification History Newspaper Vault is a priceless compilation of reporting on the little known activities of the Climate Changers.

#9

Weather Modification History Newspaper & Journal Vault

"Everybody Talks About the Weather, But Nobody Does Anything About It."

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106

Water St... contrails ... ridor fro... tions of I... Missouri, ... ture ext... that since

...uating them aboard future spaceships. Indeed, the space shuttle Columbia ...y be the forerunner of future ...tactics-like battleships that may ...use in space. But if the United ...tes is ahead in developing a reusable ...spaceship, the Kremlin's scien...s may have the edge in other cru... areas of research. Now that the Soviet Union has ap...

20 August 1981 Vol 91 No 1267 Weekly

...nted November 10, 1891.

...ich is thrown or shot into the ... the atmosphere and there ...ime-fuse. A balloon, ... arranged to elevate the shell ... the liquefied carbonic...

CLASSIFIED ... THIS SECTION

RAIN PRODUCED AT WILL.

Benvenuto Cellini (1500–71) and "Rainstopping"

Abstract

Benvenuto Cellini (1500–71), the renowned goldsmith and sculptor ... autobiography that he ...

news

The ... Times

To serve the National City and through it the Nation

THURSDAY, OCTOBER 15, 1981

Aircraft pollut...

...HE SKIES around Chicago are cloudier and greyer because of cloud cover produced by the exhaust from jets using the world's busiest airport. So says ...tanley Changnon, head of the atmospheric sciences division of the Illinois State Water Survey Department, which has released the results of a survey of weather in the Chicago area. The study shows that since the 1960s there has been a 10 per cent increase in cloudiness in the regions of Illinois, Iowa, Missouri, Indiana and Ohio under the main flight paths into Chicago's O'Hare airport, but no comparable increase in cloudiness outside the jet corridors.

In 1980, O'Hare handled 724 155 flights and 43.6 million passengers. Changnon says that at altitudes above 20 000 feet (6000 metres) the jet contrails quickly spread to form cirrus clouds 5 km wide in an hour and 32 km wide in two hours; ...th one air lane alone carrying 700 flights per day, the cumulative effect is to spread cloud over the entire visible ...

Man tries to control weather

Times ☆ Daily

FOLLOW US ON FACEBOOK
WEATHER MODIFICATION HISTORY

Spokane Chronicle

Spokane, Washington

Sarasota

Final Edition

Mysterious cloud over half of world

HILO, Hawaii (UPI) — A huge cloud covering half of the world has mysteriously appeared in the lower stratosphere "all of a sudden," the Hawaii Tribune-Herald reported.

Tom DeFoor of the Weather Observatory on Mauna Loa, said the cloud can be seen over Japan, Hawaii and Germany at the same time.

Len McMaster, a NASA scientist at the Langley Research Center in Virginia, said that only two things could have caused the cloud — an unreported volcanic eruption or some kind of nuclear detonation.

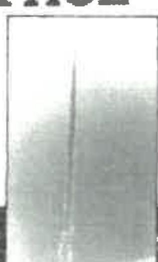
McMaster added, "I doubt that it was caused by a nuclear detonation, but I would not want to discount it."

The cloud is invisible to the naked eye but from high altitude.

noaa

Volume 12 Number 4 Fall 1982

VIEW FROM SPACE



An All-American Cloud

FOLLOW US ON FACEBOOK
WEATHER MODIFICATION HISTORY

F

Finally, in the summer of 1946, General Electric researcher Dr. Irving Langmuir, studying clouds at General Electric's Schenectady, N.Y., laboratory, discovered the principle of cloud seeding using dry ice to produce millions of ice crystals.

While much improved, Langmuir's process is basically the same one used today by scientists attempting to increase rain and snowfall, create cloud cover and suppress hail storms.

The principle behind cloud seeding is ...

Three schools of thought

"There are three schools of thought," he says. "There are pessimists, but the ranks have dwindled in the last 10 years. We have demonstrated that you can affect changes in certain clouds and ... are saying that it (rainmaking) is impossible."

The cautious middle group, to which he belongs, believes there is a lot of potential in cloud seeding, and that ...

...artificial cloud cover restricts th... ...time, it makes days cooler in summe... ...hen jet contrails are most prevalent... ...e time it moderates extremes in tem... ...e days tend to be cooler, nights ar... because the cloud blanket keeps i... ...at escaping.

...n says the increased cloudiness shoul... ...rmers because it reduces evaporatio... enabling them to conserve water, and because th... contrails apparently produce more rainfall.

In addition, more moderate temperatures mea... more favourable growing conditions for crops.

Dr Changnon says ice crystals in the contrails of the ...

taking off every 30 seconds. Last year O'Hare handled 724,155 flights and 43.6 million passengers — more than any other airport in the world.

"We know the jets make clouds, and we believe they are the major cause of the increased cloudiness ...

#11

CANADA — 1980

The Gazette

The GAZETTE, Montreal, Wednesday, May 14, 1980

Winnipeg tests of 1953 create a cloud of concern

WINNIPEG — (CP) — At one point during U.S. army chemical warfare tests with a balloon 27 years ago in Winnipeg, the reserchers had to run for cover when a teenager tried to burst the balloon with a bow and arrow.

The incident may provide the only chuckle for Winnipegers, informed this week that the city was used for the large-scale tests between July and September of 1953. Aim of the tests was to examine radiation fallout and chemical and cloud dispersal in urban areas to prepare for possible biological war.

Newspaper articles of the day quote Canadian defence officials as saying the tests were to determine if the city could be covered in a smoke screen to hide vital installations in the event of an enemy attack.

Officials are not able to say what effect, if any, the spraying had on the population. Another concern is that the tests were done without fully informing the public.

Maj. Geoff Haswell, speaking for the defence department in Ottawa, admitted the U.S. Army misled residents about the spraying in order to avoid creating anxiety.

"The program was classified as secret and it may not have been in the national interest to describe it fully," he said. "The Cold War was getting into full swing at that time and it could have created anxiety among the population."

He also said the department is still investigating whether the chemical used in the spraying, powdered zinc cadmium sulphide, was harmful or posed any danger to inhabitants.

"We have no way of providing an assessment right now of either the short or long term effects of the chemical."

Prof. Frank LaBella of the University of Manitoba's pharmacology department, said both cadmium and zinc are toxic and could be dangerous to babies, old people, asthma patients, and sick persons.

LaBella said the metals are more dangerous when used in aerosol form, as it was in the Winnipeg experiments. He said there have been a number of deaths and reported cases of brain damage in industrial workers dealing with cadmium sulphide.

Maj. Haswell said zinc cadmium sulphide was used because it sticks to everything it lands on, making it easy to trace.

The testing was revealed in documents obtained last weekend under U.S. freedom of information laws. The documents indicated that Canadian authorities approved the plan.

The Winnipeg Free Press ran a montage on the front page yesterday reproducing stories it carried in June, 1953 telling of the experiments. One headline read *Smoke Veil May Guard City in Raid.*

Minutes of a city council meeting of Feb. 2, 1953 show that councillors approved an innocuous-sounding defence department request to allow U.S. Army officials to spray the city Councillors were told the tests were to "discover the behavior of smoke in built-up areas."

#12

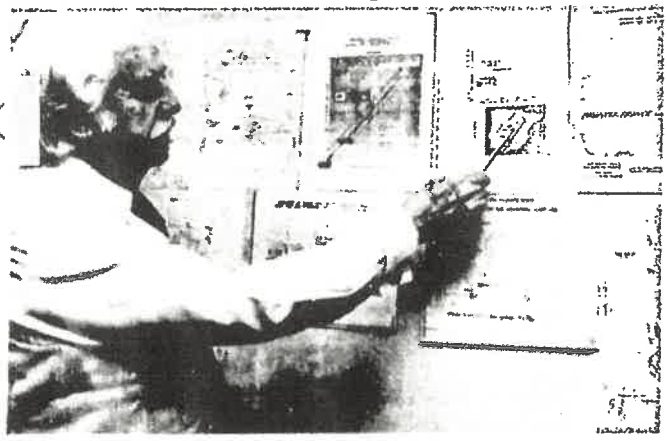
Monday
March 3, 1980
Vol. 109, No. 52
44 Pages

The Hour

Serving Central Fairfield County

Weather
Clear tonight, 20; Sunny Tuesday, 40.
20 Cents

Forecaster Portrays Possibilities of Using Weather in Warfare



Using Weather To Wage War

Dr. Irving Krick, the weatherman who called the shots for the invasion of Normandy in June 1944, says that weather warfare is possible. He is a private consultant for a firm which makes forecasts for government, industry and agriculture. UPI Telephoto

LOS ANGELES (UPI) – Weather warfare is possible, according to Dr. Irving Krick, the weatherman who called the shots on the Normandy invasion.

But Krick said, "If any nation affected weather on a broad scale, it would immediately be projected on our maps and there are indications nobody is doing this on a global scale — as yet."

Krick, a former chairman of the Department of Meteorology at the California Institute of Technology, said most countries are still in a rather elementary stage in the development of weather control.

"Only in the private sector is it really in operational posture, he said. "Our own country took 20 years to get into it and hasn't really gone at it in an operational way. We do it to increase our agricultural productivity and hydroelectric power by increasing river flows. But that's all."

Recent books and articles have indicated that Russia was deeply involved in weather modification, but Krick said if this was so, the changes would be immediately apparent over the globe and measurable in this country.

Krick, whose firm is headquartered in Palm Springs, Calif., makes forecasts for industry, agriculture and government as a private consultant. He received the Bronze Medal and the Legion of Merit for his work in World War II.

He was at Caltech before the war and answered a request by Gen. Matthew Arnold to direct a group in long range forecasting. Krick went into the Army and applied methods developed at Caltech.

"We made detailed projections accounting for a week or more and set up a 'weather central' for bombings. When D-Day came along, it was an extremely difficult situation. The British teams had no weather forecasting methods that would go beyond a day or two and weather was very changeable at the time."

Basically, what Krick did, he said, was develop an archive of daily hemispherical weather maps from 1899 to the early 1940s so they had a daily picture.

"The method, developed at Caltech, was rather fundamental. We discovered the moving pressure systems in large segments of the globe in daily periods. We were able to get a handle on things at least a week ahead.

"And we found the atmosphere was controlled by forces outside it, such as solar output, gravitational waves, the sun, moon and other planets in gravitational influence," he said.

"These wave formations that traverse the atmosphere affe highs and lows and move thes winds around to produce w fronts.

"Now we have a compu technique for a day-to-day ba... several years. It's only been in recent years that others, other nations, have realized something like this is possible."

Despite the fact other forecasters were very uncertain and storms with high waves were continuing in the English Channel, Gen. Dwight D. Eisenhower chose June 6, 1944 for the Normandy invasion based on Krick's forecasts that it would clear for that one day.

"We got into weather modification as early as 1946," Krick said.

"In 1959, I gave a seminar at NATO on the possibilities of geophysical warfare and we would have been able to affect areas downwind in the Ukraine and parts of Russia quite substantially. But nothing ever came of it. The concepts are certainly there."

1980

109

#13

Stormfury Goes Down Under

1979 ARTICLE!

By CONSTANCE A. ARNHOLS*

It was Wednesday, February 21, 1979, and Kerry, situated over the Coral Sea at a point 700 km off Townsville, Australia, was about to become the first southern hemisphere tropical cyclone* to be scientifically investigated by instrumented research aircraft. Australian meteorologists and journalists flying toward Kerry aboard NOAA's Orion WP-3D (N42RF) were eager to see the research aircraft's sophisticated weather instruments in action and more than a little curious about how it would be to fly repeatedly straight through a tropical cyclone. Their hosts were members of the NOAA Research Facilities Center (RFC) and scientists from NOAA's National Hurricane and Experimental Meteorology Laboratory (NHEML).

A rough ride lay ahead, but when it was over after 2½ nerve-tingling hours, not only had a weather first been accomplished, but some surprising information had been gathered.

The plan was to run a butterfly pattern of 193-km (120-mi) passes through the eye of the storm at 500 meters to collect near-surface information; than at about 6,000 meters (near freezing level), and finally 8,000 meters. It sounded routine. Then came the test that tries one's stomach. Jim Crawford of the Brisbane *Courier-Mail* gave his impressions. "The buffeting was immediate as we entered the cyclone . . . the up- and downdrafts rocked the aircraft and for fractions of a second, one was weightless. Immediately after, one felt squashed into the seat and then was flung side-ways . . . one gust caught the aircraft at 500 meters and it took the combined strength of two pilots to stop it flipping over."

Chief Scientist Robert Sheets who has flown through hurricanes 150 to 175 times, agreed that Kerry was rough. "On a scale of 1 to 10, I would rate it at about 5 to 7," he said.

Why were these people challenging Kerry?

Events leading up to this and following flights had started about a year beforehand when it was proposed that U.S. and Australian tropical meteorologists discuss the feasibility of conducting tropical cyclone modification research operations over Australian waters. After a NOAA expenditure of $30 million on aircraft and instrumentation, U.S. hurricane researchers are at a stage where conclusive experiments can be conducted. There have been relatively few suitable storms in the Atlantic during the 1970's, but the Australian regions of the Pacific and Indian Oceans have been especially productive, with an average of two to four tropical cyclones per year. The prospect of being able to draw upon Australia's excellent scientific community and of conducting research missions over waters where tropical cyclones often form is attractive to U.S. scientists. Australian meteorologists are equally interested in working with Americans and in adding to their knowledge of these storms.

A visit of United States scientists to Queensland was arranged for February-March 1979 as a first step toward possible cooperative research efforts in the years to come. Included would be briefings and flights in the N42RF, although there would be no actual seeding operations. Everything was well planned, except, of course, the weather. And Nature took care of that detail by creating an appropriate setting composed of two tropical cyclones (Kerry and Rosa) during four weeks of meetings among the weather experts. As a result, scientists flew five monitoring missions (almost 30 hours) into these cyclones and two cloud physics/dynamics missions.

Even as first greetings were being exchanged by U.S. and Australian participants on February 13, Kerry was whirling through the Solomon Islands, taking a course that would lead to the very section of the Queensland coast where the meteorologists were gathering. Soon afterward, Tropical Cyclone Rosa appeared over the Gulf of Carpentaria, which is on the northeast side on Australia. Meanwhile, Kerry continued its acrobatic display of loops and turns in the Coral Sea to the east.

The reason for the meeting of scientists from two nations, occurring in what might be called fortunate conjunction with two tropical cyclones, was Project Stormfury-Australia. Project Stormfury is a NOAA research program designed to test the theory that peak tropical cyclone winds can be diminished by 10 percent to 15 percent through seeding specified areas of the storm with silver iodide. According to project scientists, this could result in a 20 percent to 30 percent reduction in property damages and savings of $50 to $100 million. Although the theory remains unproven, it has a sound scientific basis. Research teams are encouraged by the seeding results obtained from Hurricane Debbie in 1969 where winds reduced by 31 percent after treatment. (Not all of this reduction, however, can reasonably be attributed to seeding.) Twenty-four hours later, after Debbie had regained strength, a 15 percent wind reduction was observed following seeding. Debbie operations set the model for future experiments.

How To Control Cyclones

The Kerry flight on February 21 was an excellent beginning to the Project Stormfury-Australia effort. Measurements radioed to Ray Wilkie, Regional Director of the Brisbane Meteorological Office, presented a far different picture of the cyclone than had been deduced from satellite observations. Instead of the expected 75-knot winds, maximum winds of 124 knots were recorded. Winds in excess of 90 knots covered a region more than 241 kilometers (150 miles) across. A central pressure of 960 millibars was measured.

Receipt of the Orion data meant that, for the first time, Australian forecasters had a directly measured, comprehensive data set concerning the strength and distribution of wind fields for a cyclone in their part of the world.

It was clear to Australian meteorologists

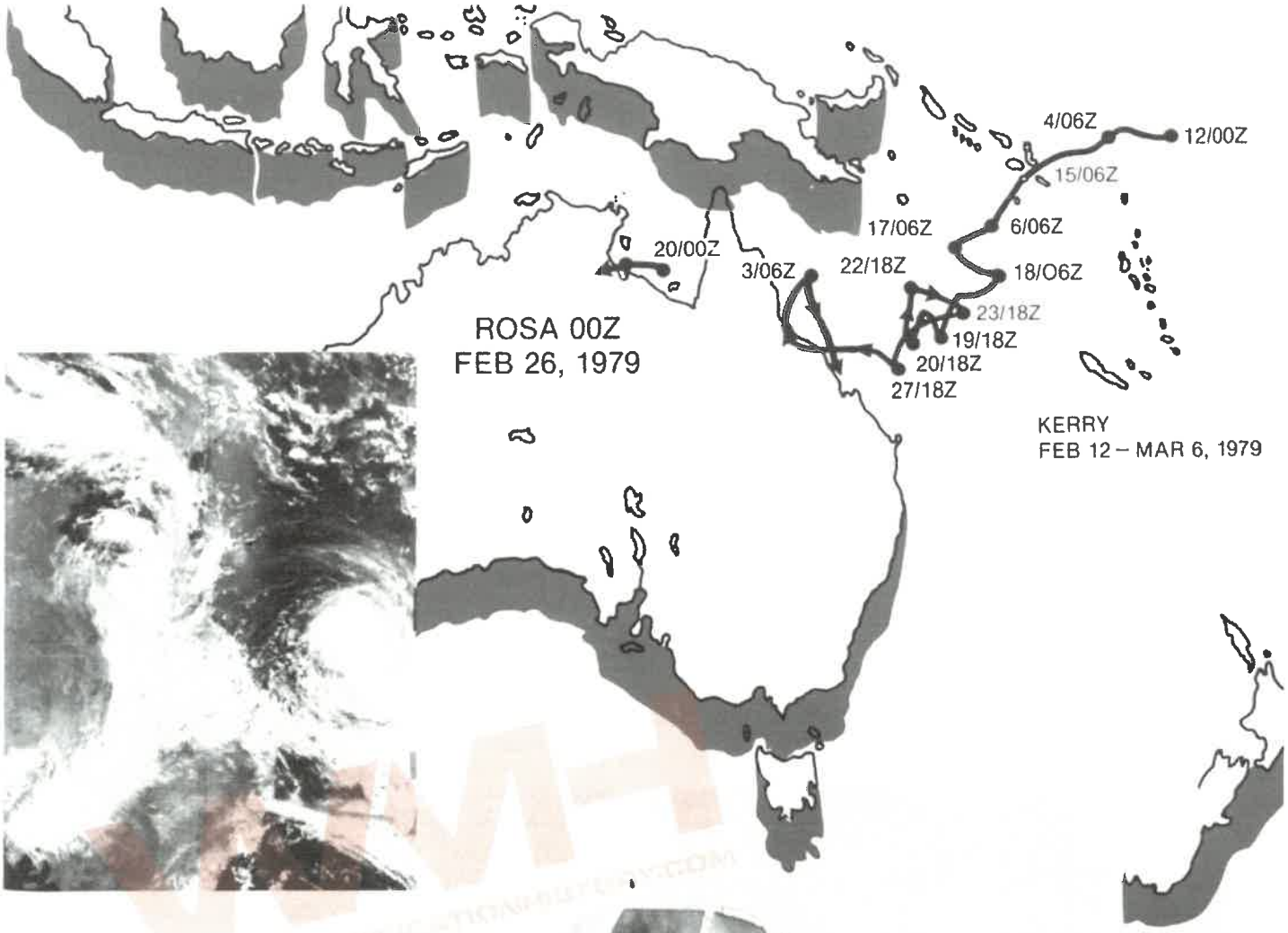
Tropical Cyclone (Hurricane) Kerry, photographed by Defense Meteorological Satellite Program in the Coral Sea off Queensland, Australia, made the long convoluted track in the upper right of illustration (opposite page) and was one of two encountered by NOAA's Stormfury-Australia project. Lower photo shows NOAA's Orion at Garbutt Field, Townsville, Australia, before takeoff into Tropical Cyclone Kerry on Feb. 21, 1979.

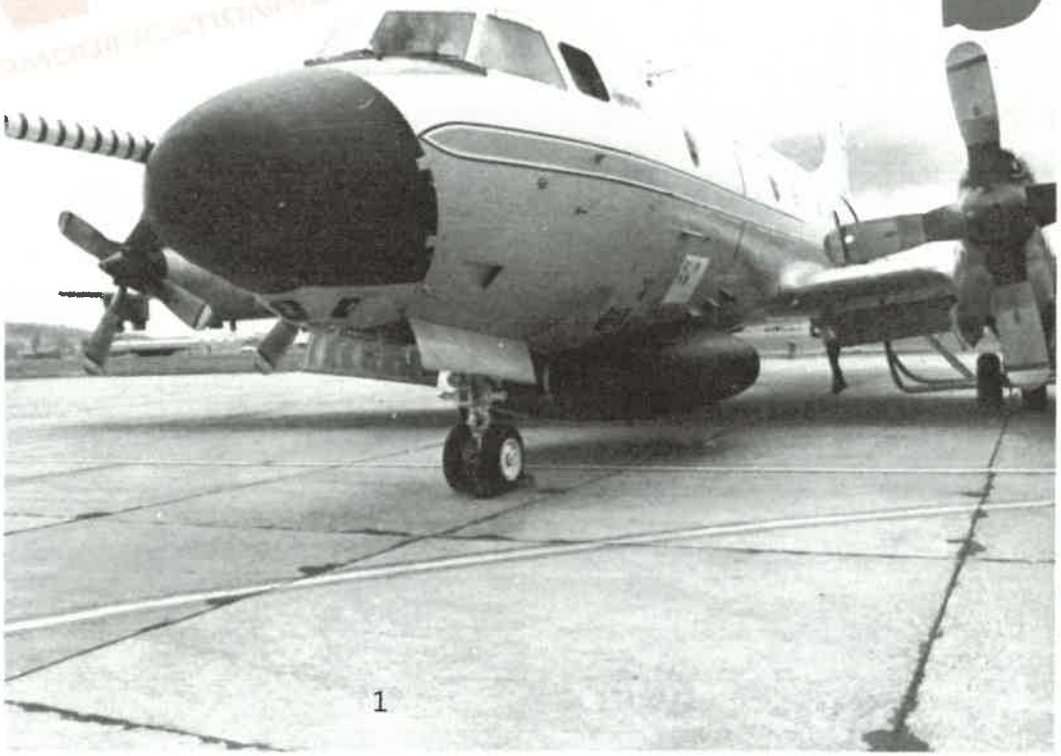
**A tropical cyclone is a cyclonic whirlpool that forms over the tropical oceans. Names for such storms (with winds exceeding 64 knots) vary according to regions where they are located: severe tropical cyclone in the Australian region of the South Pacific and Indian Ocean; hurricane in the North Atlantic, Caribbean Sea, Gulf of Mexico, and eastern Pacific; typhoon in the Northwest and South Pacific. Northern hemisphere cyclones have counterclockwise circulation; southern hemisphere cyclones have clockwise rotation.*

**Constance Arnhols is a writer-editor with the National Hurricane and Experimental Meteorology Laboratory in Miami*

#14

Hurricanes Rosa & Kerry





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(H/15)

1979

BULLETIN JOURNAL

CONCORD PUBLISHING HOUSE, INC.
CAPE GIRARDEAU, MISSOURI

FOLLOW US ON FACBOOK
WEATHER MODIFICATION HISTORY

VOLUME 8, NUMBER 64
TUESDAY, MARCH 13, 1979

Weather may be unnaturally severe because of unnatural modification

JEFFERSON CITY — With the weather we've had this winter, you would think everybody would be in favor of weather modification.

There are those, however, who believe our winters are unnaturally severe because they are being unnaturally modified.

A Missouri House agriculture subcommittee heard a witness advance that this last week. He is Gerald W. Admires of Holt, Mo., an ex-Navy chief quartermaster who is spending his sunset years not looking out into the sunset but peering at satellite photographs and weather maps.

"We haven't had a normal weather pattern since 1949," Admires said.

He calls attention especially to the last three winters — colder than usual, and more snow.

NEWS FOCUS on Jefferson City

MISSOURI LEGISLATURE 1979

By Jim Wolfe
Legislative Correspondent

Missouri is getting the residual effects of such things as Bureau of Reclamation efforts to put more water into the Colorado River, he said.

What does the rest of this winter hold for us? asked the subcommittee chairman, Rep. Harry Hill, D-Novinger.

"There will be another good storm before the end of March," Admires answered. "And this spring we'll be dodging tornadoes all over the place."

And next winter?

"It will be as bad if not worse than this one," was the reply. "The Rocky Mountain consortium will keep on cloud-seeding, and besides that there's the 1980 Winter Olympics at Lake Placid, N.Y., that will need snow."

Admires noted that President Gerald Ford signed an international weather modification act in 1976 and shortly thereafter was able to ski on fresh snow at Vail, Colo.

David Horner of Columbia, an employee of the National Weather Service, declined to express an opinion about Admires' opinions. Nor would he comment when Fowler said he had read the Russians were diverting jet streams to make it rain or arid land near the Black Sea, possibly influencing world weather.

Nor, for that matter, would Horner predict the weather for the next few months. The National Weather Service "has no particular opinion about Missouri weather for March, April, and May," he said. "For some other states we have issued a forecast with some confidence."

The weather modification hearing was held at the suggestion of Cordell Tindall of Fayette, an editor of Missouri Ruralist magazine who served on agricultural advisory boards in the Hearnes administration.

Tindall doesn't hold with Admires' theories one bit. He says, "There's no way to measure how much it would have rained anyway." He remembers that in the 1960s a Springfield reservoir was running dry and that cloud treatment produced just the right amount of water.

Rep. Hill, commenting on the testimony, said, "I can't take it all at fact value, but there's food for thought."

Hill mentioned the late Ray Batman, a rancher at Grain Valley, Mo.

Batman was a man of firm views and fat wallet. He contributed to political campaigns and thus could expound his views to tolerant ears.

One spring it was so wet that Batman couldn't plant his crops. He got U.S. Sen. Stuart Symington on the phone. He told Symington various international interests were tinkering with the weather; certainly the national government was aware of this; and would Symington arrange for the rain to let up so Batman could get his crops in? Symington listened and said, well. he hoped the weather would clear up.

The rain stopped the next day.

The trouble was, it stayed stopped. By mid-summer there was a near-drought. Batman called Symington and complained.

It took longer this time, but two or three days later Batman's crops received moisture.

1/2

on a northerly course. As the workshop ended, Kerry moved along on its seemingly endless track. In its 18th day, on March 3, the tropical cyclone turned once again, backtracking to the southeast over the Great Barrier Reef resort islands. Newspapers reported washed-out beaches and roads, shattered roofs, closed airports, halted rail service, and massive cleanups. The Brisbane Weather Bureau posted its sentiments with a sign proclaiming "Bury Kerry."

A third Orion mission on March 4 at 500 meters proved to be the eagerly awaited farewell to one of the longest-lasting storms experienced by Australians in a decade. This flight provided data on the re-formation of the storm just off the Australian coast. Land-based radar continually monitored Kerry during this mission while the aircraft provided data for use in forecasts and warnings and for an Australian research effort associated with the relationship of echo motion to wind speed. After this mission had ended, Kerry continued southward and finally dissipated.

Kerry was unusual in the extreme. The most erratic Australian tropical cyclone in 10 years, it had changed direction six times over a 3,000-kilometer (1,864-mile) course that lasted 3 weeks. Winds of 70 meters per second were recorded and, in one sector, winds of 50 meters per second extended more than 200 kilometers from the center. Kerry twice weakened and regained strength, and twice turned north in the hemisphere where such storms characteristically travel south. Small wonder that, in the aftermath, one Australian editorial pronounced Stormfury "one of the most exciting things ever to happen to North Queensland." Further endorsement came from Dr. Hugh Trollope when he said, "It is my great hope that we can continue to gather information in this way through further Australian cooperation in Stormfury and through the development of our own information gathering facility. . ."

