**Plimer's Heaven and Earth: Global Warming the Missing Science**

*By William Walter Kay*

**Intro**

Ian Plimer is a world-class geologist with a successful career in mining and academia. The author of 120 scientific papers and seven books, Plimer has earned many commendations including two of Australia’s top scientific awards. His 493-page*Heaven and Earth: Global Warming the Missing Science* (1) demolishes the anthropogenic global warming hypothesis. What follows is an attempt to lathe this text down to its 7,500-word filament.

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**Intro**

In 1974 *Time* magazine warned of global cooling. *Newsweek* did the same in 1975 as did *National Geographic* in 1976. US climatologist Stephen Schneider co-authored a book in 1977 forecasting an ice age. Crispin Tickell wrote *Climate Change and World Affairs* in 1977 to warn of global cooling. Schneider then became a prominent advocate of global warming. Tickell, Britain’s UN rep, led the 1988 launch of the central global warming promoting agency, the Intergovernmental Panel on Climate Change (IPCC).

The IPCC, a joint venture of the UN Environment Programme and World Meteorological Organization, recruited climatologists, meteorologists, and environmentalists to write voluminous publications orchestrated toward the pre-ordained conclusion of dangerous human-induced global warming. The IPCC “party line” was honed by a clique of climate modellers with everything to gain by promoting the global warming hypothesis. They cherry-picked flimsy studies supporting their hypothesis and they ignored peer-reviewed papers from prestigious journals undermining their hypothesis.

IPCC computer models impress people with little scientific training. Manipulation of source data pre-determines output. None of their 23 computer models predicted the post-1998 cooling. These models predicted intense simultaneous warming at both poles; something that has not happened in modern or ancient times. These models predicted human-induced warming would manifest in the mid-to-lower tropical atmosphere; satellite measurements show no warming in this area.

The public learns about “global warming” by being bombarded with quotes from IPCC “SummariesforPolicymakers”. These documents are not peer-reviewed.Drafts are submitted to anonymous government bureaucrats who demand changes. The Summariesare for politicians and journalists, and do not adhere to the science in the main IPCC reports. Summaries exude a certainty and orthodoxy not found in the main reports. For instance, the 1996 Summaryclaims:

“…*the balance of the evidence suggests that there is discernable human influence on global climate.”*

This statement was added by a lead author without consulting contributing scientists. The same lead author deleted four passages that expressed uncertainty about human-induced climate change*.*

With agenda-betraying bravado, prior to the release of the 2007 Summary*,* the IPCC Chairman crowed:

“*I hope that this will shock the governments so much that they take action.”*

This Summary claims: a) the climate is warming rapidly; b) this warming is mostly caused by human activities; c) industry has elevated atmospheric CO2 levels far beyond the natural range; d) humanity is consequently threatened by droughts and floods; and e) many species face extinction.

**Paleoclimatology 101**

Climate has changed throughout Earth’s 4.6-billion-year history. (2) Human forces are orders of magnitude weaker than the natural forces driving climate. Global warmings and coolings occurred long before humans appeared. Recent climate change pales compared to past change.

Earth begat oceans by 4400 Ma (million years ago). Oceans begat bacteria by 3800 Ma. Bacteria remain Earth’s greatest biomass. Bacteria live in hailstones and hot springs. They eat rocks beneath the ocean floor. Thermophile and Methanogen bacteria, which can survive temperatures over 100 C, emerged first. Such bacteria are prokaryotic (without nuclei) and anaerobic (not needing oxygen).

Our atmosphere is 21% oxygen. The atmosphere at 3800 Ma was less than 1% oxygen. The early atmosphere was made of carbon dioxide (CO2), nitrogen, ammonia, water, argon, helium, and hydrogen. UV rays were intense. The sky was brick red. An acidic rain weathered rocks on Earth’s few islands into a green soil.

Our atmosphere is 0.0385% CO2. Due to volcanic emissions, early atmospheres were 35% CO2. Airborne carbon has always been a tiny fraction of the carbon lodged in rock.

Radioactive decay of uranium, thorium, and potassium inside Earth generates heat. This radioactive heat, plus heat from the core, is convected to the surface. Plumes of heat split beneath rigid surface rocks breaking the crust. Descending cool plumes drag chunks of crust down. This multi-billion-year-old process, plate tectonics, creates continents, sculpts ocean floors, and recycles CO2.

2700 to 2500 Ma was a period of rapid plate tectonics and continent building. A light silica-alumina crust replaced a silica-magnesium crust. This continental silica-alumina crust floats over the oceanic silica-magnesium crust. Continents change climate by: reflecting solar energy, enhancing glaciation, re-directing ocean currents, and nourishing sea-life with river discharge.

The rise of continents coincided with an increase in atmospheric oxygen and the debut of eukaryotic life. Eukaryotic bacteria have nuclei. Eukaryotic cells consume CO2 and exhale oxygen gas (O2), which poisons prokaryotic cells. Atmospheric oxygen arises mainly from life converting CO2 into O2.

Ice has been intermittently present for only 20% of geological time. During the first ice age, the Huronian (2400 to 2100 Ma), glaciers reached equatorial regions and life almost ceased. After the Huronian there was an increase of life and of atmospheric oxygen. Ocean floors became blanketed by algal mats with an elephant-skin texture. Multi-cellular animals were grazing on these mats by 1500 Ma.

When the supercontinent Rodinia fragmented (825 to 750 Ma), monstrous amounts of dust and aerosols filled the air. During the ensuing Neoproterozoic Ice Age (750 to 635 Ma), glaciers approached the Equator. Earth was almost a perfect snowball. The Neoproterozoic was interrupted by hot interglacial periods wherein ocean temperature exceeded 40 C. No ocean is this warm today. Sea level rose and fell 600 metres during this ice age. After the Neoproterozoic there was another increase in atmospheric oxygen and another explosion of life.

In the Ediacaran Era (583-542 Ma) animals with hard parts evolved. The 80 identified Ediacarans resemble bizarre jellyfish, mutated worms, and quilted air mattresses. Most were soft-bodied 1 millimetre long affairs but some were a metre long and some had shells to protect them from predation and desiccation. Shell-building pulls CO2 from the air and sequesters it in limestone.

