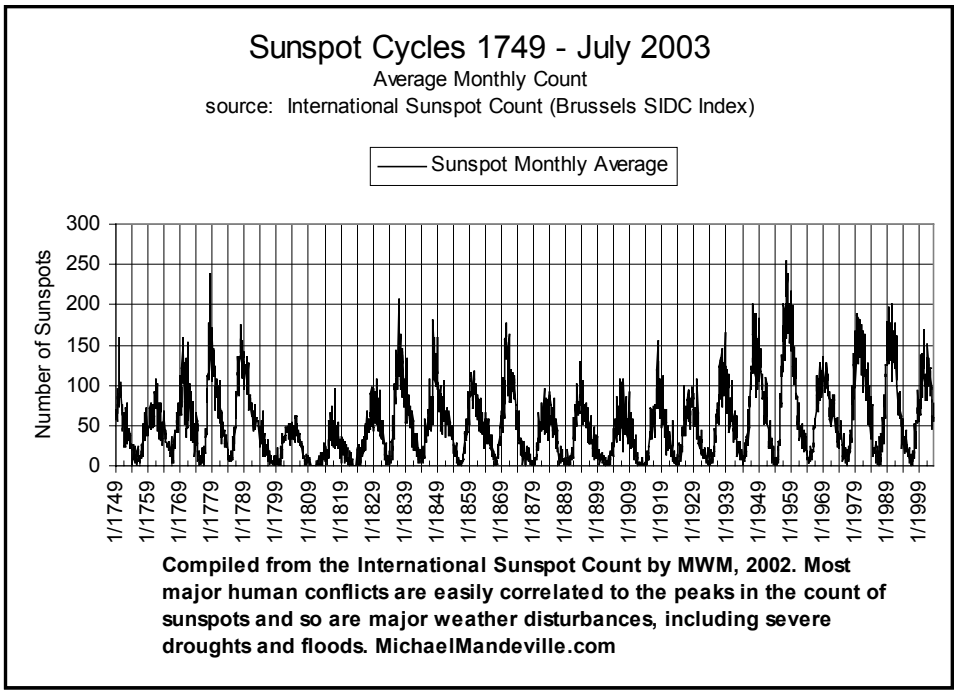
Sunspot Cycle Charts

Note: color versions of these and other sunspot graphs and charts are available on the internet: michaelmandeville.com/earthmonitor/cosmos/sun/sunspots.htm

Chart 101: Sunspot Cycles & Human History



What Are Sun Spots:

Sunspots are seen as "small" dark spots on the surface of the sun. They are easy to observe and count if the sunlight is strongly filtered. They were first noticed (in Western record) in the year 325 BC by Theophrastus, an Hellenic scientist, and they have been counted on a regular basis since the middle of the 17th century. They come and go in cycles which average about 11 years, as shown in Chart 101 above.

These "small" dark spots are conceived by modern astrophysicists to be intense "bubbles" of magnetic energy which somehow cool down the hot gasses within so that they appear dark compared with the surrounding solar atmosphere. These "cool" bubbles are not really very small, they are quite often the size of the Earth and many times giant spots many times the Earth can be seen. Many more physical facts about them can be can be found on the NASA and NOAA websites, such as at http://www.sec.noaa.gov/primer/primer.html

A. L. Tchijevsky, a Russian professor of Astronomy and Biological Physics, noticed during World War I that particularly severe battles followed solar flares. Since the sunspots were in a peak period during 1916-17, no doubt the war and its various battles were heavily stimulated by the energies which are boiling off the Sun. Intrigued by the connection of human behavior to solar physics, Tchijevsky constructed an "Index of Mass Human Excitability". He compiled the histories of 72 countries from 500 BC to 1922 AD to provide a strong database to articulate his correlations. After rating the most significant events, Tchijevsky found that fully 80% of the most significant human events, mostly related to war and violence, occurred during the 5 years or so of maximum sunspot activity.

Tchijevsky went on to observe that the 1917 Russian Revolution occurred during the height of Sunspot Cycle. Unfortunately, this was one of science's most costly observations, it earned Tchijevsky almost 30 years in Soviet prisons because his theory challenged "Marxist dialectics".

