Archibald Roy, the astronomers and the global warming
(Dedicated to the memory of Archibald Roy, 1924-2012)

Abstract

The phenomenon of global warming during the period 1975-2005 is indisputable, but many astronomers think that this is an effect of the variations of the Sun and that the human contribution is negligible.

Carbon dioxide is not a pollutant, it is a vital gas, the main aliment of plants and its greenhouse effect has been widely exaggerated.

Since 2003 the mean global temperature has either been stagnant or even slightly decreasing.

Four simple astronomical arguments supporting these ideas are presented and discussed. It seems that we will reach a cooler period as soon as 2015 or 2016.

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"*The hockey cross curve gives the concentration of carbon dioxide and not the temperature! The medieval optimum of temperature was not only local; we remember it here in Scotland, but it happens also in America, in the Middle East and in the Far-East…"* (Archibald Roy, birthday correspondence, June 24 2004) .

The hockey cross curve was presented in 2001 in the third report of the International Panel on Climate Change (IPCC) and its most enthusiastic supporters consider it as the definitive argument, the final proof of the anthropic character of global warming. The Archibald Roy contestation, even before the demonstration of the falsity of the hockey cross argument, made me doubt the merit of the reports of the ecologists of IPCC.

Today many astronomers don't accept anymore the anthropic character of global warming; they have developed a series of counter-arguments and we will consider four of these.

1. The temperatures and the CO_2 concentrations of paleoclimates.

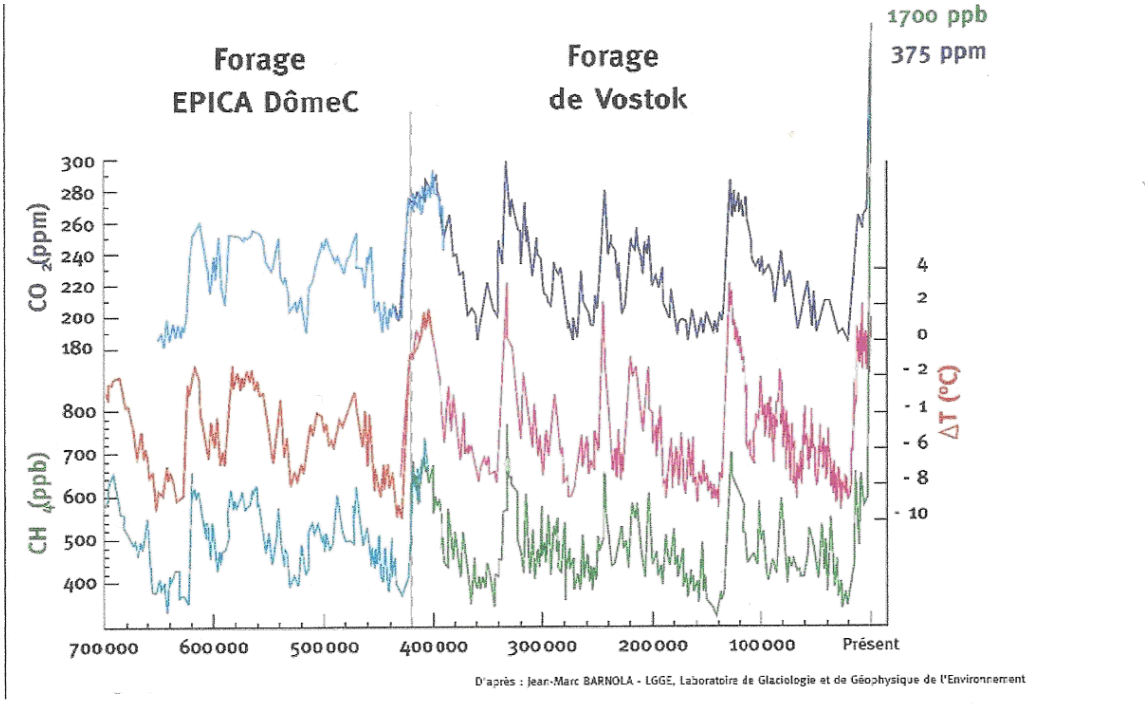
The analysis of the small gas bubbles contained in the great glaciers of Greenland and Antarctica was inspired by the French scientist Claude Lorius, and gives much more information than any previous method on the paleotemperatures and the past concentrations of carbon dioxide and methane.

The drillings of Antarctica provide data as far back as 700 000 years in the past (figure 1). The central curve gives the temperature and show a great correlation with the concentration of CO_2 (upper curve) and CH_4 (lower curve). It is easy to read the astronomical cycles of Milankovitch and the corresponding glaciations of Quaternary.