Ediacarans were overwhelmed by even bonier animals circa 470 Ma. Land plants also sprouted at this time, and they too sequestered CO2 into rock. Atmospheric CO2 levels have trended downward since this time due to sequestration. CO2 levels are comparatively low at present and the biosphere is suffocating.

The mild high-latitude Ordovician-Silurian Ice Age (450–420 Ma) was followed by the intense Permo-Carboniferous high-latitude Ice Age (300-260 Ma). The Jurassic-Cretaceous Ice Age (151–132 Ma) was confined to high latitudes, as is our ice age which hit Antarctica at 33.8 Ma and Greenland at 2.67 Ma.

Our atmosphere’s CO2 content is 385 parts per million by volume (ppmv). CO2 content was 4,000 ppmv during the Ordovician-Silurian glaciation and 2,000 ppmv during the Jurassic-Cretaceous glaciation. These were not warm periods; quite the opposite. There were other times when both temperature and atmospheric CO2 were high. There were times when temperature was high and CO2 low. There is no correlation between atmospheric CO2 levels and global temperature.

Between 112 and 88 Ma, temperatures were 14 C higher than today and the temperature differences between the poles and the Equator were far less. Antarctica was carpeted with evergreens and flowers; its winter temperatures seldom dipped below freezing, and summer temperatures hovered around 22 C.

A climate gassing at 55.8 Ma triggered a sudden 5 to 10 C warming. The 20th century warming is insignificant compared to this event. By 52 Ma again there were lush forests pole to pole.

When primates appeared, at 5 Ma, temperatures were 3 C higher than today and sea levels were 20 metres higher. The numerous primate species coexisting in Africa endured the onset of the profound cooling at 2.67 Ma. As jungles became grasslands, hominids started walking.

Over the last 2.67 million years, glaciers waxed and waned a hundred times. The last 730,000 years have seen ten glaciations separated by interglacials. These were global coolings and global warmings. Some interglacials were 5 C warmer than our interglacial.

The previous interglacial began 130,000 bp (before present). Sea temperatures were 2 C warmer, and sea levels 5 metres higher, than at present. This interglacial was not caused by high CO2.

Glaciation returned during a 400-year cold snap at 116,000 bp. The Amazon jungle gave way to grassland. Europe’s forests became tundra. Ice sheets reached New York. Icebergs drifted off North Africa. After a brief respite, 60,000 to 55,000 bp, the climate cooled to a nadir at 20,000 bp. Areas not glaciated were windy deserts. Humans eked along the glaciers’ edge. Three hominid species witnessed the start of this glaciation; one survived.

At 14,700 bp, global warming returned. Oceans have risen 130 metres since, sometimes quickly, sometimes slowly. Between 14,500 and 12,900 bp, oceans rose 1.25 centimetres per year – over five times the 20th century rate.

12,900 bp heralded a 600-year cooling: the Younger Dryas. The chill may have set in within a decade. No climate change of this rapidity and extent has occurred since. Scandinavian forests were sheered by ice sheets. Glaciers surged and calved into armadas of south-bound icebergs. The Younger Dryas ended in a 50-year heat wave wherein the climate warmed 7 C – over 200 times faster than the 20th century warming rate. Glaciers retreated, oceans rose. Trees replaced grass. Grass replaced desert.

Holocene Warming A (11,500 to 8,900 bp) brought the ascendency of humans. This era was interrupted by windy cold spells, complete with dust storms and sand dunes, possibly caused by collapsing ice dams flooding oceans with cold water.

After the Egyptian Cooling, the Holocene Warming B (8,000–5,600 bp) was 6 C warmer, and much wetter, than now. Hippopotami mucked about in Saharan swamps.

The Akkadian Cooling (5,600–3,500bp) was eclipsed by the 300-year Minoan Warming during which humans thrived. During the Bronze Age Cooling (3,200–2,500bp) the Sahara morphed into a desert.

During the Roman Warming (250 BC to 450 AD) olives were cultivated along the Rhine and citrus trees grew along the Scottish border. North Africa was a bread basket. Humans proliferated.

A bitter, dry cooling returned around 535 AD and lasted over three centuries. Ice formed on the Nile.

The Medieval Warming (900–1280 AD) was hot and wet. Tropical plankton invaded the Baltic Sea. England’s Doomsday Book chronicles grapes being grown where no grapes grow today. German vineyards were 780 metres above sea level; today they are no higher than 560 metres. Vikings established farms on Greenland. The Pope dispatched a bishop to Greenland to tend to his Norse flock. Vikings also settled on Iceland and Newfoundland; the latter they called “Vineland”. Europe’s population boomed from 30 to 80 million.

The Medieval Warming was global. China’s growing seasons were longer and more reliable. Californian forests record the Medieval Warming as do South African cave stalagmites.

The Little Ice Age (1280-1850 AD) was not an “ice age” but a cool interval within an interglacial. The Little Ice Age’s six glacial advances and retreats have been reconstructed from: glacial debris, lake sediments, mud-trapped insects, tree rings, coral growth, ice cores, boreholes, archaeological digs, and historical records. A study of 6,000 log books show 1680 to 1700 to be the coldest years. This coincides with a dearth of sunspots (Maunder Minimum). By this time: the Vikings had abandoned Greenland, the French army used frozen rivers as thoroughfares, New Yorkers crossed an ice road from Manhattan to Staten Island, and Inuit kayakers hunted off Scottish shores. There were crop failures and famine.

The Little Ice Age caused a 30% loss of global forest mass. Ontario’s forests have never returned to the diversity and productivity of the Medieval Warming.

A survey of 102 studies dealing with 20th century temperatures found 79 studies describing earlier eras as being warmer than the 20th century.

Current temperatures are colder than what they were during most of the past 500 million years. Current temperatures are colder than what they were during the four previous interglacials. Current temperatures are colder than what they were during the Minoan, Roman, and Medieval warmings.