The "solar" connection to terrestrial events has been studied ever since then, but most of the focus has been on the sun itself or on the impact of the cycle on the climate, weather, agriculture, commodity markets, and other non-human phenomenon. Awareness of the human impact, which is far more significant than the well known impact of the Full Moon, has remained highly retarded. Modern humans, unlike the ancient cultures of Egypt, Sumer, Bharati, Maya, and China, are highly reluctant to admit that their collective behavior is influenced strongly by the Sun. They prefer to *believe* that *reason* rules their societies.

Chart 101, above, was compiled by compressing all of the average monthly sunspot counts for the past 254 years into this simple graph to show the full range of variation in the average monthly number of sunspots. 23 distinct cycles are shown here, beginning with a peak year in 1749. This chart, and all the others used in this Section, are based on what is called the "ISSN", which is an acronym for the "International Sun Spot Number" which is the consensus count made by observatories every day.

As can be seen in the chart, there is a great deal of variation in the average monthly counts and these in turn make quite a variation in the size and width of the 23 sunspot cycles. Note that there are three sunspot cycle peaks which did not have monthly peaks in excess of 100 and there were at least five with monthly peaks which reached 250 or more. That is quite a range for a dynamic cycle and we should expect that the effects in the solar system and in the Earth will show a similar variation. Most likely "the shadow" of the solar cycles can be readily seen in thousands of chemical, mineral, biological, and economic data series which scientists make by studying plants, minerals, and human history. And most likely "the shadow" varies considerably.

Data Sources:

The official International Sunspot Number, which is also known by NOAA as "RI", is issued by the Sunspot Index Data Center (SIDC) in Brussels. The ISSN comes in three flavors, a daily count, a monthly average, and a yearly average. You can also use "smoothed" numbers, which round off the numbers. Astrophysicists may have a use for smoothed numbers, but for connecting the Sun with weather and human events, the simple counts and averages are generally far more appropriate. Data and plots are available from the SIDC web site at http://sidc.oma.be or at the NOAA website http://www.ngdc.noaa.gov/stp/SOLAR/getdata.html

Detailed graphs of each sunspot cycle can be found at John Alvestad's website at http://www.dxlc.com/solar/ These can be used for paralleling events with sunspot

peaks. A great quantity of explanatory material and various sunspot numbers are provided by NASA and this webpage is useful for explaining sunspot numbers:
http://science.msfc.nasa.gov/ssl/pad/solar/greenwch/spot_num.txt
A huge, ultra-wide sunspot chart which shows each year since 1749 in complete clarity can be found at
http://www.michaelmandeville.com/earthmonitor/cosmos/solarwind/sunspots.htm

History Cycle Table

The following History Cycle Table is based on the average annual ISSN sunspot number. For defining "peak periods", one has to set a "bar" for what constitutes a "peak". Is it 100? if so, we lose several cycles. If it is 50, we gain them all, but the periods are "fat" and include a lot of years in between years which may not be very significant. Most likely, to see the validity of the connection of sunspot peaks with human violence, it is best to set the bar "high" to narrow the number of years. If the major wars all fall within these limited number of narrow bands, it is clear that the connection is very real.

To make sure we include all sunspot cycles, the year of the maximum average sunspot count in every cycle was used to define the high point of the solar cycle. The year before and the year after it are added to define the "nominal' sunspot peak years. For the sunspot cycles with high counts over a longer period of time, a "bar" was set at 100 and all years which were above 100 were included in the "peak" for that period.

This is an arbitrary method because the sunspots vary considerably in peak size and also because each of them has a somewhat different peak width. In truth, it is hard to generalize specifically about a sunspot peak because of the high degree of individuality and variability which they show.

This method was adopted mainly because of the thesis that human reactions are not caused so much by the absolute numbers of sunspots, but by substantial "changes" in the numbers which drive "shifts" in human mental and emotional processes By using this "dual" method for defining a peak , we have a simple, convenient way to define the periods of maximum change regardless of the numbers.