Thus, the framework was established for an international study of southern hemisphere tropical cyclones in the 1980's. Should the project go forward, a team of 100 American scientists and support staff and five specially instrumented aircraft would spend about 3 months per year for 3 to 5 years in Australia during the cyclone season. If the start of an effort can be said to set the pace for its future, surely Stormfury-Australia studies are destined to yield significant and beneficial results. □

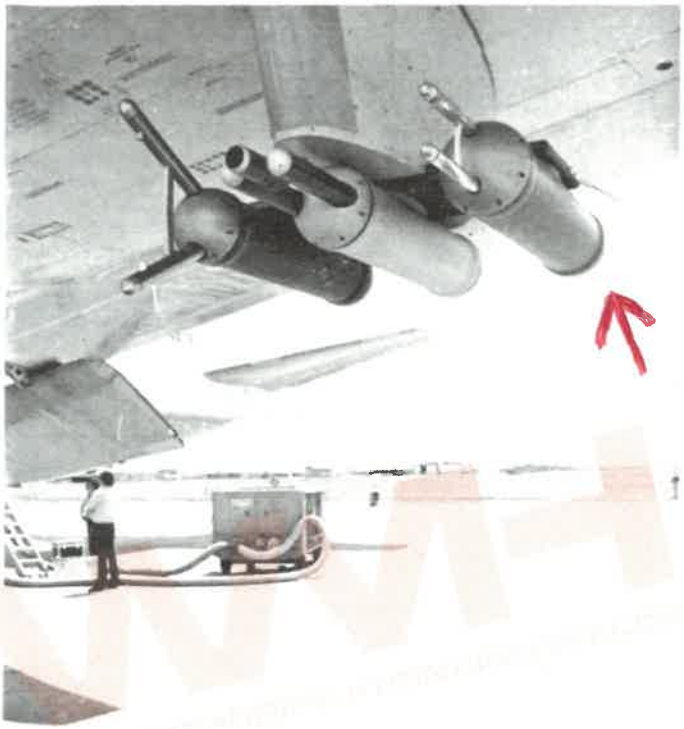
Stormfury Australia: The NOAA Team

Project Stormfury is NOAA's long-term research project for investigating methods of reducing the destructive forces of hurricanes. Three units of the Environmental Research Laboratories provided staffers to introduce Stormfury to Australian and selected members of the team provided formal and informal briefings aboard the aircraft and on the ground, from Darwin on the northern coast of Australia to Melbourne in the south.

The Weather Modification Program Office sent Merlin Williams.

The National Hurricane and Experimental Meteorology Laboratory provided Stanley Rosenthal, Robert Sheets, Peter Black, Billy Lewis, and Paul Willis.

The Research Facilities Center staff for the trip consisted of C. B. Emmanuel, David Turner, Fred Werley, Harlan Davis, Jim Brown, Jim DuGrannut, Paul Connor, Jim McRory, Larry Rose, Leon Correll, Bill Moran, Hughlon Nunn, Thomas Bergner, Gerald Schissel, and (on contract from Air Tech Service of Miami) Jack Ellwood.



Array of instruments under Orion wing measured cloud particle sizes, shapes, and counts. Dr. John Zillman (foreground in photo at top right), Commonwealth Director of the Australian Bureau of Meteorology, shown with John McIGann, Officer-in-Charge of the Townsville Meteorological Office. At right, Dr. Sheets and Greg Holland, Australian Bureau of Meteorology, conduct preflight scientific briefing of (l. to r.) Prof. Trollope; Ray Wilkie, Regional Director, Australian Bureau of Meteorology; Dr. Mal Heron of James Cook University, and Joe Oost, manager of two Australian radio stations.

1

#17

1979

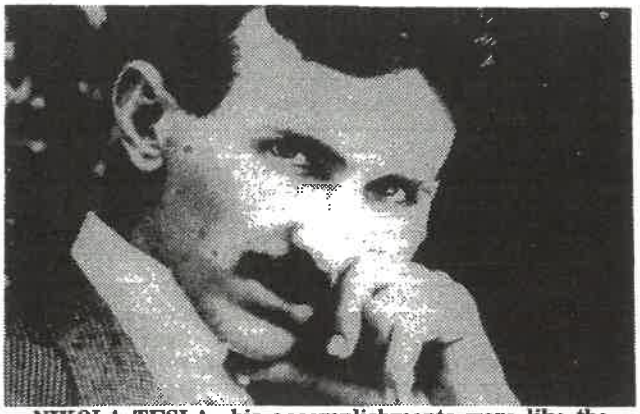
THE JOURNAL

A Park Newspaper

VOL. 26 NO. 6754 Daily Entered As Second Class Matter Post Office Ogdensburg, N.Y.

OGDENSBURG, N.Y. — FRIDAY, APRIL 20, 1979

USSR May Be Developing Tesla Theories To Control The Climate



NIKOLA TESLA: his accomplishments were like the dreams of an intoxicated god.

If Tesla was brilliant beyond understanding, he was also suspiciously eccentric. He shunned women, was terrified of germs, and could not be in the same room with round items such as billiard balls. He talked incessantly of such things as death rays, impenetrable waves of energy and other items never produced. Tesla said he knew how to destroy the Empire State building through electrical vibrations from a palm-sized box.

"What the scientists have in their briefcases is frightening."
—Nikita Khrushchev

BY TOM TIEDE

OTTAWA—(NEA)—In March of 1977, during a cold and clear evening, a strange phenomenon occurred over Ontario. As reported by Canadian government official Andrew Michrowski, "the sky lit up with sheets of light traveling in a 360-degree circle." Michrowski says the light pulsated, in a perfect pattern, for an hour.

The Aurora Borealis? The tailings of a UFO? Michrowski says he considered every possible explanation before deciding, gravely, that the sheet lightning was man-made, in the Union of Soviet Socialist Republics, and was part of an ongoing experiment by the Russians to modify the weather for agriculture and defense purposes.

Michrowski, employed as a futurist in Canada's office of the secretary of state, had for some time suspected the Soviet Union in this regard. The sheet lightning activity sealed his opinion. He has spent the time since then trying to convince his government, and that of the U.S., that the world may be in new and imminent peril.

And he's not alone in this belief. A growing number of mostly private citizens on the American continent are increasingly worried that the USSR is behind the recent souring of global climate conditions. Theirs is at best a frustrating interest. Few scientists believe the theory, and many of its advocates are considered to be wacky.

No one doubted that, as late, the weather has indeed been odd. A record freeze on the eastern side of the U.S. and Canada is but part of a gradual cooling of the earth since 1940. Yet no government would say this is the Russians' doing. The conventional wisdom is that the chief culprit is pollution which masks the sun.

Also, few scientists would doubt that weather modification techniques are actively coveted by super-power nations. In testimony before Congress in 1974, Dartmouth's Dr. Gordon MacDonald advised that climate control would perhaps be the ultimate "covert" weapon:

"Storms, floods, droughts, [illegible] and tidal waves [illegible]

Dr. Andrija Puharich, a medical researcher from Ossining, N.Y., says he has "personally seen to it that Jimmy Carter is aware" of the alleged Russian interest, but he expects no thankful action for his troubles; "Nobody is listening," he says, "nobody believes it, nobody cares."

Except the few, that is. Michrowski, Puharich and others care enough about the weather modification possibility to risk their reputations in its exposure. And they seldom risk on the side of moderation. Says Dr. Puharich: "If the Russians can affect world weather, and I believe they can, it's the most ominous development on the planet."

According to believers, the full gravity of the matter is as yet years away. Ken Killich, a Canadian technician and science activist, says the Russians are now merely learning about weather modification. In fact, Killich says, the weather that has been altered by the USSR to date has been done so through experimental error. Killich believes the Russians have set out to cultivate vast new areas of their nation, much the same as the U.S. and Canada did earlier in the century. Not wanting to create a dust bowl of their own, however, Killich says the Russians have been trying to stimulate the climate to do the biddings of groundbound button pushers.

Instead of just influencing their own region, though, Killich says the Soviets have "lost control" and hence have affected the world. Michrowski adds the opinion that Soviet experiments in the last year were responsible for shifts in massive high pressure fronts; these shifts backfired, giving the Soviet Union "a lousy winter too."

Just what it is the Reds may be doing wrong is unknown. This is partly because no one knows what it is the nation may be working with. The only thing Russian critics do know, they say, is that the Soviet experiments are based on the work of a Yugoslav-American scientist named Nikola Tesla. Who is Tesla? That's a story in itself.

Nikola Tesla was the son of a Croatian preacher, who immigrated to America from Belgrade in 1884. On arriving in New York he had four cents in his pocket, and a vision in his mind that man was superman if only he allowed himself to be. In the past 50 years he

Nikola Tesla's greatest achievement was the discovery of the rotating magnetic field, the fundamental element of alternating current. Until Tesla, electricity was confined to direct current, a system that prevented its transmission over any but short distances. Tesla's AC was to change the whole nature of power. The change was not without its critics. No less an expert than Thomas Edison said Tesla's system was dangerous, therefore impractical. Tesla countered that anything is dangerous, if mishandled. To prove the merits of properly applied AC he gave exhibitions where he passed 1 million volts through his body; and the public was convinced.

Tesla teamed with George Westinghouse to establish the first polyphase alternating current system in America, at Niagara Falls. For the first time power was sent over a distance to feed a city, in this case Buffalo, 30 miles away. Tesla's biographer, John O'Neill, says every transmission pole in the world is a monument to that moment.

Yet if Tesla was brilliant beyond understanding, he was also suspiciously eccentric. He shunned women, was terrified of germs, and could not be in the same room with round items such as billiard balls. What's more, he talked incessantly of such things as death rays, impenetrable waves of energy and other items never produced.

Tesla said he knew how to destroy the Empire State building through electrical vibrations from a palm-sized box. He said he could create a beam of light that could send fuel to ships at sea. He actually began one effort, financed by J. P. Morgan, to create a system that would transmit energy around the world without the aid of wires.

This latter work, according to Andrew Michrowski and others, is what is being used by the Russians today to modify the weather. Tesla said the ground "is literally alive with electrical vibrations," therefore it can be used as a conductor. Tesla said electricity can be driven into the earth at one point and brought out at any other.

Tesla used a coil of his own invention to prove his hypothesis. He worked in a Frankensteinian laboratory in the Rocky Mountains, complete with regular thunderstorms from above. He reportedly was able to create his own lightning, to bounce wireless current back and forth on the globe, and to illuminate 200 bulbs via earth 26 miles

Michrowski insists this is not so preposterous as it sounds. He reminds that much of the world's communication system was disrupted by strange forces of interference coming from the Soviet Union. The interference was so harsh that ens of nations filed complaints.

"The Russians admitted they were the cause," says Michrowski, "they also said they were conducting experiments. But what kind? They wouldn't say."

Michrowski suggests the experiments were Tesla-like in nature. "The Russians admire Tesla. They revere his work. I believe they have bene able to use him to great scientific advantage."

Meanwhile, the western world is not so keen on N. Tesla. For all of his amazing work and prophesies, the scientist died in New York (in 1943) in near obscurity. The U.S. War Department of the time did assign a man to examine Tesla's papers for "practical ideas" for the war effort; otherwise, he was hardly remembered in his adopted nation.

One man who does remember Tesla, with fondness, is a scientist named Robert Golka. He heads a research effort called "Project Tesla" at Utah's Wendover AFB. Using an "exact replica" of a Tesla apparatus of 1899, Dr. Golka is trying to create "ball lightning," which can now be done only through the process of nuclear explosion.

Dr. Golka says he is "amazed" that Western science has forgotten Tesla. He feels the man's works have unlimited possibilities today. He says for example that he is "close to creating ball lightning," and when he does it will be "as great a discovery as the laser" — all because of a long dead man whose name is known to almost no one.

Dr. Golka has no comment as to whether the Russians may be tapping Tesla for purposes of weather control. But he strongly wishes more Western scientists would tap Tesla for a variety of reasons. Andrew Michrowski, Dr. Puharich, Ken Killich and a host of others agree; they want a commission set up to study Tesla and also the Soviets' use of Tesla.

In his biography of Nikola Tesla, John O'Neill suggests the scientist was, unwittingly, responsible for both world wars. He created the power system

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Today named "conspiracy theorist"

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"List of Participants" 1979

that improved warning and forecasting capabilities would be possible through aircraft penetration of threatening storms. Dr. Robert Brock of the Department of Science's Bureau of Meteorology, and Australian Scientific Coordinator for the U.S. visit, was quoted by the *Townsville Daily Bulletin:* "Australian meteorologists have very little information about the actual structure of storms. At the moment, the forecasters have to depend on numerical models based on mathematics. This project will give them data to verify these models."

The second Kerry mission took place on February 22 when the storm was 600 kilometers (373 miles) east of Cairns. On board were: Ray Wilkie (Bureau of Meteorology, Brisbane), John McGann (Officer-in-Charge, Townsville Meteorological Office); Professor Hugh Trollope (Deputy Vice-Chancellor, James Cook University); and Greg Holland (Bureau of Meteorology, Melbourne). They returned with valuable data from what they thought would be the last flight into Kerry.

Meanwhile, a new tropical disturbance manifested itself and within 24 hours developed into Tropical Cyclone Rosa. A 7-hour flight was made through the trailing half of the storm on February 24 when Rosa began to cross an isolated section of the Gulf of Carpentaria. Although no eye penetration was made because Rosa was beginning to cross the coast, excellent radar coverage was obtained of a storm making landfall.

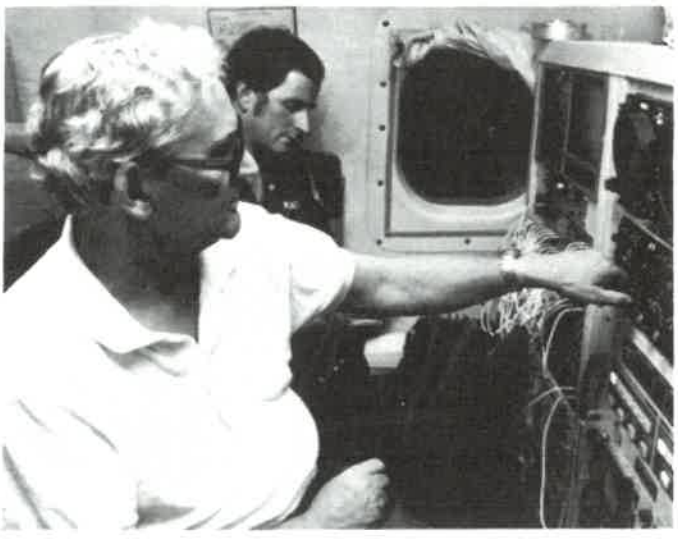
This was the first time aloft in a tropical cyclone for Dr. John Zillman, Commonwealth Director of the Australian Bureau of Meteorology. He described Stormfury as an "excellent initiative" that would give Australia the ability to improve tropical cyclone warnings and forecasting.

Rosa dissipated almost as quickly as it had formed, but Kerry remained a good subject for study. On February 28, the Orion made another flight into this storm at 6,000 meters elevation for collection of landfall data.

At last, attention could be turned to the 3-day Workshop on the Mechanisms of Cyclones (February 28 - March 2) sponsored by NOAA, the Australian Bureau of Meteorology, and James Cook University in Townsville. The purpose was to provide a forum for an exchange of views between visiting American scientists and Australians engaged in tropical cyclone research. It would also help to define the current state of knowledge about cyclone mechanics. An additional benefit, remarked upon at a close of the meetings, was the coming together of scientists from two countries, which would lead to the establishment of personal contacts and future cooperative research projects.

Australians represented the Commonwealth Scientific and Industrial Research Organization (CSIRO) Divisions of Atmospheric Physics and Cloud Physics; Australian Bureau of Meteorology; Australian Numerical Meteorology Research Center; James Cook, University of North Queensland; Melbourne, Monash, and New England Universities; and the Royal Australian Air Force. The United States contingent was made up of NOAA personnel from the three ERL units. Dr. Stanley Rosenthal, NHEML's Director, delivered the opening address in which he described the modeling of hurricane-scale phenomena. Other NOAA speakers covered hurricane dynamics and structure, Project Stormfury, cloud physics, satellite (Seasat) measurements of hurricane wind fields, airborne expendable bathythermograph (AXBT) data on ocean response to moving tropical cyclones, radar measurements in hurricanes, cumulus representation in hurricane models, and use of the aircraft as a research platform.

Nature was not waiting for scientific discussion and analysis to catch up with her, however. On the second day of the workshop, Kerry churned past the port of MacKay, about 300 kilometers (186 miles) south of Townsville, leaving $10 million in crop, livestock, and property damage in its wake before heading inland between Proserpine and Bowen. It seemed as though Kerry would weaken, but on March 2 the storm headed back over water, strengthened, and continued



Clockwise from upper left, participants in Stormfury-Australia included Capt. David Turner, RFC, shown at controls of the Orion aircraft; Dr. Robert C. Sheets, NHEML, Scientific Director of project Stormfury; Dr. Robert R. Brook (l.), Australian Scientific Coordinator for the two-nation effort, and Dr. C.B. Emmanuel, RFC Director; and (at Orion radar console) Prof. Hugh Trollope (foreground), Deputy Vice-Chancellor, James Cook University, and Peter Black of NHEML.

"Participants "Stormfury"

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be construed as approval or disapproval of a proposed project or as an indication that, if carried out as proposed or recommended it may, in any way, protect or endanger persons, property, or the environment or affect the success of any Federal research project. Any advisory notification issued by the Administrator shall be available to the public and be included in the pertinent activity report file.

§ 908.13 Address of letters.

Letters and other communications intended for the Administrator, in connection with weather modification reporting or activities, shall be addressed to: The Administrator, National Oceanic and Atmospheric Administration, Environmental Modification Office, Rockville, Md. 20852.

§ 908.14 Business to be transacted in writing.

All business transacted with the National Oceanic and Atmospheric Administration with regard to reports of weather modification activities should be transacted in writing. Actions of the National Oceanic and Atmospheric Administration will be based exclusively on the written record.

§ 908.15 Times for taking action; expiration on Saturday, Sunday, or holiday.

Whenever periods of time are specified in these rules in days, calendar days are intended. When the day, or the last day, fixed under these rules for taking any action falls on a Saturday, Sunday, or on a Federal holiday, the action may be taken on the next succeeding day which is not a Saturday, Sunday, or Federal holiday.

§ 908.16 Signature.

All reports filed with the National Oceanic and Atmospheric Administration must be dated and signed by or on behalf of the person conducting or intending to conduct the weather modification activities referred to therein by such person, individually or, in the case of a person other than an individ- Notwithstanding the foregoing, such reports may also be signed by the duly authorized agent or attorney of the person whose activities are being reported. Proof of such authorization shall be furnished to the Administrator when filing a report, unless previously furnished.

§ 908.17 Suspension or waiver of rules.

In an extraordinary situation, any requirement of these rules may be suspended or waived by the Administrator on request of the interested party, to the extent such waiver is consistent with the provisions of Pub. L. 92-205 and subject to such other requirements as may be imposed.

§ 908.18 Matters not specifically provided for in rules.

All matters not specifically provided for or situations not specifically addressed in these rules will be decided in accordance with the merits of each case by or under the authority of the Administrator, and such decision will be communicated in writing to all parties involved in the case.

§ 908.19 Publication of notice of proposed amendments.

Whenever required by law, and in other cases whenever practicable, notice of proposed amendments to these rules will be published in the FEDERAL REGISTER. If not published with the notice, copies of the text of proposed amendments will be furnished to any person requesting the same. All comments, suggestions, and briefs received within the time specified in the notice will be considered before adoption of the proposed amendments, which may be modified in the light thereof. Informal hearings may be held at the discretion of the Administrator.

§ 908.20 Effective date.

These rules are effective on June 10, 1976.

§ 908.21 Report form.

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REMEMBER THIS ACRONYM

Volume 9 Number 4 October 1979

noaa

Photo: Harold M. Lambert Studios, Inc.

For story see page 14

NOAA (USPS 417-370) is published quarterly by the Office of Public Affairs, National Oceanic and Atmospheric Administration, Rockville, Md. 20582, to acquaint readers with the policies and programs of the agency. The Secretary of Commerce has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through October 31, 1979.

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1979

Weather Modification Board Seeking Ways To Modify Hurricanes

By HARLAN CLEVELAND
Monitor News Service

For several days in early September, the destructive fury of a hurricane named David bounced through the Caribbean and up the Southeast coast of the United States.

David left in its wake more than a thousand fatalities and those all-too-familiar newsphotos of flying trees, collapsed buildings and streets looking like Venetian canals. In the second week of September, a hurricane named Frederic whirled out of the Gulf of Mexico and did multimillion-dollar damage in Alabama and Mississippi.

Something probably can be done about this kind of weather. Last year the government's Weather Modification Advisory Board laid out a program of research and action to learn how to moderate nature's most devastating storms. Action so far: zero. How big a storm will it take to overcome the federal lethargy?

More and more people are moving into hurricane paths: the U.S. migration to the Sunbelt has enormously increased the populations, property and productive industry at risk. Evacuation of whole populations on existing highways, within the short warning times present weather forecasting makes possible, gets harder every year as Florida and the Gulf Coast fill up.

In 1969 hurricane Camille cost 225 lives and $1.4 billion in damage. Today another Camille, moving up the sea-level delta from Galveston past Houston, could cost 10,000 lives and inundate two-thirds of the U.S. petrochemical industry in a few hours.

(Monitor News Photo)

KNOCKING THE WIND out of hurricanes is a big order.

IN MOST HURRICANES striking the United States during this century, 90 percent of the fatalities and more than half of the property damage have been due to storm surge. Storm surge is the rise in sea level as the spinning winds "suck up" the comparatively warm sea water and build up the height of the waves on the sea surface. The height of the storm surge rises, often very greatly, as the storm approaches landfall over shallowing waters.

Hurricanes also produce torrential rains and therefore a flood threat to low-lying coastlines on inland areas that cannot handle a large sudden runoff of extra water. But the extra moisture is not all bad. Some areas, such as the Yucatan, depend on a few seasonal storms to provide most of their water supply for the year. That is why the hurricane modifiers have mostly focused on reducing the wind speeds without decreasing the quantity of rain.

Can hurricane winds be moderated? No scientist will say so for sure. But some promising theories are ready for serious testing.

One theory is to use proven cloud-seeding technology — that is, to inject silver iodide (from airplanes) near the hurricane's central "eye" to displace outward the ring of ascending air. The idea, says the Weather Modification Advisory Board, is to reduce maximum wind speeds by slowing the storm's rotation, as is done by the spinning ice skater extending arms away from the body.

A THEORY LIKE this can be tested only in part by simulating its effects in a computer. The atmosphere is so gigantic and so complex a system of interactions that the only valid test can be conducted on real storms in a real sky. Even then, since the cloud physicists are not yet able to follow the physical cause and effect through a cloud — that is, it's hard to know in any particular case whether the silver iodide actually caused the observable effects — the experimenter is stuck with statistical inference as his precarious "proof." And that requires plenty of cases from which to draw inferences.

Three Atlantic hurricanes have been seeded — in 1961, 1963 and 1969 — to reduce their wind speeds, and in each case wind speeds did go down; a positive but statistically inconclusive outcome. There are too few big Atlantic storms on which to base a major experiment to validate, or reject, the theory. Project Stormfury, administered by the Commerce Department's National Oceanic and Atmospheric Administration (NOAA), has been waiting ten years for another storm to seed. Small as their number is, most Atlantic hurricanes are too close to populated islands and coastlines to risk changing them, at human command, in the wrong direction — for instance, increasing their wind speeds, or "steering" a hurricane's path toward a city which might otherwise have been spared.

The best bet is to experiment in the Western Pacific where most of the hurricanes are. Several years ago the State Department asked the Japanese and Chinese whether they would mind our moving Project Stormfury, as a U.S. experiment, into their back yards — and naturally received in reply several Oriental versions of "no way." But a truly international approach might receive a more cooperative reply. It would invite the peoples at risk to join with us in learning how to moderate, to our mutual benefit, hurricanes that threaten our Pacific neighbors even more than they threaten us.

THERE MAY BE other ways to modify hurricanes. A cooler sea surface makes for a weaker hurricane. A hurricane produces a cool wake as it stirs up and rains on the ocean waters in its path; in two documented cases, a second hurricane passing over such a cooled path a few days later dramatically lost power. Cooling large areas of ocean surface along the Eastern seaboard or in the Gulf of Mexico is a challenging assignment. But some experts think it could be done as a by-product of ocean thermal energy conversion (OTEC) — a "solar energy" technique designed to bring cool water up from the deep ocean anyway. And there are even advocates of the idea that icebergs — already proposed as a source of fresh water for thirsty populations in crowded coastal zones — might also be used to cool the sea surface off the most vulnerable coasts during hurricane seasons.

The Weather Modification Advisory Board last year proposed a 10-year test of hurricane moderation, which might cost $8 million to $15 million a year. The recommendation is still resting comfortably in an executive pigeonhole.

In the nature of modern government, it may take a couple of billion-dollar, kilo-fatality hurricanes to get it proposed by the president, legislated by the Congress and funded by them both. But the president and members of Congress then in office will have trouble explaining why we didn't do our scientific and technical homework ahead of time. And that time is now.

(Political scientist Harlan Cleveland directs the international program for the Aspen Institute for Humanistic Studies. He served as chairman of the U.S. Weather Modification Advisory Board in 1977 and 1978).

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ARTICLE APPEARED ON PAGE TEMPO-9

THE CHICAGO TRIBUNE
10 December 1979

CIA 1-04 Peterson, Dale
CIA 2-05.1 FOIA
CIA 4-01 MKULTRA
CIA 4-01 Scientologists
CIA 4-01 Operation Big City (N.Y.)
(Long under Coates)

CIA's Manhattan 'tests': Experiments on New Yorkers?

By James Coates

WASHINGTON — The CIA did something sinister in New York City in 1955 and early 1956 — possibly exposing unsuspecting Manhattanites to germ warfare agents or drugs such as LSD.

Everybody who was involved in the covert operation is long gone, said agency spokesman Dale Peterson. "Nobody here remembers the details," he explained.

But if dead men — or for that matter, retired men — tell no tales, their expense accounts live long after them. And it is a CIA expense account that gives chilling hints that agency operatives did something nasty in New York with germs or hallucinogenic drugs.

A fragmented picture emerges from a pile of yellowing receipts released by the agency under the Freedom of Information Act. Here are some of the things the spy bureaucrats billed the home office for:

"Cigarets, Development Security $1.30"
"Bottle stoppers — juice, biol. exp. $2.02"
"Beer, security, exp. devel. $1.58"
"Ice, 275 lbs. emergency $1.56"
"Book, The Complete Shepherd $3.97"

UP TO THAT point the vouchers could be for a slightly weird party involving small amounts of beer and large amounts of ice.

But, the chits soon become more menacing:

"Bug duster, one dozen, dissemination $2.98"
"N.Y. Times, Subscription-Information $1"
"Shotgun shells, dissemination study $10"
"Nasal filters, sampling 3 at $12.50 each $37.50"
"Driver license, car rental, proposed field test — area survey — security $9.70"
"Nasal filter pads — Emergency sampling $8.15"
"Animal Fresh Food, emergency $2.89"
"Book — WRITING CODE, security $2.50"
"Dual Exhaust Dissem — study $8.50"

THERE ARE 93 separate expense items listed in the receipts and several people have pondered the nature of the program they financed. Here are some highlights of the speculation:

● A team of CIA agents working with Army personnel from the germ warfare labs at Ft. Detrick, Md., equipped a 1953 Mercury with a dummy exhaust system, which may have served as a dispersal system for a germ or drug weapon.

● The automobile was driven many miles on New York streets, bridges, expressways, and tunnels for "tests."

Afterward the automobile was scrubbed at a commercial car wash for "decontamination," the expense vouchers say.

● Scores of bug dusters — the ordinary "flit gun" variety with a pump at one end and a little jar for holding bug killer at the other — were purchased. The agents also bought numerous packs of "nasal filters" as well as suitcases, miniature motors, and soundproofing material.

THE IMPLICATION LURKING in that series of purchases, say some analysts of the documents, is that the agents hooked motors to the bug guns and placed the devices in suitcases converted to conceal the spraying apparatus. Wearing nose plugs, the agents carried the devices in city crowds where bystanders got a dose of whatever was being sprayed.

The vouchers also covered purchases of hundreds of small boxes and vials — apparently to hold specimens taken around town to establish just how well whatever was being sprayed covered surrounding people and objects.

The CIA-Army team also collected a lot of weather data during their experiment, feeding speculation that conditions had to be just right before the spray was effective.

A voucher for $1.50 to visit the observation tower of the Empire State Building for "weather data" was one major tipoff that Operation Big City — the CIA's code name for the project — occurred in New York. Other data includes numerous — and obvious — references to Manhattan's streets.

The expense accounts, like most other CIA data released under the Freedom of Information Act have been heavily censored. Names of hotels, car washes, restaurants, food suppliers, and the like have been crossed out.

THERE ARE TANTALIZING hints for armchair analysts that the CIA operatives made mistakes during their tests. One voucher, for example, shows they bought a quantity of "nasal filter pads — emergency sampling."

Another cryptic entry reads as follows: "Toy dog, No official Recp. (receipt?). Air contamination test $0.98/.02 tax /$1."

Why did the spies need a $1 toy dog? One observer speculated that the toy was a wind-up animal that was operated in a corridor filled with the chemical, then tested to see how much had adhered to its fake fur.

Between May 17, 1955, and Feb. 13, 1956, the agents sought reimbursement for the purchase of 93 items, which they justified to the home office.

Many of the project's expenses were covered elsewhere in the regular CIA budget, the documents show. But attached to the receipts now circulating, there is an agency-memo saying these expense accounts were covered by a slush fund because "proper funds for a given activity will require an undesirable amount of written or oral justification."

WHATEVER THE AGENTS were doing in New York, it appears unlikely that people were infected with disease or intoxicated with any hallucinogenic drugs.