**Mann-made Warming**

The Medieval Warming and Little Ice Age annoy climate alarmists because they are great temperature variations not attributable to industry.

The IPCC’s 1996 *Summary for Policymakers* sports a temperature graph for the last 1,000 years acknowledging the Medieval Warming and Little Ice Age.
In 2001 the IPCC displays a temperature graph for the last 1,000 years wherein the Medieval Warming and Little Ice Age are flat-lined and followed by a 20th century warming uptick. This “hockey stick” shape implies runaway warming. The “hockey stick” adorned the cover-page of the 2001 *Summary for Policymakers* and appeared four times in the text, sometimes occupying half a page.

The “hockey stick” originated in a 1998 study by Michael Mann et al. published in *Nature*. For the years 1000 AD to the early 20th century, Mann’s temperature estimates were based mainly on tree ring analysis. However, to represent the 20th century, he surreptitiously grafted thermometer readings (mostly from urban areas) onto this temperature line. This “trick” generated the sudden warming uptick. This study re-appeared in the IPCC’s2001report entitled, “*Was there a Medieval Warming and Little Ice Age*?” where it relegated these two global climate changes into trivial North Atlantic anomalies. Mann, a recent grad, became an instant celebrity. He was made an editor of the prestigious *The Journal of Climate* and an IPCC lead author.

By embracing the “hockey stick” the IPCC rejected thousands of published studies confirming the Medieval Warming and Little Ice Age derived from a myriad of climate proxies and historical records.

Getting Mann to reveal his primary data was like extracting teeth (*Nature* never requested this data). Because Mann’s study was US-government-funded, this data had to be made available. After eight years of struggle, culminating in action by the US Congress, the data and programs underlying the “hockey stick” were released. (Congressional inquiries of Mann conjured a wave of indignation from learned societies, none of whom expressed offence at Mann’s refusal to disclose.)

Mann’s primary data was riddled with collation errors, unjustifiable truncations and extrapolations, obsolete sources, location errors, and incorrect calculations. His pre-1421 temperature estimates were based on a single tree. His own data had early 15th century warming exceeding 20th century warming. His computer program pulled hockey stick shapes out of random numbers. He gave extraordinary weight to a Sierra Nevada tree ring study even though this study warned its evidence of a growth spurt did not jive with local temperature readings.

(Tree rings are a proxy not just of temperature but also of soil fertility, CO2 levels, and moisture. When tree rings are compared with known local temperatures, they reveal huge variability. Europe’s 2003 heat wave did not affect tree ring growth.)

Congress appointed a team of statisticians led by Dr Edward Wegman to investigate Mann et al. They concluded the paleoclimatology community relied on a flawed peer review process run by a clique of 43 professors who co-authored and refereed each other’s publications. This clique could not abandon the human-induced global warming theory without losing credibility. Mann’s papers were written in a confusing manner, obscuring methodology. Only the clique could decipher them. Wegman accused Mann of misusing statistics to fabricate a “hockey stick” shape in temperature history. Mann’s claim that the 1990s were the warmest decade of the millennium was unsubstantiated.

(The IPCC claim that the 1990s were the 20th century’s hottest decade is also unfounded. Across North America the 1930s were hotter than the 1990s. NASA concedes the century’s four hottest years occurred in the 1930s. Readings from 44 Artic and sub-Arctic weather stations show the 1930s with the highest temperatures. Accounts from shipping companies and fishermen confirm this. Antarctica was also warmest in the 1930s.)

Wegman concluded:
“*Making conclusive statements without specific findings with regard to atmospheric forcings suggests a lack of scientific rigour or possibly an agenda*.”
The Chairman of the US National Academy of Sciences agreed with Wegman’s criticism.

Mann issued a “correction” but insisted his errors did not undermine his conclusions. While the “hockey stick” quietly disappeared from the IPCC’s next report (2007), save for an obtuse reference buried in the science section, it is still used by environmental groups.

The “hockey stick” scandal was hardly an isolated incident. A paper in *Nature* claimed temperatures in Burgundy from 1370 to 2003 could be derived from grape harvest records and that the summer of 2003 was the warmest since 1370. After prying free the authors’ primary data, this claim was shown to be baseless. In 2006 the media went into alarmist overdrive after *Nature* published a study predicting a warming-induced breakdown of the Gulf Stream. The exposure of elementary measurement errors soon muzzled this doomsday scenario. The IPCC’s 2007 *Summary for Policymakers* claimed South African rainfall declined from 1900 to 2005; it actually increased 9% during this period.

**Real Climate Drivers**

The drivers of climate change are: solar variation, orbital flux, continent/ocean floor re-shaping, supernovas, and volcanoes.

Earth’s orbital and rotational cycles affect climate. Variations in the ellipticity of Earth’s orbit change the sun’s distance from Earth. This manifests in 90,000-year coolings and 10,000-year warmings. As well, oscillations in axial tilt, occurring every 41,000 years, change climate by varying the relative amount of sunlight hitting polar and equatorial regions. Finally, Earth wobbles on its axis like a spinning top. This precession has a periodicity of 21,000 years and also modifies Earth’s distance from the sun.

Continental drift changes climate. After the breakup of the supercontinent Gondwana (50 Ma), India drifted north, crashed into Asia, and crumpled up Asia’s crust into the Himalayas. India is still pressing into Asia and the glacier-bearing, climate-bending Himalayas are still rising. Similarly, when Antarctica was attached to a larger continent it was warmed by tropical ocean currents. Antarctica’s gradual isolation created the Circumpolar Current. Now, the same icy waters swish round and round Antarctica where interior winter temperatures average -50 C.

Dust cools the climate. There was far less dust during the Medieval Warming than during the Little Ice Age.

40,000 tonnes of space-dust fall to Earth each year. This dust comes from starbursts, the asteroid belt, and from our solar system’s 2.5 million comets. These particles, being one hundredth the diameter of a human hair, reflect sunlight and serve as condensation centres for raindrops.

Our glaciation may have been triggered by a nearby starburst or by volcanic activity. Ocean sediments dating to 2.67 Ma reveal a tenfold increase in volcanic dust.

