Written by **Ed Hiserodt** on June 9, 2010

Climate-change Science

Last December, as even every cloistered monk and Third World inhabitant probably knows, there was an International Conference on Climate Change in Copenhagen, attended by government functionaries from around the world. The pampered delegates, who evidently weren't worried about their own carbon footprints, caused a Scandinavia-wide shortage of black stretch limousines.

The conference actually had very little to do with climate change, ignoring almost out-of-hand the prominent news at the time: the Climategate scandal — the release of the e-mails indicating top global-warming scientists were skewing temperature data and engaged in a smear campaign against climate-change skeptics. But the conference had much to do with money. So-called Third World countries demanded reparations for damage done to their satrapies by CO2 emissions from industrial nations, totally ignoring the fact that but for those nations said delegates would be sleeping in huts instead of five-star hotels. Certainly there was little room for science or the consequences of turning the economies of the world on their heads through instituting carbon-emission limits.

In stark contrast to the Copenhagen affair, the 4th International Conference on Climate Change, sponsored by the Heartland Institute, convened May 16, 2010 on Chicago's Magnificent Mile. Without their hands in taxpayers' pockets, attendees had to pony up $540 for the conference, and nearly $300 per night for a room. Some 800 in attendance came from over 40 countries, including a sizable contingent from "down under" where a "cap and tax" debate has been raging for the last few years and recently soundly defeated. But how many of you heard about the Chicago conference and the long list of experts who gave presentations there, making the case that global warming is not a problem?

Let's look at some of the general subjects of inquiry and extract parts of many presentations that are applicable to those subject areas. First we'll look at something simple: Is the Earth warming?

Is the Earth Warming?

Ha, ha. That's my little joke, being as determining some mean temperature of the Earth is anything but a trivial problem. Where the heck are we going to stick the thermometer?

Surface Temperatures: As in most scientific matters, terrestrial temperatures are measured in degrees Celsius. So if we add the daily low temperatures for every point on Earth to the corresponding high temperatures, then divide by two, we should be able to get the average temperature for the Earth for that day. Then we add these up for a year, divide by 365 and get the average temperature for the year. We'll compare this to previous years where this same procedure was done, and we can tell if we're warming or cooling. Of course, we're not measuring temperatures at all points on Earth, and in fact the number of weather stations has decreased. (In Canada the number fell from 600 in 1975 to 35 in 2009.) And to whom should we entrust these data?

There is, in general, much anecdotal information showing that the Earth has been warming in recent times. Both Revolutionary and Civil War records describe rivers that were frequently frozen during winters of their day, but do not freeze today. An example is the Arkansas River at Little Rock, where Union Army reports speak of an annual ice bridge across the river capable of supporting both foot and wagon traffic, something no one alive today has ever seen. As a result of these sources, there has been general agreement that we are in a warming trend since the 18th century, and this trend has continued into the late 20th and early 21st century. This was more or less a "given" in the debate over climate change.

On November 19, 2009, this house-of-concurrence over recent global temperature records came tumbling down when the holy-of-holies repository for all these records — not just the modern ones since we've had thermometers, but the paleotemperature analyses that give us a historical account of what temperatures were in the Middle Ages and earlier — was caught fudging data and committing other improprieties. Where were the records held? They were at the CRU — the Climatic Research Unit — located at East Anglia University in merry old England. And the chief keeper of records? None other than discredited Professor Phil Jones.

As Cato's Dr. Patrick Michaels pointed out in his keynote address at the Heartland conference, we should have been suspicious of Jones all along. Data were constantly being adjusted in a manner to make them appear to show a warming trend. Using the same data, the temperature for 1950 mysteriously drops between IPCC assessment reports, causing the slope of the Temperature vs. Time curve to become steeper, and therefore more ominous. Another example was the squelching of weather-balloon data from the tropics because of alleged "noise" in the readings. Dr. Michaels noted that it is well known that warming is more prevalent in the higher latitudes than in the tropic, so the effect of Jones' action was "throwing out all the data that didn't show any warming." Jones and the CRU were about as forthcoming with temperature data as Colonel Sanders was about his chicken recipe. For example, when in 2005 Australian climatologist Warwick Hughes requested temperature data he thought was suspicious, Jones wrote back, "We have 25 years or so invested in the work. Why should I make the data available to you, when your aim is to try and find something wrong with it?"

In later years requests were turned down because the data were lost, or because there hadn't been enough computer storage for the original raw data, so all that was available was "the homogenized, value-added product."

If anyone questions that data were being intentionally withheld — in this case from a threatened Freedom of Information request — the following e-mail from Jones to Michael Mann of the hockey-stick temperature-graph infamy, should put any doubts to rest:

> Mike, Can you delete any emails you may have had with Keith re AR4 [Fourth IPCC Assessment Report]? Keith will do likewise. He's not in at the moment — minor family crisis. Can you also email

> Gene and get him to do the same? I don't have his new email address. We will be getting Caspar to do likewise.