One analyst of the documents, a well-financed foe of the CIA, said that checks of newspapers, death certificates, and other sources during the experiment showed no unusual incidents had occurred. The expense accounts are among 20,000 pages of once-classified material from an agency project code named MKULTRA, a governmentwide effort to develop mind control methods and use LSD and other hallucinogenic chemicals on urban populations.

The project was developed during the Cold War when extensive publicity was focused on how the Soviets had brainwashed Cardinal Jozef Mindszenty and how the Communist Chinese had broken the wills of numerous American POWs in Korea.

Under MKULTRA, the CIA sought to provide a U.S. capability for the same techniques — and it was expanded into studies of mind control drugs and chemical agents, a CIA official explained.

John Marks, a former CIA agent now considered a renegade by his one-time colleagues, documented many of the farfetched MKULTRA schemes in several books and articles, including a recent volume called, "The Search for a 'Manchurian Candidate.'"

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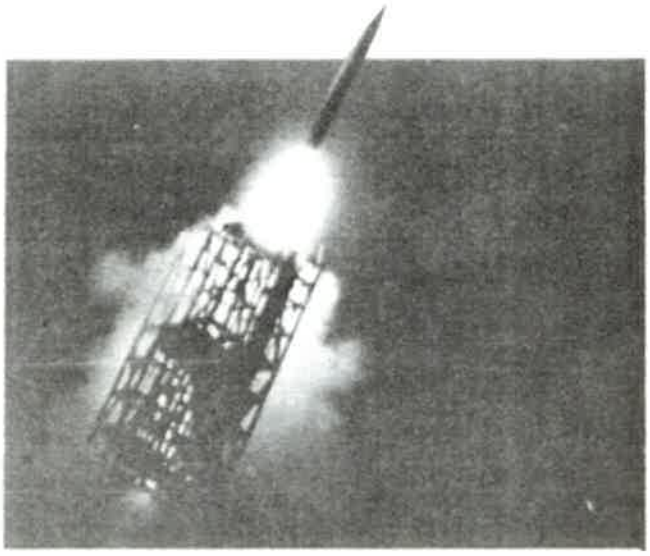
newscientist

Weather in a can

The first international test of scientists' ability to alter weather for peaceful purposes is due to start by the end of the year. Sponsored by the World Meteorological Organisation (WMO), the experiment should last seven years and help clear up doubts about the value of weather modification techniques. The venue for the experiment and the exact timing are still being discussed, but Spain is a likely choice because of the suitable climate and the existence of well-documented weather records.

The interest in a rigorous test for weather modification comes after the signing last year of a United Nations treaty which seeks to stop countries using the weather as a weapon. The US and USSR have been in the forefront of research in this field—the US used cloud seeding during the Vietnam war to produce flash floods, although it is not clear to what effect—and they and 38 other countries, including Britain, are now in the process of ratifying the treaty.

The techniques with which both the treaty and the WMO experiment are chiefly concerned involve cloud seeding. After an extensive five-year look at existing weather patterns, these techniques will be applied to see what changes do occur. The chemical normally chosen is silver iodide which has a crystal structure similar to that of ice. The substance is usually dropped into the cloud from a plane, or fired into it from the ground.



Novosti

Soviets rocket-seeding clouds

Philip Goldsmith, deputy director of the Meteorological Office at Bracknell and a member of the WMO committee on cloud physics and weather modification, said he was not convinced by the claims for the techniques made by other countries. Even in the most favourable circumstances, he said, condensation could be expected to increase by only 10 to 20 per cent due to seeding, and this did not always lead to the desired amount of rainfall. □

(H 23)

1978

The Canberra Times

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WEATHER MODIFICATION HISTORY

Jets 'may affect weather'

URBANA, Illinois, Wednesday (AAP-Reuter). — Vapor trails from jet aircraft may be responsible for some weather changes, according to studies being carried out at the University of Illinois.

Mr Stanley Changnon, head of the atmospheric sciences section of the Illinois Water Survey, said records for the past 25 years showed an annual increase in cloudy days each year, a narrowing of daily temperature ranges and a decrease in the number of rain-generating thunderstorms.

For the past five years, Water Survey cameras had been photographing the Illinois sky every 10 minutes, and Mr Changnon said they showed a frequently repeated pattern that began with a clear sky at dawn being broken by jet vapor trails.

These trails increased and merged to form a blanket of high cirrus clouds that turned a sunny day into a cloudy one.

The Illinois-Indiana area, which Mr Changnon described as the "centre of the air corridor" of jet traffic, had experienced a particularly noticeable decrease in sunshine and a narrowing of temperature range.

He said the drop in the number of thunderstorms was on a global scale, with the United States suffering the greatest decrease.

The trend began in the 1940s, he said, explaining that thunderstorms were spawned by solar energy reflecting from the earth cloud cover would cut off that energy.

NOT JET VAPOUR — NOT TELLING PUBLIC TRUTH

1978

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1978

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WEATHER MODIFICATION HISTORY

THE LIEDTKE SYNDROME

When I was a young lad, I can recall signs hanging over the back bars of Chicago's saloons which read "WATSMMHATTAH."

The literal translation was, "Why Are There So Many More Horse's Asses Than There Are Horses?"

I thought of this a few weeks ago when I stumbled across a news item in the *New York Times* that told of one Klaus Liedtke, described as being the Acting Director of the Weather Modification Office of the National Oceanic and Atmospheric Administration in Boulder, Colorado.

President Carter inspects by helicopter some of the damage done by Hurricane Frederick and the Weather Modification Office. Do you see your boat? UPI photo

It seems that in May of 1978, five aircraft were fitted with special equipment that would allow them to seed budding hurricanes with silver iodide and thus dissipate their high winds. After David had managed to kill thousands of people, leave millions homeless, and destroy dreams and families in such poverty ridden areas as Dominica, Haiti and the Dominican Republic, some reporter thought it might be interesting to know why Acting Director Liedtke had not acted to save some of these unfortunate people from the misery left by the storm.

"Our aircraft were in an experiment in the Indian Ocean, out at Diego Garcia, and they arrived back here fairly late. A decision was made not to attempt a seeding this year," said Mr. Liedtke.

I suppose it would be out of line to question the government as to why After all, you wouldn't want these planes to be near the National Hurricane Center in Miami. Everybody knows that hurricanes originate in Colorado, right? If Mr. Liedtke was situated in Florida, where he might have lost everything he held dear when Hurricane David threatened to come ashore, you can bet your bippy those planes would have been out there dumping silver iodide like it was going out of style.

I'll tell you something. While I was running for cover up the New River in Fort Lauderdale, I thought about the hurricane seeding program (which languished during the Nixon administration) and wondered what had happened to it. If someone had told me NOAA could have reduced David's power by 20 percent just by a bit of seeding, I'd have been on the phone yelling, "Seed! Seed, for God's sake!" And so would every other resident of the Caribbean and the Gulf Coast, as well as the entire East Coast.

Now, you'd think with so many millions of dollars in property, it would seem to me it would be worth the trip. That is why our tax dollars were used to equip and man the planes, isn't it? It is why our tax dollars pay Mr. Liedtke's salary, isn't it? Or have I missed the point somehow?

I don't suppose the thousands who were injured or lost their homes can look to Mr. Liedtke for recompense, but surely they can look to him for a better explanation than "Our planes were in an experiment in the Indian Ocean." Why were our planes in the Indian Ocean during hurricane season in the Atlantic? Why weren't the planes flown back to the States at the first sign that David was a major hurricane? If they got back too late for David, couldn't they have seeded Frederick?

Well, I suppose we'll never know. But one thing really bothers me. I expect to be in Florida next year during hurricane season. It would be of some comfort to know that should another killer storm brew up in the Atlantic, that the Weather Modification Office would get off its butt and start modifying. But, unfortunately, the future looks no brighter than the past. When asked about his plans for next year, Mr. Liedtke said, "No decision has been made yet." How does that grab you, hurricane watchers of the world?

I don't know what the experiment was all about in the Indian Ocean. Perhaps it had to do with getting as far away from a hurricane as possible without flying to the moon. Perhaps the folks in Diego Garcia have pull with Washington that we know nothing about. If so, let their taxes fund Mr. Liedtke and his missing planes. Meanwhile, I suggest that the seeding planes be kept closer to the hurricane breeding grounds. I suggest that Mr. Liedtke be put to sea in a small boat in the midst of the next killer storm so he can have a first-hand look at the thing. I'm sure it will appear different from that vantage point than from a satellite photo shown on the Today Show the day after it wipes out an entire island . . . or maybe the East Coast of the United States.

Meanwhile, I'd like to nominate Klaus Liedtke for the 1979 WATSMMHATTAH Award in memory of those who, for

1978

Sarasota Herald-Tribune

This Area's Great Morning Newspaper

SUNDAY, JULY 2, 1978

China To Step Up Weather Research

TOKYO (AP) — China will step up research of weather control methods to regulate rainfall, disperse hail and fog and lessen the intensity of typhoons, the official Chinese news agency Hsinhua said Saturday.

The agency, in a dispatch received here, said groups have been formed throughout China to supervise the research and that a cloud and fog physics laboratory is being built in Peking.

1978

#26

the prescott courier

tuesday, january 3, 1978 vol. 96, no. 2—15 cents

USSR:

1978

Secretly controlling climate?

By TOM TIEDE

OTTAWA—(NEA)—Last March, during a cold and clear evening, a strange extra-terrestrial phenomenon occurred over Ontario. As reported by Canadian government official Andrew Michrowski, "the sky lit up with sheets of light traveling in a 360-degree circle." Michrowski says the light pulsated, in a perfect pattern, for an hour.

The Aurora Borealis? The tailings of a UFO? Michrowski says he considered every possible explanation before deciding, gravely, that the sheet lightning was man-made, in the Union of Soviet Socialist Republics, and was part of an ongoing experiment by the Russians to modify the weather for agriculture and defense purposes.

Michrowski, employed as a futurist in Canada's office of the secretary of state, had for some time suspected the Soviet Union in this regard. The sheet lightning activity sealed his opinion. He has spent the time since March trying to convince his government, and that of the U.S., that the world may be in new and imminent peril.

And he's not alone in this belief. A growing number of mostly private citizens on the American continent are increasingly worried that the USSR is behind the recent souring of global climate conditions. Theirs is at best a frustrating interest. Few scientists believe the theory, and many of its advocates are considered to be wacky.

No one doubts that, as late, the weather has indeed been odd. Last winter's record freeze on the eastern side of the U.S. and Canada was but part of a gradual cooling of the earth since 1940. Yet no government would say this is the Russians' doing. The conventional wisdom is that the chief culprit is pollution which masks the sun.

Also, few scientists would doubt that weather modification techniques are actively coveted by superpower nations. In testimony before Congress in 1974, Dartmouth's Dr. Gordon MacDonald advised that climate control would perhaps be the ultimate "covert" weapon:

"Storms, floods, droughts, earthquakes and tidal waves (are) viewed as unusual but not unexpected. (A secret climatic war) could go on for years with only (the perpetrating nation) being aware of it. The years of storms would be attributed to unkindly nature, and only after a nation was thoroughly drained would an armed takeover be attempted."

But theory is one thing, application another.

Dr. Andrija Puharich, a medical researcher from Ossining, N.Y., says he has "personally seen to it that Jimmy Carter is aware" of the alleged Russian interest, but he expects no thankful action for his troubles; "Nobody is listening," he says, "nobody believes it, nobody cares."

Except the few, that is. Michrowski, Puharich and others care enough about the weather modification possibility to risk their reputations in its exposure. And they seldom risk on the side of moderation. Says Dr. Puharich: "If the Russians can affect world weather, and I believe they can, it's the most ominous development on the planet."

According to believers, the full gravity of the matter is as yet years away. Ken Killich, a Canadian technician and science activist, says the Russians are now merely learning about weather modification. In fact, Killich says, the weather that has been altered by the USSR to date has been done so through experimental error. Killich believes the Russians have set out to cultivate vast new areas of their nation, much the same as the U.S. and Canada did earlier in the century. Not wanting to create a dust bowl of their own, however, Killich says the Russians have been trying to stimulate the climate to do the biddings of ground-bound button pushers.

Instead of just influencing their own region, though, Killich says the Soviets have "lost control" and hence have affected the world. Michrowski adds the opinion that Soviet experiments in the last year were responsible for shifts in massive high pressure fronts; these shifts backfired, giving the Soviet Union "a lousy winter too."

Just what it is the Reds may be doing wrong is unknown. This is partly because no one knows what it is the nation may be working with. The only thing Russian critics do know, they say, is that the Soviet experiments are based on the work of a Yugoslav-American scientist named Nikola Tesla. Who is Tesla? That's a story in itself.

Nikola Tesla was the son of a Croatian preacher, who immigrated to America from Belgrade in 1884. On arriving in New York he had four cents in his pocket, and a vision in his mind that man was superman if only he allowed himself to be. In the next 59 years he became one of the most prolific and remarkable inventors of his time.

According to one writer, Tesla's accomplishments were like "the dreams of an intoxicated god." He was responsible for modern radio, he perfected neon and fluorescent lighting, he invented radar 40 years before World War II, and he created robots a century before Star Wars. The exact number of his patents is unknown; it is more than 125.

Nikola Tesla's greatest achievement was the discovery of the rotating magnetic field, the fundamental element of alternating current. Until Tesla, electricity was confined to direct current, a system that prevented its transmission over any but short distances. Tesla's AC was to change the whole nature of power. The change was not without its critics. No less an expert than Thomas Edison said Tesla's system was dangerous, therefore impractical. Tesla countered that anything is dangerous, if mishandled. To prove the merits of properly applied AC, he gave exhibitions where he passed 1 million volts through his body; and the public was convinced.

Tesla teamed with George Westinghouse to establish the first polyphase alternating current system in America, at Niagara Falls. For the first time power was sent over a distance to feed a city, in this case Buffalo, 30 miles away. Tesla's biographer, John O'Neill, says every transmission pole in the world is a monument to that moment.

Yet if Tesla was

Tesla

State building through electrical vibrations from a palm-sized box. He said he could create a beam of light that could send fuel to ships at sea. He actually began one effort, financed by J.P. Morgan, to create a system that would transmit energy around the world without the aid of wires.

This latter work, according to Andrew Michrowski and others, is what is being used by the Russians today to modify the weather. Tesla said the ground "is literally alive with electrical vibrations," therefore it can be used as a conductor. Tesla said electricity can be driven into the earth at one point and brought out at any other.

Tesla used a coil of his own invention to prove his hypothesis. He worked in a Frankensteinian laboratory in the Rocky Mountains, complete with regular "thunderstorms" from above. He reportedly was able to create his own lightning, to bounce wireless current back and forth on the globe, and to illuminate 200 bulbs via earth 26 miles away.

How does Nikola Tesla square with weather modification? Andrew Michrowski says the Russians have tapped Tesla's experiments in order to send gigantic amounts of energy in precise ways, against the elements. A cold front, therefore, may be moved by waves of Russian currents coming up in formula from the earth or sea.

Michrowski insists this is not so preposterous as it sounds. He reminds that last year much of the world's communication system was disrupted by strange forces of in-

Tesla-like in nature. "The Russians admire Tesla. They revere his work. I believe they have been able to use him to great scientific advantage."

Meanwhile, the western world is not so keen on N. Tesla. For all of his amazing work and prophesies, the scientist died in New York (in 1943) in near obscurity. The U.S. War Department of the time did assign a man to examine Tesla's papers for "practical ideas" for the war effort; otherwise, he was hardly remembered in his adopted nation.

One man who does remember Tesla, with fondness, is a scientist named Robert Golka. He heads a research effort called "Project Tesla" at Utah's Wendover AFB. Using an "exact replica" of a Tesla apparatus of 1899, Dr. Golka is trying to create "ball lightning," which can now be done only through the process of nuclear explosion.

Dr. Golka says he is "amazed" that Western science has forgotten Tesla. He feels the man's works have unlimited possibilities today. He says for example that he is "close to creating ball lightning," and when he does it will be "as great a discovery as the laser"—all because of a long dead man whose name is known to almost no one.

Dr. Golka has no comment as to whether the Russians may be tapping Tesla for purposes of weather control. But he strongly wishes more Western scientist would tap Tesla for a variety of reasons. Andrew Michrowski, Dr. Puharich, Ken Killich and a host of others agree; they want a commission set up to study Tesla and also the

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1978

THE SPOKESMAN-REVIEW

FOLLOW US ON FACEBOOK
WEATHER MODIFICATION HISTORY

CITY EDITION

THURSDAY MORNING JULY 13, 1978. PRICE 20 CENTS.

Weather modification caution urged

WASHINGTON (AP) – Man will be able to change weather significantly within the next two decades and the government must assure that the implications of producing more rain or lessening storm damage are considered early, a federal advisory panel said Wednesday.

The Weather Modification Advisory Board said in its report to Commerce Secretary Juanita Kreps that weather modification is a new technology that has a chance of being introduced properly.

"The history of our time is sprinkled with instances of new technologies running ahead of the social, economic, environmental, international and institutional thinking that should accompany them," Harlan Cleveland, board chairman, said in a letter to the secretary.

For example, critics say nuclear power is a technology that was pushed into use before dealing with such long-term implications as environmental effects, radioactive waste storage and disposal of old power plants.

The one-year weather modification study said the abilities to increase rain and snowfall, and to lessen some storm damage, are "scientifically possible and within sight."

The panel predicted that by the early 1980s, scientists will be able to increase mountain snowpacks by 10 percent to 30 percent. By the latter part of the decade, rainfall in the High Plains and Midwest could be increased 10 percent to 30 percent, it concluded.

By the 1990s, the report said, it will be possible to reduce hurricane winds by 10 percent to 20 percent and cut the amount of hail in some storms by 50 percent.

The group, established under the National Weather Modification Policy Act of 1976 and charged by Congress to recommend a national policy, said the best approach at this stage is to accelerate national research and minimize federal regulation.

Most current weather modification involves localized projects of seeding clouds with chemicals to affect rainfall within one state's borders, the report said.

The federal government should establish guidelines for doing this work and license weather modifiers for competence, as it does airplane pilots, the study group said. As future projects get larger and affect many states, more federal regulation may be needed, the group said.

The major federal effort should go into a 20-year research and development program to improve weather modification techniques and assess their environmental impact, the study said.

1978

#28

1978

Australia 85 cents. Canada $1.00. Germany DM 3.50.
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7 September 1978 Vol 79 No 1119 Weekly 35p

newscientist

1978

Monitor

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WEATHER MODIFICATION HISTORY

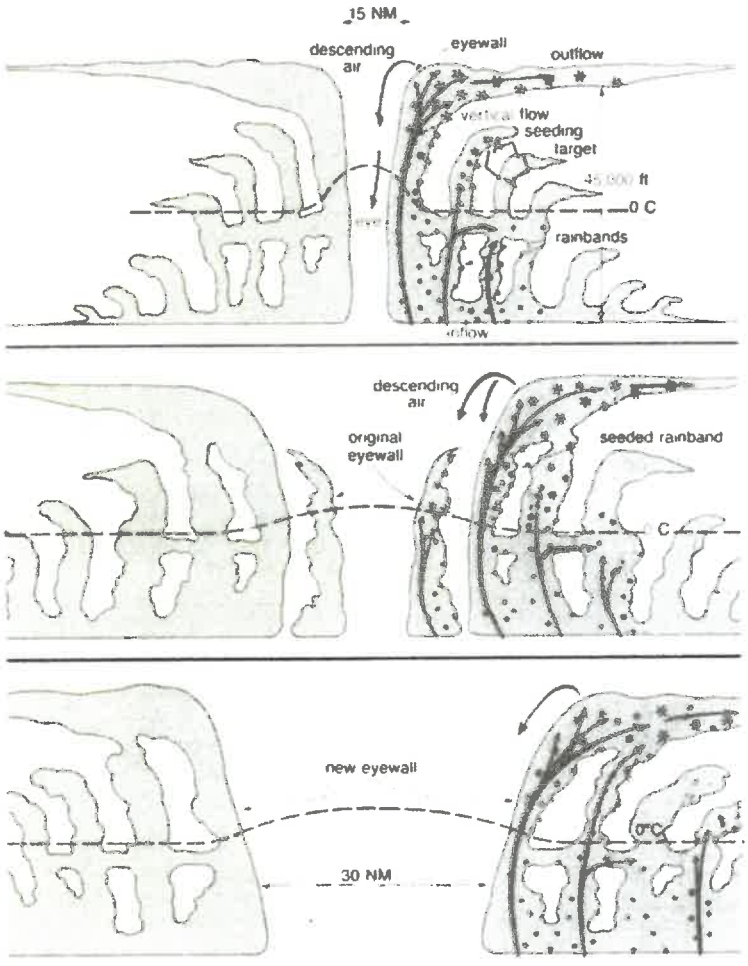
Hurricane seeding back on the air

During the next six weeks, the first experiment for seven years to investigate the effects of chemical seeding on the wind speeds of a hurricane will take place off the coast of Florida. Project Stormfury, sponsored by the National Oceanic and Atmospheric Administration, is now monitoring Caribbean weather for a suitable candidate storm. Four hurricanes have been seeded before, Esther in 1961, Beulah in 1963, Debbie in 1969 and Ginger in 1971 but the results have been a source of controversy. While none of the storms increased in strength after treatment, only one, Debbie, showed a clear decline. After both its two seeding periods, Debbie showed reductions in wind speeds of 30 and 15 per cent.

The new project is expected to gather more convincing evidence of wind changes. The NOAA plans are to seed the second or third cloud wall of the chosen hurricane with 500 pounds of silver iodide at a height of 27 000 to 30 000 feet over 10 hours. It hopes that this will rapidly develop vertically into a new much wider storm eye with a consequent reduction in wind intensity. Four large transport aircraft will do the seeding and the techniques being used have been developed from experience with single cumulus cloud seeding experiments and extensive computer storm modelling.

In order to qualify, the storm to be seeded must be within 700 nautical miles of the NOAA bases in Miami and San Juan for at least 12 hours and have maximum winds of 65 knots. When such a candidate presents itself, the project will swing into action and after seeding, it will be followed for at least 30 hours by five monitoring aircraft and every available weather satellite.

Meteorologists are hoping that the precision with which seeding will be carried out will establish firm evidence for wind reduction. If this hope is fulfilled, the procedure could ultimately become standard to reduce the force of hurricanes for the 12 to 24 hours they take to cross areas which are very heavily inhabited. □



How hurricane seeding works. Supercooled water in the cloud towers on the outside of the eyewall (see top diagram) freezes after seeding, releasing latent heat into the systems of clouds. This makes the seeded clouds more buoyant, and so they grow vertically more quickly than otherwise would have been the case.

As clouds build up to the hurricane's outflow layer (see middle diagram), they replace the original eyewall as the main vertical conduit of the storm. The original eyewall has meanwhile dissipated, leaving an eye of greater diameter (bottom diagram).

The crucial point is that the maximum wind strength is cut, so the effects of the hurricane at ground level are reduced.

Project "Stormfury"

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(#29)

1978

VOLUME 8 NUMBER 4 OCTOBER 1978

noaa

Weather Modification Advisory Board Presents Report

Weather Control Effort Advised

Secretary of Commerce Juanita Kreps receives report from Weather Modification Advisory Board Chairman Harlan Cleveland (center) and NOAA Administrator Richard A. Frank.

A panel of weather modification experts say that technologies for increasing rain and snowfall and for lessening weather damage are "scientifically possible and within sight."

They predict that scientists will be able to produce 10 to 30 percent increases in mountain snowpack by the early 1980's, and 10 to 30 percent increased rainfall in the High Plains and Midwest by

Basic research support at academic institutions would continue to be provided by the National Science Foundation.

The Board recommends against a comprehensive Federal regulatory system for weather resources management at this time, but asserts a clear need to make sure that both research and operational projects are designed and op-

"The public interest requires that deliberate changes in the atmosphere be designed and carried out with environmental prudence and after consultation with the people likely to be most affected. The air and clouds are a public good, belonging to no one. The size and power of atmospheric systems are such that sensible policy must start with Federal re-

(#30) 1978

Press-Republican—Monday, October 30, 1978

Barium released in Alaska traced south

WASHINGTON (UPI) — The space agency released barium from a satellite over Alaska Sunday, creating glowing, bluish-white clouds for a weather experiment to study the movement of particles in the earth's atmosphere.

Within several hours the spreading clouds were spotted by tracking telescopes as far south as Arizona and Hawaii, although they were too high to be visible to the naked eye except in Alaska, the National Aeronautics and Space Administration said.

On a command from NASA's tracking station at Gilmore Creek, Alaska, the satellite released four canisters of barium at 40-second intervals, beginning at 6:09 a.m. EST, as it moved southward in a near-polar orbit. Each canister created a separate cloud more than 600 miles long that was slowly following the satellite's orbit.

"If the weather conditions in the upper atmosphere are good, there's a chance the clouds will be seen (by telescope) all the way around the world," said a spokesman at the Goddard Space Flight Center in suburban Maryland.

The purpose of the experiment is to enable scientists to learn more about the complex movements of above the earth's ionosphere by plotting the movement of the barium particles.

"It was launched as part of our continuing study of the weather," the NASA spokesman said. "We will try to determine how the upper reaches of our stratosphere affect our weather."

NASA said barium is a harmless chemical that dissipates in space. Barium has been previously released in the atmosphere from rockets, but never before from a satellite and never quite as high above the earth.

The flow of the natural ionized particles in the upper atmosphere and in space above it is somewhat like the eddies and whirlpools in a fast-flowing river, and scientists hope to learn more about it.

The space scientists said they used the sheets of glowing barium in the sky as one might use dye dumped into a river to make the water's flow easier to understand.

The space agency called it Project Cameo, for "chemically active material ejected into orbit." At a later date, NASA plans to release lithium, another harmless chemical over northern Scan

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(H 31)

1978

Bangor Daily News

BANGOR, MAINE, MONDAY, OCTOBER 30, 1978

NASA creates clouds over Alaska in conducting weather experiment

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To get exact pictures, the NASA scientists placed camera stations at three Alaskan sites: along the coast, at Gilmore Creek and Ft. Yukon. In addition, a NASA jet operated out of Fairbanks

The satellite was the orbiting second stage of the Delta rocket that was used last Tuesday to launch the Nimbus 7 into a polar orbit.

* Also released from satellite

(#22)

1978

Spokane Daily Chronicle

6 SECTIONS SPOKANE, WASH., THURSDAY, DEC. 7, 1978. 20 CENTS HOME DELIVERY

Control Over Weather Seen Within 10 Years

SAN FRANCISCO (AP) — Within 10 years governments could be manipulating weather to end war, prevent drought and starvation, reduce hurricanes and hail storms and keep ski areas packed with snow, a social scientist predicts.

"Another (Hurricane) Camille hitting in Galveston would wipe out 40 percent of the petrochemical industry and kill 10,000 Americans, so it's time we got on with developing a weather modification program," said Harlan Cleveland, who runs the Aspen Institute for Humanistic Studies in Princeton, N.J.

Cleveland, the former chairman of the U.S. Weather Modification Advisory Board, said in an interview this week that scientific progress should go hand in hand with "environmental prudence" and consultation with the people who would be affected by the weather changes.

Within 10 years, snow and rainfall could be increased by 10 to 30 percent and hurricane winds could be reduced by as much as 20 percent, Cleveland said. Storms would be controlled, droughts could be avoided and crops would flourish.

Scienusts have seeded supercooled fog to improve visibility and opened holes in winter stratus clouds to increase the solar radiation that hits the ground.

He warned that weather modification could be used to make war or peace. In Vietnam, he said, cloud seeding was used to make mud and inhibit the passage of North Vietnamese forces along the Ho Chi Minh Trail. It didn't win the war, he pointed out.

In the Middle East, it could be used to make peace. The Israelis claim they have increased their rainfall by 10 to 15 percent and in the process, more rain is falling in neighboring Jordan and Syria.

"That's one area in which they aren't complaining about what the Israelis are doing," said Cleveland.

Weather change can be induced by:

— Injecting energy by brute force, direct heat or mechanical mixing.

— Triggering and intensifying the atmosphere's natural energies with chemical seeding agents such as dry ice or silver iodide.

— Altering the land or water surface to change its interaction with the lower boundary of the atmosphere, for instance by paving surfaces with black asphalt.

1978

The Desert Sun

Saturday, October 30, 1976 Palm Springs, California 34 Pages, 3 Sections 15 Cents

Canadian's Suit Continues

WASHINGTON (UPI) — A federal judge must decide whether the CIA and the Pentagon infringed on a Canadian meteorolgist's rainmaking process during the Vietnam War.

Bernard A. Power, a professional meteorologist and president of Weather Engineer Corp. of Canada, Ltd., sued the U.S. four years ago and the trial began Sept. 22 in the U.S. Court of Claims. Arguments ended Friday.