Volcanic ash blocks sunlight. Volcanoes also emit sulphuric aerosols whose average diameters, 0.5 micrometres, perfectly eclipse sunlight’s middle wavelength. Because ash has a short atmospheric residence time, its climate impact is brief. Sulphuric aerosols have longer atmospheric residence times, hence greater impact. These aerosols are also nuclei for water vapour, hence facilitate cloud formation.

The 1815 eruption on Indonesia’s Tambora Island blasted away 1400 metres of mountain top, broke the island in two, and plunged the archipelago into darkness for days. In 1816 snow never melted across much of the Northern Hemisphere. There were famines. In 1991 Pinatubo blasted out 5 cubic km in 3.5 hours. Pinatubo’s aerosol cloud circled Earth in three weeks and caused a brief 0.6 C global cooling. At 74,000 bp Toba’s 2800 cubic km of dust and 1 billion tonnes of sulphuric aerosols may have triggered a millennium of cooling. In the not so distant past, supervolcanoes ejected 100,000 cubic km.
Earth has thousands of volcanoes. 500 have erupted in recorded history; some more than once. An almost eruption free period, 1912 to 1963, coincides with a global warming of 0.5 C.

85% of volcanoes quietly emit unmeasured volumes of CO2, sulphur, and methane under the ocean. They are joined by thousands of submarine hot springs pumping out gas at temperatures up to 420 C. Lava erupts at 1100 C. Recently discovered volcanoes under the Arctic Ocean may influence climate in substantive ways. El Nino may have a volcanic trigger. Sub-glacial volcanoes in western Antarctica may accelerate melting. These phenomena are ignored by mainstream climate science.

The sunis the engine of climate. Tiny solar variations change climate. Greenhouse gases only amplify solar driven change.

The solar constant is not constant. Solar cycles of 11, 22, 87, 210, and 1,500 years are recorded in Earth’s ice sheets, cave deposits, tree rings, sediments, pollen, peat, etc. These cycles pertain to the sun’s orbit, magnetism, and sunspots.

Churning convection belts of plasma plunge deep beneath the sun’s surface, then bubble up in magnetic knots (sunspots). Sunspots wax and wane in 11-year cycles. The size and number of sunspots varies from cycle to cycle.

Sunspots have been written about for 2,000 years. The Armagh Observatory (Northern Ireland) has numbered and named each sunspot cycle since 1795. A study published in 1801 related sunspots to grain prices. A 1850s study connected sunspots with Indian famines. An 1889 study linked sunspots with temperature and rainfall. The fewer the sunspots, the cooler the climate. The IPCC presumes the short-term cyclic variation of solar heat to be 0.1%. The actual variance, 0.22%, translates into Earthly temperature variations of 0.45 C (long-term variations are five times greater than short-term variations).

Massive outer planets ensure the sun is not the solar system’s centre of gravity. Due to irregularities in the combined angular momentum of the big planets, the sun is at times 1 million km from the centre and at times coincidental with it. The varying distance between sun and centre changes solar radiance.

The sun’s path around the Milky Way crosses four star-populated galactic arms. Starbursts render galactic arms thick with space-dust and cosmic rays that manifest in our atmosphere as electrically charged aerosols. Major glaciations correspond to encounters with galactic arms.

The amount of particles and rays hitting Earth also depends on the magnetic strength of the sun: our cosmic gatekeeper. An energetic sun blasts away intruders. Depending on the sun’s galactic location, its magnetic field may extend beyond Pluto or only as far as Jupiter. As well, the sun’s 22-year cycle of magnetic field reversals impairs our solar shield. Dust trapped in glaciers verifies the 22-year cycle.
Evidence that it is the sun, and not greenhouse gases, driving recent warming is provided by the fact that other planets and moons in our solar system are warming. In 1998 the Hubble telescope revealed Neptune’s moon, Triton, had warmed since it was visited by the Explorer space probe in 1989. Air pressure on Pluto tripled between 1988 and 2002, indicating a 2 C rise. NASA believes Mars warmed 0.65 C between the 1970s and 1990s.

The 20th century warming occurred mostly before 1940, when the sun was energetic. The 1940-1976 cooling came during solar weakness. The post-1976 warming coincided with increasing solar strength.

A peer-reviewed study concluded solar variation’s contribution to 20th century warming was near 50%.

Another peer-reviewed study, published in 2006, fixed the 20th century’s overall warming at 0.56 C of which humanity’s contribution was 0.01 C.

**Melting Scare Meltdown**

Climate alarmists contend that rising sea levels, resulting from melting glaciers, will inundate coasts and islands.

There is no simple relationship between ice melting and temperature. A large amount of heat is required to melt ice. Antarctic glaciers survived the hot 17-to-13 Ma era. Past interglacials were 5 C warmer than now, for millennia, yet polar ice did not disappear. Greenland was balmy during the Medieval Warming, yet its ice sheets persisted.

Glaciers retreat or advance; they always melt. Precipitation is often more consequential than temperature. Glaciers may shrink during cold periods if they are not replenished by snow. Mt. Kilimanjaro’s glacier became a celebrity by shrinking from 12 square km to 2 square km since 1880. This shrinking is due to regional dryness, not global warming. This glacier emerged during the African Humid Era (11,000-4,000 bp) when rainfall was twice current levels.

Across Earth, in the mid-19th century, mountain glaciers began retreating. Circa 1940 half stopped retreating and some began advancing. Detailed measurements of 246 major glaciers between 1946 and 1995 indicate no global trend one way or the other. On the Russian island Noyaya Zemlya, mountain glaciers stopped retreating at 1950 and tidewater glaciers started to advance. Many Scandinavian glaciers are growing. Caucasus glaciers are at equilibrium.

Satellite measurements show Greenland’s high altitude glaciers are rising 6 cm per year. Greenland’s low altitude glaciers are decreasing 1.5 cm per year, but their melt rate is slower than it was during the 1900-to-1969 period.