We have then two main possible hypotheses:

Hypothesis A. The hypothesis of IPCC: The correlation is a consequence of the greenhouse effect of carbon dioxide and methane: when their concentrations increase the greenhouse effect follows and the temperature increases.

Hypothesis B : On the contrary, the correlation is due to the emission of gases from the oceans when the temperature increases. The oceans contain fifty times more CO_2 than the atmosphere, and cold water is a better solvent of gas.



(Age in years)

Figure 1. The concentration of atmospheric CO_2 (upper curve) and CH_4 (lower curve) with the variations of temperature (central curve) for the last 700 000 years.
Source : http://www.ign.fr/adminV3/display/000/527/755/5277550pdf ("Fiche 8").

How can we choose between these two hypotheses?

A simple method is to examine the curve that draws along the other two.

This study shows that, almost always, the variations of temperature precede the other two. The advance is usually two or three centuries and can be as much as eight centuries (which is hardly visible on a figure representing 700 000 years). There is however a case where the three variations are concomitant – a recent study by Laboratory of Glaciology and Geophysics of Environment (Grenoble) - the case of the end of the last glaciation, essentially about 15 000 years ago.

Nevertheless that period is an excellent example of a warm period of the astronomical cycles of Milankovitch – a strong sunshine of the arctic – and this emphasizes the great influence of astronomical factors in the evolution of temperatures.

Hence it is reasonable to conclude that hypothesis B is the good one, the hypothesis of the emission of CO_2 and CH_4 molecules contained in the oceans when the temperature increases. We will observe in the third argument that the greenhouse effect of carbon dioxide is indeed much smaller than usually expected.

After many years of strong support for hypothesis A, and almost total neglect of hypothesis B, the ecologists of the IPCC are now trying to minimise the importance of their first conclusions; they now claim that the temperature derived from the accurate physical and chemical analysis of gas bubbles is only "local" and without real correlation to the "global" temperature.

The present increase of concentration of carbon dioxide due to human activities, is larger than any increase observed in the Quaternary (even if they were earlier past geological periods with five times more CO_2 than today…), As a result the relation observed during the past 700 000 years between the CO_2 concentration and the temperature has disappeared, but of course that present increase doesn't modify the properties of carbon dioxide.

2. The recent heating of planet Mars and some satellites of Jupiter and Neptune.

This second argument is a delicate one because the effects are small: namely an elevation of one or two degrees of the temperature of the Galilean satellites of Jupiter (save Io) and of Triton, the great satellites of Neptune, a slow decrease of the winter maximum of the south polar cap of Mars (almost 20% between 1985 and 2005) but almost no decrease of the north polar cap…

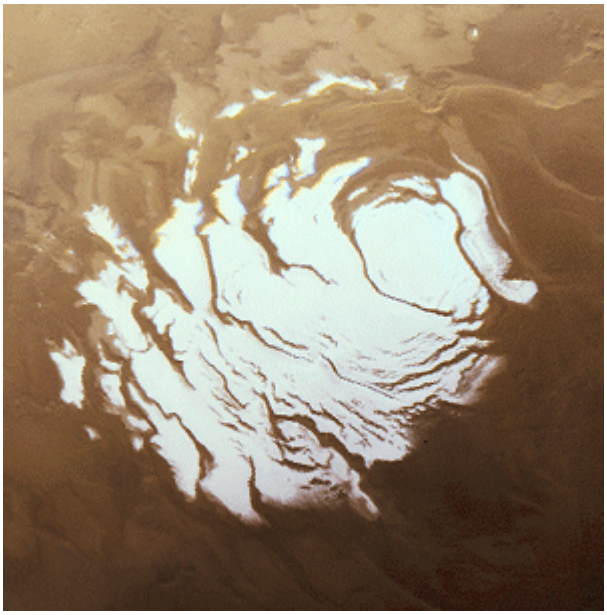


Figure 2 A recent picture of the Martian south polar cap.

It is of course the concomitance of all these effects that suggest a solar origin, an origin related to the solar activity that also affects the Earth…

It must be understood that the variations of the solar radiative power are small (0.1 % during the period 1985-2005 under review) and the variations of its magnetism are much larger.

The solar magnetism affects profoundly the atmosphere of the large satellites and of planets such as Mars and Earth (but not those of giant planets, well protected by their very strong magnetic field). This also explains why no effect is observed on heavenly bodies without atmosphere e.g. the Moon or Mercury.

However, why is there a difference between the two Martian poles?

