

The intent of the paper is to start a conversation on the subject of damage done by solar storms and the subsequent negatively charged high speed electrons that enter the earth's atmosphere and cause neurological damaged in MS patients.

Having lived with a close family member for thirty two years, that had MS, I took a keen interest in the disease and what caused its devastating damage. I studied what we know and looked at all the alternatives. Like everyone one else I felt helpless and wanted to try and find an answer.

That search for an answer led me to the understanding that we are not just earthlings, we are universal beings and we are affected by our universe. For many years I correlated the MS attacks with the reports sent out by NASA as to an approaching solar storm and how strong the storm was or how fast it was coming.

- We looked at the eleven year solar cycle.
- The fact that both the North and South poles draw in the electors.
- The density of MS patients and their geographical location.
- Ontario, Canada and Tasmania, Australia has the highest number of MS patients.
- Matching the sporadic reach of MS into the southern states with the far reaching effects of the larger, stronger storms of the solar high every eleven years.
- The damage that these storms have caused to the electrical and communication systems.
- The milliamp circuitry of the human body.
- The effects of these storms on satellites and astronauts.
- The publication of NASA's reports.
- The different ways to protect MS patients against these damaging electrons.

I believe that a correlation study between the location and frequency of MS attacks and the frequency and strength of solar storms, both past and present will reveal compelling evidence that these storms are the geographical trigger for the genetic disposition of MS.

If you agree that this report has merit please pass it along to those who can help.

# Multiple Sclerosis

## The Environmental Cause

### A Discussion Paper on the Environmental Cause for MS

A thesis by \_\_\_\_\_ (2004)

Multiple, because many scattered areas of the brain and spinal cord are affected. Sclerosis, because the disease involves “sclerosed” or hardened tissue in damaged areas of the brain or spinal cord. There is no known cause or cure for MS. Scientists have three theories, 1) Virus Attack, 2) Immune Reaction, 3) Or a Combination of Both. We can’t predict who might get it, however there is a pattern in who is more likely to get it. Symptoms usually appear between the ages of 20 and 40. MS seldom “strikes” (a reference to diagnoses) people under 15 or over 40. Slightly more women than men develop MS. MS occurs more in the **temperate zones, often between 40 and 60 degrees north and south latitudes**. There are four recognized types/stages of MS, Relapsing and Remitting, initially, this is the clinical course in 80% of affected individuals but a high proportion later enter the Secondary progressive phases. Primary progressive (third type) is described as an initial onset in which disability and impairment persist and accumulate from the onset of the illness, and Progressive Relapsing, in which 20% of patients, the disease progresses slowly from the onset, usually with predominant spinal involvement, and this form of MS is even more predictably disabling.

Granieri E, Casetta I, Tola MR, Govoni V, Poolino E, Malago S, Monethi VC, Carreras M  
 J Nevrol Sci 1993 April 115 Suppl:S16-23  
 Univ of Ferrara, Institute of Clinical Nurology, Italy  
 PMID #8340788; UI393340680

Abstract:

The Epidemiological approach has undoubtedly contributed to our knowledge of MS by providing some Etiological hypotheses in spite of the fact that a definitive bases for the **conclusive resolution of its enigma is still lacking**.

Epidemiological studies have indicated that MS has an uneven geographical distribution and a changing incidence over time at least in several areas of the world; this suggests an **Etiological role of both Genetic and environmental factors**.

The racial difference in the disease risk, the results of familial and twin studies as well as the association between MS and some HLA markers, support the great importance of Genetic factors.

On the other hand, the evidence of temporal trends and the data from migrant

studies seem to underline the Etiological **contribution of environmental factors**. In the light of these results much of the present views have emerged interpreting the disease as caused by multiple factors acting at a susceptible age in **genetically predisposed** subjects.