The information in the following table is of course merely illustrative. The number of wars and major economic events which "connect" with the sunspot cycle peaks are much larger than the small number of "major events" which are included here. I have omitted data for the first seven earliest cycles. Prior to the first named solar cycle, which is called Solar Cycle 1, there were at least five cycles for which there is a good consistent profile of daily counts. For students: filling these in with your own school reading and learning assignments would make a first class term paper.

Solar Cycle 1704-1706	Solar Cycle 1749-1751
Solar Cycle 1716-1718	Solar Cycle 1: 1760-1762
Solar Cycle 1726-1728	Solar Cycle 2: 1768-1770
Solar Cycle 1737-1739	

Solar Cycle 3: 1777-1779
1776-1783 American Revolution

Solar Cycle 4: 1786-1788
1788-1791 French Revolution
1789 US Constitution adopted

Solar Cycle 5: 1803-1805 under 100 wide (1802-1806)
1803-1806 Napoleon conquers Europe

Solar Cycle 6: 1815-1817 under 100

1815-1817	Two wars to defeat Napoleon; German, English and Serbian riots; Brazil, Chile and Argentina declare independence.

Solar Cycle 7: 1829-1831 under 100

1828-1832	Revolts in Turkey, Mexico, Belgium, Poland, France, Britain; Virginia slave revolt; the Black underground railroad begins

Solar Cycle 8: 1836-1838

1837-1840	Constitutional revolts in Canada, slavery debate outlawed in US, Texas Independence, Boer separatists occupy African lands, British-Afghan war; Opium War
1937	Major Banking Crisis in the U.S.

Solar Cycle 9: 1847-1849

1846-1848	Mexican War
1848-1851	Revolts and revolutions in Poland, Switzerland, Paris, Vienna, Berlin, Milan, Venice, Naples, Prague, Budapest, Warsaw; US Mexican War starts; Taiping Rebellion starts

Solar Cycle 10: 1859-1861 under 100

1858	Bottom year of a depression in the U.S.
1861	American Civil War begins
1861-1865	Civil War in America, revolts in India, Italy, China

Solar Cycle 11: 1869-1871 wide 1869-1872

1869-1870	Franco/Prussian War
1869-1872	Paris Revolutionary Commune

Solar Cycle 12: 1882-1884 under 100

1883-1886	Big US labor strikes, revolt in Sudan, First Indian Congress meets
1883	Bottom year of a major depression in the U.S.

Solar Cycle 13: 1892-1894 under 100

1893-1895	Zulu revolt, Cuban revolution

Solar Cycle 14: 1905-1907 under 100

1904-1905	Russo-Japanese War
1905-1908	first revolts begin in Russia
1905-1908	Widespread strikes, revolts among German miners, Hottentots, Turks, Indians, Honduras
1908	Bottom year of a short depression

Solar Cycle 15: 1916-1918 just barely 100

1914-1918	First World War
1916-18	Irish and Indian revolts
1917	Russian Revolution
1919	The Atom is Split

Solar Cycle 16: 1927-1929 under 100 wide 1926-1929

1927-1929	Fabled American Bull Run ends in crash of the stock market in long slow slide which bottoms in 1933
1926	Hitler in jail for NAZI's attempted Munich Putsch, begins writing Mein Kampf which outlines how he will lead Germany to make the world's greatest power.
1927-1931	Mussolini and Hitler build power on economic unrest; revolt in Vienna and China; formation of Red Army; Spanish Republic formed; mass civil disobedience in India launches Ghandi's campaign to free India

Solar Cycle 17: 1936-1938 wide 1936-1939

1936-1939	Spanish Civil War, Germany and Japan start World War II
1937-1940	US steel strike

Solar Cycle 18: 1947-1949 wide 1947-1950

1946-1949	Greek Civil War, India-Pakistan riots, Red Army wins China, Vietnam revolts
1947 - 1948	Flying saucer sightings begin, saucer crashes in Roswell, NM, "shadow" government is set up inside the military industrial complex with the CIA to

	fight communism and hide the remains of ET
1948	Ghandi assassinated, Israel's War for Independence
1950-1953	Korean War