The eccentricity of the Martian orbit is large: 9.3% (for the Earth 1.6% only), and the southern summer solstice is very close to the perihelion, the point of orbit nearest to the Sun. As a consequence, the southern summer is much hotter than the northern summer: it enjoys a maximum solar radiation of 715 watts per square meter instead of the minimum of 492 watts per square meter…

In these conditions it is not surprising that the Martian south polar cap is more influenced by the Sun than the Martian north polar cap.

However that second argument meets strong opposition in spite of the concomitances. Further studies and researches in this field are still required.

3. The comparison of the greenhouse effect of carbon dioxide with that of water vapour.

For centuries astronomers are experienced in spectral analysis of planets and stars. Emission and absorption rays and bands provide extensive information about the atmosphere and the chemical composition of the bodies under examination.

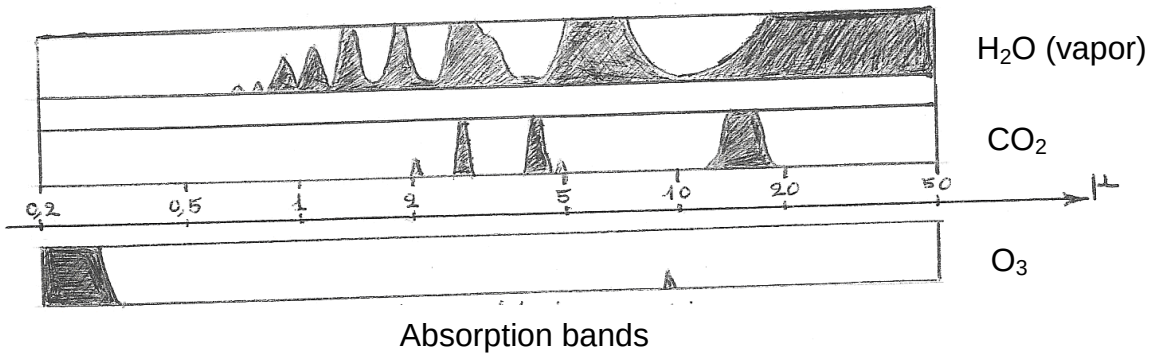


Figure 3. The absorption bands of water vapor, carbon dioxide and ozone in terms of the wavelength (central scale) from 0.2 microns to 50 microns.

The figure 3 is a classical figure of astronomy; it represents the absorption bands of water vapour, carbon dioxide and ozone in terms of their wavelength.

Ozone is known for its absorption of ultraviolet wavelength, it protects us from these dangerous radiations (shadowed zone in the bottom left corner). The efficient fight against the "ozone hole" is a success of ecological preoccupations.

The water vapour is obviously an absorbent much more efficient than carbon dioxide and let us remember that this vapour is twenty to forty times more abundant than CO_2 in the first kilometers of atmosphere (but less at high altitude). Hence among the 33° of the classical greenhouse effect in the Earth's atmosphere the contribution of water vapour is above 32°. Twice more carbon dioxide in our atmosphere will increase the mean temperature by less than 1°.

The estimations of professor Richard S. Lindzen (Chair of Meteorology, MIT) give only 0.24° for this twofold increase of CO_2 (Ref. 1), because of a series of negative counter-reactions, for instance a larger production of clouds that will increase the Earth's albedo (i.e. the proportion of solar light directly reflected or diffused in space).

The publications of the ecologists of IPCC give usually an increase of temperature of 2 to 4° for the 21st century only - and sometimes much more – hence it is not surprising that many astronomers don't believe anymore in the theory of human responsibility in global warming. They consider that the global warming is an effect of the variations of the Sun and observe that the mean Earth temperature is either stagnant or even slightly decreasing since 2005.

4 . The correlation between the temperature and the length of solar cycles.

Sunspots have been known by the Chinese for millennia. They are impressive transitory phenomena accurately studied by scientists for more than three centuries. The large sunspot of figure 4 is twenty times larger than Earth.