In February 2010, serious questions arose concerning the "fabrication" of data from weather stations in remote China where a dramatic rise in global temperature was attributed by an IPCC report to anthropogenic (man-made) changes in climate. The effect of urbanization was pointedly ignored as "at most an order of magnitude less than the warming seen on a century timescale." This de-emphasized the "urban heat island effect" in which roads and buildings cause temperature increases. This effect can be most easily understood by imagining where you would prefer to spend a summer evening: on a shopping center parking lot, or in a grassy field. Pavement and buildings absorb and re-radiate far more heat energy than fields and forests.

Heartland conference speaker Steve McIntyre, a Canadian "hard rock mineral explorer" for 30 years and amateur mathematician noted for his refutation of Michael Mann's discredited "hockey stick" graph, challenged the following statement in the National Oceanic and Atmospheric Administration (NOAA) report: "Contrary to generally accepted wisdom, no statistically significant impact of urbanization could be found in annual temperatures." To the contrary, McIntyre showed the difference between urban and rural temperatures for the set of stations used in the NOAA report was 0.7 degrees Celsius, and between large cities and rural areas as much as two degrees. This is four times the temperature rise recorded in the United States over the last hundred years!

But wait, there's more. While the financial haggling was still going on in Copenhagen, Russian news agency Ria Novosti reported the Moscow-based Institute of Economic Analysis (IEA) charged that the CRU "had probably tampered with Russian climate data." The IEA said Jones' organization had only used data from 25 percent of Russian meteorological stations, and those stations happened to be the ones with the warmest temperature readings. IEA founder Andrei Illarionov's analysis concludes that an artificial increase in warming of 0.64 degrees Celsius resulted from an exclusion of 40 percent of Russian territory.

One of the more interesting documents discovered as a result of Climategate is known as the HARRY_READ_ME log where CRU programmer Ian "Harry" Harris wrote about the "hopeless state of their data base. No uniform data integrity, it's just a catalogue of issues that continues to grow as they're found…. There are hundreds if not thousands of pairs of dummy stations … and duplicates … Aarrggghhh! There is truly no end in sight. This whole project is SUCH A MESS. No wonder I needed therapy."

Thank goodness, you say, for the good old reliable USA. Certainly we keep accurate records even if Jones, et al., have completely fouled up global temperature records in an attempt to manipulate data to provide the IPCC with records verifying the need for massive government intervention, control, and taxation. So sorry. We are just as bad.

As meteorologist Anthony Watts, founder of SurfaceStations.com, pointed out in his presentation, our official temperature records come from 1,221 National Weather Service locations. In an audit of 860 stations, 89 percent failed to meet the Service's siting requirements that instrumentation must be 30 meters from any artificial heating/radiating or reflecting heat source. According to Watts, the errors in the record "exceed by a wide margin the purported rise in temperature of 0.7 degrees C during the twentieth century."

While some $89,000,000,000 in U.S. tax dollars have been spent on climate research and renewable

energy source subsidies, thanks to the destruction of data by the climate alarmists to conceal what is actually happening, there is apparently no reliable record *anywhere* of the Earth's surface temperature history. Yet we are expected to sheepishly go along with destroying our lifestyles on the basis of not a whit of reliable evidence of any actual temperature increases, much less any of anthropogenic causation.

Satellite Data: Measurement of atmospheric temperatures by satellite began in 1979 and was first reported on (*Science*, 1990) by conference speaker Dr. Roy Spencer of the University of Alabama at Huntsville, with his colleague Dr. John Cristy. From the beginning there was tension between the CRU and those providing the satellite data. This was owing in part to the fact that satellite temperatures did not mirror the steady increase in surface temperature from the CRU — and quite possibly because the IPCC did not have control over the collection and dissemination of the Huntsville data.

An example of the growing disparity between the satellite and station data was the announcement by NOAA (generally in agreement with the CRU and the IPCC) that June 2009 was, for the globe, the second warmest June in 130 years, just below that of 2005. In contrast, the Huntsville data showed June 2009 to be the 15th *coldest* in 31 years, in close agreement with Remote Sensing Systems (RSS) that assessed it as the 14th *coldest* since satellite measurements began. You cannot have it both ways.

The first 30 years of Globally Averaged Satellite Temperature of the Lower Atmosphere is included in *The Report of the Nongovernmental International Panel on Climate Change* and shows a basically undetectable rise of 0.09 degrees Celsius over those three decades. While many alarmists' models are predicting a four or five degree rise by 2100, extrapolating the actual temperature rise for the next 90 years yields less than a single degree. When data and models disagree, the ration-al scientist will choose the data. A daily report on satellite temperature can be seen online at www.drroyspencer.com.