East Antarctica holds 90% of Earth’s ice. Satellites, using altimeter echoes, measured this ice’s thickness 347 million times between 1992 and 2003. It is gaining 45 billion tonnes per year. NASA confirms that despite melting on the Antarctic Peninsula, the continent’s overall ice mass is growing.

In 1998 and 2002, media frenzy welcomed the Antarctic Peninsula’s loss of ice. The calving of glaciers is not evidence of global warming. Iceberg armadas were a feature of every ice age. The Peninsula’s ice sheets have calved and reformed many times.

More media fanfare greeted the 2009 proclamation of Antarctic warming. The source of this blessing was a “*statistical-climate-field reconstruction*” undertaken by Mann et al. The study was missing data from key temperature measuring stations and relied on interpolation for vast areas between stations. One station, “Harry”, had been buried in snow for years, then re-sited in 2005. Data said to be from “Harry” was actually from a distant station. Adding post-2005 data from “Harry” to earlier data from this other station produced an abrupt warming signal. Such data is worthless. The paper’s abstract boasted its “*reconstructions*” proved Antarctica warmed 0.6 C in 50 years. Deep in the paper is an obscure analysis conceding that, absent “*de*-*trended* *data*”*,* there was no warming.

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Sea level has risen and fallen countless times. Ephesus, a port city in the Bible, is now 24 km inland. The ancient city of Lydia is now underwater. Among the causes of sea level change are: earthquakes, volcanoes, ocean floor subsidence, high wind, low atmospheric pressure, and lunar-tidal cycles. As well, soil weathered from continents collects on the ocean floor where it displaces water.

Changing land levels confound sea level measurement. Earth’s mantle is surprisingly elastic. Continents are trampolines. The weight of water behind dams is enough to cause land to sink. Urbanization causes subsidence. During ice ages land is loaded down by glaciers. When this ice melts the land bounces up. This is occurring in Scandinavia, Scotland, and Canada. Sea level has risen and fallen 600 metres. Land levels, due to a variety of factors, have risen and fallen 10,000 metres.

The island of Tuvalu is a poster-child of warming-induced sea level inundation. The ocean floor around Tuvalu is sinking. The sea level rise is illusory.

While coral atolls grow upwards in response to sea level rise, atolls atop sinking volcanoes often cannot keep pace with the volcano’s subsidence. This is happening to Bermuda although Bermuda is cited as another casualty of global warming.

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Paired satellite-borne radar altimeters measure sea level with extraordinary accuracy. Their data show recent average global sea level rises of 0.24 cm per year, with virtually no rise since 1999.

A past president of the venerable International Union of Quaternary Research’s Sea Level Commission observes no discernable sea level trend over the last 300 years. Historical records show no acceleration of sea level rise since the Industrial Revolution.

124,000 years ago sea level rose 2 cm a year. Over the last 14,000 years sea level rises averaged 1 cm per year but often exceeded 2 cm per year. In the last 6,000 years sea level occasionally rose or fell 300 cm in a century.

In 1990 the IPCC predicted that by the year 2100 sea level would be 30 to 100 cm higher. In 1996 the IPCC predicted that by 2100 sea levels would be 13 to 94 cm higher. In 2001 this prediction was changed to between 9 and 88 cm. In 2007 this prediction was changed again to between 18 and 59 cm.
These predictions: a) betray seat-of-the-pants guesswork; b) are parlayed into freakish, catastrophic scenarios yet are within the range of normal, inconsequential sea level rise; and c) are greater than actual measurements of sea level rise.

**Extinction Fears Extinguished**

Extinctions are natural. 99% of species that have existed are extinct. Conservation of species is not a scientific activity.

Earth has enjoyed five major mass extinctions and many minor mass extinctions. From 370 to 360 Ma 70% of species perished. Volcano-induced climate change at 251.4 Ma wiped out 96% of marine species. Around 12,500 bp, when 57 species died off (mammoths, mastodons, ground sloths, etc) the culprits were human hunters and the cold dry climate of the Younger Dryas.

Global warming does not accelerate extinction, it bolsters biodiversity. Cooling causes biological stress. Glaciation causes extinction, as does desertification. Cooling lessens evaporation, precipitation, and vegetation. Warmings do not produce deserts, coolings do.

Contrary to propaganda, Africa is not undergoing severe desertification, and droughts in the USA are becoming shorter and less frequent. Australian droughts are hardly novel; 48 of the last 144 years brought drought to some part of that country.

Climate alarmists contend that a 0.8 C warming over 50 years will extinct 20% of Earth’s species. If this were true, there should have been mass extinctions during the Minoan, Roman, and Medieval warmings. There were not. Wyoming’s Fremont Glacier records a sudden mid-19th century warming, yet the surrounding region experienced no extinctions.

Climate alarmists claim human CO2 emissions will acidify oceans to the point where shells of marine organisms will dissolve. Oceans are alkaline and loaded with calcium. Ocean life lodges CO2 into calcium carbonate. CO2 fertilizes ocean life. These processes prevented ocean acidification when atmospheric CO2 was 25 times current levels.

Corals are allegedly threatened by global warming/sea level rise, but corals have survived much warmer eras. Despite a 130 metre sea level rise over the last 14,000 years, coral reefs kept growing. Coral reefs grew during the 20th century.

Polar bears are the stars of the endangered-by-warming narrative. This species survived numerous warmings. Moreover, a 2004 US National Biological Service study found polar bears thriving. A 2006 US Fisheries and Wildlife Service survey found only 2 of 20 populations decreasing, and they lived in areas that had cooled. The 2 most prosperous populations lived in warming areas.

Claims that global warming has already wrought extinction are based on a single study of Costa Rican golden toads whose demise resulted from land clearances.

Scares about arctic fox endangerment derive from a single study about the migration of red foxes into arctic fox habitat. The arctic fox survived previous warmings.

Elevated CO2 levels do not cause extinctions. CO2 is plant food. Plants are animal food. Satellite measurements made between 1982 and 1999 show global vegetation grew 6%. This is mostly due to increased CO2. If CO2 levels doubled, plant productivity would rise 50%.

Claims that elevated CO2 levels threaten human health are based on a single study of men in a submarine where CO2 levels were 15 times present atmospheric levels. Some submariners exhibited signs of restlessness and tension!