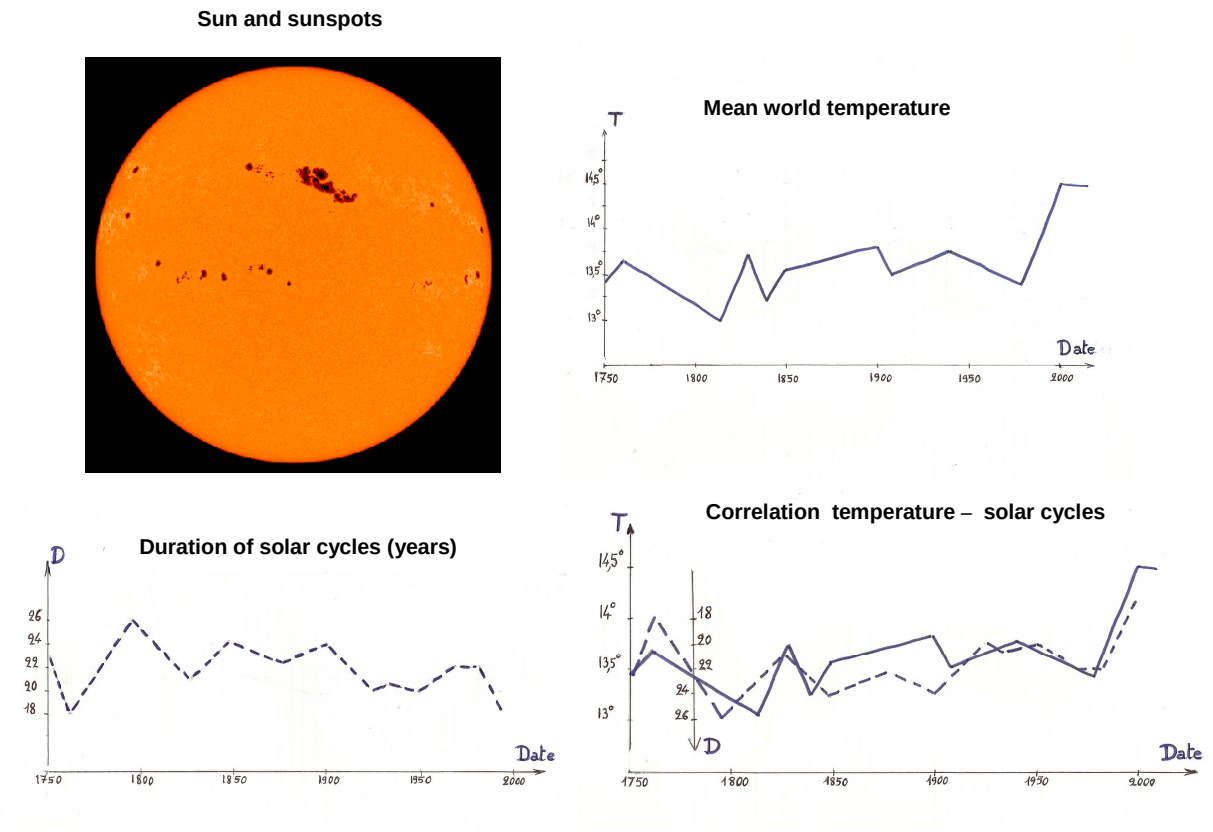


Figure 4. A) The Sun with its spots. B) The mean Earth temperature from 1750 to 2000. C) The duration of solar cycles in the same interval. D) The correlation between the two phenomena (The scale of duration has been reversed in order to emphasize the correlation).

Sunspots have a duration of a few days at least and several months at most. They have revealed the non uniform rotation of the Sun (the rotation period is 25 days at the equator and 34 days near the poles). The number of sunspots has a cyclic variation of about eleven years with almost no sunspot at the beginning and the end of the period. The polarization being reversed from one period to the next, it is considered that a complete cycle contains two periods and the semi-cycles (formerly named cycles) are numbered since 1750.

The duration of a cycle can be from 18 years (active Sun, many sunspots) to 26 years (quiet Sun, few sunspots). On Earth the short cycles correspond to hot periods or to periods with increasing temperatures and the long cycles to cooler periods or to periods with decreasing temperatures. This correspondence was already noticed two centuries ago by William Herschel (the discoverer of planet Uranus and of infra-red rays). Of course he did not know the average world temperature, and he had used the fluctuation in the price of corn at London as an indicator of the solar activity. This was an excellent choice, but it was not considered seriously by the London academicians…

The semi-cycle number 22 was short, 10.1 years only from 1986 to 1996, and so was its predecessor the semi-cycle 21 from 1976 to 1986; they both correspond to the recent period of warming. But the semi-cycle 23 was long: 12 years until the end of 2008. It corresponds to the present period of stagnation of temperature (2003 had only 0.01° more than 1998). The present semi-cycle, number 24, began at the end of 2008; it is difficult to guess its total duration, but it has few sunspots, only about one half of usual semi-cycles.

Under these conditions it is reasonable to predict a cooler period within two or three years, and some precursor to the future may be the three last winters that were particularly cold in Russia and in North America (down to ten degrees less than usual).

That correlation temperature-duration of solar cycles is now obvious but remains unexplained; it is of course related to the powerful electromagnetic phenomena of the Sun, for which the sunspots are a paroxysm. There is certainly a major interest to study thoroughly this question.