Ocean Temperatures: With 80 percent of the Earth's surface covered with water, one might wonder about sea temperatures and how they interact with other terrestrial measurements. Taking the ocean's temperature is not as straightforward as one might think since, among other factors, measurements made by ships are dependent on the depth at which they are taken. Indeed the surface is constantly "turning over" and currents are moving water at great depths driven primarily by the temperature differences between the tropics and polar regions.

During the last decade, when the temperature has refused to meet the IPCC's upward prediction, alarmists have suggested that the heat was being stored in the ocean, and that eventually it would come back with a vengeance to destroy civilization as we know it.

To measure the heat content of the oceans, it is necessary to obtain a temperature profile, i.e., a record of the temperature at various depths. From these data the heat content of the ocean can be calculated. To facilitate such measurements, NOAA's ARGO program began in 2003 to deploy buoys that could dive as deep as 2,000 meters (more than a mile), recording temperature and salinity data on the trip down and back. On the surface these data, along with position information that shows effects of ocean currents, are transmitted to a satellite before the next elevator ride.

Although deployed seven years ago with worldwide coverage, the ARGO fleet of 3,341 floats is *not* used operationally. Why would this very expensive NOAA project be languishing, even though it is providing the data it was intended to provide? Simple. It *is* providing the data it was intended to provide, but this isn't the data that fits in with NOAA's bias toward global warming.

But What if We're Wrong?

Our planet is coming out of a very unhappy and dangerous time for the human race: the Little Ice Age that reached its minimum temperatures about 1650. It would not be unusual for this warming trend to continue — if we are lucky, as a return to the cold climate of the geologically recent past would be truly devastating to life as we know it. In the next section we shall see the folly of the anthropogenic global-warming (AGW) position, and why the question to be answered is not whether there is such a trend, but if is it caused in any significant way by human activity. But for now let us look at the effects of a warmer planet.

There is an online list called "Global Warming Ate My Homework" showing 100 unfounded examples of how global warming is already supposedly destroying civilization, even though the temperature rise in the last century has been less than one degree Celsius. The real horror of this rhetoric is that far too many people believe it, and we would be remiss in not addressing their concerns.

The first poster child of the AGW movement was the polar bear — never represented as the malevolent beast that zoo keepers fear among all their charges. The bear was pictured on an ice floe apparently floating to sea because AGW had destroyed his icy habitat.

Over time the truth came out: Out of 13 known colonies of bears, 11 were increasing in population (to the chagrin of their potential victims) and the other two were holding steady. A total of two bears were killed from storms. (Likely not heat waves.) While never reported by the mainstream media, polar bears are known to have been around for at least 10,000 years — which includes the period when Greenland was being farmed, and temperatures in the arctic region were much higher than today.

As it is hard to refute every disastrous claim by *bona fide* crazies worldwide, let us instead look at some of the scientific evidence presented at the Heartland Climate Change Conference.

Ocean Acidification: This is a perfect new concern of the alarmist camp because of the difficulty in refuting their claims. Actually, there was at least one scientist who noticed in the alarmist literature an emphasis on this subject and prepared a rebuttal in advance: Dr. Craig Ipso, founder of the Center for the Study of Carbon Dioxide and Global Change. In his presentation Dr. Ipso reviewed over 500 papers on the subject, and quantified their conclusions on the basis of such criteria as survivability, reproduction rate, and life cycle. He also analyzed the possible limits of negative pH values attainable in a "real" ocean. His results showed, on balance, that a pH decrease is beneficial to ocean organisms. His research will be published soon and more information will be available on his website, www.co2science.org.

Plant and Animal Extinctions: Robert Ferguson, president of the Science and Public Policy Institute, presented a paper that showed plants flourished at higher temperatures when atmospheric CO2 content is increased. Photosynthesis efficiency also increased, as did the maximum temperature at which plants die from heat-induced death. The advantage of increased CO2 is attested to worldwide by increases in crop yield and plant growth.

Mortality: If an increase in temperature is unhealthy for humankind, why is mortality worldwide significantly higher in winter months than summer? In the United States, we have 108,500 excess winter deaths, so why do we want colder weather (unless we're trying to rid the planet of pesky human beings)? Dr. Indur Goklany of the American Enterprise Institute answers these questions and notes that the worst crisis facing the world's population is that of people being "underweight," caused in part by high agricultural cereal prices driven up by the insane burning of our food in the form of ethanol.

Sea-level Rise: Visit any public school — and many private ones — and you will see posters on the

classroom walls showing Florida, or the Statue of Liberty, being submerged by a rise in sea level. Children have been convinced by abusive propaganda that our country is in great peril because of SUVs and power plants, and their future is dependent on stopping the industrial engine that provides them a standard of living never known in world history. But what is the truth about eustatic (global) sea-level rise? In short, it is not happening.