**Much Ado about CO2**

The contention that carbon dioxide (CO2) fluctuation is a main driver of climate change is absurd.

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A key tenet of climate alarmism, that atmospheric CO2 content increased from 270 ppmv to 385 ppmv since the Industrial Revolution, is questionable.

Gauging atmospheric CO2 is tricky. Levels fluctuate 75 ppmv in a week. CO2 is scrubbed from the air during growing seasons. CO2 is higher over cities.

Between 1812 and 1961, ninety thousand atmospheric CO2 measurements were made using the Pettenkofer (chemical) method. Mid-19th century readings were often over 425 ppmv. Between 1935 and 1950, levels were over 385 ppmv. In 1942 CO2 levels were 400 ppmv.

After the 1959 opening of the Mauna Loa (Hawaii) facility, CO2 measurement switched to infra-red spectroscopy. Hawaii was chosen because it was far from CO2-emitting industrial areas. However, Mauna Loa volcano and adjacent volcanoes emit CO2, and much ocean degassing takes place around Hawaii.

The spectroscopy method was never validated against the Pettenkofer method. Early Mauna Loa measurements were lower than simultaneous measurements from European stations using the Pettenkofer method. European measurements showed CO2 levels up to 380 ppmv with means of 315-331 ppmv. The level reported by Mauna Loa for 1959 was 316 ppmv.

Mauna Loa readings fluctuate daily and seasonally. Mauna Loa’s operator “edits” what he deems to be bad data. In 2004, there were 8,784 measurements. Instrumental errors eliminated 1,102 measurements; 1,085 measurements were deleted because of upslope winds; 866 were deleted for excessive hour-by-hour variability; 655 had large variability within the hour but were not deleted. In short, data is selectively edited in order to preserve an upward curve consistent with increased human CO2 emissions.

In 2001 the IPCC decreed that only spectroscopy measurements were reliable. Pettenkofer measurements were to be discarded. However, for their pre-industrial yardstick of 270 ppmv, the IPCC relies on a 1938 survey of historic Pettenkofer measurements. The IPCC rejects Pettenkofer data when it conflicts with their hypothesis, but their entire framework is predicated on Pettenkofer data.

Even accepting IPCC legerdemain, CO2 presently occupies only one ten-thousandth more of the atmosphere than it did before the Industrial Revolution.

\*

CO2 slows heat loss in infra-red wavelength bands between 14 and 16.5 microns; it does not permanently trap this heat.

CO2’s greatest “greenhouse effect” is in its first 100 ppmv. By way of analogy: the first 100 ppmv of CO2 is like hanging a thick curtain over a window. Increasing atmospheric CO2 levels to 200 ppmv is like hanging a second curtain over the same window; this will not have as much impact as the first curtain. Doubling current CO2 levels will be like adding a 5th, 6th, and 7th curtain; this would have negligible affect.

The IPCC’s 2007 report claims CO2-induced radiative forcing increased 20% over the previous decade. They arrived at this figure by forgetting that each additional CO2 molecule causes less forcing than its predecessor. The real increase in CO2-induced radiative forcing over the previous decade was 1%.

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Each year, 18% of atmospheric CO2 goes to ground. When air heats, it expands, becomes lighter, and rises. When air rises it cools, becomes compact, and dive-bombs through the biosphere where CO2 gets eaten. A CO2 molecule floats in the air for about five years.

IPCC models assume CO2 atmospheric lifetimes of 50 to 200 years in defiance of 37 independent studies each arriving at figures around 5 years – a figure previously acknowledged by a former IPCC Chairman. If five years is correct, the percentage of CO2 in our atmosphere originating from fossil fuels is 1.2%, not the 21% assumed by the IPCC.

\*

186 billion tonnes of CO2 enter the atmosphere annually. 100 billion tonnes come from ocean degassing. 71 billion tonnes are exhaled by animals, notably insects. 6 billion tonnes come from human activities.

The Indonesian forest fires of 1997-1998 emitted a volume of CO2 equal to 40% of global annual emissions from the burning of fossil fuels.

Volcanoes, geysers, etc. emit more CO2 than all cars and factories combined. One hot spring can release far more CO2 than a large coal-fired electrical station. Yellowstone’s Mammoth Hot Spring pumps out 175 tonnes of CO2 a day. Geothermal vents on New Zealand’s White Island can pump out 4,000 tonnes a day. Vents along fault lines release huge amounts of CO2 after earthquakes. There are 10,000 earthquakes a year. All these emissions are ignored by the IPCC.

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While contemporary climatologists obsess about the carbon cycle, it is H2O, not CO2, driving climate change. The carbon cycle piggy-backs on the water cycle.

Earth’s surface is 71% water. Oceans, being great absorbers of solar energy, contain 22 times more heat than the atmosphere. Oceans, not the atmosphere, dictate the surface heat balance.

Ocean currents are streams of warm water propelled by the centrifugal momentum of Earth’s rotation. These currents are the largest movement of mass and energy on Earth’s surface, and they profoundly affect climate. The Gulf Stream rises in the Caribbean and warms the entire north Atlantic coast before draining into the Arctic. Oscillations in northern Pacific currents manifest in 30-year cycles that significantly alter regional climates. The mysterious El Nino/La Nina oscillation causes temperature and precipitation anomalies across the southern Pacific.

Oceans contain 80 times more CO2 than does the atmosphere. Wind pumps CO2 into seawater. Aquatic organisms pull CO2 from the atmosphere. Adding CO2 to the atmosphere increases these air-to-sea transfers. To permanently double atmospheric CO2 levels, and maintain the air-to-sea CO2 balance, would require increasing atmospheric CO2 by a factor of 50.

Clouds mystify climatologists. Clouds warm and cool Earth. Water vapour, the stuff of clouds, is responsible for 98% of the greenhouse effect. On the other hand, clouds reflect 60% of sunlight. A 1% reduction in cloudiness could explain all 20th century warming. As there is no observational data measuring cloudiness within an accuracy of 1%, no one knows how much recent warming is natural.