Solar Cycle 19: 1956-1958 huge peak wide 1956-60

1957 - 1960	Israel invades Sinai, Hungarian uprising, Cuban revolution, civil rights movement begins in US, French-Algerian war, MauMau revolt, Iraq revolt,
1957	Vietnam War begins
1958	Eisenhower recession
1960-1961	Eisenhower warns of the danger of “shadows” in the unfettered military industrial complex, Kennedy “race to the moon” begins

Solar Cycle 20: 1967-1969 stumpy wide 1967-1970

1965- 1967	Haight-Ashbury Flower Children launch the hippie movement
1967-69	Height of Vietnam War, peace demonstrations, worldwide student uprisings, Czechoslovakian uprising/USSR invasion, US inner city riots, Israeli Arab war, Woodstock and height of hippy movement,
1968	Martin Luther King and Bobby Kennedy assassinated , first big anti-war marches in US, first US inner city riots,
1969	First public men on Moon

Solar Cycle 21: 1978-1980 wide 1978-1982

1978	World's First Test Tube Baby Born, Carter Camp David Accords between Israel and Egypt
1979	Three Mile Island Nuclear Plant leaks radiation
1979-82	Polish Solidarity begins, US anti-tax movement reaches heights and elects Reagan, Shah of Iran overthrown, Iraq-Iran war begins, USSR invades Afghanistan, Falklands War, Sandinistas oust Somas, Zimbabwe gains independence, anti-nuclear and peace demonstrations increase worldwide, US aid to "contras" in Nicaragua, US invades Grenada, Tamils rebel in Sri Lanka
1979-1980	US Bid to Rescue Hostages Fails
1980	Iran-Iraq War begins (lasts until next peak in 1988)
1981	President. Sadat of Egypt assassinated
1982:	Israel Invades S Lebanon, Falklands War
1982	Reagan recession

Solar Cycle 22: 1988-1990 wide 1988-1992

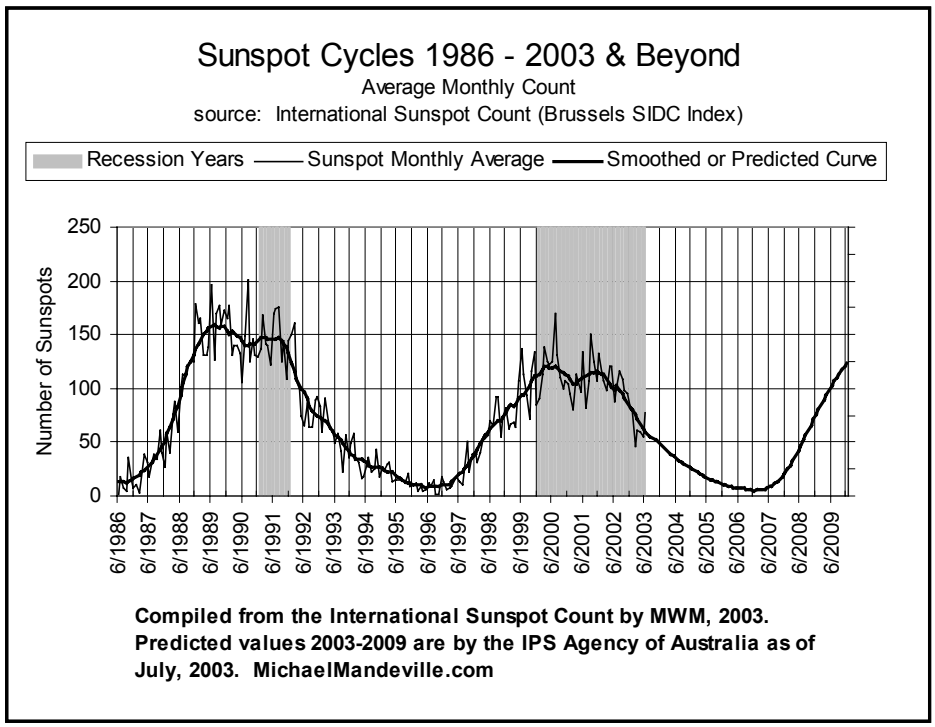
1987-88	Palestinian Infiltada begins, Eastern European dissidents organize, USSR & US sign missile treaty, USSR begins pullout from Afghanistan
1987	Crash in World Stock Markets
1989	Tianamen Square Chinese student democracy movement crushed
1989	Protest and peaceful revolution in Eastern Bloc, dismantling of Berlin Wall,
1989-1992	Glasnost process begins dissolution of Soviet Union, end of Communist Party domination; Communist Party coup in Russia fails
1989-91	End of apartheid in South Africa, beginnings of patriot and militia movements in US, Somalia civil war, Yugoslavia begins slaughter in Bosnia, Sandinistas lose Nicaraguan elections
1990	Mandela Released, East and West Germany Re-Unite
1990	Iraqi Troops Invade Kuwait
1991	The Gulf War; multi-national forces liberate Kuwait from Iraq, Balkan Civil War begins as communist Yugoslavia collapses.