#### EPIDEMIOLOGY:

**The relation between geographic latitude and the risk of MS developing is striking.** The prevalence varies from 5 to 10 cases per 100,000 in tropical zones to 50 to 175 cases in temperate zones. Studies of migrant populations have disclosed that the factors determining susceptibility to MS are acquired before 15 years of age. Individuals who migrate before age 15 assume the risk that is prevalent in their new environment, whereas those who migrate after age 15 carry the risk that is prevalent in their place of origin. The incidence of **MS is also greater in urban dwellers** and among affluent socioeconomic groups. These epidemiological features strongly suggest a viral etiology.

The incidence of MS appears to be increasing. Epidemiological studies in Rochester, Minnesota, revealed an annual sex and age adjusted incidence of 6.3 cases per 100,000 persons between 1975 and 1984. During the period 1965 to 1974, the incidence in Rochester had been 3.6 cases per 100,000. Similarly, the prevalence of MS in the US, overall increased from an estimated 123,000 persons in 1976 to an estimated 250,000 to 350,000 persons in 1990. Life expectancy is significantly reduced in men with MS, but it is not significantly reduced in women.

#### Multiple Sclerosis Linked To Caucasian Ancestry

Oger J; Lai H

Ann Neurol 36 Suppl: S22-4(1994)

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UI#94288567

#### Abstract

Since its creation in 1980, the Multiple Sclerosis Clinic at the Univ. of British Columbia has actively followed over 2,500 patients from the Canadian province of British Columbia (BC) who have Clinically Definite Multiple Sclerosis (MS).

These patients include 2,496 European Caucasians from BC population of 3,858,505 (prevalence 64.7/100,000) in contrast with 92 patients of other origin (prevalence 14.6/100,000). Prevalence was higher in South Asians (15.7 from a population of 114,355) than in East Asians (6.25 from 287,845).

Among individuals with Natives Ancestry, MS was not rare when there was also European Ancestry (46 cases from a population of 94,615), but MS was not encountered in pure-blooded Natives (0 cases from 74,420 individuals).

In contrast, among 5 patients with HTLV-I-Associated Myelopathy (HAM), 4 (from a population of 74,420) were of single Native Ancestry and only 1 (from a population of 94,615) was of multiple ancestry, including Native Ancestry. HAM was not found among Caucasians. This preliminary account clearly establishes that HAM is linked to Native Ancestry and that MS is linked to Caucasian Ancestry.

**Genetic factors** are clearly important in MS. Studies of **European whites** have revealed a significant association with the HLA class II antigenic determinants HLA-Dw2 and HLA-DR2, particularly the DRw15, DQw6, Dw2 haplotype. HLA cell surface molecules encoded by these genes bind foreign antigen, and this complex is then recognized by the T cell receptor (TCR). MS susceptibility may also be determined by TCR genes. The TCR is a transmembrane glycoprotein with X and B chains containing variable (V), diversity (D), and joining (J) segments. About 60 to 80 Vb gene segments are thought to exist in men. Studies of the distribution of haplotypes defined by alleles with Vb8 and Vb11 probes showed significant differences between patients with MS and healthy individuals, including those who were HLA-DR2 positive.

Population based studies of twins have revealed the concordance for MS in monozygotic twins to be approximately 30 percent, compared with a concordance of 2 to 5 percent in dizygotic twins. The fact that many monozygotic twins do not develop MS seems to support the idea that environmental factors play an additional role. First-degree relatives of individuals with MS face a 3 to 5 percent risk of developing MS, this risk is 30 to 50 times than that of the general population.

#### DRB1 Va186/Va186 Genotype Associates With Multiple Sclerosis In Australia

Teutsch SM, Bennetts BH, Buhler MM, Heard RN, Stewart GJ

Hum Immunol 1999 Aug;60(8):715-22

Westmead Hospital, Dept of Clinical Immunology, NSW, Australia

PMID# 10439317; UI# 99368172

#### Abstract

Genetic susceptibility to Multiple Sclerosis (MS) has so far been strongly localized to the MHC Class II region encoding the alleles of the haplotype HLA-DRB1\*1501, -DQA1\*0102, -DQB1\*0602.