Judge Joseph V. Colaianni is expected to rule in about 10 days on the first part of the two-section case — the validity of Power's patent. If it is valid, another hearing will be needed to decide if U.S. government agencies infringed it.

Power charged he was the first to devise a container that could be dropped from an aircraft, explode in a cloud, and make rain.

#35

US - CANADA - - - 1973

Weather: Warfare's Next Weapon?

Admiral Predicts Arsenal of Storms, Icebergs, and Fog

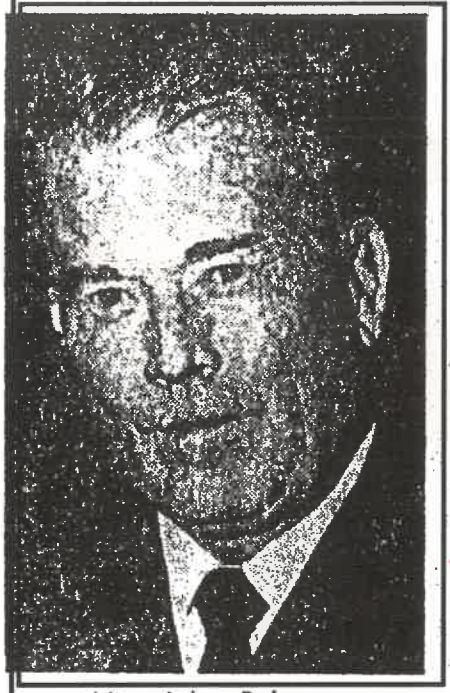
A startling picture of weather as a weapon of war is offered by Vice Adm. William F. Raborn, deputy chief of naval operations in charge of research and development, in the current issue of the monthly magazine, Naval Institute Proceedings.

In an article on the Navy of 1973, outlining current and future naval development projects, Admiral Raborn outlines such possibilities as diverting storms toward enemy communications, causing destructive weather phenomena, or controlling the weather to help a military assault. He placed no timetable on these developments.

Here—reprinted with permission of the United States Naval Institute, which has copyrighted the material—is the key section on weather from Admiral Raborn's article:

"The possibilities for the military employment of the 'weather weapon' may be as diverse as they are numerous. An ability to control the weather could introduce greater changes in warfare than those which occurred in 1945 with the explosion of the first nuclear weapons.

"A severe storm or hurricane striking a naval force may well inflict greater damage than could an enemy. The capability to change the direction of destructive storms and guide them toward enemy concentrations may exist in the future arsenal of the naval tactical commander.



Vice Adm. Raborn

"Ground, sea, air, and amphibious operations might be supported by the dissipating of fog or clouds, or by the production of rain or drought. Conversely, the creation of solid, low overcasts might be used to conceal troop concentrations, movements, and task force deployments. Large-scale weather control techniques might be used to cause extensive flooding in strategic areas or even to bring a new ice age upon the enemy. By influencing the ionosphere and atmosphere simultaneously, magnetic, acoustic, and pressure effects might be generated in such a way that oceanwide sweeping of mines would occur.

"Creating or dissipating atmospheric temperature/humidity ducts might modify the refractive index of the atmosphere enough to influence radar or radio transmission. Artificially induced ionospheric storms might produce a blackout of communications.

"Certain electromagnetic waves are unable to pass through an area of precipitation. A cloud-seeding generator could be employed under appropriate meteorological conditions to produce precipitation that would interfere with the operation of radio-guided or remotely controlled devices or vehicles.

"We already have taken our first steps toward developing an environmental warfare capability. We are using satellite weather data from Tiros II for current, tactical operations and more accurate long-range weather predictions. Some experiments in fog dissipation have shown promise, and some exploratory research has been conducted on ways to change the heading of major storms.

"For these reasons—and because our advances in science make it reasonable—we are now engaged in planning a 10-year, comprehensive study of the atmosphere, a study which we will designate ATMOS."

They can now: Divert Storms - Cause Storms
: Communications Black Outs
: Artificialy Induce Ionospheric Storms
: Control Hurricanes, Typhoons, Cyclones
total control!

#36

CANADA - 1974

The Star.

Recent Experiments In Scientific Rain Making

Popular Science

FOUNDED MONTHLY

Rainmaking Airplanes for Montana *

POPULAR SCIENCE

Weird Schemes To Make It RAIN

Canada & United States
Weather Modification Agreement-1974
Head Quarters in Montana

#37

1970

The Washington Post

Joshua Lederberg

In Deflecting Hurricanes, Where Do We Aim Them?

ON NOV. 13, 1946, Dr. Vincent Schaefer, working with Dr. Irving Langmuir of the General Electric Research Laboratory, first demonstrated that a natural cloud could be seeded with dry ice. Since then, many efforts to demonstrate a useful manipulation of the weather by seeding with various kinds of ice-nucleating particles have resulted in more controversial heat than proven rainfall.

These technical uncertainties have given us almost 25 years in which to work out the political and legal framework of weather management. However, our channels for social wisdom are so overloaded that we cannot realistically expect an appropriate level of public interest until the flood is upon us.

Dr. Myron Tribus, formerly dean of the Dartmouth School of Engineering and now Assistant of Commerce for Science and Technology, has been deeply concerned with the analysis of weather technology from its beginning. In a comprehensive overview in Science magazine, he suggests that cloud-seeding research is ready to proceed to larger-scale demonstrations.

DR. TRIBUS' remarks will elicit further rebuttal, and my purpose is not to follow every detail of the technical controversy. It is rather to echo his concern for public understanding that "meteorology is too important to be left only to the meteorologists." This principle is also recognized in the initiation of social and legal research projects by the National Science Foundation under its mandate to coordinate and report weather research information.

The redistribution of rainfall has its most obvious applications as a support to agriculture, where it has already generated conflicts based on vital interests. What social mechanism should we establish for the fair treatment of owners of land whose value may be drastically altered by encouraging or preventing rainfall?

In principle, the situation resembles the evaluation of reclamation and water redistribution projects. But we will face even greater difficulties of measurement and correspondingly pressing fantasies about the potential value of the rain that might have fallen.

The portent of weather modification also bears on water resource projects that may be prematurely made obsolete. Where dams and canals damage the environment, we have even more reason to look into the advantages of future innovations.

A MORE immediate opportunity is the modification of destructive hurricanes. To illustrate a moral dilemma, a hurricane might be predicted to smash New Orleans with a loss of 1,000 lives and $1 billion in property damage. Recent studies (the "Stormfury Project") suggest the possibility of weakening such a hurricane. But what if it should also veer toward Houston or Tampico, Mexico? We might never know whether it did so on its own account or in response to a seeding.

When the path of a hurricane is an "act of God," we can do little more than post storm warnings and grieve at the losses. Once we can intervene, we face an inescapable social decision: Who should bear the brunt of the hurricane? The possibility of intervention seems to require that the whole burden of hurricane damage be socialized—which is easier for property than for human life.

THIS IS, of course, being obliged to "play God," but it is only a pale shadow of the control over human destinies that the state has always exercised. What is new is merely that our national defense here is against natural rather than political adversaries. What is most awkward is that we probably have better foresight about the consequences of intervening in a hurricane than in a social revolution.

It is futile simply to turn our backs on the violence in the universe. But we must take care that these most vital decisions are made by representatives who know our social will as well as they profess to know the short-run technicalities of the battle.

BULLETIN OF THE ATOMIC SCIENTISTS
science and public affairs

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THE INTERNATIONAL IMPLICATIONS OF WEATHER MODIFICATION CONTINUED...

projects in weather modification conducted over the sovereign territory of any nation might disclose strategic information as to the vulnerability of the nation. Weather neighbors would have to be good trustworthy political neighbors if such weather modification operations were to be shared with security.

CLIMATIC THREAT

We can pursue the more ominous water analogy and note that, since states can already control river flow to a considerable degree, the possibility of intentional change and deprivation has already stirred the world on several occasions. Thus, both Israel and the Arab nations involved stated in the pre-June 1967 period that the other's attempt to interfere with its use, present and prospective, of the waters of the River Jordan would amount to "aggression" and would lead to an armed resistance. No doubt any major attempt to modify deliberately the world's climate as a form of "nonmilitary" weapon would elicit similar labels and threats from the potential "losers." If weather modification appeared to be a total weapon, the argument might well be made that even a threat or response with nuclear weapons was "proportional" retaliation for those states which could not otherwise successfully reverse attacks on their climate.

One class of cases which has already engaged the world's attention in the space field involves changes in the earth's environment without causing specific losses. Since weather experimentation and eventual attempts to control climate may, even if they are not zero-sum games, have similar re-

space. These claims have been made both generally and with respect to specific national operations in space. For example, project West Ford—the effort to place a band of copper needles in an orbit for communications purposes—was attacked by scientists in several countries, and by government spokesmen in a few, as a potential interference with radio astronomy and with other observation techniques as well. It was denounced as a "dangerous" unilateral interference with the cosmos. When it was pointed out that such allegations were excessive, and, on the facts, untrue, it was opposed as at least the forerunner of a scientifically undesirable "cluttering" of space (see Bernard Lovell, "Pollution of Space," December 1968 *Bulletin*).

Similarly, high altitude nuclear explosions were opposed by some scientists as creating distortions in the Van Allen Belt, as making the study of the earth's natural environment more difficult, of causing interference with scientific and other satellites in orbit, and as a menace, present and future, to man in space. The Soviet bloc has called such experiments "acts of aggression" and contrary to international law, to the U.N. Charter, and to U.N. Resolutions. Yet the high altitude tests were themselves, in part, designed as an interesting scientific experiment. While some of these criticisms have been obviously politically self-serving—for example, Soviet attacks on U.S. high altitude tests when the Soviet Union has in fact done the same thing—they have been widespread enough to indicate a general interest around the world in protecting nature's status quo even where no

all states; the implementation of any measures that might hinder the exploration or use of outer space for peaceful purposes by other countries shall be permitted only after prior discussion of and agreement upon such measures between the countries concerned.

The American delegation opposed this provision on the ground that it was an attempt to interpose a veto on a state's activities in outer space. However, the American representative stated his government's belief that, according to established principles of international law, states should take all reasonable steps to avoid activities restricting the free use of outer space by other countries. He stated also that the American government was prepared to consult with scientists of other countries whenever consistent with the national security. The possible harmful effects of space experiments should be studied by competent and objective scientific bodies and the United States welcomed the establishment of a consultative group for that purpose by COSPAR (Committee on Space Research). The United Kingdom, France, and Australia also appeared to be in favor of a certain measure of prior discussion between states concerning experiments by one state which might impair the use of outer space for other states.

While the United States successfully resisted this attempt to impose a potential veto on its space activities, the 1963 U.N. Resolution on outer space activities provides that:

> In the exploration and use of outer space, States shall be guided by the principle of cooperation and mutual assistance and shall conduct all

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APRIL 1969 VOLUME 4 NUMBER 2

Lake Erie - Canada/USA

U.S. DEPARTMENT OF COMMERCE, MAURICE H. STANS, Secretary
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION, Dr. Robert M. White, Administrator
Dr. John W. Townsend, Jr., Deputy Administrator

Ruskin, made scientific measurements inside the cloud. Meantime, a Navy S2D surveyed the bottom of the cloud, and a U.S. Air Force C-130 made meteorological measurements with dropsondes from 30,000 feet. These drops, being restricted to overwater areas, were made at the closest possible point to the experimental cloud.

To qualify for further study, the cloud top had to be located between 19,000 and 26,000 feet in altitude and had to be supercooled. That is, the cloud had to contain water below the freezing point which had not yet turned to ice. Nineteen such clouds were found, and 14 of them were seeded with silver-iodide flares dropped from the ESSA/RFF B-57 jet aircraft. As the flares burn and fall through the cloud, they leave a trail of silver-iodide smoke particles which act as freezing nuclei.

The five clouds left untouched to serve as controls were chosen by a randomization scheme to eliminate human bias. After receiving airborne instructions to seed a specific cloud, the meteorologist aboard the B-57 opened an envelope which gave him his first instruction to seed or not seed. Despite the randomized envelope instruction, the B-57 aircraft performed its seeding pattern run, and the project scientists studied the cloud after the seeding runs without knowing whether the seeding flares had actually been dropped.

Post-seeding studies of the experimental clouds included further "fly-throughs" by the research aircraft and extensive photography of the clouds' growth and behavior. In addition, two fixed, calibrated radars at the University of Miami probed and recorded the radar echoes from the clouds. This radar facility measured rainfall rate from the clouds with a special radar method and yielded quantitative rain measurements for both the seeded clouds and the other cumulus around them.

Cloud rainfall derived from radar reflectivities was part of the ESSA project, because meteorologists wanted to improve their mathematical model of what happens to a cumulus cloud after seeding. This process of "modeling," common to all scientific fields where the scientists attempt to "synthesize" a physical situation with mathematical equations, is most important to meteorology where experimental results can never be repeated under exactly the same atmospheric conditions.

Dr. Simpson says: "We have a whole zoo of models. With data from the 1968 project, we hope to design a new model which will account correctly for the effects of seeding. Each correct modeling step brings us that much closer to understanding and predicting the physics and structure of cumulus clouds. And, of course, once we have done that, we will have taken a long step toward modifying severe storms."

Great Lakes Snow

APCL's second project in 1968 involved a totally different seeding concept. Concentrating on the eastern and southern shores of Lake Erie in late fall, APCL scientists seeded cloud lines to study the feasibility of inhibiting the massive snowfalls that traditionally fall in these regions. Dr. Helmut K. Weickmann, director of APCL and project director, says: "About

York at Albany, State University of New York at Fredonia, Pennsylvania State University, and the Desert Research Institute, Reno, Nevada—had made extensive observations of lake-effect storms in past years.

These studies indicated that, in their developing stage, the clouds consist primarily of supercooled liquid water. Ice crystals that form naturally in the cloud tops can then grow rapidly as they fall through the supercooled cloud, because there is so much liquid available to them. The growth process is called riming, and the heavy snowfalls from the lake-effect storms are characterized by heavily rimed ice crystals, large aggregates of crystals, and graupel or snow pellets. Winds do not carry such heavy forms of snow very far, and consequently almost all of the snow falls out in deep accumulations very near the lake shore.

The APCL experiment was aimed at introducing sufficient artificial nuclei into the clouds so that all the supercooled droplets would be changed into small ice crystals. Thus, the water necessary to form heavily rimed crystals would no longer be available. The resulting smaller snowflakes and crystals would then fall more slowly and be blown farther inland.

In short, APCL's research was aimed at studying the feasibility of redistributing heavy snowfalls more thinly over a wider region. The project was envisioned as a broad step toward understanding and possibly modifying lake-effect storms. Such storms are not limited to the Great Lakes regions. Similar phenomena occur over the Sea of Japan, the Adriatic Sea, and the Gulf Stream.

CANADA

The actual experiment lasted five weeks, ending on December 14. Some 60 scientists, meteorologists, radar specialists, and aircraft crew members participated in the experiment. They used an RFF four-engine DC-6, two twin-engine aircraft, three weather radars, and many ground observing and collecting sites.

Fifteen flights were conducted, of which thirteen were seeding missions using silver iodide or dry ice. Considerable scientific information was obtained, but Dr. Weickmann says further lake-effect snowstorms need to be studied for a total appraisal of the influence of cloud seeding on such storms.

Tests of the basic seeding hypothesis were made during three periods of short-lived cold air outbreaks which were accompanied by light natural snowfall. Seeding effects on clouds were observed from aircraft, on radar, or on the ground. A thorough analysis of all data collected will be made to reveal the response of the cloud to the treatment.

Other cloud-seeding experiments were performed to collect pertinent supporting scientific data. On six days, seeding experiments lasting up to 30 minutes were carried out on non-precipitating cloud decks. It was established that substantial snow and rain showers could be released either by dry ice or silver iodide if the cloud deck were thicker than 5,000 feet. Data was obtained on the drift of a seeded area with the wind, to determine whether effects of treatment can be "targeted" over stationary ground instrumentation. Other studies showed that natural turbulence

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U.S. DEPARTMENT OF COMMERCE, MAURICE H. STANS, Secretary
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In ESSA's Florida Cumulus Seeding Project, seeded clouds grew explosively. 1. Before seeding. 2. After seeding. 3. Byron B. Phillips (right) and John Kelly of the Atmospheric Physics and Chemistry Laboratory poured dry ice into the "hopper" atop the clouds during the Great Lakes Snow Redistribution Project. 4. Howard Mason, Jr., (left) is Director of the Research Flight Facility, and Dr. Joanne Simpson directs the Florida Cumulus Seeding Project. 5. Keeping track of one experimental cloud in a cloud-filled sky can be a complex task—especially with four aircraft studying the same cloud at the same time. Here, William S. Callahan, RFF navigator, coordinates the research aircraft and assists the University of Miami in vectoring its ground-based radar onto the right cloud. 6. In the Great Lakes project, remote temperature sensing by means of infrared equipment allowed airborne scientists to take the temperatures of surrounding clouds, lake surface, or the ground below. Using the equipment aboard an ESSA RFF plane are Dr. Helmut K. Weickmann (left) and Dr. Peter M. Kuhn. 7. A solid cloud deck over Lake Erie's shores was seeded on December 3. The broad trough of fuzzy precipitating cloud beneath the aircraft's wing was created by the seeding. The bright spots also are a seeding effect—glaciation in the seeded section of the cloud reflects sunlight in this manner.

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tion or freezing nuclei must be present in the cloud. Natural nuclei come from a variety of sources such as sea salt, dust, smoke, and air pollution. The familiar term "cloud seeding" means adding artificial nuclei to the natural nuclei population in a cloud.

Clouds can be seeded with trillions of extra freezing nuclei to cause instability in what had been a colloidally stable cloud. This should then result in rain or precipitation that would not otherwise form and fall. Or, in the case of thin, layer-type clouds and fog, such seeding should totally dissipate them. Cloud seeding can be employed to lengthen or shorten the life cycle of individual clouds by encouraging them to grow to showering thunderheads or discouraging the formation of precipitation and inhibiting the cloud's growth. Seeding can also change the rate of conversion of cloud water to precipitation. This can be used to control the size of precipitation particles for such purposes as affecting the production of hail, for example.

In cumulus clouds, where isolated explosive growth can create severe thunderstorms or even tornadoes, competing convective systems in the vicinity can be helped to compete when cloud seeding gives the non-threatening clouds heat energy.

Cloud seeding and weather modification are not exact sciences. There are many difficulties in using the atmosphere as an experimental laboratory. Stratus clouds, which provide only a small fraction of the world's total precipitation, can be modeled remarkably well in the laboratory deep freeze. This is not true with the more important convective clouds. They cannot yet be reproduced satisfactorily in a laboratory. Experimental meteorology is further hampered by the inability to specify or control the initial conditions of any particular experiment. Researchers must simply accept the cloud systems and weather conditions which nature provides.

Attempts to change the clouds started in 1946 when Vincent Schaefer, then with General Electric, dropped dry ice into a supercooled stratocumulus deck and changed the seeded path into falling snow. A clear-cut case of successful weather modification? Yes, but with this first weather modification experiment came the bugaboo that has plagued scientists since: "Is the seeding effect real or would it have occurred naturally?"

In studying the cumulus cloud, scientists must contend with complex interactions between cloud microphysics and cloud dynamics. Within each of these areas are many unanswered questions and numerous variables. Adding interactions between the two further compounds the problem. A definite answer is possible with careful statistical controls incorporated in the experiment.

Since precipitation control may be the key to ultimate weather control, research continues with elaborate statistical analyses to help compensate for the uncertainties in atmospheric work. The ESSA Research Laboratories' Atmospheric Physics and Chemistry Laboratory, headed by Dr. Helmut K. Weickmann, conducted two cloud-seeding research projects last year. of EMB in Miami, Florida, directed the study of cumulus seeding over southern Florida in cooperation with Robert Ruskin of NRL.

Dr. Simpson explains: "A study of natural cumulus clouds is basic to and prerequisite for all seeding experiments. After nearly three decades of cumulus study, some general characteristics of natural cumuli are emerging. A cumulus cloud is born when small water droplets gather together at a concentration of about 100 million per cubic meter. Cloud droplet concentration is highest near the base of the cloud and the older the cloud, the more likely it will be to have frozen droplets or ice. The microstructure of cumuli varies with their geographical location, the season of the year, and the air mass in the cloud. These microstructure differences are presumably related to the availability of suitable nuclei—both condensation and freezing, the nature of the underlying surface, the availability of moisture, the intensity of the updraft, and cloud depth."

In 1965, STORMFURY studies resolved the 20-year-old problem of whether overseeding supercooled cumuli with silver iodide could promote cloud growth. STORMFURY is a joint ESSA/U.S. Navy project for basic research work in hurricanes. After the 1965 STORMFURY research, the problem was one of finding the minimum seeding rate necessary to produce cloud growth and the effect that such seeding has on precipitation.

In the multi-aircraft seeding research program over southern Florida, 19 clouds were studied on a randomized seeding basis. That is, 19 clouds were chosen as seeding candidates, but only 14 were actually seeded. Five were left in their natural state to serve as experimental controls for comparison with the seeded clouds.

William L. Woodley, of EMB, described this work before the American Meteorological Society meeting recently: "There was one obvious effect of seeding on Florida cumulus which needed no analysis. Seeding caused explosive cloud growth—both vertical and horizontal—of a magnitude never observed in any cloud-seeding experiment."

All but one of the seeded clouds grew to cumulonimbus or "thunderhead" stature, growing an average of 11,750 feet and reaching an average maximum height of 35,400 feet after seeding. The unseeded control clouds grew an average of only 1,600 feet, topping off at 26,300 feet.

Changes in rainfall from the seeded clouds were deduced by changes in echoes from long-range radar and compared with calculations made from the aircraft circling at cloud base after seeding. On this basis, the seeded clouds produced an average of 100 to 150 acre-feet more water than the controls within 40 minutes after seeding. This represents an increase in precipitation of 100 to 150 percent and, although the small number of clouds in the experiment makes statistical significance difficult, the results are promising.

The seeding research was restricted to three pre-selected areas over southern Florida. Two of these were over the Ever-

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1959

The Spartanburg Herald

Spartanburg, S. C., Saturday Morning, November 21, 1959

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WEATHER MODIFICATION HISTORY

Weather Wars Said Possible

DENVER, Colo. (AP)—The possibility of a war of weather was described by a University of Colorado scientist to a Senate committee Friday.

He said it can't happen now and he doesn't know whether it ever will, but he added, if it comes, "We can't afford to be last."

In such a war, said Dr. Walter Orr Roberts, director of the university's high-altitude observatory, each side would try to send droughts and flood-causing storms to disrupt its enemy.

The Question? Did It happened in Germany, Italy Greece and Haiti, Chilli, etc! Just in other forms ???

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1969

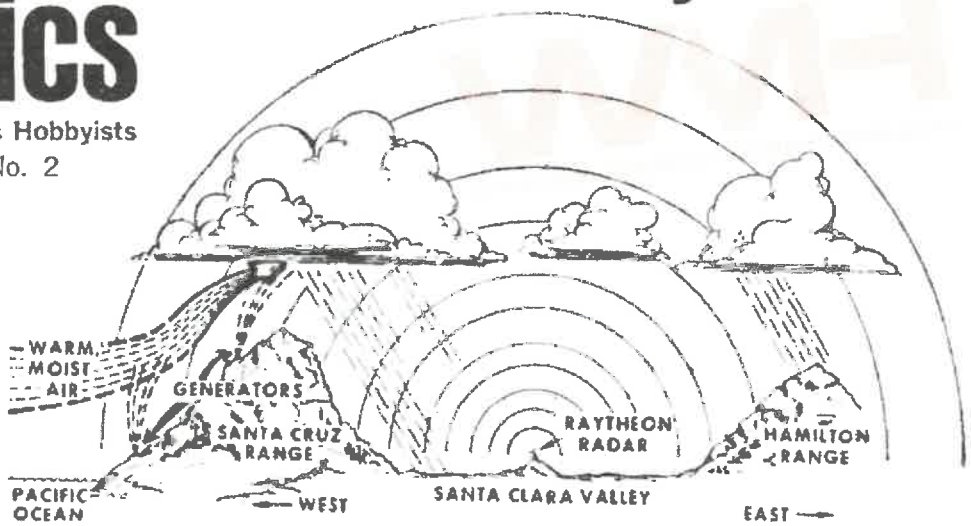
elementary Electronics

Dedicated to America's Electronics Hobbyists

• May/June 1969 • Vol. 8 No. 2

Sunshine They Have

Raytheon Radar pinpoints approaching clouds so that weather watchers at San Jose, Calif. can track their approach and start cloud seeding generators located in the path of the clouds at the most effective time! Radar is a type designed for shipboard use.



A ship-board radar designed to sweep over the water to detect distant land is cast in a reverse role at San Jose, Calif. The landlocked radar sweeps the Santa Clara Valley and the sky above it looking for water in clouds approaching the valley. The radar is part of a sophisticated water control system operated by the Santa Clara County Flood Control and Water District.

Located some 50 miles south of San Francisco, the fertile valley is bounded on three sides by mountains ranging up to 4200 feet high. Population growth in the valley has placed added emphasis on capturing rain water to sustain reservoir levels.

Radar detects moisture laden clouds which, when seeded with silver iodide crystals, will cause rain to fall in the Santa Clara Valley. Unseeded clouds seldom reach the height necessary for rain to form until they have passed over the valley and are many miles down wind.

The source of rain in Santa Clara Valley is warm moisture-laden air that blows in from over the Pacific Ocean. As the winds reach shore the steep slopes of the Santa Cruz mountains, lying between the valley and the sea, force the air masses to rise abruptly. Swept upward rapidly, the water droplets in the clouds are supercooled but will not freeze until they reach an altitude where the temperature is 40 degrees *below* zero. If there are minute particles of natural impurities in the air such as molecules of salt, dust or hydrocarbons, the water droplets will freeze at −4° Fahrenheit.

Upon freezing, their weight will help them overcome the updrafts and they'll fall, gathering other droplets as ice until they descend into warmer air, melt and become full-fledged rain drops.

But typically the air does not contain the *rallying agents* or *nuclei* for the cloud droplets and the updrafts do not carry them high enough to encounter −40° temperatures.

Daniel F. Kriege, senior hydrographic engineer for the District system, reports that their program of water control has been scientifically evaluated by statisticians who attest to the production of increased rainfall at selected target locations in the valley. By the most conservative index, the rainfall in the valley over the last 12 years totalled 218.71 inches. This was 24.61 inches, or 12.7 per cent, more than that in the adjacent control area.

To keep the reservoirs full, the county rain increasers have installed 21 generators that look and act like oversize vaporizers used in a sickroom. The generators burn a 2.75 per cent solution of silver iodide. Operating at full capacity, each can vaporize 25 grams of the chemical each hour.

Located at key points on the ocean side of the coastal mountains and along the ridge of the Santa Cruz mountains, the generators release their fine mist of microscopic silver iodide crystals into the air. The strong updraft carries them high into the sky to mix with the moisture laden clouds.

Silver iodide acts as a nucleating agent. It forms a rallying point for the moisture in the clouds. It's more efficient than natural nucleii, for the ice crystals start to form at 23° Fahrenheit and reach their peak at −5° Fahrenheit. By injecting the crystals into the right type of clouds one can raise the temperature and lower altitude at which freezing, and hence rain, can be expected.

The silver iodide crystals swept up into the sky attract cloud droplets that measure only one one-thousandth of an inch in diameter. A gram of silver iodide can produce more than a quadrillion nucleii or rallying points for cloud droplets. To become a raindrop each droplet must attract one million others before it grows to a diameter of one tenth of an inch and is heavy enough to overcome the updraft and fall as rain.

The District has installed silver iodide generators at ranches and other locations as near the strategically-correct upwind positions as possible. Generator tenders are somewhat like lighthouse keepers. When certain generators must be started, a telephone call goes out to start them on cue, tend them, and log the time of their operation. Knowing which generators to operate and when to start them depends upon the radar plot.

The District staff watches the long range advisories received by facsimile from the Weather Bureau and monitors the hourly radio forecasts. When meteorological conditions are conducive, they man a converted house trailer on top of 440-foot-high Canoas Hill in the center of the valley.

A special antenna fitted to their Raytheon Model 2505 marine radar enables them to tilt it skyward and capture the electronic "watermarks" of the still-distant clouds. The radar they can see which parts of the cloud formation contain the highest concentration of moisture. This information, coupled with a plot of the advancing front permits the District staff to evaluate whether cloud seeding will be effective and to determine which generator stations are in the best location to have a chance to pull more rain out of the sky.

The radar makes it possible to pinpoint silver

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1969

1st Big Attempt To Tame Hurricane Termed Success

LOCKPORT, N. Y., UNION-SUN AND JOURNAL, Wednesday, August 20, 1969

ROOSEVELT ROADS, Puerto Rico (AP) — The first massive attempt in history to tame a hurricane has been called a huge success by the project director.