Solar Cycle 23: 1999-2001 wide 1999-2002

1998-2000	Peace treaty in Northern Ireland, overthrow of Indonesia’s Suharto, Serbian-KLA conflicts increase and US/ NATO decides to "resolve" conflict through massive bombing of the whole nation, India-Pakistan skirmishes over Kashmir increase; militias burn East Timor, drive people into camps in West Timor; big demonstrations at WTO meeting in Seattle; rising religious strife in India and Indonesia, increasing civil war in Sierra Leone and Sri Lanka; overthrow of Milosevic in Serbia;
1999	Worldwide Y2K Scare
1999	Palestinian Infiltada re-commences after “virtual agreement” with Israel

2000	Dot-com bubble breaks; Supreme Court intrudes in the U.S. elections, throws results of Florida vote to make the loser of the popular vote into a winner of the electoral vote to become the U.S. President made by judicial interference.
2001	Attack on World Trade Center and Pentagon; War on Terrorism begins
2000-02	Peace treaty disrupted in Northern Ireland; land confiscations in Zimbabwe; worldwide protests against WTO/IMF/World Bank in Seattle, Washington DC, Prague, Goteborg, Quebec City, Genoa and other cities
2002-2003	Bush diverts War on Terrorism into personal vendetta against Saddam Hussein, massive protests demonstrate against Iraq war

Chart 102: Sunspots Cycles & Last Two Recessions



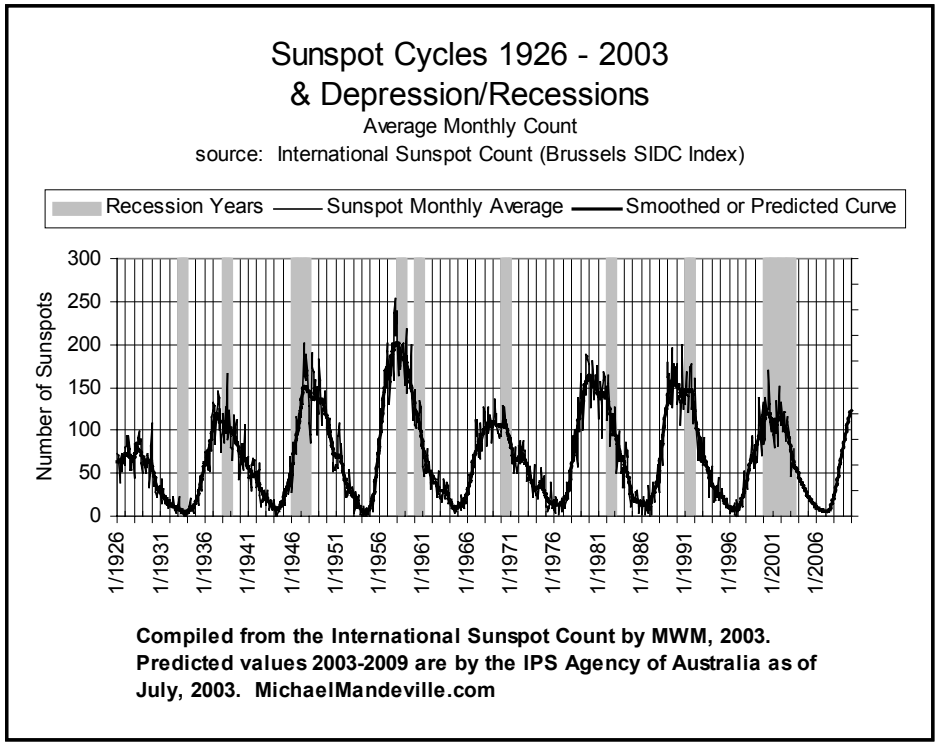
In the History Cycle Table, it is easy to see that both political and economic affairs are profoundly caught up and influenced by the "waves" of sunspot energy. The connections are even easier to spot if we see the sunspot cycle in greater detail. In Chart 102 above, just two cycles are displayed, the current one out of which we are gradually emerging and the last one which took the world on a highly transformative ride from 1988 to 1992.