Rises in sea level are typically referred to in millimeters per year. One mm/yr over 100 years would be 10 centimeters, or about four inches. Dr. Nils-Axel Mörner, director of the Paleogeophysics and Geodynamics unit at Stockholm University, presented a spectrum of estimates of present sea-level rise rates. The highest was from satellite altimetry at three mm/yr, although the original data before "personal calibration" was less than one mm/yr. Other IPCC models and selected tide gauges were approximately two mm/yr, while global records from 1840 to 1940 were at one mm/yr. A recent average of 159 tide gauge stations showed about 0.5 mm/yr. And observation of the Maldives, Bangladesh, Tuvalu, and other "threatened" areas were at zero mm/yr.

Dr. Mörner gave special attention to the Maldives, where there are quite accurate records going back 1,600 years. Between 1600 and 1700, sea level was 50 cm (20 inches) above present levels, dropping sharply to 12 cm below that until about 1800. There was a rise again of some 30 cm, followed by a 20 mm fall in the early 1970s to present levels. Even though the President of the Maldives posed in knee-deep water and the Cabinet performed duties in SCUBA gear to dramatize the need for reparations from industrialized nations, there has been *no* sea-level rise in the Maldives in 30 years.

Arctic Ice Loss: Uh-oh. There may be a real problem here as reported by the U.S. Weather Bureau. "The arctic ocean is warming up, icebergs are growing scarcer and in some places the seals are finding the water too hot. Reports all point to a radical change in climate conditions and hitherto unheard-of temperatures in the arctic zone. Expeditions report that scarcely any ice has been met with as far north as 81 degrees 29 minutes. Great masses of ice have been replaced by moraines of earth and stones, while at many points well known glaciers have entirely disappeared."

Wait a minute. This news is from a U.S. Weather Bureau report from 1922.

The Crux of the Matter

The real question, indeed the *only* significant question in the science of this debate is: *Are increases in global temperatures caused by mankind's activities, in particular the emission of carbon dioxide from the combustion of fossil fuels?* All other questions, while interesting and vital in the context of a warming planet, are of lesser consequence.

Let us look at the core of the debate over greenhouse gases and global warming, beginning with, "What effect do greenhouse gases have on the Earth's temperatures?" Without the greenhouse effect, solar radiation would be absorbed by the Earth during the day, and then this energy would be radiated back into space at night. This would cause a wide temperature swing as seen in the desert, where the most important greenhouse gas, water vapor, is basically missing. The greenhouse effect can be beneficial, so the question becomes, "Can too much greenhouse gas by man cause catastrophe?"

Because water vapor totally overwhelms any effect of CO2 at low altitudes, let us imagine a layer of CO2 at, say, 10 km over the tropics and determine its effect. Long wavelength radiation (heat) is trapped by the CO2 molecules, which does increase the ambient temperature. This is agreed to by both alarmists and realists. With a doubling of CO2, it is relatively simple (for other people) to calculate that an increase of about one degree C would occur. Again, no debate here.

The increased temperature, however, causes other changes such as increased radiation, increased evaporation, and differing effects on cloud formation, depending on altitude. Those who believe in AGW argue that this "feedback" is positive, meaning that the increase in temperature causes a further increase in temperature. In all the 22 models used by the IPCC, positive feedback is assumed and by so doing causes the increase in temperature to climb from one degree to three or more degrees depending on the model. (One might consider that if the feedback were actually positive, we would be in danger of "runaway heating" — increased CO2 would cause increased temperatures, which would cause increased water vapor, which would cause even higher temperatures, and so on. They ignore that CO2 has been much higher in the past without any such effect.)

For about 10 years, scientists led by MIT's Richard Lindzen and the University of Virginia's Fred Singer have been collecting data from two satellites designed to observe how much radiation was escaping from Earth. The two satellites are the Earth Radiation Budget Experiment (ERBE) and the Clouds and the Earth Radiant Energy System (CERES). The results of years of careful measurement with some of the most sensitive instrumentation ever created shows that *more* radiation is escaping than if there were no feedback. In short this means that the Earth's temperature is self-regulating, since an increase in temperature from CO2 causes more heat to escape, bringing the temperature down. This is incontrovertible evidence of negative feedback and, if science were honest, all IPCC models would be scrapped as forecasting tools and we could start debating something of real importance.

Your correspondent would like to give Dr. Art Robinson, president of the Oregon Institute of Science and Medicine, the last word on this subject. His plans to be at the Chicago conference were sidetracked by his campaign for the Oregon 4th Congressional District Republican nomination (which he won quite handily). In videotaped remarks, Dr. Robinson sent the following message to the conferees: "Never before in the history of science have so many resources been spent to disprove such a miserably poor hypothesis."

Thanks to those like Dr. Robinson and the sponsors and participants at this 4th International Conference, we are well on the way to finally scuttling this "miserably poor hypothesis."