Weary, but elated from 14 hours of flying through Tropical Storm Debbie, Dr. Cecil R. Gentry touched down late Monday night and pronounced his mission a "huge operational success." But, scientifically, he cautioned: "We might still have to work for months."

Gentry did not go into details on the claims of success and Debbie probably will be attacked again Wednesday.

"Today was meteorology's man on the moon," said the alternate project director, Harry Hawkins. "The difference is we won't know for six months whether we've landed or not."

Hawkins explained that months of scientific data analysis will be needed before any conclusions can be made. He emphasized that taming the hurricane was only one goal.

The all-day hurricane seeding and reconnaissance mission, which was begun Monday from Roosevelt Roads, was a joint effort of the U.S. Commerce Department and the Navy to tame and study the destructive storms.

It was the first hurricane seeding operation in five years. An agreement between the Commerce Department's Environmental Science Services Administration and the Defense Department stipulates that any storm within 700 miles off the U.S. coast is ineligible for seeding.

Two other hurricanes have been seeded—Esther in 1961 and Beulah in 1963, but never in an all-out attack as the one on Debbie. Results then were considered encouraging but inconclusive.

In the Debbie operation, Navy A6A jets made five separate penetrations into the eye of the storm, 600 miles off the coast of Puerto Rico in what Gentry called the "first multiple seeding operation in history."

The planes, flown by trained pilots and bombardiers flew directly into the eye of Debbie at 50 miles an hour, and dropped their bombs—containing silver iodide expected to dissipte the storm's energy by causing ice crystals to form.

If Debbie continues to cooperate, the men will be back in probing, attacking and studying her again Wednesday.

(#45)

1969

Salamanca Republican-Press

SALAMANCA, N. Y., TUESDAY, AUGUST 19, 1969

Seeding is Success In Taming Debbie

By PEGGY ANN BLISS

ROOSEVELT ROADS, Puerto Rico (AP) — The first massive attempt in history to tame a hurricane has been called a huge success by the project director.

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1969

F&M 1787 COLLEGE REPORTER

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WEATHER MODIFICATION HISTORY

Vol. 6, No. 25 | November 14, 1969 | Six Pages

Biologists Predict Disaster In Man's Abuse of Nature

● Feasibility studies are presently underway to melt the polar icecap to make the Arctic navigable This venture could alter the climate of the northern hemisphere and could cause a new ice age

● But even if we don't deliberately melt the icecaps, there's a chance it will happen anyway The percentage of carbon dioxide in the air is close to 10 per cent Some scientists estimate its density may reach 25 per cent by the end of the century—if automobile and jet aircraft usage continues as it does (and of course it won't, but instead increase geometrically). Jet airplanes, it seems, are even more responsible than cars. The carbon dioxide they leave in their vapor trails does not altogether disperse, particularly at high altitudes.

A U.N. report on the biosphere issued last year suggests the possibility of these gases accumulating to form a perpetual cloud over the earth. The cloud would then produce a "greenhouse effect" letting in the sun's light, but not letting the heat escape. As temperatures rose throughout the world, the tropics would become uninhabitable, and the ice around the poles would melt. The subsequent flood could submerge 57 of the world's major cities.

1969

It is the Jets Airplanes Not Cars.

High Altitude CO_2 accumulates!!!

(#48)

MAN, THE DESPOILER

1968

Super Planes' Exhaust Particles May Cause Melting Of Polar Ice

EDITOR'S NOTE—In his effort to go faster and higher, man may be setting in motion forces which will change the environment of the earth he inhabits. What is concerning scientists and what they see for the future is outlined in the following second of five articles on what man is doing to his surroundings.

By ALTON BLAKESLEE

Rockets, spewing out exhausts, are launching men and instrumented laboratories out to explore space. Inevitably, many more will soar up.

And the future promises fleets of supersonic transport—SST—airplanes, flying so high and fast they shrink the world in time for their passengers, also releasing clouds of exhaust particles at extremely high altitudes.

A consequent cost from both might be:

—The partial drowning of New York, London, Tokyo, and other cities and land on low-lying coastal areas around the world—because the earth's climate warms up and all the ice caps melt.

—Or the freezing grip of a new Ice Age creeping over the world—because the earth's climate cools down.

Serious scientists are speculating and making calculations about both possibilities that might result from long-lingering exhaust particles thrust up into the high, thin atmosphere.

They are not predicting that either of these man-caused disasters will happen. Remedial steps could be taken if they threatened.

The great significance of their concern is that now—after past bitter experiences—men are taking a new kind of prudent and protective look at the earth's environment, before the act, rather than after.

The scientists have reason to believe that a relatively small concentration of gaseous or solid particles, only thousandths of an inch in size, could alter the earth's climate.

If they were mostly of one given size, they would reflect more of the sun's incoming heat back into space, while allowing more of the earth's heat, the earth is always radiating heat outward, to escape into space. Result: a cooling of the earth, and in time a new Ice Age.

If of a different size, the particle umbrella would allow more of the sun's heat to reach the earth's surface, while holding in more of the earth's outgoing radiation. Result: a warming up that could melt the polar icecaps, thus raising ocean levels by 200 to 250 feet, by some calculations.

Scientists interviewed on this subject say they are not yet agreed on what concentration of exhaust particles would affect world climate, and in just which direction. They are using computers to help check out the theories.

They do agree that there would be no danger except through a combination of exhaust particles from both space-age rockets, and many SST or supersonic jet flights.

The reassurance is that if a potential threat began occurring, and could be recognized, the rocket of jet flights could be limited in numbers until some of the particles fell to the ground.

Among atmospheric scientists, there is increasing awareness that small alterations affecting the intricate mechanisms controlling climate and weather might trigger great and perhaps undesireable effects.

Daily, for example, hundreds of jet planes criscross the nation or great parts of it, often leaving fluffy contrails of water vapor, manmade clouds, as signature of their passage.

Some contrails soon dissipate. Others turn into or are soon followed by high cirrus clouds that can and do influence the earth's heat balance with the sun.

Dr. Walter Orr Roberts, director of the National Center for Atmospheric Research in Boulder, Colo., is one who wonders whether these manmade clouds may trigger changes in local or distant weather.

Depending on circumstances, the cirrus clouds might warm or cool the earth below by one to a few degrees.

Natural cirrus clouds apparently can deflect the jet stream at times, which can vastly affect weather elsewhere. Might, he wonders, cirrus clouds born of contrails form at critical times to do the same thing? Dr. Roberts and others think the possibility merits real investigation.

The sun pours forth enough ultraviolet light to be murderous to human life. But much of it is blocked by ozone in the atmosphere. The vertical distribution of ozone varies by day and season, latitude and longitude. But at times the maximum layer is at an altitude of 70,000 to 80,000 feet.

In a few years, supersonic jets will be flying at this altitude, Dr. Walter D. Komyhr of the Environmental Science Services Administration—ESSA—in Boulder points out. Their exhausts throw out carbon, which is an efficient catalyst or agent to destroy ozone.

"This could become a real problem when there are many such flights," Dr. Komhyr says. Jets might destroy enough ozone to permit a harmful increase in ultraviolet light reaching earth, or cause other effects.

ESSA and other organizations, therefore, are seeking "benchmark" measurements of normal levels and fluctuations of ozone. These could serve as a warning system if human activities began to produce adverse effects, Dr. Komhyr explains.

Natural mechanisms that determine weather and climate are intricate and complex, but vigorous research here and abroad is beginning to unravel some mysteries. Much of the knowledge still is speculative, Dr. Roberts says, but in time the human effect on weather and the natural mechanisms will become clear.

Such understandings might allow man to alter his weather artificially.

But scientists are wary about rushing into experiments yet. Producing the rain desired in one area might produce devastating drought elsewhere.

So meanwhile their goal is to seek facts, to check theories, and use computers to create simulated models of the weather—and ask the computers what would happen in nature's mysterious chain-reaction weather box if they put one influence in, or took one out.

This is insurance against creating, inadvertantly, a crisis or disaster in the world's climate and weather, such as is happening with the air humans breathe.

#49

1968

U.S. DEPARTMENT OF COMMERCE / Environmental Science Services Administration

essa news

Volume 4 Number 18 May 3, 1968

AMS WEATHER MODIFICATION CONFERENCE HELD

The American Meteorological Society's First National Conference on Weather Modification was held in Albany, N.Y., April 28 - May 1. ERL scientists scheduled to present papers at the four-day meeting included: Dr. Syukuro Manabe and Dr. Kirk Bryan, Geophysical Fluid Dynamics Laboratory; Dr. Joanne Simpson and Victor Wiggert, Atmospheric Physics and Chemistry Laboratory; Dr. R. Cecil Gentry, National Hurricane Research Laboratory; and Jean T. Lee and Dr. Edwin Kessler, National Severe Storms Laboratory. Dr. Joseph Smagorinsky, director of GFDL, chaired the session on Large-Scale Climate Modification, and Dr. Joachim P. Kuettner chaired the Instruments and Techniques for Weather Modification session.

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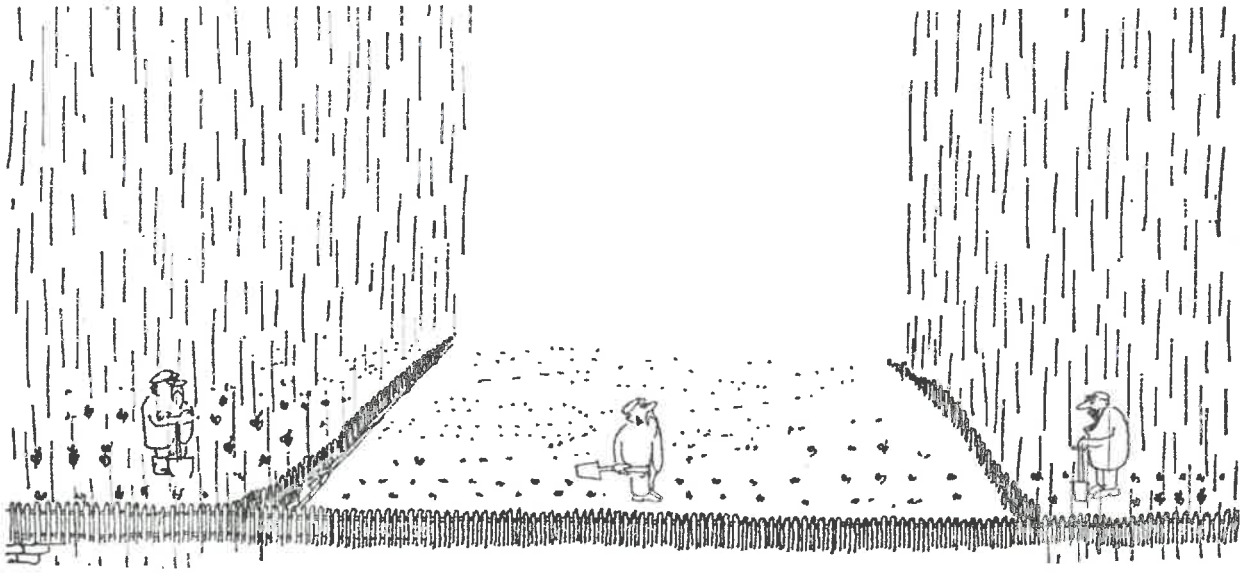
science and public affairs

Science and Politics of Rainmaking

1968

GORDON J. F. MacDONALD



The author is vice-chancellor for research and graduate affairs at the University of California, Santa Barbara, and former executive vice-president of research, Institute for Defense Analyses. Dr. MacDonald analyzes the future of weather modification and points out that the scientific basis "remains uncertain and much basic research remains before operational programs can be embarked on with confidence."

Congress, in 1953, established an Advisory Committee on Weather Control for the purpose of "making a complete study and evaluation of public and private experiments in weather control." Three years later, Congress extended the life of the Advisory Committee to permit a more complete and thorough investigation. In its final report to President Eisenhower in 1957, the Committee concluded: "Statistical procedures employed indicate that the seeding of wintertime storm clouds in mountainous areas in the western U.S. produced an average increase in precipitation of 10 to 15 per cent from seeded storms, with heavy odds that the increase was not the

made a number of recommendations for increased federal participation in weather modification.

The Committee's judgment on the positive effects of seeding was violently attacked by statisticians, largely on the grounds of hidden bias. It was argued that a cloud seeder could forecast those storms likely to produce more precipitation in the "target" area than in "control" areas and then could selectively seed promising storms. The Committee replied that the control areas for the Advisory Committee cases were selected, without knowledge of the results, by the statistical analyst, not the seeders.

The recommended randomized experiment was indeed begun in the mountainous region near Santa Barbara, California, in 1956. Unfortunately, the results were somewhat equivocal largely because of a probable contamination from nearby seeding operations of another project. In addition, the meteorologists and statisticians on the project had a public falling out after three seasons.

In the years following the Report of the President's Advisory Committee on Weather Control, there was a

a Panel on Weather and Climate Modification "to undertake a deliberate and thoughtful review of the present status of activities in this field and of its potential and limitations for the future." The Academy issued the report in January 1966. The Panel's cautious conclusion on the augmentation of natural rain or snow by cloud seeding was: "There is increasing but somewhat ambiguous evidence that precipitation from some types of clouds and storm systems can be modestly increased or redistributed by seeding techniques." With regard to seeding of winter storms in the mountainous regions of the western United States, the Panel arrived at essentially the same position as had the earlier committee.

In a repeat of history, the Academy's Panel report was vehemently attacked by statistical critics of the earlier report. Alexander Brownlee, of the University of Chicago, denounced the report in a four-page review published in the *Journal of the American Statistical Association* (June 1967). He faulted the statistical methodology employed by the Panel, and by implication questioned the Panel's integrity. The flavor of the review is given by Brownlee's closing one-sentence paragraph: "That such nonsense

Royal Statistical Society on March 15, 1967. His objections were based not so much on alleged failures in statistical methodology but for the emphasis on results gained by the analysis of reports of commercial operators rather than university experimenters. In 1967, Professor Fred W. Decker, an Oregon State University meteorologist, called on the American Meteorological Society to investigate the report for "error" and possible "fraud."

While the cautious optimism expressed in the two thorough studies on weather modification has been attacked as unrealistic, politicians have viewed scientists as downright pessimists. During the past 20 years, Congress has devoted substantial attention to weather modification. Indeed, Congress has frequently displayed considerable impatience with the scientific community's slowness to accept weather modification as an important area for research and development. Congressional reaction is well illustrated by Senator Clinton Anderson's comment after my March 1966 presentation to the Senate Subcommittee on Water and Power Resources of the National Academy's Panel Report: "I am pleased to see that the National Academy has finally concluded that the Senate Interior Committee has been on the right track for more than 15 years in stimulating scientific and engineering research in weather modification. It is good to have you folks on the team, too."

It should be emphasized that weather modification is far broader than rainmaking. Today, there are operational programs for clearing supercooled fog at airports; substantial research programs for reducing damage resulting from hailstorms are underway in the United States and the Soviet Union; lightning suppression techniques are being investigated; a variety of mechanisms for affecting weather and climate have been proposed. These developments indicate the richness of the field of weather modification. Historically, however, the most controversial area has been, and continues to be, rainmaking.

TECHNICAL ISSUES

The modern history of rainmaking began twenty years ago when two General Electric scientists, Irving Langmuir and Vincent Schaeffer, modified clouds by seeding them with dry ice pellets. Soon afterward, Bernard Vonnegut demonstrated that silver iodide crystals could serve the same purpose. In 1946, the General Electric group was able to verify experimentally the theory advanced in 1933 by Tor Bergeron, a Swedish meteorologist, and Walter Findeisen, a German physicist, that clouds would precipitate if they contained the right mixture of ice crystals and supercooled water drops.

The mechanism for increasing precipitation from clouds is in principle straightforward. In a cloud, when vapor saturation is reached, water droplets form on so-called condensation nuclei. Ice crystals form in a cloud at temperatures below freezing on crystallization nuclei. Relative natural frequency of condensation to crystallization nuclei at a temperature of —10°C is about 10^5 or 10^6 to 1. In a cloud, one condensation nucleus will lead to a single water drop and one ice nucleus to a single ice crystal. Supercooled clouds result since among 10^5 to 10^6 water droplets there will only be one ice crystal. At very low temperatures, on the order of — 40°C, the ratio of droplets to ice crystals converges to unity as all the condensation nuclei function as crystallization nuclei.

The introduction of a substance, such as silver iodide, which acts as an ice nucleus can convert the supercooled water droplets to ice. If a sufficiently large number of ice crystals are generated in a supercooled cloud, they grow rapidly at the expense of the water droplets, the vapor pressure of the drops exceeds that of the ice crystals and fall out of the cloud, either to evaporate or to reach the ground as rain or snow. The efficacy of silver iodide seeding can be demonstrated by cutting a cloudless figure in a supercooled stratus cloud by flying a given pattern—for example, a figure 8 over or in the cloud—and depositing dry ice or silver iodide. While there is no question of the gross effects of seeding, the controversial issue is whether seeding effectively increases precipitation at ground level.

The controversy arises from the inherent variability of the atmosphere, particularly of natural precipitation, and our present inability to predict with sufficient accuracy what would have occurred in the absence of seeding. Therefore, the efficacy of cloud seeding is to be assessed statistically. Once the target areas have been decided upon, the usual procedure in commercial operations is to choose an adjacent control area of similar size, shape, and topography which is unlikely to be affected by the seeding. Evaluation then takes the form of determining whether seeding is followed by significant departures from the normal historical relationship between the rainfall in the target and control area. Such a departure can be statistically significant only if there is a consistent and high correlation between past rainfall in the two areas. This method of evaluation has been used in many cloud seeding operations and has been criticized on the grounds of bias mentioned above. A further criticism that can be raised is that if the pattern of major storms during the seeding period differs appreciably from the long-term average on which the historical relations are based, the latter cannot be used to accurately predict the rainfall in the target area, and consequently the assessment of the seeding effects may be quite misleading. This storm type of bias is less likely to be of importance for operations carried out over several years. Proper randomization can be achieved by either seeding half the storms on some randomized basis; or alternate seeding in target and control areas. Randomized experiments have been carried out by scholarly groups usually supported by government.

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I will illustrate some of the technical difficulties of the subject by discussing three randomized experiments from Australia, Israel, and the midwest United States, and then consider commercial operations both in eastern and western United States. From 1962 to 1965, a group in the Commonwealth Scientific and Industrial Research Organization (CSIRO) experimented with 69 clouds over inland Australia. In the design of the experiment, an aircraft was equipped with a device to produce silver iodide smoke and to measure the rain which fell from the seeded cloud. The airplane carried a crew of three: a pilot; an experimenter who selected the cloud; and a randomizer who applied one of two possible treatments, or no treatment, according to a random series, but did not inform the experimenter. The subsequent behavior of the cloud was observed and any rain which fell from it was measured. Data were then stratified in various ways, and it was discovered that when the cloud-top temperatures were warmer than —10°C or when rain fell within 30 kilometers of the seeded cloud, no effects of seeding were detected. When the cloud-top temperatures were —10°C or colder and there was no adjacent rain, the mean rainfall from clouds treated with a large silver iodide burner was several times greater than that from unseeded clouds; the difference was statistically significant and as a result the experimenters drew the conclusion that seeding increased rainfall provided sufficient silver iodide was introduced into the cloud. The indicated percentage increase is substantially greater than that reported in other randomized experiments. The dependence of seeding effects on cloud-top temperature can perhaps be understood in terms of the effect of temperature on the effectiveness of silver iodide as an ice crystal nucleus. The number of ice crystals produced by a given amount of silver iodide increase by a factor of 100 by lowering the temperature from —10°C to —15°C.

A particularly comprehensive randomized experiment is the University of Chicago's Project Whitetop, carried out in southern Missouri for five summers, from 1960 to 1964, under the direction of Professor Roscoe Braham. The Whitetop studies incorporated both a carefully planned seeding design and a variety of auxiliary physical measurements on important cloud and precipitation parameters. The aircraft seeded clouds with silver iodide along a 30-mile arc about 45 miles upwind of the central ground radar site. A network of precipitation measurements plus radar data were used to assess the seeding effect. The radar and precipitation data gave somewhat contradictory results. The radar precipitation data reveal some evidence for positive seeding effects (on the order of 5–10 per cent increase of radar echo frequency) in the region lying just downward of the seeding arc; changing over to negative effects, about the same order of magnitude, beyond the downward distance of 40 to 50 miles, and returning to positive effects still further downwind. There is, as yet, no sound interpretation of these results. Precipitation data, on the other hand, show that in the plume of the silver iodide smoke that is downwind of the seeded areas, precipitation was as much as 50 per cent less than in the area that was not seeded. It would appear that in this experiment seeding not only did not increase rainfall but rather may have led to a rather substantial decrease in total rainfall.

Another well randomized and documented study has been carried out in north and central Israel with results available from February 1961 to January 1967. In this experiment, each day was designated at random and independently for seeding in one or the other of the areas, so that about half of the days were designated for seeding in the northern part of the country and the other in the central part. The rainfall in the two areas is highly correlated so that it is possible to test statistically the difference in rainfall—comparing northern and central precipitation amounts. Averaged overall for five-and-a-half rainy seasons, there was about 18 per cent greater rainfall in the seeded regions than in the non-seeded.

The three experiments briefly described above are representative of about 20 properly randomized experiments that have been carried out the world over. Some of these show significant increases in precipitation while others show no effect or negative effects. As yet there has been little work on determining conditions under which seeding is effective, although the observations in Australia strongly suggest that temperature at the cloud-top level must be lower than some minimum of about —10°C for silver iodide seeding to be effective.

OPERATIONAL EXPERIMENTS

The cloud seeding experiments I have reviewed so far were designed specifically as experiments. Other possible sources of information on seeding are contained in the records of the many operational programs conducted by commercial cloud seeders for clients seeking additional precipitation on their agricultural lands, forests, or watersheds. Unfortunately, the open scientific literature contains little information on these operational programs, even though a large number of such operations have been conducted.

The most thorough analysis of these operational experiments was undertaken by Professor James McDonald, University of Arizona, during the course of the National Academy's study of weather modification. From the eastern United States, McDonald selected 14 projects running from 19 days to five months, and from the mountainous regions of the western United States, four wintertime projects of much longer duration. Using original sources, he tried to recover relevant data from rain gauge stations, weather maps, and other sources of meteorological information. Since the operational experiments were not randomized, McDonald's analysis compared historical rainfall records both in the target

areas and in those surrounding regions used as control areas.

In all these operations, the nucleating agent, silver iodide smoke, was introduced at ground levels several miles downwind from the target region, which in the eastern experiments had characteristic dimensions of about 30 miles. The fact that the silver iodide was introduced by ground burners rather than by airplanes has sometimes been noted as contributing to the apparent difference in the results between those obtained in experiments and those obtained in operations.

Among the 14 eastern experiments carried out in summer, fall, and winter, the percentage increase in precipitation ranged from zero to 57 per cent; there was no operation for which precipitation was decreased by the seeding. Although the level of significance of any particular experiment was small, the combined experiments indicated that precipitation had been increased in the target region in statistically significant ways. Of particular importance are the four orographic projects conducted in the western states, since these lasted from 8 to 14 years, certainly long enough to eliminate the storm type of bias referred to previously. In these long-term projects, the percentage increase ranged from 6 to 18 per cent. The National Academy's Panel undertook a number of additional studies to determine if other kinds of bias had entered into the operations, such as bias associated with the operator's option of starting and stopping. While such bias could be important in the short-term projects, it is almost certainly negligible for the long-term winter seeding programs. The Panel, after examining both experiments and the commercial operations, concluded that precipitation from some types of clouds and storm systems can be modestly increased or redistributed by seeding techniques.

I am convinced that under some meteorological circumstances, precipitation reaching the ground can be increased perhaps by a substantial amount by seeding. This does not imply that seeding is effective in all meteorological circumstances. The National Academy Committee recommended an intensified research program into rainmaking with particular emphasis on large-scale randomized experiments. Until this has been completed and the conditions whereby seeding is effective clearly defined, the technical situation with regard to rainmaking must remain in its present unsatisfactory state.

POLITICAL ISSUES

Today there are at least nine agencies with an interest in weather modification. In addition, rather complex interagency mechanisms have been set up to deal with governmental programs. Despite these activities, we shall see that there is "no national program in weather modification."

In response to the recommendations of the Advisory Committee on Weather Control, Congress passed Public Law 85-510 in 1958 which gave to the National Science Foundation special responsibilities with regard to weather modification in general, but with special emphasis on precipitation enhancement. In particular, NSF was supposed to initiate and support a program of study, research, and evaluation in the field of weather modification. The Foundation was also given an information collection role and was directed to report annually to the President and Congress on the status of weather modification, and to coordinate various activities in the different agencies.

In addition to the legislation leading to the designation of NSF as a focus for weather modification activity, the Public Works Appropriation Acts of 1955 and 1956 authorized the Bureau of Reclamation of the Department of the Interior to conduct research in weather modification in support of a program to supplement water resources in the Colorado River Basin. This indirect legislation established the Department of the Interior as one of the largest supporters of weather modification research within the federal government. In addition to NSF, weather modification programs were initiated within the Weather Bureau, the Departments of Agriculture, Commerce, and Defense, and, in recent years, even Nasa has had a small program in weather modification.

Various attempts have been made over the years to coordinate to some extent the efforts of the various agencies but there was no strong move on the part of the executive branch to put together a "national program" despite the restlessness of Congress which, in 1966, undertook steps markedly changing this situation. Two major bills were introduced: one, by the Senate Committee on Commerce, would transfer the responsibility in weather modification from NSF to the Environmental Sciences Services Administration (ESSA) of the Department of Commerce; the other was a bill introduced simultaneously in the Committee on Interior and Insular Affairs assigning major responsibility for research in atmospheric water resources to the Department of the Interior. In the introduction of these two bills, a battle was joined between two major agencies, Interior and Commerce. The question at issue was whether the Department of Commerce, with its long-standing concern for providing meteorological services, should be responsible for weather modification activities or whether the Department of the Interior, with its traditional role in water resources, should have a major responsibility.

In the eyes of many in Congress, the Department of Commerce had failed over the preceding 20 years to exercise adequately its position of leadership. Therefore, it was felt that some agency, other than the old Weather Bureau or its spruced-up successor, Environmental Sciences Services Administration, should be involved in weather modification. There was quite

general agreement in Congress that NSF was not the proper agency to play a leading role in the development of a large operational program. While NSF did sponsor basic research in many areas of weather modification since the enactment of Public Law 510, it had not put together a national program satisfactory to Congress.

A Senate Commerce bill, introduced in the Ninetieth Congress, assigns lead responsibility for the development of weather modification to ESSA, but permits weather modification activities in Interior; Agriculture; Health, Education and Welfare; the Federal Aviation Agency; and NSF. Coordination of the weather modification program was assigned to the President. The bill is necessarily vague on the mechanism by which the President will achieve coordination. One of the more interesting features of the bill is that no federal agency other than the Federal Aviation Agency would be authorized to conduct operational activities in weather modification without prior approval of Congress. This raises the question of whether or not the current activities of the Department of the Interior are to be construed as operational or research and development. It would appear that many in Congress and in the Bureau of Reclamation feel that these activities are designed to increase water resources through increasing the snow pack in certain selected basins in the western states. If this is so, passage of the Commerce bill would leave open the question of whether the Department has the authority to proceed with its cloud-seeding projects.

In the absence of new legislation, NSF continues to have major responsibility for the weather modification program. However, in 1966 and 1967, Congressional interest and various cautious but optimistic reports on the efficacy of cloud seeding led to a substantial interagency battle to determine which agency should receive the largest funding. As is the case in such interagency disputes involving research and development, the question came up before the Federal Council for Science and Technology. The Council gave an interagency committee, the Interdepartmental Committee on Atmospheric Sciences, responsibility for looking into problems of weather modification. The Committee asked the individual agencies to present plans for weather modification programs through fiscal 1970. In fiscal 1966, the agencies were spending about $7million on weather modification, but the agencies reported that by fiscal 1970, they would be spending about $150 million, a figure at least three times larger than the growth recommended by the National Academy Panel. A special group was appointed under the chairmanship of Dr. Homer Newell of Nasa, who, as a disinterested party, would make recommendations on what the interagency program should be. He concluded that the estimated growth rates were unrealistically large, sometimes by a factor of two. Whatever the aspirations of the various agencies in late 1966, the current stringent budgetary situation has effectively slowed efforts in weather modification, so that in 1970 the total federal government expenditures in this field will only be a small fraction of the $150 million that the agencies initially expected; in 1967, about $9 million was spent in weather modification largely supporting rain and snow-making experiments.

ORGANIZATION FOR THE FUTURE

In weather modification we see many of the problems associated with the development of environmental science and engineering. Should government itself undertake essentially all the research efforts in the field? Or should government create an environment in which private efforts are encouraged through governmental services? Where international effects might be expected the federal government will have to play an important role.