IPCC’s computer models do not do clouds well and do not consider fog at all. The IPCC admits clouds are a quandary even though their bogeymen, clear-sky droughts and heavy rainstorms, are cloud events.

The water cycle is the climate’s thermostat. Warming increases evaporation which increases cloudiness which causes cooling. 1 C of global warming increases water vapour by 7%. The IPCC monkeys with this thermostat by arbitrarily choosing smaller rates of evaporation in order to bolster their exaggerations about CO2’s warming potential.

\*

Ice sediment analysis indicates that increases in atmospheric CO2 levels *follow* increases in temperature by several centuries. Rising CO2 levels, mainly from ocean degassing, are a response to warming, not the cause of warming. Current CO2 rises may be a time-delayed response to the Medieval Warming.

**Degrees of Uncertainty**

“Global temperature” is almost a meaningless datum. Local temperatures vary greatly from night to day and from winter to summer. A few kilometres can separate frozen peaks from burning sands. Determining global temperature trends requires “homogenizing” an overwhelming matrix of dodgy local temperatures.

The five main meteorological data compilation centres are:

a) Hadley Centre at the University of East Anglia (a branch of the UK Meteorological Office);

b) Goddard Institute of Space Studies (GISS, part of NASA);

c) National Oceanographic and Atmospheric Administration (part of the US Commerce Department);

d) University of Alabama in Huntsville;

e) Remote Sensing Systems (RSS) of Santa Rosa, California.

The last two centres use satellite data. The first three integrate historical and modern thermometer readings with radiosonde and satellite data. GISS, the lair of uber-warmist James Hansen, consistently comes up with the warmest estimates.

The oft-heard claim – “*Earth warmed 0.7 C since 1880*” – is not a scientific statement because it contains no uncertainty factor. Most thermometer readings from the last 130 years are below research quality. These thermometers were never calibrated against a standard thermometer. Most readings are given to the nearest 1 degree, hence carry a minimal uncertainty factor of +/- 0.5 C. Even today, 50% of US temperature measuring stations are incorrectly positioned. Until recently, ocean temperatures were taken by sticking a thermometer into a bucket of sea water.

Most weather stations are doubly biased because they are: a) on land (29% of Earth’s surface); and b) near populated areas (1.4% of Earth’s surface). Buildings, pavement, factories, vehicles, and power lines increase temperature. Even small towns are heat islands. To minimize the urban heat island effect, weather stations were often located near airports; however, urban sprawl and increased air traffic have contaminated these measurements. A major downsizing of US measuring stations in 1990 increased the percentage of urban-sited stations and consequently increased average temperature readings. In Australia, only urban-sited stations record a warming trend. The urban heat island effect probably inflates global warming estimates by 0.4 C.

The IPCC relied on a paper by P.D. Jones et al. to resolve the urban heat island issue (Jones, a University of East Anglia man, was a coordinating author of the IPCC’s 2007 report). The paper used temperature measurements from 89 meteorological stations in China. The authors claimed they selected stations with histories of few location changes. Inscrutably, Jones co-authored an earlier paper using Chinese data to demonstrate how station relocation substantially changed temperature measurements.

When sceptics requested Jones’ primary data, he responded:

“*Why should I make the data available to you, when your aim is to try to find something wrong with it?*”

East Anglia University refused to comply with a Freedom of Information Act request but eventually capitulated. The data was made available in 2007 – 17 years after the first paper was published. Contrary to what Jones had claimed, 49 stations used in his survey had no recorded history. Of those with recorded histories, several had been relocated, often in ways that would increase temperature readings. Subsequent studies have shown recent increases in Chinese temperature measurements are mostly due to the urban heat island effect.

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The available evidence has it that global temperatures warmed 0.5 C between 1880 and 1940, cooled 0.2 C from 1940 to 1976, and then warmed 0.3 C from 1976 to 1998.

Temperature measurement by satellite began 30 years ago. Satellites cover the entire globe and provide a more accurate data set. Satellite data shows the Southern Hemisphere’s lower troposphere experienced no temperature change since 1979. Collated satellite and thermometer readings show the Northern Hemisphere to have warmed 0.5 C between 1979 and 1998. Global warming in only one hemisphere cannot be attributed to CO2 because changes in atmospheric composition are global.

RSS satellite data show a slight global cooling since 1998. Balloon measurements confirm this. The Hadley Centre concedes that warming stopped in 1998. Data from 3,000 ocean-borne thermometer robots show cooling between 2004 and 2009.

Much of Earth was unusually cold in 2008. The 2007-to-2008 chill was the steepest since 1880. Between August 2007 and August 2008, Arctic sea ice grew 30%.

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There is no correlation between temperature and human CO2 emissions. The 1880-to-1940 warming preceded significant human CO2 emissions. The 1940-to-1976 cooling happened while human CO2 emissions rapidly escalated. There has been little warming since 1979 despite substantial increases in human CO2 emissions. The UK Meteorological Office acknowledges a global cooling since 1998 despite a 25% increase in the burning of fossil fuels.

**Consensusology 101**

Building consensus is a socio-political, not a scientific, process.

There has never been a scientific consensus around the assertion that industrial emissions are dangerously heating the climate.

After Lord May hitched the Royal Society of London to the climate alarmist bandwagon, he tried to get other national academies to sign an alarmist manifesto. The US Academy of Sciences did not sign. The Russian Academy of Science took a contrary view.

While Lord May was preaching on behalf of his “consensus”, a poll of climate-interested scientists found 30% sceptical of human-induced global warming. Earlier (1996), the UN’s *Climate Change Bulletin* reported that only 10% of 400 surveyed climate researchers strongly agreed with the assertion that global warming was underway, and 48% expressed little faith in global climate forecast models.

A study published in 2004 by *Science* claimed a search of the ISI Web of Knowledge data base for the years 1993-2003 using the words “global climate change” retrieved 928 articles, each with abstracts supporting the consensus view. In truth, only 905 of these articles had abstracts, only 13 explicitly supported the consensus view, and some opposed the consensus view.