However, this haplotype is not carried by approximately 40% of MS patients; a potential explanation could be that they carry other MHC Class II alleles with similar function due to the sharing of nucleotide sequences encoding critical Amino Acid residues. The DRB1 Gene is polymorphic at residue 86, encoding Valine or Glycine.

In view of the increasing evidence for a functional role for DRB1 aa86 in the

binding and presentation of Auto Antigenic peptides such as Myelin Basic Protein, this study investigated associations with the residue 86 polymorphism in an Australian MS population.

A significant increase in the Val86/Val68 genotype was observed in the MS patients, which was still present in the absence of the DRB1\*1501 allele ( $p=0.032$ ). This suggests that DRB1 aa86 may have an independent role in contributing to MS susceptibility.

The Val86/Val86 genotype was correlated with genotyping for other putative MS susceptibility Genes, including T-Cell receptors beta chain germline polymorphisms, HLA-DMB alleles, and -DQA1 and -DQB1 alleles encoding critical Amino Acid residues, with a significant interaction only observed with DQB1 Leu26 ( $p=0.014$ ).

Additional studies of the HLA-DRB1 aa86 polymorphism in MS, and its function, are needed to more fully understand this association.

MS is a disease with many signs and symptoms, including tremor, spasticity, weakness, vision problems and difficulties in walking. Although the medical community is well funded and research has made some significant advances, their efforts are focused on pharmaceuticals, as it is the drug manufacturers that are receiving the greatest portion of the research funding.

There are several, well known facts about MS but the **actual triggers are unknown**. It is understood that there is a genetic component as well as an environmental component to the onset of MS.

The medical community is looking into viruses as well as bacteria in the environment that could trigger the onset but the exact causes have not been identified. If these triggers could be found it has the potential to help thousands of people lead more normal lives by slowing or even stopping the advancement of the disease. In the best case scenario Genome mapping could inform a person of their **genetic disposition** to the disease and if the environmental triggers could be found then we would have a fighting chance at preventing these triggers from bring on or advancing MS for these people.

MS affects the nerves and the insulating myelin that surrounds them effectively shorting out the nerve and preventing or slowing the command (the electrical signal) from the brain to the muscles. These shorts are called lesions and predominantly affect the larger clusters of nerve cells in the brain or spinal cord effecting motor control of the muscles and or cognitive ability. These lesions can repair themselves in time but often result in a dampening or permanent impairment

of the transition of the signal. This can result in fatigue, walking, grasping, bladder, memory, and cognitive problems to name a few. See Table 1. The effects of MS signs/symptoms on activities of daily living in a survey of 656 MS patients.

Sign/Symptom	Percentage Reporting Interference With Activities of daily living
Fatigue	56
Balance problems	50
Weakness or paralysis	45
Numbness, Tingling	24
Sensory disturbance	24
Bladder problems	34
Spasticity	26
Bowel problems	20
Difficulty remembering	16
Depression	18
Pain	21
Difficulty solving problems	9

**Canada has the highest incidence (per 100,000 people) of MS in the world**, it is estimated there are 50,000 men and women in Canada who have the disease, and central Canada has the highest numbers per population, because of the importance of this issue, Canada has some of the best researchers and scientists working in the medical community alongside the MS society, which works diligently to raise both awareness and funding for this research.

This thesis is not meant to be a challenge to the mainstream research but rather a compliment to it.