In my view the federal government has clear responsibility for several functions:

1. The federal government should enunciate national policies concerning weather modification activities within the United States. The ultimate goal of weather modification would be the ability to control weather phenomena affecting the safety and economy of national activities. This long-term goal implies a pursuit of scientific investigations for describing, understanding, and controlling the atmosphere.

2. The federal government should promote research leading to the description, prediction, and development of capabilities in modification of the atmosphere. This would take place through support of research within government laboratories, universities, and private industry. In particular, government should play a leading role in providing for large-scale field experiments.

3. The federal government should foster the application of weather modification through the establishment of appropriate legal, regulatory, enforcement, advisory institutions, and measures. This function implies that operational weather modification activities are to be undertaken both in private and governmental sectors. We should expect that governmental activities would be principally in the area of modification efforts involving extensive territory and perhaps encompassing more than one state. Private industry could participate in these large activities by direct contracts with the customer.

4. The federal government should initiate, support, and encourage programs of education, training, and research in weather modification and provide technical services and facilities related to activities in the pertinent sciences and technology.

A review of the activities of the nine federal agencies presently concerned with weather modification, indicates that each plays a role in one or more of the above functions and that all four are to some degree carried out at the federal level. However, only the second and fourth functions are to any degree well-developed and

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coordinated across agency lines. As has been noted above and emphasized by Congress, the present organizational structure does not provide for the formulation of national weather modification policy or the fostering of application and use of weather modification.

Weather modification cannot be isolated from other developments in the atmospheric sciences or even other environmental sciences. The scientific basis for weather modification remains uncertain and much basic research remains before operational programs can be embarked on with confidence. Measured in terms of federal dollars, weather modification is still a relatively small effort. In light of these considerations, it is my view that weather modification will prosper only if it is supported as part of a larger effort having the goal of making use of the environment for the betterment of society. I suspect that this will come about only through a major reorganization of federal programs in which a new agency, preferably an independent one, would have primary responsibility for promoting and fostering research and development in environmental prediction and modification. Such reorganization would place in a single agency all those federal activities related to description and prediction, attempts to develop capabilities of modifying the environment (atmosphere, ocean, solid earth), and those activities concerned with the provision of services in support of modification programs. The proposed reorganization emphasizes the unity of the environmental activities in both technology and science—a unity which has been noted in many studies of the environmental sciences.

Another basic motivation for restructuring and focusing government programs in the environment is the fact that the ability to modify the atmosphere depends very heavily on our proficiency in describing and predicting the atmosphere. Extensive weather modification activities will in all probability not be undertaken until we have developed the capability of predicting the consequences of such activities in some detail. A reorganization which would bring together the research parts of the various weather modification programs presently residing in various agencies would markedly enhance the national capabilities. The operational weather modification would then be conducted in support of individual agency missions. For example, one would expect the Department of the Interior, through the Bureau of Reclamation, to continue its responsibilities for enhancing water resources in the western United States, using rain and snow-making as one means of increasing available water.

At present, we are a long way from such reorganization. However, the fundamental problems in development of a national program in the proper use of the environment should be faced; and it should be recognized that the existing structure, even the structures proposed under legislation introduced in the last and present session of Congress, fall far short of what is required.

JUSTIFIED OPTIMISM?

I have presented perhaps a more optimistic view of the future of weather modification and in particular of rainmaking than would be put forth by others in the field. I justify my views in light of three major scientific and technological advances.

1. Understanding of the physical processes within the atmosphere has advanced to such an extent that physical models of the atmosphere, incorporating its most important elements, have been developed. Processes in clouds, in turbulent exchanges at the earth's surface, in transmission of both short-wave and long-wave radiation through the atmosphere are no longer as mysterious as they once were. Scales of increasingly sophisticated atmospheric models are precise enough to simulate the entire atmosphere, or merely a single cloud.

2. The advent of high speed computers has enabled these atmospheric models to be studied in great detail. While we are not yet able to forecast the history of any individual cloud with any degree of accuracy, I expect the capability to do so to develop within the next few years. With this capability, it will be possible to assess the effects of seeding and other attempts at modification on physical rather than statistical grounds.

3. A new array of instruments has been developed to observe and detect atmospheric changes. At the scale of single-cloud observations, I have referred to such instrumentation in discussing the Australian experiments. On a larger scale, meteorological satellites will provide platforms from which the atmosphere can be observed not only from geographically inaccessible regions but also with new physical parameters. Such observations are essential if the longer-term consequences of deliberate manipulation of even small elements of the atmosphere are to be understood adequately.

I am not as optimistic about solutions to weather modification's nonscientific problems as I am about its future technological strides. The political, legal, economic, and sociological consequences of deliberate weather modification can be so complex and farreaching that our present involvement with nuclear affairs will seem simple. Our present understanding of the basic environmental science and technology of weather modification is primitive. Even more primitive, however, are our current notions of proper political forms and procedures thought necessary to deal with the consequences of such modification. Past experience demonstrates that much smaller technological changes than environmental control finally transform political and social relationships. Experience also shows that such transformations are not entirely predictable and the guesses we might make now, based on precedent, are likely to be quite wrong in relation to future activities and needs. These nonscientific, non-technological problems, however, are of such magnitude that they deserve consideration by serious students if society is to live comfortably in a controlled environment.

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1968

A Proud Newspaper Serving a Proud Area

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THE EVENING NEWS

NEWBURGH, N.Y., WEDNESDAY, NOVEMBER 20, 1968 ★

Cloud Seeders Battle Blizzards

DUNKIRK, N.Y. (AP) — A team of scientists from Miami have traded hurricane hunting for a new pursuit—seeding clouds over Lake Erie in an attempt to lessen the severity of storms that plaster Western New York's snowbelt.

Flying over the lake about 25 miles west of this city Tuesday, the 15-man team from the U.S. Weather Bureau's Environmental Science Services Administration (ESSA) released dry ice and silver iodide into the clouds.

They hope this will reduce the size of the snowflakes created during a storm, and that the smaller snowflakes will be spread over a wider area than that in which they normally fall.

Marshall Hatch, one of the meteorologists from Miami, said he and his teammates usually study tropical storms and hurricanes in the Gulf of Mexico and Atlantic Ocean.

They use aircraft to gather information about the formation and nature of these storms.

In Western New York, the scientists use two aircraft—a modified DC-6 cargo plane and a five passenger Piper Twin-Commanche—to seed the snow-clouds.

Flying out of the U.S. Air Force base at Niagara Falls, the scientists head for this city 60 air miles to the southwest to begin their seeding operations.

They drop the dry ice into the clouds, or use a flare mounted under the aircraft's wing to spread silver iodide in vapour form.

Hatch said of Tuesday's flight, "We didn't see any immediate reaction from the seeding even though we hung around for 30 minutes or so. Of course, it was a bad day for seeding, as local snow squalls formed all over the place without any help from us."

The Miami group will operate in the area until Dec. 15.

Hatch said crews would gather snow samples from Dunkirk, Jamestown and other sites in the Southern Tier area. They would analyze the snow samples and look for traces of silver iodide and other chemicals that would indicate that the seeding process had been responsible for the snowfall.

WHAT OTHER CHEMICALS ??

Other groups participating in the project are Buffalo's Cornell Aeronautical Laboratory, the State University of Fredonia and Pennsylvania State University.

While most residents of the snowbelt area wish the scientists every success in spreading the wealth of snow, one group is objecting.

Ski resort operators in the area complain that the project could rob them of the heavy snowfalls they need for their businesses

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The Gadsden Times

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Washington Today

NASA To Study Cloud Strata

WASHINGTON (AP) — The National Aeronautics and Space Administration plans to launch a series of 18 rockets from Canada and Alaska during a 14-hour period beginning at 6:15 p.m. EST today. JAN. 30, 1967

The rockets, to be launched from Churchill Research Range in Manitoba and from the Arctic Research Laboratory at Point Barrow, Alaska, are designed to investigate variations in weather conditions between the altitudes of 12 and 124 miles.

Some of the 12 rockets sent aloft from Manitoba will release sodium vapor that will be dispersed by winds into orange and pink clouds visible for hundreds of miles. Others will release trimethyl aluminum to form blue-green cloud.

The six rockets launched from Point Barrow will eject and detonate special explosive charges which will be recorded by radio and sensitive microphones.

CANADIAN- MANITOBA

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science and public affairs

Founded in 1945 by Hyman G. Goldsmith and Eugene Rabinowitch

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THE INTERNATIONAL IMPLICATIONS OF WEATHER MODIFICATION CONTINUED...

activities in the peaceful exploration and use of outer space may request consultation concerning the activity or experiment.

SELF-POLICING

Even more recently, the Outer Space Treaty of January 1967 provides, in Article 9, that:

> States parties to the treaty shall pursue studies of outer space, including the moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the earth resulting from the introduction of extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose. If a state party to the treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space, including the moon and other celestial bodies, would cause potentially harmful interference with activities of other states parties in the peaceful exploration and use of outer space, including the moon and other celestial bodies, it shall undertake appropriate international consultations before proceeding with any such activity or experiment. A state party to the treaty which has reason to believe that an activity or experiment planned by another state party in outer space, including the moon and other celestial bodies, would cause potential harmful interference with activities in the peaceful exploration and use of outer space, including the moon and other celestial bodies, may request consultation concerning the activity or experiment.

The treaty is self-policed and involves no enforcement technique. It appears to demonstrate the likelihood of international efforts to prevent at least certain perceived general dangers. We cannot be sanguine about largely self-interpreted, self-policed controls over valuable phenomena and resources. Nations which believe that a particular activity is truly vital or even very valuable to their national interests may well be willing to risk the censure in proceeding with West Ford (although the United States did not continue its testing).

Even earlier, in 1962, the Committee on Space Research established a Consultative Group on Potentially Harmful Effects of Space Experiments consisting of scientists from the Soviet Union, India, Sweden, the Netherlands, the United States, and the United Kingdom to study all questions relating to possible harmful effects of proposed space exploration and to make recommendations to COSPAR. The United States reports its efforts to COSPAR and consults with other states concerning these matters. Again, we can conclude that evidence suggests that prior consultations at least are recognized by the states as necessary to maintain international amity in the face of consciously induced prospective changes in man's environment such as those we could expect from certain types of weather experimentation. The State Department position noted earlier seems consistent with this observation. It can be expected that this would suffice to contain international conflict only where damage to a particular nation is not expected or can be compensated adequately on agreed standards.

APPLYING THE ANALOGUES

We can summarize the findings of this section thus: It is difficult for individuals to bring claims successfully against sovereigns, their own or another. If we look at the general international regime for the use of international rivers as of possible utility as an analogy for the prospective regime for the control of international weather operations, we must note that, except where special international regimes have been negotiated, the general regime relies on voluntary consultation and cooperation and mutual agreement among coriparians. No state has an automatic legal veto over the actions of other states even when these affect its traditional use of the river's waters. Except where especially negotiated, there are few or no shared operations. We noted that regional cooperation is quite likely to be more

lance as a by-product of weather modification activities and the likelihood that, unlike the simpler river control problems, operations may lead to substantial losses as well as gains to individuals, and might upset the ecological balance in the region of operation. This implies, if the "region" involves several countries, that claims against sovereigns will be necessary and this, as noted, is a difficult pursuit.

We have also noted that analogous experience suggests that the international control of national programs of scientific experimentation in weather modification—even those which may bring damages to some states or to all states—promises to be difficult to achieve. The realities are that scientific evaluations and prognostications often differ. Scientists do not relish sacrificing their freedom to experiment when *they* regard it as sufficiently safe.

Nations have proved unwilling to allow other nations or international bodies a veto, much less control, over their own partly strategic research programs. They have pursued experiments despite objections. Such international bodies or agreements as have been evolved either have been advisory, as with COSPAR, or have provided for largely self-interpreted, self-enforced international cooperation to control even major risks due to nationally devised and run experimentation, as is the case in general with experimentation in outer space. On this record we can doubt that international control of weather experimentation which is designed to assure that such activities will be technically and politically safe for mankind will be easy to negotiate among the present jealous, highly sensitive, national-security-conscious sovereigns of the international community.

There is nevertheless another side of the coin. There is already a history of international cooperation in weather-oriented activities, in sharing weather information, and in cooperating in national activities designed to lead to greater and more extensive knowledge about the weather.

A fair number of cooperative international ventures of various sorts al-

#54

CANADA?? 1966

Spokane Daily Chronicle

2 SECTIONS | SPOKANE, WASH., TUESDAY, MARCH 15, 1966. | PRICE TEN CENTS

FOLLOW US ON FACEBOOK
WEATHER MODIFICATION HISTORY

Weather Patterns Altered

Dust May Spell Mankind's Doom

WASHINGTON (UPI) — Without at all meaning to, man may be sentencing himself to dusty death.

It lies within his power—perhaps—to suspend or remit the sentence. But will he?

The threat of dust and other atmospheric pollutants, including jet vapor trails and the smoke of cities, was aired at a symposium here for science writers on atmospheric physics.

Effect Pointed

Dr. Reid A. Bryson of the University of Wisconsin said that dirty air, by reflecting sunlight back into space before it can do its normal work, alters the atmospheric heat flow which drives the weather.

It thus may make deserts more desert-like and cold climes colder.

Carbon dioxide from burning fuels tends to warm the planet because this gas blocks radiation of heat back to space. So you would think that as man burns more and more fuel in his industries, cities and automobiles, his climate would get warmer and warmer and warmer.

The average world temperature did, indeed, rise something like half a degree between 1850 and 1950, a period in which the carbon dioxide content of the atmosphere rose about 30 per cent.

Readings Decline

But an odd thing has happened. In the past 15 years, with the carbon dioxide level still rising, the world temperature has gone down as much as it had risen in the previous 100 years. Why?

Between 1950 and 1965, Bryson said, the dirtiness of the atmosphere (in the United States, at least), practically doubled. Dirt particles, it may be reasoned, are turning back more solar heat than carbon dioxide is trapping.

Where does the dust come from which may be affecting climate? *Jet aircraft produce vapor droplet contrails ("dust" for meteorological purposes) which reflect sunlight.

Bryson has studied the great Rajputana desert in northwest India and found that dust ascending to 35,000 feet from the surface was helping to keep the desert a desert.

In ancient times, up to 3500 B.C., the Rajputana supported a rich farming civilization. By 700-800 A.D. it was a region of blinding dust storms, having been "brutally overused" for agriculture.

New technological methods — brainy computers, satellite systems capable of making weather observations in the 90 per cent of the globe not now covered, a brand new system of round - the - world atmosphere-studying balloons — may improve weather forecasting and pave the way to intelligent climate modification.

Bryson thinks that what man has done, as in Rajputana, he can somehow undo. But not all experts are convinced current ideas of climate control can stave off disaster.

TRUDEAU WANTS TO BLOCK SUN! WHY? See CBC article in Main Document attached 2023

*Scientists determined it is Jet airplanes Contrails at High altitudes that remains in the Upper Atmosphere that is causing Warming of the earth NOT Cars! See confirming Document located in this PDF Document.

#55

1966

THE AMERICAN LEGION MAGAZINE 20c · AUGUST 1966

THE AMERICAN LEGION MAGAZINE 20c · AUGUST 1966

THE WORLD OF THE FUTURE

The Control of the Weather

MEN IN 16 NATIONS are now tinkering with the weather with serious ambition to: (a) stimulate rainfall, (b) dissipate fog, (c) thwart hail, (d) blunt hurricanes, (e) abort tornadoes, (f) suppress lightning and (g) modify major weather systems.

Partial success in many of these fields is already old hat. Scientists look to a world of the future when weather control will be limited more by what they dare or should do than by what they can do.

If they ever learn to modify major weather systems the matter of what *should* be done will be a big problem. You don't change the weather in Arkansas or England without changing it in perhaps a different way in Illinois or Germany.

Indeed, it is quite possible that if an open strait several miles wide were dug through the Central American Isthmus, Europe might freeze. Most of the Gulf Stream—northern Europe's chief source of temperate climate heat—might be induced to flow into the Pacific, which is lower than the Atlantic at that point. (It's lower because the Gulf current is backed up against Central America and forced to escape north around Florida.)

An unwanted control. The Gulf Stream opened to the Pacific.

Any such fanciful engineering project in the Isthmus could probably be a cause of war. But except for a Russian proposal put forth by M. I. Budyko to dam the Bering Strait (in the hope that it would warm Canada and Siberia), most scientific thoughts on weather control run along other lines, though they don't exclude such large ideas. Many weather projects flow from the now not-so-new discovery that cloud-seeding can induce rain and in other ways affect the characteristics of clouds. It was back in November 1946 that General Electric physicists Vincent Schaefer and Irving Langmuir showed that ice crystals scattered into some clouds caused raindrops to form. Later silver iodide and then common urea (of the kind used in fertilizer) proved to be effective and cheaper.

Despite controversy, and the need to have the right kind of cloud in the first place, rainmaking in the United States is now a thriving business. Fifteen commercial operators seeded clouds over 98,000 square miles last year. Government experiments, chiefly in U. of Chicago labs and in Montana skies, indicate that seeding can raise rainfall by as much as 15% over areas of a thousand square miles. Because seeding affects a lot of people on the ground who don't necessarily want its results, legal controls today include the outlawing of cloud seeding in Maryland, and a federal law requiring 30 days notice of seeding operations, and proper record-keeping.

Seeding was later used to disperse ground fogs. That's possible with dry ice or propane if the fog is near freezing. It's now standard procedure at many airports. But it won't disperse warm fog, nor will any other known method except the expensive use of heat. The Defense Department is experimenting with salt and sand sprays to try to make a warm ground fog fall out by electrical stimulation.

Another application of seeding has been aimed at lightning. Army scientists from Fort Monmouth, N.J., recently flew a C-47 into a thundercloud and short-circuited its charge centers with millions of scattered dipole needles. Last summer, the end of the third year of a U.S. Forestry Service project seemed to show a 30% reduction in cloud-to-ground lightning strokes as a result of similar seedings.

Joint Navy-Weather Bureau efforts to modify full-blown hurricanes by seeding haven't been successful. Attention is now directed at their warm-water, tropical breeding grounds. High speed computer analyses of the hurricane life-cycle suggests that chilling infant hurricanes can abort them. Submarines will try artificially cooling the sea surface, while high altitude planes and rockets will spin a veil of artificial cirrus cloud to cut out the sun over squall centers identified as incipient hurricanes—and see what happens. The same principle is being applied to tornadoes—first to understand their spawning mechanism, then seek ways to strangle them at birth.

Hail, a world-wide crop destroyer, is the target of international efforts at suppression. About $100 million in anti-hail research is spent in the United States annually. France is attacking the problem with 162 seeding generator stations. Italian grape growers and Kenya tea planters have lessened the severity of hailstorms by firing small rockets with TNT warheads into their cores. The Russians spend twice what we do in weather modification efforts. By bombarding suspected hailstorms with radar-guided rockets and artillery shells containing silver iodide, they claim to have averted 10 million rubles of crop damage in a single year.

An artist's projection of an IBM plan for an instantaneous world-wide weather watch computerized from information including satellite data.

ILLUSTRATED BY EUCLID SMOOR

Incipient hurricanes may die from artificial cooling.

The long view of weather control comes back to research in the possibility of altering entire climates favorably by rearranging ocean temperatures and circulation.

Successfully predicting the consequences of such rearranging is a job comparable in magnitude to that of making it happen. Rand Corporation researchers are using computers to analyze the effects of theoretically removing the polar icecaps. It's well-known that melting the Antarctic icecap would raise sea levels significantly. The Rand people are looking into all the other possible effects, too. If you think such massive projects are for dreamers, the National Science Foundation estimates that within the next decade man will have the needed knowledge and computer capacity to start planning climate modifications in real earnest.

There are seeds of international trouble in weather modification, but so far the emphasis has been on cooperation between countries. With the launch of two Essa Weather Watch satellites last February, the United States made a contribution to global weather observation and prediction that's more dramatic than its earlier experimental weather watchers in space. President Johnson put the spurs to American weather modification efforts in 1965. "I want us to move ahead in this field," he said. "I want us to make a breakthrough." Seven U.S. agencies working on weather control had a 1965-66 fiscal year budget of $7¼ million. By 1970 the figure is apt to exceed $30 million. With this priority on our national agenda, one or more breakthroughs in weather control may not be far away.

By Len Guttridge

Men in 16 Nations

156

#56

1966

N71-29671-81
NASA SP-264

BARIUM RELEASES at ALTITUDES BETWEEN 200 and 1000 KILOMETERS

A JOINT MAX-PLANCK-INSTITUT–NASA EXPERIMENT

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FOREWORD

In September 1966 two sounding rockets were launched from Wallops Island, Virginia, under a joint agreement between the National Aeronautics and Space Administration and der Bundeministerium für wissenschaftliche Forschung of West Germany. The Langley Research Center, Hampton, Virginia, represented the NASA with the Institut für extraterrestrische Physik am Max-Planck-Institut für Physik und Astrophysik, Garching b. München representing the West German Government. These rocket vehicles carried barium chemical release payloads to produce artificial clouds in the ionosphere and the exosphere.

This publication presents the results of the observation of these artificial clouds, both neutral and ionized. Data are presented on the payload yield, expansion of the neutral cloud, ionization, and growth and motion of the ionized cloud. Payload and vehicle descriptions are also given.

Participants in the joint experiment from the following agencies and educational institutions have contributed to this document:

NASA – Langley Research Center
MPI – Institut für extraterrestrische Physik
Johns Hopkins University – Institute for Cooperative Research
North Carolina State University – Department of Physics
Georgia Institute of Technology – School of Aerospace Engineering

CANADA #57 1965

THE WINNIPEG TRIBUNE

No. 152 SATURDAY, JUNE 26, 1965

Operation Umbrella bans artificial rain

QUEBEC (CP) — Cloud-seeding to provoke rain artificially has been discontinued in Quebec.

The end came June 15 after housewives from the province's Lake St. John region descended on Quebec with an ultimatum for Resources Minister Rene Levesque.

The Lake St. John women called themselves Operation Parapluie (Operation Umbrella) and asserted that artificially provoked rain was giving their children no sunshine to play in and washing out their husbands' crops.

Lake St. John is some 100 miles north of the provincial capital and Mr. Levesque at first said cloud-seeding could not be responsible for heavy rain there. But finally he gave in to the demands of the 60,000 angry mothers.

He asked private companies which had been flying over Quebec clouds with rain-making equipment to desist.

The halt was called for, he said, by "social common sense."

Should the Rest Of Canada Be Doing this too?!?

ARMY RESEARCH AND DEVELOPMENT NEWSMAGAZINE

AUGUST 1965

Army Meteorologist Resigns To Head Weather Bureau Unit

One of the U.S. Army's leading meteorologists, Dr. Helmut K. Weickmann, resigned in mid-July to become director of the U.S. Weather Bureau's Atmospheric Physics and Chemistry Laboratory, Washington, D.C.

Considered a foremost expert in the field of cloud and precipitation physics, Dr. Weickmann was chief, Atmospheric Physics Branch, Meteorological Division, U.S. Army Electronics R&D Laboratory, Fort Monmouth, New Jersey.

Since coming to the United States from Germany in 1949 under the Paper Clip Agreement, which enabled German scientists to continue their work in the U.S., Dr. Weickmann gained wide acclaim for his work at Fort Monmouth. He became a U.S. citizen on Mar. 3, 1958.

Son of an internationally known German meteorologist, Ludwig Franz Weickmann, he received his Ph.D. degree summa cum laude in 1939 from the University of Frankfurt. Formerly chairman of the Cloud Physics Committee, American Geophysical Union, he is presently a member of the Committee on Cloud Modification, American Meteorological Society.

In 1961 he received the Electronics R&D Laboratories' first Laboratory Achievement Award. Last year he was invited to participate in the National Academy of Sciences Panel on Weather and Climate Control.

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CANADA 1965

THE WINNIPEG TRIBUNE

No. 188 FOLLOW US ON FACEBOOK WEATHER MODIFICATION HISTORY SATURDAY, AUGUST 7, 1965 ★★* PHONE WHitehall 2-8101

René Lévesque And The Infernal Machines

Life was a big drizzle in parts of La Belle Province until the ladies declared all-out war on rainmakers

By James Quig
Weekend Magazine

Rain, rain and more rain. That's how it was until Quebec Cabinet Minister René Lévesque (above) gave in to public opinion, ordered the infernal machines turned off.

"It's sunny now that they have turned off the machines," says Mrs. Janine Sénard, Alma, Que., housewife, below. She organized Operation Para-Pluie, a group of women (above) that collected 50,718 signatures from angry northern Quebec women. Action helped end the rainmaking.

THERE'S NOTHING LIKE a good story, and this is one of them. It has everything — 50,718 angry women, as many angry men, frustrated politicians, fish that won't bite, grain that won't grow, birds that just sit around all day, a lion that refuses to roar, mystery and suspense. But, best of all, it has those infernal rainmaking machines and René Lévesque.

Don't laugh! Rainmaking may have been so much hocus-pocus at one time but nowadays it is strictly for real. It works. And anyway, this isn't a very funny story, at least not to the people in the Saguenay-Lac St. Jean region, northeast of Quebec City.

They have lived with the rainmaking machines for 10 years and it has been a rather soggy experience. Rainmaking may be a giant step forward in man's dream to control the weather, but to the people of northern Quebec it is a giant pain.

Life during the past decade has been one big drizzle, and it's those machines, they swear, that have made it that way. When they talk about it they keep one eye on the skies and if they see a cloud heading their way chances are they will run for cover. They are dam sure that the cloud will dump more rain.

They admit *le bon Dieu* is surely responsible for some of it but it is usually *ces maudites machines à pluie* that take the rap.

The culprit they point accusing fingers at is Weather Engineering Corp. of Canada Ltd., a Montreal firm that uses generators that are strategically located on the ground to send clouds with silver iodide.

Vapor from the generators is swept by winds to high-altitude clouds that are filled with tiny floating water droplets. The silver iodide then causes the droplets to grow, and when they do, they get heavy enough to fall on water-weary man, land and beast below.

Seeding has been done in four target zones throughout the province: the upper Ottawa and Gatineau valleys, the North Shore of the St. Lawrence and the Saguenay-Lac St. Jean region.

Weather Engineering was hired to seed the Gatineau and Ottawa valley regions at the request of Hydro-Quebec and its affiliates, which wanted to raise reservoir levels. In the other areas the rain fell for Laurentian Forest Protection Services, a co-operative owned by several pulp and paper companies that wanted to reduce the incidence of forest fires which level priceless stretches of Quebec timberland every year.

"There's nothing to it," says Raphael Bouchard, of Alma, Que., who operated one of the generators between 1952 and 1958. "All we had to do was turn her on every time Weather Engineering called from Montreal.

"Then we would call our wives and tell them it was going to rain. That gave them time to get in the house or to get their washing off the clothes line. It worked every time."

Every time?

"When we turned on the machines it rained — every single time."

Bouchard wasn't paid for turning on the machine. He worked for a paper company at the time, and rainmaking pay went to the superintendent.

"Our own company had nothing to do with it. The money received by the superintendent went toward a tropical-fish collection we had on the job," he explained.

It wasn't long before residents in the area started to notice there was something fishy going on with their climate.

"I kept telling them it was artificial rain," said Bouchard. "Every time we turned on the machines you could see a yellow ring around the puddles of water along the streets. I knew that ring came from the seeding but they just laughed. They thought it was just that the climate was changing on its own."

IT TOOK the people a long time to catch on that Raphael Bouchard wasn't joking with his rainmaking talk. But when they did, they did it with a vengeance, and they wonder why they didn't believe it at first.

Bouchard himself finally got fed up with the rain. "Our climate hasn't been the same since this started. Last year was the worst," he said. "I work shifts and I only managed to go swimming once. The people have a good reason to complain because we didn't get any summer at all."

The former rainmaker also backed up another opinion held by many people, which is that winters have changed as much as summers.

"Sure," he said, "in the winter time they take the generators up into the mountains and do the same thing to the clouds. They make the snow fall on top of mountains rather than in the valleys. It helps reduce spring flooding."

Dr. Gérard Tremblay, mayor of Chicoutimi, said the climate was as changeable as it was rainy. He cited a letter published in Progrès-Dimanche, an area newspaper.

The author said he was writing with his left hand to protect his laboring and went on to say that a new group had been formed in the region to stop artificial rainmaking "even if it is necessary to shed blood to reach our goal." He said the group would use guns, explosives and fire to make their point and that the operators of generators and their families would lose everything, including their lives, if it didn't stop raining. The letter was signed *Fils du Soleil* (Son of the Sun).