The IPCC boasts “2,500 scientists” co-wrote, and hence agree with, its main 2007 report. Writings from 1,656 authors were incorporated into the overall report. Writings from 1,190 authors were incorporated into the report’s science section. Many of the 1,190 were not scientists but environmental activists. The real writing was done by 53 men of whom 40 had either co-authored papers with one another or were colleagues in the same establishments. The gang of 40 “peer review” each other’s work.

The peer review process of scientific journals is flawed. Editors pick reviewers. Reviewers veto troublesome papers. A team from Flinders University (Australia), using Pacific Ocean tidal measuring stations, concluded sea level was static. They were unable to publish this study in any major journal.

In 2000 Germany’s Geological Research Department hired two eminent scientists to write a compendium of climate knowledge. Their book concluded: a) there was nothing extraordinary about the modern climate; b) CO2 did not drive climate change; and c) the sun, Earth’s orbit, and plate tectonics were the main climate drivers. Germany’s Environment Minister denounced the book, which, despite being a best-seller, was never reprinted.

Scientific research is primarily government funded. If one argues climate change has a solar origin, it is hard to obtain funding. Most contrarians have spent a lifetime in science, no longer rely on research for professional advancement, and hence do not have to toe the party line.

Scepticism abounds. Numerous Chinese studies contend CO2’s impact on temperature is grossly exaggerated. The American Physical Society recognizes “*a considerable presence within the scientific community of people who do not agree with the IPCC conclusion*.” 32,000 American scientists have signed the explicitly skeptical Oregon Petition.

The IPCC fabricated a Potemkin consensus from like-minded people in a small area of science who depend on each other for publication approval and research grants. This clique advertises their “pathological science” orientation with phrases like “tipping point” and “precautionary principle”. Pathological scientists are identifiable through their claims of great certainty regarding matters beyond the threshold of optical visibility and their countering of criticism with ad hoc excuses.

**Afterword**

During the writing of this abridgement, several new climate commotions erupted. In June 2011 the US National Solar Observatory issued studies heralding a sunspot hibernation. Comparisons are being made with the Maunder Minimum (1645-1715), which overlapped the coldest years of the Little Ice Age. Humans instinctively dread the onset of winter. Cold times are hard times. Facing the prospect of glaciation begs the question: What was it about that mild 20th century warming trend that was so horrible?

At the same time, a scary new sea level study held the media agog. This study was co-authored by the notorious Michael Mann and by Stefan Ramstof (of the ought-to-be notorious Potsdam Institute for Climate Impact). These climate geniuses produced another “hockey stick” graph wherein sea levels for the past 2,000 years are flat-lined and followed by a sudden uptick representing the industrial era. This multi-millennia history of all the world’s oceans was extrapolated from microscopic fossils dug out of North Carolina marsh mud. The study did not just contradict conventional wisdom regarding sea levels; it contradicted recent papers by Mann and Ramstof.

Also in June 2011, the co-author of a recent IPCC report was revealed to be Greenpeace International employee Sven Teske. The report (a re-hash of one written by Teske for Greenpeace) claimed the world’s energy industry could transition to a 77% reliance on renewables by 2050 while phasing out nuclear power. Outrage was directed at the IPCC for passing off activist propaganda as peer-reviewed scientific analysis. However, the IPCC has long trafficked in unchecked enviro-propaganda. Recent IPCC predictions that 40% of the Amazon forest would soon vanish were written by the WWF. At least 16 claims of doom from the IPCC’s main 2007 report originated from enviro-activist groups. This is hardly surprising given that the IPCC is a subsidiary of the UN Environment Programme (UNEP) – an opaque enterprise (annual budget, $450 million) with Greenpeace, WWF et al. incorporated into its decision-making process. UNEP formally brags about having been created as a result of environmental organization lobbying and about how its main achievements have been cooperative ventures with environmental organizations.

The IPCC was launched on 6 December 1988 pursuant to UN General Assembly Resolution 43/53. This mandate all but precluded the IPCC from investigating any cause of climate change other than human activity. In 1998 this mandate was expressly narrowed to the investigation of only “human-induced” climate change. The IPCC is prohibited from seriously considering solar, celestial, volcanic phenomena. The IPCC is programmed to amass studies and models consistent with the hypothesis that industrial emissions are damaging climate. The IPCC is, by design, a vanguard agency within an international campaign to smear the coal and oil industries. The IPCC was never an unbiased, science-based organization.

The defining rivalry of our times is between two movements each with its class champion, each with its geographical redoubt. Environmentalism is the procrustean re-imposition of the rule of the pre-capitalist elite. Their goal is a polity dominated by the old land-owning families wherein industrial growth, land development, consumer spending, and international trade are de-prioritized. Such visions resonate from the palaces of Old Europe. Their pro-market, pro-development rivals are best exemplified by the industrial entrepreneurs from the hinterlands of the USA, Canada, Australia, Brazil, etc. The Climate Change campaign is an effort by the former to overpower the latter.

**Footnotes**

1. All facts and quotes in this abridgement (except for those appearing in the Afterword) are from: Plimer, Ian; Heaven and Earth: Global Warming, the Missing Science, 2009; Taylor Trade Publishing; Langham, Maryland.
2. limer details how geological sleuths use proxies to detect past climates. For instance, because waxy coats protect pollen spores from decay, pollen can be used to reconstruct plant life sustained by past climates. Because coral thrives in shallow warm water, reef growth rates correlate with sea level and temperature. The sizes of breathing holes in fossilized leaves are CO2 proxies. Titanium residues in soil-based sedimentary rock tell of past rainfall and wind speed. Oxygen isotopes in sea shells reveal ocean temperature. Carbon isotopes give insights into air composition and temperature. Glaciers archive: volcanic eruptions, dust storms, starbursts, and solar strength. Stalagmites are formed by, and thus record, seasonal rains filtering through soil and limestone. Boreholes retrieve former surface rocks and measure heat flows. Diaries, ships’ logs, and accounts of military campaigns describe wind and rain, etc. Annals, harvest records, and tax ledgers also provide data, particularly on extreme weather.