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Conclusion

The notion of anthropic climatic warming has a great unconscious advantage: it flatters our Self: We are powerful: we have disturbed the climate! We are clever: we have understood this phenomenon! We are virtuous: we will repair the damage as soon as the skeptics will be silenced!

This belief has a major drawback: it determines behaviors that are opposite to the scientific ethic. It is sufficient to remember the avatars of the hockey-cross curve presented in the third report of IPCC (2001), and considered by the most enthusiastic supporters of IPCC as the definitive argument, the final proof of the anthropic character of global warming, but discreetly removed from the fourth report (2007) after the demonstration of the falsity of that argument. A recent example: a widespread publicity is given to the decrease of the Arctic floe but you have to look for the publications of the US National Snow and Ice Data Center to learn that on the opposite side of Earth the Antarctic floe had an **historical maximum** in September 2012 !

Addition in December 2013 : Even in the Arctic floe the warming is not obvious, the summer minimum of 2013 was more than 30% larger than that of 2012: more than 5 millions of km² instead of 3.5 millions... .

The astronomers are of course not in such a comfortable psychological situation. Are we really such a negligible quantity? Is adaptation our only possibility until a new climatic modification? Can we really do nothing more than reforest our tropical forests, insolate our homes, put solar water-heaters on our roofs and reduce locally the pollution of cities by methods such as the “Clean Air Act” that have saved London from the smog attacks? Are the fight against CO_2, the use of very expensive and not very useful windmills, the carbon tax meaningful?

We must remember that natural phenomena are generally far greater than human ones. The part of solar energy that reaches the Earth is ten thousand times greater than our production of energy in our power-stations and our dams (and only half a billionth of solar energy reaches the Earth…). Even on Earth, when the Icelandic volcano Eyjafjöll erupted in April 2010, it released into the atmosphere an energy equivalent to the Hiroshima bomb every seventeen seconds… and that most active part of the eruption lasted fifteen days! Let us add that among the ashes expelled into the atmosphere there were a large quantity of radioactive materials, more than ten times those produced by the Chernobyl and Fukushima disasters…,

but dispersed on the wide areas of Europe and Atlantic, they have represented a very small percentage of natural radioactivity.

Furthermore the Eyjafjöll eruption was only a small one: that of the Pinatubo (1991) was one hundred times more powerful and that of Tembora (1815) was one thousand times more powerful…What would we think if one thousand Eyjafjöll had an eruption at the same time? Not to mention the earthquakes, the tsunamis, the hurricanes, the fall of large meteorites…The energy and the power necessary for the circulation and the renewal of the waters of some large river like the Nile or Mississippi far exceeds what mankind produces and uses for its needs…

Finally let us state that carbon dioxide is not a pollutant: it is the main aliment of plants… and some extra carbon dioxide is supplied to the greenhouses when a faster growing of plants is desired! It must not be confused with the very dangerous but fortunately unstable carbon monoxide ($2\ CO + O_2$ gives $2\ CO_2$).

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Reference

Richard S. Lindzen http://www-eaps.mit.edu/faculty/lindzen/htm (Lindzen MIT/ publications).

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Addendum (March 2014)

There are now more and more facts that contradict the official theory of IPCC, not only among the works of geologists and geophysicists (in France, Claude Allègre [Ref 1] and Vincent Courtillot, chairman of the French Institute of global Physics) , but also among mathematicians that contest the seriousness of the mathematical methods used [Ref 2-3], among the meteorologists [Ref 4], among the physicists [Ref 5] and among the astronomers that think that they have obtained the explanation of the correlation between solar spots and temperature and that have recognized that the greenhouse effect of Carbone dioxide is almost saturated [Ref 6-7], the increase of its proportion in atmosphere cannot increases the temperature.

In this very cold winter in Russia and North America (but mild in France) , the Canadian scientist Patrick Moore, former chairman of Greenpeace, has witnessed in front of the the US senators : « The global warming in undeniable on the period 1975-1998, but there are no proof that Man is responsible of that warming » [Ref 8]. What is then the interest of carbon taxe ? Is the sequestration of carbon dioxide nothing more that a deadly error that deprives the plants from their food ?

One after the other the US states of Middle West and Far West forsake the production of electricity by aeolian – that production costs much more than it returns and it kills

numerous migrating birds – and more than 10 000 aeolians rust in the Great Plains and in the Rocky Mountains…

Hundreds of « climatosceptic » scientific papers can be found at http://www.populartechnology.net/2009/10/peer-reviewed-papers-supporting.html .

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