Continued on next page

From Pravda — Weekend Magazine

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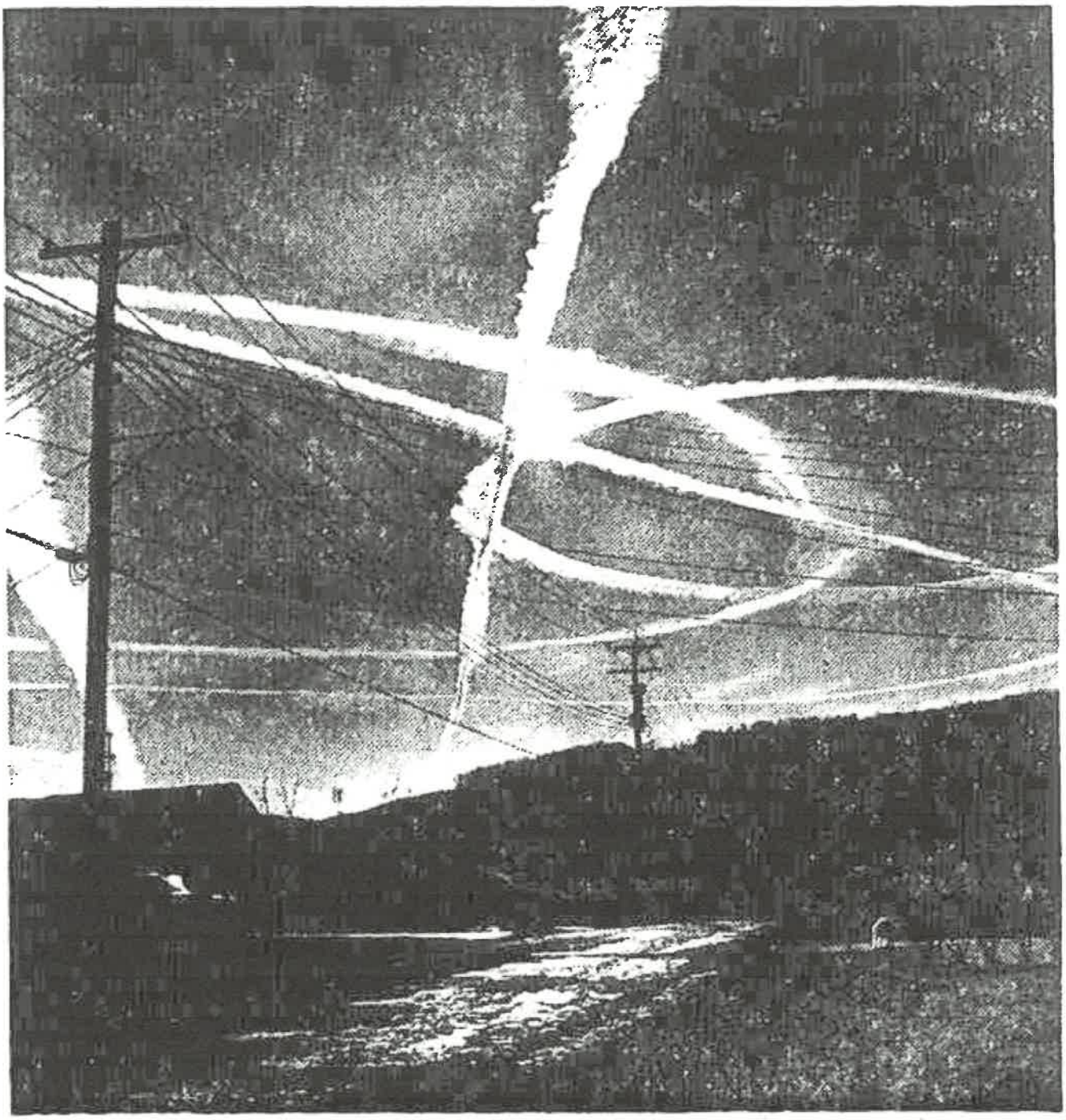
(#60)

Sat., March 28, 1964 PRESS, Binghamton, N. Y. 5



—PRESS PHOTO BY PAUL KONECNY.

NOT CIRRUS-LY—These jet contrails hung for hours over the Southern Tier recently. Experts at the Weather Bureau said the patterns had relatively long lives because upper air winds were not strong enough to disperse them. Some weathermen, according to meteorologist Gean di Lauro, occasionally mistake jet vapor for cirrus clouds.

SPEWING BS BACK THEN!

1964

The Greenwich Journal

and Fort Edward Advertiser

VOL. 122—NO. 36 GREENWICH, NEW YORK, THURSDAY, JUNE 25, 1964 10c A COPY

Operation RAIN Will Start Tomorrow

Operation RAIN has been launched. Tired of waiting for Mother Nature to provide the desperately needed moisture, some 175 farmers of Washington county and a few representatives from Saratoga and Rensselaer counties have pledged financial support to a rain-making project which is expected to begin tomorrow.

Howell Associates of Lexington, Mass., will start seeding the clouds Friday, or as soon as the proper atmospheric conditions exist, and will continue for a minimum of ten days and probably as much longer as is necessary to relieve the drought conditions which are ruining farm crops in this section.

Operation RAIN was unanimously approved at a meeting at Salem Union grange hall Tuesday evening arranged by the Washington county Farm Bureau. Monday Dick McGuire, Jackson, state Farm Bureau director, and Ray Johnson of Easton, county Farm Bureau president, arranged for Dr. Wallace Howell to explain to farmers the rain-making service his firm provides. Mainly by word of mouth farmers and town officials were invited to the meeting and more than 175 of them turned out.

Dr. Howell promises nothing but describes the scientific rain making process as "nudging the clouds in favor of rain." The farmers' sentiment was "what have we got to lose?" and to a man they voted for the program.

Unlike the popular notion of rain making, Dr. Howell's firm seeds the clouds from the ground, not from an airplane. Some 25 portable generators will be set up in various locations determined by field meteorologists from the firm.

These scientists will be in contact with the Lexington office and with weather stations to determine when conditions are best for seeding and they will direct the operation.

The seeding equipment consists of a metal box containing a generator, string which is impregnated with silver iodide, and a gas burner. When the meterologists give the word, the generator is started, the gas burner lit, the string is fed through the flame and the silver iodide released in the air.

The chemical rises to the cloud where it tends to form ice crystals there, which causes rain. Dr. Howell explained seeding shortcuts nature's way, can trigger rain when it would not happen naturally, and increases the amount of natural rainfall up to 25 per cent.

The cost of this project is an initial amount of $2,000 for the setup, plus $200 a day. The Washington county Farm Bureau is acting as the agent contracting with Howell Associates. However, the project will be financed by voluntary contributions.

Farmers at the meeting agreed that a fair assessment for them would be 20 cents a crop acre, and at Tuesday's meeting some $2,000 was paid or pledged. At least twice that amount, and probably considerably more if the project is to continue beyond the 10-day period, is needed.

As everyone wants rain, it is thought everyone will be glad to contribute to the project. Donations from village residents whose lawns and gardens are bone dry, from business firms whose economy depends on that of the farmers, and of course from every farmer in the area, are sought. Any amount will be welcome, and money may be left with any town clerk in the county, at Wheeldon's Electric in Greenwich, or mailed to Operation RAIN, Washington County Farm Bureau, Box 97, Salem.

The Farm Bureau will set up a special account to administer this program, and a committee is being named to direct it. It is expected residents of both Saratoga and Rensselaer counties will join in Operation RAIN as drought conditions in those two counties are growing severe.

Dr. Howell's firm has conducted successful rainmaking projects in various parts of the world, and two years ago was employed by farmers in Dutchess and Columbia counties where rainfall was increased 39 per cent above the 13-year average in some sections by scientifically seeding the clouds for a period of several weeks. Asked if cloud seeding in one place makes it drier in another, Dr. Howell answered "No," and explained that when showers are stimulated, it stimulates the entire atmosphere and this "doesn't rob the down-stream neighbors."

For the convenience of those wishing to help "nudge the clouds in favor of rain," here is a coupon which may be used in sending a contribution to the Farm Bureau.

Operation RAIN
Washington County Farm Bureau
Box 97, Salem, New York

Yes, I want Rain, and here is my contribution toward it. ..... $.....

Name .....

Address .....

NATURE TAKES THE HINT

It's raining, just a little, as The Journal goes to press.

(# 62)

Pittsburgh Post-Gazette THURSDAY, OCTOBER 1, 1964

Soviet Sees War 1964

U.S. Accused Of 'Arming' The Weather

MOSCOW, Sept. 30 (AP)—A Soviet colonel charged today that U.S. scientists are working on ways of turning hurricanes toward Communist countries.

Col. I. Zheltikov said the United States hopes to turn the weather into weapons more powerful than atomic bombs.

He warned that such "wild ideas" could touch off a new war and inevitable defeat for the West.

Zheltikov made the charge in the Soviet defense ministry newspaper Krasnaya Zvezda (Red Star).

He said the Pentagon had directed U.S. scientists to work out ways of changing the course of hurricanes, and also claimed U.S. scientists were working on experiments "to bring on the territory of socialist countries floods and even a new ice age."

Zheltikov also reiterated Soviet charges that U.S. weather satellites were being used for spying.

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CANADA - 1964

THE STAR

Vol. XVIII — No 37 VAL D'OR, QUE., THURSDAY, OCTOBER 15, 1964 10 cents per copy

Rain . . .

The Federation of the Saguenay Farmers Catholic Union intends to take court action against those responsible for experiments which provoke excessive rainfall, and against the provincial government which gave no opposition to such experiments despite the prejudices caused to the farmers. The UCC declares that experiments undertaken in the Saguenay and surrounding regions proved disastrous to the farmers. That is why a court action is necessary in this case.

A few years ago when such experiments were made in the Abitibi region, our neighbours from Lake St. John suffered the same disadvantages. This year it is noticed that our region has been also influenced by the experiments made in the Saguenay region. The fact is that we have had rainy weather for the past two months and it is unlikely that this is a result of natural causes.

It is time that such experiments be discontinued in the whole province. We may be able to accept bad weather after we are positive that it is caused by nature.

H 64

1963

Radio-Electronics
OCTOBER 1963 VOL. XXXIV NO. 10
Over 55 Years of Electronic Publishing
Hugo Gernsback, Editor-in-Chief

ELECTRONIC WEATHER CONTROL

...We Now Have the Technical Means to Modify the Weather...

IT WAS Charles Dudley Warner (and not Mark Twain) who first observed: "People are always talking about the weather, but no one does anything about it!" True in his day, and true today. But it probably will not be true at the turn of the next century, A.D. 2000.

The key, as we see it, is a combination of meteorology and electronics. But first let us look at the problem.

Scientists are in full accord that the sun, our titanic atomic furnace, 92 million miles distant, is the supreme and chief source of all weather. Its huge caloric output varies little over the ages and may, for all practical purposes, be called constant in its radiant heating power. Its energy is so great that *on each square mile of our earth we receive over 4½ million horsepower of actual energy*. A good percentage of this energy is lost—radiated back into space by reflection. Much more energy is lost by the heated earth at night when the sun is below the horizon.

Our largest heat reservoirs are the atmosphere and the oceans, but on account of the seasons, the total amount of solar energy received at any given point on earth varies constantly. Meteorology is not yet an exact enough science to cope with this variability, which is further complicated by the earth's daily rotation and seasonal inclination of its axis toward and away from the sun—its chief heat source. This is also the reason for the great variability of the weather—to an extent. Admittedly, this outline is an oversimplification of the problem, but for our purpose quite adequate. (There are other lesser factors that influence weather: internal heat of the earth, the polar icecaps, glaciation of high peaks—the Himalayas, the Swiss Alps, etc., man-made vitiation of the atmosphere by hydrocarbons, etc.)

It probably will be impossible for many thousands of years for man to influence either the rotation of the earth on its axis or change its seasons. Nor would this be advisable, even if it could be accomplished. Such a change would certainly aggravate acutely the weather problem.

But suppose we could *equalize* or modify solar radiation received by the earth to a certain degree. Suppose we could partly light the dark side of the earth with the sun's radiant energy *every day, during all seasons*. In other words, a sort of perpetual "day" for much of the habitable world. This we can do in the foreseeable future if the world governments are willing to pay the considerable price—which in the end may be very low, if one figures the huge benefits that will accrue to humanity.

The answer to the problem is the *Oberth spatial mirror*. Prof. Hermann Oberth, the great mathematician and physicist, in the early Twenties published his epochal book, *Wege Zur Raumschiffahrt* (Ways and Means to Space Navigation).*

In this classic book, Professor Oberth laid the entire groundwork for our present-day space navigation as well as all pertaining mathematics. Not only did he develop the proto-principles of modern space ships, but he was also the inventor of the World War II German V1 and V2 rockets.

More important was his brilliant conception of the gravitating space mirror, also called a *spatial mirror*. When he designed it in the mid-Twenties, 20 years before the atom bomb, the space mirror became widely known as the world's most frightful potential weapon.

Assembled in space, the lightweight mirror was to be about 60 miles in diameter, constructed of paper-thin squares of sodium, a white silvery metal of high reflecting power. These squares were to be mounted on a light metal frame network. All the metal squares would be hinged individually so they could be focused by electric motors in any desired direction.

The spatial mirror, gravitating between 400 and 700 miles above the earth, would make one complete revolution around the earth in about 1¾ hours. As a purely military weapon, Oberth wanted to use it as a gigantic burning glass to destroy cities, cause cyclones and hurricanes and destroy armies in the field by literally burning them alive.

It was also Oberth's idea to have a resident (military) crew on the mirror to guide it for observation and for eventual offensive purposes. But since the advent of the A- and H-bombs, the space mirror as a war weapon has become obsolete.

Yet for purely peaceful uses and particularly for meteorological reasons, to *regulate* the earth's weather, the spatial mirror now appears an ideal instrument that is certain to come into its own in the not-too-distant future.

To be fully effective, the space mirror will probably be much larger than the original Oberth concept, probably over 100 miles in diameter.

It will also be unmanned, electronically operated by radio impulses from earth. The electric power to focus the individual facets made of paper-thin chrome sheets will come from solar semiconductor batteries, which will operate continuously because the mirror will *always* be in full sunlight.

To be fully effective, we must use a plurality of mirrors, say eight to ten (or perhaps more). Because the mirrors are constantly moving around the earth, they cannot all illuminate the night side of the globe (at the same time), which is their prime purpose. Hence more mirrors are needed to illuminate the dark side.

The space mirrors always turn their face, the "mirror" side, toward the dark side of the earth which they illuminate; their own dark side is turned to the sun when they are over the sunny side of the earth.

The entire philosophy of the space-mirror meteorology is based on the concept that, for the maximum climatic efficiency, man requires but one season—eternal spring, or if you wish, eternal autumn. No destructive frosts, no hurricanes, no tornados, no heavy winter-long snows, no months-long glaciation. The result—blooming deserts, more abundant crops, more food for more people.

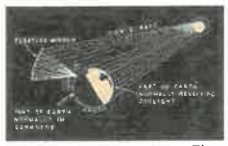
Here are a few technical details in this rather sketchy

(Continued on page 74)

*Published in 1925 by Verlag von R. Oldenbourg, Munich and Berlin.

Illustrations by Frank Paul

The Oberth Space Mirror, under construction, as it would appear approximately 700 miles above the Earth. The three objects at left are the solar energy plant which furnishes power for the workers, as well as heat and light. Matter being weightless here, everything not rigidly attached floats off into space.



This shows how the Spatial Mirror operates. The solar energy is caught by the mirror, then is concentrated on the dark side of the earth. For clarity's sake only one of more than 8 to 10 mirrors is shown. The mirrors' rays concentrate chiefly on the upper part of the atmosphere. The reflected energy of the mirrors is unimaginably large.

Another view showing only one of 8 to 10 space mirrors as they gravitate around the earth, as does the moon, below. Once in position the mirrors function continuously, except during the rare occasions when the earth eclipses the sun. Mirrors usually will be focused on the upper atmosphere.

Directly above we see a Space Rocket unloading chromium sheets which become the mirror's facets. The mirror measures some 100 miles in diameter. To the right is the Observatory Rocket, which also houses the workers. At lower right is the earth as it appears from 700 miles up. The sun is overhead.

(Continued from page 25)

account of the idea—many books can and probably will be written on it.

1. It is *not* the sole purpose of the mirrors to illuminate the dark side of the earth. At best, with all mirrors working at maximum illumination, the night side will be in a constant twilight.

2. The chief purpose of the mirrors is to heat the two subpolar regions sufficiently to keep the so-called temperate zones free from frost, deep snow and ice. No attempt would be made to melt the polar caps. (That would raise the level of the oceans more than 100 feet and put all the world's coastal cities under water.)

3. The solar mirrors would seldom concentrate their heat on the earth itself. *The mirrors would chiefly heat the atmosphere at the stratosphere level and above.* It is here weather is created and air currents are generated. the so-called jet currents that vastly influence our weather. It will be one of the tasks of the space mirrors to *regulate* these air currents for full efficiency.

4. Most important, just where, geographically, are the mirrors to concentrate their maximum heat for full efficiency? These regions will change from day to day, depending upon the seasons. Hence a global meteorological network must continuously feed such information to the mirrors' central headquarters.

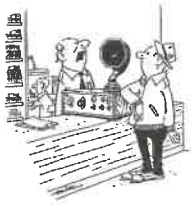
5. This vastly detailed global weather information is then fed into special electronic computers and the result is then transmitted to the individual mirrors which now will concentrate their energy on the exact regions and atmospheric altitudes for the exact period required.

The above outline gives only an incomplete idea how the weather on our planet can be *regulated* in the future.

6. It must be realized that here we have to do with extremely vast cosmic forces running into many billions of horsepower an hour. Hence we must understand that even with all solar mirrors working at full efficiency, the climatic changes will be very slow and gradual. *It will not be perpetual spring all over the world immediately.*

It will take a number of years to derive the full benefit of our vast expenditures, which will run into many billions. But in the end it will be cheap and very much worth while.

—H. G.



"On the contrary, we have a very large tube inventory. However..."

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(#65)

CANADA---1959

SARASOTA JOURNAL

LINDSAY NEWSPAPERS, INC., SARASOTA PUBLISHERS SINCE 1926

VOL. 7 — NO. 201 | Entered as Second Class Matter at The Post Office at Sarasota, Florida | SARASOTA, FLORIDA, TUESDAY AFTERNOON, JANUARY 20, 1959 | PRICE FIVE CENTS

FOLLOW US ON FACEBOOK
WEATHER MODIFICATION HISTORY

IT'S POSSIBLE

Control Of Weather Next War Weapon?

WASHINGTON (AP —Sen. Clinton P. Anderson (D-NM) says weather warfare may some day be more effective than missiles in bringing a nation to its knees.

"Weather warfare could be so applied that the operator of the modification could not only damage his opponent but escape undamaged himself — something that might not be said of multi-megaton thermonuclear blasts," Anderson said.

He addressed a symposium of weather modification Thursday night.

"Who needs to be told how long it would take to bring the United States to her knees if it lay in the power of another country to deny us at will our drinking water or our wheat crop, to alternately freeze us or burn us up, to flood our cities and scorch our farms?" he asked.

Two top meteoroligists joined Anderson in urging intensive further research on weather control techniques.

Dr. Horace R Byers of the University of Chicago said progress in weather modification has been distressingly slow since such studies were started 12 years ago. He said this was mainly because most of the effort had gone into trying to apply principles that were too poorly understood instead of doing basic research on atmospheric processes.

Dr. Edward A. Ackerman of the Carnegie Institution of Washington said a new federal agency should be set up to promote basic research in the field.

Ackerman said "the exploration of outer space has captured our minds and our funds. However, it does not yet offer the same wide vista (beneficially) altering the conditions of life for the human race as manipulation of the atmosphere."

The symposium was sponsored by Resources for the Future Inc., a research and educational agency supported by the Ford Foundation.

Canadians it could be done by your own govt!?

THIRTY-SECOND YEAR

The Desert Sun

The Desert Empire's Daily Newspaper

FOLLOW US ON FACEBOOK
WEATHER MODIFICATION HISTORY

CXII, No. 138 20 Pages—2 Sections Palm Springs, California, Saturday, January 31, 1959

AF GIVES VILLAGE 2 CHOICES: LIVE WITH TRAILS OR MOVE

THE VAPOR TRAIL STORY is explained to City Councilman Ted McKinney, Chamber of Commerce Manager Jimmy Cooper and Chamber President Warren Slaughter by Brig. Gen. Prescott M. Spicer, commander of the 27th Air Division, during the "summit conference" on the vapor trail problem at Norton Air Force Base. (Desert Sun Photo).

By AL LE ANCE

Palm Springs quietly gave up the battle of the vapor trails this week after a "summit conference" that ended in an amicable but unyielding armistice with the United States Air Force.

It was a hands-down victory for the Air Force, which offered but two rigid alternatives to Village delegates attending the high-level conclave.

"LET'S FACE IT, men," said a crisp-talking, star-studded general, "we're well aware of your problem," he continued, "but I don't know how we can beat it. I guess you'll just have to live with it."

Air Force officials expressed their concern by dispatching a mammoth Fairchild C-123 transport to Palm Springs to ferry various dignitaries back to Norton.

PURPOSE OF THE trip: An orientation tour of Norton Air Base designed to acquaint the complainants with the operations of the Air Defense Command.

Promptly at 12:30 p.m., a delegate of city councilmen, bankers, businessmen and Chamber of

TWO AIR FORCE buses met the plane at Norton, and quickly whisked the delegation off to its first impressive exhibition—an Air Defense Command film and a visit to "the blockhouse."

The blockhouse is an impregnable, thick-walled building that houses the heart and brains of the Los Angeles area section of the North American Air Defense net.

This is a highly complex organization which plots the courses of all aircraft flying in a vast west-

Vapor trails do not form clouds, it was pointed out. But circus clouds, which look like vapor trails, are created by the same conditions which create the contrails.

While they digested these vital facts, the delegates were introduced to Brig. Gen. Prescott M. Spicer, commander of the 27th Air Division, and Brig. Gen. James L. Jackson, deputy commander of the San Bernardino Air Materiel Command.

GENERAL JACKSON, an af-

THE GENERAL indicated that it would be easier to move Palm Springs than it would be to relocate the "Palm Springs intersection."

It's the "only path out of the West Coast" for air traffic, he said.

"Well, I can understand why we have vapor trails," said

#67

1958

The San Bernardino Daily Sun

A Newspaper for San Bernardino County.

-Associated Press
)—United Press

SATURDAY MORNING, APRIL 5, 1958

Five Cents a
$1.95 a mo

Cloud-Seeding Suspended by Soggy Ventura

VENTURA (UP) — The Ventura County Board of Supervisors made official note yesterday of a series of heavy storms by suspending cloud-seeding operations.

The board had entered into a $25,000 contract last January with North American Weather Consultants for cloud seeding to increase rain which then was badly needed.

The contract runs through April 30, but cloud seeding now will be suspended at least until April 12.

As one county official put it, "Enough is enough."

#68

The San Bernardino Daily Sun
A Newspaper for San Bernardino County.
-Associated Press ed Press International
MONDAY MORNING, SEPTEMBER 15, 1958
Ten Cents a $1.95 a mo

1958

State, Others Sued Over Flood Damage

MARYSVILLE (UPI)—Charges of rainmaking and improper flood control actions were made in a suit filed in Superior Court here by some 120 Sutter County residents.

The consolidated suit asked for $8,376,548 for damages to personal property and real estate during the Christmas-time floods in 1955.

Defendants in the suit were listed as the State of California, the State Reclamation Board, Sacramento and San Joaquin Drainage District, Pacific Gas & Electric Co., North American Water Consultants, and some 50 John Does.

#69

1958

Spokane Daily Chronicle

S SPOKANE, WASH., SATURDAY, DECEMBER 6, 1958. PRICE TEN CEN

Darn Sky Riders

Jet Trails Dim Sun, Palm Springs Gripes

WASHINGTON, Dec. 6. (UPI)—The air force is long since resigned to the fuss about noise from its jets. Now comes Palm Springs, Calif., with a new complaint—that jet trails overhead are so thick they are beginning to blot out the sun.

Jimmy Cooper, manager of the Palm Springs Chamber of Commerce, outlined this "most serious and urgent problem" in a telegram to Representative D. S. (Judge) Saund (D-Calif.), who has asked the air force what can be done.

"As you know," Cooper wired Saund, "our entire economy is dependent upon the tourist trade, which is predicated on our bright sunshine and warm climate. Recently our sky has resembled a mob of exuberant sky riders performing an aerial circus.

"The 'contrails' are not disappearing but are breaking down into a haze and creating a cloud-like appearance in the sky.

"With the unlimited expanse of barren, uninhabited land in the west, does such activity have to be centered over a resort area, which is offering the visitor cloudless skies and unlimited sunshine?"

The air force, so far, is flabbergasted. No doubt in time it will recover its aplomb sufficiently to give Saund the usual answer to all congressional inquiries—that the matter will be investigated.

The air force figures its jets couldn't blot out the sun short of a wing-to-wing mass flight like the European bombing raids of World war II. If anything like that is going on out of March air force base at Riverside, Calif., the nearest jet base to Palm Springs, air force officials here want to know all about it.

(#70)

1956

MAIN AVE

CATSKILL MOUNTAIN NEWS

THE CATSKILL MOUNTAIN NEWS HAS THE LARGEST AUDITED CIRCULATION OF ANY NEW YORK STATE WEEKLY PRINTED IN A VILLAGE THE SIZE OF MARGARETVILLE

1 in 1863. MARGARETVILLE, NEW YORK, FRIDAY, MARCH 9, 1956

County Trial Up Soon

Ulster Rainmaker Flood Suit On Supreme Court Calendar

Ulster county expects to try its rainmaking case in the Supreme court. The outcome of the action will be watched closely by residents of this area, who suffered great damage in the same flood, that of Nov. 25, 1950.

The following news story in the Kingston Freeman of Monday, this week, tells of the Ulster county action.

"Ulster county's 'rainmaking' action against the city of New York is on the Supreme court calendar in the county of New York for trial.

"When the action will be reached for disposition depends on how many cases are moved ahead of the county's action.

"An examination before trial in which the county of Ulster seeks to ascertain information in regard to certain engineering phases of the 'rainmaking' program which the city of New York carried out in 1950, is on program. Last week County Attorney Arthur A. Davis Jr. and Assistant County Attorney Robert Carnwright, examined John A. Aalto, engineer for the city of New York, who is in charge of the local office. The examination was help open for examination of other employes and for the inspection of certain records.

"The examination is designed to ascertain certain facts and information necessary for the county to prosecute its action.

Seeded the Clouds

"In 1950, following cloud seeding operations carried out under the direction of Dr. Howell, the county alleged the operation designed to augment the water supply in the New York city reservoirs was responsible for a serious flood on Nov. 25, 1950. In that flood bridges and roads were damaged and the county seeks to recover an estimated $380,000 for that damage.

Many Private Claims

"In addition to the action brought by the county there are several other claimants who have brought similar actions. The present examination before trial, however, does not affect those actions, the application for the examination being confined to the county's case.

"Appearing for the city of New York was John Suglia and Mr. White of the corporation counsel's office.

Reservoir Was Low

"In 1950 the water supply in the Catskill reservoir system was low. Dr. Howell claimed to have a system for seeding the clouds and causing additional artificial rainfall. The city of New York appropriated $50,000 to carry out the experiment in this area and increase the water supply.

Supervisors Opposed Rainmaking

On April 7, 1950, the board of supervisors passed a resolution 'strenuously and vigorously' opposing the program on the grounds such action might cause floods. On November 25, 1950, following the 'rainmaking' operations there was a severe flood in the Esopus valley causing damage to property, washing out roads and bridges and at a meeting on March 16, 1951, the board adopted a resolution authorizing the county attorney to bring action against the city of New York to recover damages.

"Other actions by individuals followed and all of these actions are pending.

"The Ulster county action is on the New York county calendar of the Supreme court. County Attorney Davis said it was impossible to tell when the case will be reached for trial."

(#71)

1956

The San Bernardino Daily Sun

A Newspaper for San Bernardino County.

(AP)—Associated Press (UP)—United Press

MONDAY MORNING, SEPTEMBER 10, 1956

Five cents a copy $1.95 a month

'Awful' Climate War Foreseen

WASHINGTON (AP) — A member of the Atomic Energy Commission (AEC) predicted Sunday that nations within a few decades will achieve global climate control, raising the "awful" prospect of weather warfare.

Commissioner John Von Neumann said man's knowledge is "rapidly approaching a level that will make possible, in a few decades, intervention in atmospheric and climatic matters."

He did not indicate what form climate control methods might take but said once they are developed, "they will be exploited."

Von Neumann, a noted mathematician, gave his views in a world-wide Voice of America broadcast.

He said use of weather-harnessing procedures in one region "may critically affect another."

Thus, he added, "present awful possibilities of nuclear warfare may give way to others even more awful. After global climate control becomes possible, perhaps all our present involvements will seem simple."

#72

1955

THE SPENCER DAILY REPORTER

THE ASSOCIATED PRESS — The Spencer News-Herald — LEASED WIRE SERVICE

FOLLOW US ON FACEBOOK
WEATHER MODIFICATION HISTORY

COUNTY NEWSPAPER — SPENCER, IOWA, FRIDAY, APRIL 29, 1955

Blames Air Force for Floods

ALBUQUERQUE, (AP)— The man who fathered the science of making rain said Thurs. he believes armed forces experiments may have caused the disastrous Missouri Valley floods of June 1952.