The monthly average counts are shown in the jiggly line and the "smoothed" average annual curve is shown to better define the overall cycle. As we can see from this

chart, the first "Bush" recession in 1991 came during the last part of Cycle 22. It was preceded, of course, by the 1987 crash in world stock markets which came just as Cycle 23 was on its way up.

The most recent "bubble" crash in 2000 initiated a recession which began almost immediately. Though Republican propagandists are now trying to convince people that the recession ended in 2001, massive job losses through to 2003 suggest that the recession did not end until, maybe, sometime during the early part of 2003 year. It remains arguable in July 2003 that the recession is in fact not yet over.

Chart 103: Sunspot Cycles & Major Economic Contractions 1926-2003



How strong is this historical connection between major economic downturns and the sunspot cycles? We can learn more about this connection of sunspots to economic downturns by directly graphing them together in Chart 103, above. Quite clearly, Chart 103 shows us that there is a rather strong connection between major recessions and the peaks of the sunspot cycles. There was one major exception, the last Great Depression, the bottom year of which (1933) can be seen in the trough between sunspot peaks. The next Great Depression may parallel this exception nearly to a T.

Can this historical connection be used to predict stock prices? Is there a correlation between sunspot peaks and the Dow Jones Industrials? (Dow Jones

Industrials: these are select stock prices often referred to as the DJI) There is no usable connection except as a harbinger of a coming break. There is zero correlation between daily price movements and average daily sunspot numbers. Is there a connection between long term historical trends in the prices and average monthly or annual trends in the numbers of the sunspots? Not really, the only direct connection that appears is as a "breaking" signal. During a sunspot peak, the speculative Bull Run bubbles in stocks "break" and an economic recession begins fairly soon thereafter. This often leaves the stock prices headed down even while sunspots are still rising. This destroys any statistical averages which can be used for prediction.

As can be seen in the graph, there is a decidedly strong parallel between recessions and the peaks. It has been consistent throughout most of the century with one notable exception. The bottom year of the Great Depression in 1932/33 was at the bottom of the sunspot cycle. The collapse of the stock market, however, paralleled right on the peak of the solar cycle in late 1929. Stock prices slid as sunspot numbers slid, and the economy wallowed as sunspot counts reached 0.

We may be paralleling the 1929 to 1933 era. There is probably a strong tendency in this era to continue to slide after the bubble break in 2000 for a few years until all of the speculation has been squeezed out of stock prices. From the Bears, we already know that this means stock prices generally must fall yet another 35% to 75% from their levels in June 2003, depending upon the industry and the company.

This will eventually probably be the outcome of the current 25 year long depression cycle and we are likely to catch up with this inevitability in 2006 and 2007. In the meantime, most likely we are currently still buoyed up by massive subsidy stimulation, 70 years of institutional barriers, and various social security buffers. This may be enough to create a very modest "faux" bubble amidst a "jobless" economic recovery.