Dr. Irving Langmuir, a Nobel Prize winner and consultant for General Electric Co. experiments with rainmaking, also declared:

1. An Air Force test on a tornado off the eastern coast Oct. 17, 1947,, may have turned the twister off its course and pushed it into Savannah, Ga., with damage of five million dollars.

2. There is evidence that rainmaking in some areas may create drought in others.

Langmuir was interviewed while attending the International Arid Lands Symposium, where scientists from 18 nations are seeking answers to the rapidly growing arid regions which already cover a third of the earth's land surface.

Steady Downpour

He declared that he thinks now —and insisted at the time—that a single silver iodide generator operating at Alamogordo, N. M., under Project Cirrus caused the steady downpours which drowned the Missouri Valley three years ago.

"We had been seeding for some time, and the storms kept getting bigger and better. I told them (the armed forces heads administering the project) that I felt we ought to stop seeding as the rains in the Missouri Valley kept falling.

"But the administrator of the project was on vacation at the time. No one would take responsibility for ordering the seeding stopped.

"Finally, I told them we must stop, things were getting serious.

"We stopped on July 2. On July 7 the flood just about devastated Omaha.

"If we had stopped our generator two weeks earlier," Langmuir said, "the Missouri Valley floods would not have happened."

(#73)

CANADA — 1955

THE WINNIPEG TRIBUNE

WINNIPEG, WEDNESDAY, MARCH 30, 1955

Farmers to Buy More '55 Rainfall In Saskatchewan

SASKATOON (CP) — Weather Modification Co-operative, an organization of farmers, will operate again this year in an effort to increase precipitation by cloud seeding with silver iodide in a 3,000,000-acre area of west-central Saskatchewan bounded roughly by Rosetown, Biggar, Langham and Saskatoon.

At Delisle Monday night Gordon Loucks, Delisle, was re-elected

1955

The Sun-Telegram

A NEWSPAPER FOR SAN BERNARDINO COUNTY

(AP)—Associated Press
(UPI)—United Press

SUNDAY MORNING, OCTOBER 9, 1955

10c Per Copy

Water Districts to Share Costs of Cloud Seeding

San Bernardino Valley and Western Municipal Water Districts have contracted to pay $13,500 of the cost for the winter's cloud seeding in an effort to increase rainfall in the Santa Ana River Basin.

Howard W. Holcomb, chairman of the San Bernardino Valley Municipal Water District directors, said the Santa Ana Weather Corp. will undertake the job which will cost $23,500. Previously, county flood control districts, municipal and mutual water companies had paid all costs for the project.

"The records show that wherever seeding has been done the precipitation increased 20 to 25 per cent," said Holcomb. "Although we directors still realize it is a debatable subject, it was the consensus that we should do everything possible to develop water."

Western Municipal Water District (Riverside) will pay $7,000; San Bernardino Valley, $8,500; and Chino Basin Municipal Water District and companies in Orange County have agreed to pay the remainder of $8,000, according to the Associated Press release from Riverside.

World Climate Declaration

THERE IS NO CLIMATE EMERGENCY

1828 SIGNATORIES

Well over 2,000 to date January 2024.

GLOBAL CLIMATE INTELLIGENCE GROUP

WWW.CLINTEL.ORG

#74

World Climate Declaration

THERE IS NO CLIMATE EMERGENCY

GLOBAL CLIMATE INTELLIGENCE GROUP

WWW.CLINTEL.ORG

#94

There is no climate emergency

Climate science should be less political, while climate policies should be more scientific. Scientists should openly address uncertainties and exaggerations in their predictions of global warming, while politicians should dispassionately count the real costs as well as the imagined benefits of their policy measures

Natural as well as anthropogenic factors cause warming

The geological archive reveals that Earth's climate has varied as long as the planet has existed, with natural cold and warm phases. The Little Ice Age ended as recently as 1850. Therefore, it is no surprise that we now are experiencing a period of warming.

Warming is far slower than predicted

The world has warmed significantly less than predicted by IPCC on the basis of modeled anthropogenic forcing. The gap between the real world and the modeled world tells us that we are far from understanding climate change.

Climate policy relies on inadequate models

Climate models have many shortcomings and are not remotely plausible as policy tools. They do not only exaggerate the effect of greenhouse gases, they also ignore the fact that enriching the atmosphere with CO_2 is beneficial.

CO_2 is plant food, the basis of all life on Earth

CO_2 is not a pollutant. It is essential to all life on Earth. More CO_2 is favorable for nature, greening our planet. Additional CO_2 in the air has promoted growth in global plant biomass. It is also profitable for agriculture, increasing the yields of crops worldwide.

Global warming has not increased natural disasters

There is no statistical evidence that global warming is intensifying hurricanes, floods, droughts and suchlike natural disasters, or making them more frequent. However, there is ample evidence that CO_2-mitigation measures are as damaging as they are costly.

Climate policy must respect scientific and economic realities

There is no climate emergency. Therefore, there is no cause for panic and alarm. We strongly oppose the harmful and unrealistic net-zero CO_2 policy proposed for 2050. Go for adaptation instead of mitigation; adaptation works whatever the causes are.

OUR ADVICE TO THE EUROPEAN LEADERS IS THAT SCIENCE SHOULD STRIVE FOR A SIGNIFICANTLY BETTER UNDERSTANDING OF THE CLIMATE SYSTEM, WHILE POLITICS SHOULD FOCUS ON MINIMIZING POTENTIAL CLIMATE DAMAGE BY PRIORITIZING ADAPTATION STRATEGIES BASED ON PROVEN AND AFFORDABLE TECHNOLOGIES.

#14

The undersigned:

WCD AMBASSADORS

NOBEL LAUREATE PROFESSOR JOHN F. CLAUSER / USA
NOBEL LAUREATE PROFESSOR IVAR GIAEVER NORWAY/USA
PROFESSOR GUUS BERKHOUT / THE NETHERLANDS
DR. CORNELIS LE PAIR / THE NETHERLANDS
PROFESSOR REYNALD DU BERGER / FRENCH SPEAKING CANADA
BARRY BRILL / NEW ZEALAND
VIV FORBES / AUSTRALIA
DR. PATRICK MOORE / ENGLISH SPEAKING CANADA
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DR. THIAGO MAIA / BRAZIL
PROFESSOR FRITZ VAHRENHOLT / GERMANY
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DUŠAN BIŽIĆ / CROATIA, BOSNIA AND HERZEGOVINA, SERBIA AND MONTE NEGRO

WWW.CLINTEL.ORG

TOTAL SIGNATORIES
1828

SCIENTISTS AND PROFESSIONALS FROM ARGENTINA

1. Mauro Borsella, Environmental Consultant & Auditor
2. Dr. Aldo Brandani, Coastal Specialist and Environmental Scientist
3. Rosa Compagnucci, PhD in Meteorological Sciences, Climate Researcher, Full-time Professor at the University of Buenos Aires and Principal Researcher at CONICET

SCIENTISTS AND PROFESSIONALS FROM AUSTRALIA

1. *Ian Plimer, Professor Earth Sciences, The University of Melbourne; WCD Ambassador*
2. *Viv Forbes, Geologist with Special Interest in Climate, Founder of www.carbon-sense.com, Queensland, Australia; WCD Ambassador*
3. D. Weston Allen, Physician and Medical Director of Kingscliff Health, New South Wales, Author of a number of Climate-related papers
4. Don Andersen, Retired Teacher, Programmer
5. David Archibald, Research Scientist
6. Rick Armstrong, retired metallurgist and strategic planner
7. Michael Asten, Retired Professor in Geophysics and Continuing Senior Research Fellow at the Monash University, Melbourne
8. József Balla, retired teacher and manager of a small business
9. Stuart Ballantyne PhD, Senior Ship Designer, Sea Transport Corp.
10. Jeremy Barlow, Energy and Mining professional, Director and CEO
11. Dr. Colin M. Barton, Geologist, Retired Civil Engineer with Experience in Project Control, Research and Professional Training, Honorary Fellow RMIT University Australia
12. Gordon Batt, Director GCB Investments Pty Ltd.
13. Maxwell Charles S. Beck, lifetime of experience in law, retired Magistrate and Coroner on the bench
14. Robert M. Bell, Retired Geologist, Victoria
15. Karen Benn, Double major PhD Biologist and Environmental Scientist, Government Policy, Educator and University Lecturer in Sciences, Biology, Environmental Sciences, Water Quality and Water Resource Management
16. Richard Blayden, Professional Engineer
17. Colin Boyce, Engineer, Member of Parliament, Queensland State Parliament, Engineer, Farmer and Entrepreneur
18. Howard Thomas Brady, Member Explorers Club of New York, Member of the Australian Academy of Forensic Sciences
19. Geoff Brown, Organizer of a Critical Climate Group
20. Andrew Browne, Exploration Geoscientist, Fellow AusIMM (CP), 50 Years Global Experience
21. Frank Brus, holds a B. Comm from UNSW, spent most of his working life with the Electricity Commission of NSW
22. Ernest Buchan, Chartered Engineer MIET, Kardinya, W. Australia
23. Douglas Buerger, Fellow Australasian Institute of Mining and Metallurgy, Member of Australian Institute of Comapany Directors
24. Mike Bugler, Retired Environmental Consultant
25. Paul Buncle, Medical Practitioner
26. Tony Burns, PhD in Chemical Engineering
27. Charles Camenzuli, Structural Engineer specializing in Remedial Work, Catcam Group, Sydney
28. Ray Carman, Organic Chemist, Honorary Fellow University of Queensland
29. Peter Champness, Radiologist
30. Andrew E. Chapman, Expert on Rainfall and Flood Events
31. Michael F. Clancy, Retired Civil Engineer, Brisbane

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The most up to date Version

May be found at

www.clintel.org. *

Colofon

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The World Climate Declaration was initiated in 2019 by emeritus professor Guus Berkhout, founder of the Dutch Climate Intelligence Foundation (CLINTEL). The list of signatories is a living document that is regularly updated with new additions. The most up-to-date version can be found on www.clintel.org. *

Graphic design: www.zinontwerpers.nl
Lay-out: Little Shop of Graphics (www.visg.nl)

#15

FILE NAME WEATHER MODIFICATION CANADIAN STATES LEAD IN BLOCK FED/UN/WHO EDICTS

States lead in blocking Fed/UN/WHO edicts, weather modification

https://canadafreepress.com/article/states-lead-in-blocking-fed-un-who-edicts-weather-modification

Instead of "States" replace with "Province" Same applies to Canada too."

Those white fluffy streaks seen criss-crossing what would otherwise be blue skies are not a figment of the imagination. They are attempts to alter the earth's natural weather patterns, and are the real manmade influence on "climate change"

By A. Dru Kristenev ——Bio and Archives--April 11, 2024

National sovereignty is up for grabs as far as international money interests are concerned. They may have a point in that too many politicians are willing to sell-out their country for a pittance when compared to the trillions of dollars (and other currencies) controlled by the One Percent, whose wealth in America has reached $44 Trillion.

In the United States, what the billionaire class may have overlooked is the founding document that stands between them and their attempt to take over the nation via a compromised administration, judiciary and Congress. The Constitution, which powerbrokers believe is easily trod upon, empowers the 50 singular entities – the states – more than the confederation seated in Washington, D.C.

State legislatures are waking up to the fact that the national constitution limits federal power to herd them into compliance, retaining ultimate authority in the hands of the individual states and the people.

While the World Health Organization is ramping up their effort to try to force all (if they can get it) nations to submit to its unethical and illegitimate authority, states like Louisiana are invoking their Ninth and Tenth Amendment rights to reject it.

#15

There appears to be a void of comprehension about the scope of authority that can be wielded over Americans by treaty. Chalk it up to schools no longer teaching proper English grammar but replacing it with language arts. As much as progressives (communists, really) have tried to brand the U.S. Constitution as a "living" document in an effort to make the language malleable to suit what's currently popular, the document is to be plainly interpreted exactly as written.1

Accordingly, no other agreement or treaty can supersede the Constitution, and any treaty that attempts to override or undermine the individual rights of American citizens is not enforceable. Not only that, but states' obligation to protect the rights of their citizens, even at the expense of federal regulations or legislation that would impugn those rights, gives states the ultimate power to nix such infringement.

Recognizing this charge to protect their citizens, Louisiana has passed legislation that denies international entities such as the WHO, United Nations, and World Economic Foundation from attempting to impose authority within, or interfere with, the state.

Other states have begun to deny access to programs that have heretofore run roughshod over state authority.

The Tennessee Senate recently passed a bill banning weather modification and geo-engineering in their state, and has now passed it on to the Tennessee House. Despite legacy media demeaning the effort as empowering conspiracy theories about whether these programs exist, cloud seeding and other forms of weather manipulation are decades old, and a wider range of methodologies have since been implemented.

Here is an article from William and Mary Law that describes cloud seeding, weather modification and solar geoengineering policy from 2021 Enhancing the Weather: Governance of Weather Modification Activities of the United States.

Take a gander at another article from Technology Review about titanium dioxide particles used in seeding clouds:"titanium dioxide nanoparticles as a shell layer and sodium chloride crystal core. This nanoengineered shell core structured material can be activated at much broader relative humidity conditions such as about 65%. Because the coated nanolayers are more hydrophilic and porous, the water can be absorbed easily and increase the local relative humidity of the crystals and increase the probability of forming water droplets. So it is a synergistic effect."also: "We designed and fabricated a porous nanocomposite of 3D reduced graphite oxide and silica dioxide nanoparticles."

"One patent is filed on the titanium dioxide, sodium chloride material for warm cloud seeding, and another patent is filed for porous graphite oxide, silica dioxide, nano

#15

compensated for cold cloud seeding."

Take New Hampshire that has also begun action to halt stratospheric aerosol injection, and place limits on geo-engineering in what shows up in the skies as chemtrails that the media denigrates as a fairy tale.

None of the above are imaginary. Solar Radiation Management (SRM) has hit the big time with an unannounced experiment being conducted in San Francisco Bay area April 4, 2024. Scientific American ran an article describing the quiet pursuit of geo-engineering to block sunlight. This is being heavily promoted by Bill Gates, who has spent billions to indoctrinate the masses with the ludicrous idea that global warming (which actual statistics negate) can and should be manipulated by shooting salt crystals (to start) in an aerosol form into the atmosphere to inhibit the sun's rays from making their way to the earth's surface.

Should readers still believe that this is unsubstantiated and the states are jousting with windmills, here are a few more articles for reference:

Weather modification project reports from NOAA: Weather Modification Project Reports

How geoengineering works; from Rutgers regarding SRM Solar Radiation Management with sulfur; 100 patents on weather modification; and this one on inadvertent weather modification.

To cap it off, the DOD is interested in geo-engineering as a deterrent to Directed Energy Weaponry (DEW) that media has partially written off as a rightwing fable.

Noticing the problems being created by weather modification efforts, states must pass serious legislation to prohibit private, NGOs, and governmental entities from spraying and dropping nanoparticles from the heights. It should be noted that weather modification isn't being practiced all around the world, but experimentation has been concentrated in North America, particularly the United States.

Those white fluffy streaks seen criss-crossing what would otherwise be blue skies are not a figment of the imagination. They are attempts to alter the earth's natural weather patterns, and are the real manmade influence on "climate change."

1. Of interest: it's nearly impossible to find a website that quotes the Constitution without adding their ideological "interpretation," assuming that We, the People aren't capable of understanding the original text.

Former newspaper publisher, A. Dru Kristenev, grew up in the publishing industry working every angle of a paper, from ad composition and sales, to personnel

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management, copy writing, and overseeing all editorial content. During her tenure as a news professional, Kristenev traveled internationally as a representative of the paper and, on separate occasions, non-profit organizations. Since 2007, Kristenev has authored five fact-filled political suspense novels, the Baron Series, and two non-fiction books, all available on Amazon. Carrying an M.S. degree and having taught at premier northwest universities, she is the trustee of Scribes' College of Journalism, which mission is to train a new generation of journalists in biblical standards of reporting. More information about the college and how to support it can be obtained by contacting Kristenev at cw.o@earthlink.net.

https://canadafreepress.com/article/states-lead-in-blocking-fed-un-who-edicts-weather-modification

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File Name: Weather Modification Aircraft Cloud Seeding over Northern California.

Aircraft 'cloud seeding' was done over NorCal this morning.

Here's what that is and how it can he...VIDEO

Mar 15, 2022

For the first time in over two months, measurable rain fell this morning in California's Central Valley. At the same time, a special aircraft was navigating the gray skies releasing flares into the clouds below. Those flares contained a chemical solution that acts as "cloud seeds." The concept of cloud seeding has been used off and on, mainly by militaries, since the 1940s. It is a type of weather modification that can boost the productivity of rain or snow-producing clouds. Here's the basic science.

https://www.youtube.com/watch?v=BElZrnuskq8

Phase 2 - block the sun and destroy farmers

https://www.youtube.com/watch?v=PbWKHKZYT5c

BELOW ARE INDIVIDUAL COMMENTS BY INDIVIDUALS

Phase 2 - block the sun and destroy farmers

When BC has lots of forest fire why they did not use this cloud seeding and bring more artificial rain to stop the fire.

Why do the experts not cloud seed over forest fires?

Won't this increase the amount of metal in air?

Forget weather, this has massive potential to be used as a bio/geo weapon.

They've been able to do this since the 1970s as fair as I'm aware.

'm fairly convinced this is one of the root causes for these increasing droughts. China is conducting this technique to green it's deserts across an area of 5.5 million km². If you make it rain artificially here, then that rain will not fall where it was supposed to fall, given those clouds are gone. This likely has a significant impact on global weather patterns and global wind currents.

Also, if we can affect the climate with these geo-engineering techniques to reverse 'climate change', then it's entirely possible to affect the climate in such

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a way that it appears as though the climate is rapidly changing. They're using climate change to reduce the freedom of everyone, while making the people pay for things unnecessary/damaging for the sake of evermore power and profit.

I used to believe the whole climate change issue, but seeing how they claim they're going to tackle the problem really made me wonder whether any of it is actually true. None of the proposed measures will have the proclaimed effect. If things really are as dire as they say, I'd imagine they'd actually try to remedy the problem instead of imposing the useless/damaging measures we see and hear today. Do we emit too much CO2? Absolutely. But not in the way they claim. Carbon is a vital, nay THE vital ingredient in ALL living things we can see and touch. the problem is imbalance. We cut down trees and poison the oceans while emitting increasing amounts of CO2. That has to change. How? Farming procedures must be altered to heal the land instead of destroying it. We must stop the all-for-profit-industries. Stop producing these utterly useless gadgets & gizmos that break down the moment you unbox it. Or things that are completely unnecessary to begin with.

The real problem is the poisoning/polluting of land, air and water, and thereby all other living things on this planet. PFAS, phthalates, and many other chemicals humans invented and are now seeping into everything we eat, drink, breathe, ...

'Climate change', the excess of CO2 in the air, is an easy fix compared to the continuous pollution with manmade forever-chemicals. The latter is likely impossible to fix at all. We can only prevent it from getting worse. That's what we should do...but we don't...because it's inconvenient and "not economically viable".

Insurance companies seed cloud seeding projects in alberta *

Why couldn't this be Used to help the fires in Cali, Brazil and Australia...we lost so much forest and animals. I don't understand

Think this out if control, crazy floods everywhere

That's not true at all, it doesn't have to be cloudy. They use it in the clear Middle East to rain daily

Ok, cloud seeding, seems harmless enough.. fly a plane, drop some frozen water- it combines with the moisture in the air & POOF; Rain. We as a society accept this & who's to say 1 in 10 of those planes aren't dropping carcinogens or poisonous chemicals, hard metals - whatever.. we truly are down a sketch

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road.

Its great in theory but the chemicals they really use for cloud seeding can be toxic to life, human and animal! ow, and plants, and it makes Bush fires so much more flammable and the smoke more toxic to breath in..

You didn't talk about the enormous flooding it can cause and destruction of property.I remember when cloud seeding was considered a conspiracy theory.

Remember the movie, Forest Gump? when he was in Vietnam and it rained for FOUR MONTHS? that was Military Modification (weapon) tactics, to slow down the Vietcong or disrupt them for lack of a better word. The U.S Military has weapons beyond our knowledge. Hugo Chavez wasn't too far of when he said that the earthquake in Haiti was intended for Venezuela but somehow it backfired and that the (USA) has weather modification weapons that (maybe) in a hundred years from now will be known. Just think about this "cloud seeding" science in the 196os Vietnam era most folks couldn't understand this science (used for military purposes first!!)

Next to admit is dynomat which is used to make it not rain.

dney and Queensland 2022. I've seen a lot of small airplanes the past couple of weeks and there has been non stop rain

"He that controls the weather will control the world."

Germany and Europe and China July 2021.

So this is what hit us in Texas smh.

Dubai has cloud seeding last week and it's cold as hell rn,coz it's raining lol

hat about creating hurricans, tornados to destroy cities? Patent US20030085296A1

"What are the negative effects of cloud seeding? Risks or concerns like unwanted ecological changes, ozone depletion, continued ocean acidification, erratic changes in rainfall patterns, ..." Forbes - 22 Jun 2017. Silver Iodide can also cause miscarriages and fetal abnormalities, as well as other symptoms. Just google it.

After calling people crazy for decades, they finally tell us it's true

This is about controlling people and dollars, if you control the weather you control the food

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Cloud seeding is just cutesy name for weather manipulationIf only the masses could watch this and really understand what they're doing.

So they finally admit that they can control the weather. I hate our government more and more everyday

They were seeding clouds back in the Vietnam war.

I remember in 3rd or 4th grade (early 80's,late 70's) reading a 'recommended" book called, "My Dad, the weathernan" or something similar (can't seem to find book now) and it was a story about a little girl's Dad, a weatherman, who told his daughter about how "rain can be made". Beginning of storey went into how she and her friend were complaining about how hot it is. Then, her Dad went into detail about how rain can be "made" through the use of airplanes...intro into geo-engineering ...I dismissed it but now, later on, I see that this has been going on for quite some time now. People want to easily label others as "conspiracy theorists " yet, the truth comes out in the end. Why mess with Mother Nature to begin with in the first place? What else is going on up there?

Definitely wondering if this is what's currently caused the extreme weather conditions hitting Australia right now

I am here after a week of rain and hail in the uk in May! Crazy weather!

We could only have wished this technology was used over Lahaina to save lives & prevent it from devastation when their officials turned off all water supply causing firetrucks unable to fill up & sprinkler systems from serving purpose all for excuse water shut off was needed for watering crops instead of used for fighting the fire +saving lives.

https://www.youtube.com/watch?v=bU4z8ZiX_eA

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FILE NAME WEATHER MODIFICATION UN's "Chicken Little" Of Climate Change Makes Ridiculous Demands And Moronic Claims

Really, how stupid do they think we are?

UN's "Chicken Little" Of Climate Change Makes Ridiculous Demands And Moronic Claims

Canada Free Press **April 13, 2024**

https://canadafreepress.com/article/uns-chicken-little-of-climate-change-makes-ridiculous-demands-and-moronic-claims

The Covid "plandemic" was a monstrous scam that was perpetuated on most of the world. The elites orchestrated a training exercise that accomplished two things very high on the New World Order agenda. First, they learned how compliant people are when you endlessly lie to them and invoke fear as part of the compliance regimen. Second, they used untested vaccines, unjustified lockdowns, respiratory damaging masks, and irrelevant social distancing requirements which when combined, caused millions to die and planted medical time bombs within additional millions that are yet to explode.

Simon Stiell, Executive Secretary, United Nations Climate Change: "Two Years to Save the World"

Yet, the climate change hoax, ... Yes, I said HOAX will do more damage worldwide than the "plandemic" ever did. "Climate Change" DOES NOT EXIST! The plan for climate change is to orchestrate the largest transfer of financial wealth to the elites that the world has ever known, as well as the most massive reduction of human rights that will eventually reduce the world to two classes. By believing the climate change lie, you will be essentially exterminating 75 to 90 percent of the human race and reducing those that survive to slaves.

Earlier this week, Simon Stiell, the Executive Secretary of United Nations Climate Change, gave a speech at Chatham House in London. During his speech, Stiell emphasized the importance of prioritizing climate change. He warned that if people fail to make climate change their top priority, the world could be destroyed within two years.

In fact, this wack job titled his speech, "Two Years to Save the World." Naturally, money was one of the first things that Stiell discussed, demanding "a quantum leap in climate finance this year."

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Leaving no leftist stone unturned

"As of today, national climate plans, called Nationally Determined Contributions or NDCs, in aggregate will barely cut emissions at all by 2030." He went on to explain, "why the next two years are so essential in saving our planet, and how there's no room for half measures."

He went as far as to imply that defeating climate change outweighs trying to cure pandemics or ending poverty and hunger. Leaving no leftist stone unturned, he even preposterously suggested that increasing gender equality can help in curbing climate change.

He stated:

"Let's consider for a moment what is up for grabs if we do make the next two years really count. Bold new national climate plans will be a jobs jackpot and economic springboard to boost countries up that global ladder of living standards.

"In the face of crop-destroying droughts, much bolder climate action to curb emissions and help farmers adapt will increase food security, and lessen hunger. Cutting fossil fuel pollution will mean better health and huge savings for governments and households alike. The transformative potential of bold climate action – in tandem with steps to advance gender equality – is one of the fastest ways to move away from business as usual.

Stiell then went on to threaten the American public with inflation

"For those who say that climate change is only one of many priorities, like ending poverty, ending hunger, ending pandemics, or improving education, I simply say this: none of these crucial tasks – indeed none of the Sustainable Development Goals – will be possible unless we get the climate crisis under control.

"In fact, business-as-usual will further entrench the gross inequalities between the world's richest and poorest countries and communities that unchecked climate impacts are making much worse. These inequalities are kryptonite for cooperative global climate action, and every economy, every country and its people pays the price of that.

"To start curing this global cancer of inequality, we need to enable bold new national climate plans by all nations that protect people, boost jobs and drive inclusive economic growth. And we need them by early next year. The next generation of national climate plans must be investment plans for sustainable and strong

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economies."

Stiell then went on to threaten the American public with inflation. Claiming arrogantly that if people think inflation is bad now, wait to see how bad it will be if climate financing isn't increased.

Hinting at the possibility of implementing carbon taxes

"We have just seen what supply chain disruptions flowing from covid did to inflation, and to households and businesses. Well, you can bet your bottom dollar these disruptions and inflationary impacts will only get dramatically worse, without bolder climate action.

"So, the financial firepower the G20 marshaled during the global financial crisis should be marshaled again and pointed squarely at curbing runaway emissions and building resilience now."

He reiterated the importance of securing new financing and called on the world's population to take action, while also hinting at the possibility of implementing carbon taxes.

"Ultimately, it's not enough to invest in clean energy and resilient infrastructure without measures that also speed up the decline of fossil fuels. Stronger domestic progress on carbon pricing is essential to reflect the real economics of fossil fuels, including the massive health and economic costs of greenhouse gas pollution, which should not be shunted on to government, households, and other industries to pay. When I say we have two years to save the world, it begs the question – who exactly has two years to save the world? The answer is every person on this planet."

During the World Economic Forum meeting in Davos, Switzerland earlier this year, a panel of leftist elites suggested that carbon taxes are necessary and should be implemented soon.

No scientific basis for the fast-paced fossil fuel phaseout agenda

They also mentioned that the required framework to implement these taxes is already in place and just needs to be put into action.

Stiell mentioned that COP29 and COP30 are crucial events to obtain more funding and reassert the phony global necessity to combat climate change. Unfortunately, the previous climate forum, COP28, had a rocky start, as the meeting's president acknowledged that there was no scientific basis for the fast-paced fossil fuel phaseout agenda.

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There is an expression that says if you tell a lie long enough and often enough, people will believe it. By their own admission, there is no scientific basis for the fast-paced fossil fuel phaseout agenda. In other words, the entire story is being fabricated.

The Earth is estimated to be 4.54 billion years old. Like other planets, it was formed in the early days of the Solar System, which began to form about 4.6 billion years ago.

The Hadley Centre for Climate Prediction and Research located in the U.K. has some temperature measurements beginning in 1850, but there is insufficient data before 1880 for scientists to estimate average temperatures for the entire planet.

So, the planet is 4.54 billion years old, and we have accurate temperature readings for less than 150 years. There is no such thing as climate change, and we need to shoot down these lies at every opportunity.

Really, how stupid do they think we are?

Milt Harris——Bio and Archives

Milt spent thirty years as a sales and operations manager for an international manufacturing company. He is also a four-time published author on a variety of subjects. Now, he spends most of his time researching and writing about conservative politics and liberal folly.

https://canadafreepress.com/article/uns-chicken-little-of-climate-change-makes-ridiculous-demands-and-moronic-claims