### SYNOPSIS:

Communication commands within the human body, from the brain to the muscles, are conducted by electrical signals through the myelinated nerve fibers. The human nerve cell ‘fires’ between 55 mille amps and 70 mille amps. Anything above or below this range and the nerve cell will not conduce or ‘fire’. These electrical signals are in the form of DC current, **in mille Amps**. Different types of cellular structure are capable of generating, transmitting and insulating this current in order that all life forms can function. In normal myelinated nerve fibers, electrical impulses are conducted in a salutatory fashion from one node of Ranvier to the next through activation of Na<sup>+</sup> channels that are clustered in the nodal region. When the internodal segments become demyelinated, current is shunted and the excitation of successive nodes is slowed. Factors contributing to total conduction failure may be demyelination of several contiguous segments, changes in extra

cellular fluid composition caused by edema, circulating factors that block synaptic transmission, temperature changes or surges in amps and volts of electrical impulses causing shorts, lesions or demyelination of nerve fibers.

Electricity is a universal phenomena, it is in our universe, all aspects of our environment and our bodies. Electricity is the transmission of energy from electron to electron in succession. Life as we know it could not happen without it. It can bring life or end it. It wasn't until the nineteenth century that man has been able to recognize, measure, generate and control electricity. The consequences of electrical energy, and it's by product magnetic fields, and the damage they can cause in the human body is an under studied field. The consequences of living near to strong electrical currents or magnetic fields, such as power lines has long been associated with illness, but remains unproven.

Residential and commercial power networks seem to defy the geographical association to MS but other factures in our environment can and do play an important role. As the leading line in the section of epidemiology would suggest there is **a striking geographical association between the incidence of MS and our environment**. Two factors are prevalent 1) the temperate zones, particularly eastern Canada and Australia (the proximity to the north and south poles), and 2) the association of urban dwellers to higher incidences of MS (large steel structures or steel cities). In the northern hemisphere, central/eastern Canada has the highest incidence rate per 100,000 of population and in the southern hemisphere Australia has similar rates of incidence per 100,000. The closer you get to the magnetic poles the higher the rate of incidence. As per urban dwellers it is the association to large steel structures. Whether encased in concrete or not, large steel structures (Cities centers) have the same effect as the poles for their ability to ground electrical current or "electrons in motion" from earth's atmosphere to the surface of the earth. It is these "electrons in motion" and where these electrons come from, and how they affect human life that is the essence of this paper.

#### CAUSE AND EFFECT:

In the solar system there is a phenomena on the surface of the sun known as solar flares, these are essentially nuclear blasts that throw energy, in the form of Plasma (made up of high speed electrons and protons), thousands of kilometers into space. An interplanetary shock wave from a solar coronal mass ejection. Once they clear the gravitational force of the sun they form solar clouds that travel through and out past our solar system, these solar clouds create an phenomena called space storms. To begin to understand the perfect space storm you must first begin to understand the gargantuan numbers with which plasma physicists work with every day. At

over 1.4 million kilometers (869,919 miles) wide, the sun contains 99.86 percent of the mass of the entire solar system: well over a million Earths could fit inside its bulk. The sun is 150 million kilometers (about 93 million miles) from earth. The total energy radiated by the sun averages 383 billion trillion kilowatts, the equivalent of the energy generated by 100 billion tons of TNT exploding every second. But the energy released by the sun is not always constant. Close inspection of the sun's surface reveals a turbulent tangle of magnetic fields and boiling arc-shaped clouds of hot plasma dappled by dark, roving sunspots.

Every once in a while an event occurs on the surface of the sun that releases a tremendous amount of energy in the form of a solar flare or a coronal mass ejection (CME), an explosive burst of very hot, **electrified gases** with a mass that can surpass that of Mount Everest. Solar winds blow these CMEs out through the solar system at an average speed of 400 km per second (250 miles per second)

The earth's outer atmosphere works as a heat shield to deflect and absorb some of the damaging energy, but in the process creates a **billion degree cloud of electrified gas** that sets up loops of **multimillion amp electric current**. Scientists at the U.S. space agency said they were somewhat surprised by the data from NASA's Imager for Magnetopause to Aurora Global Exploration (IMAGE) spacecraft, which has been watching what happens when solar storms hit the planet since it was launched in 2000.

The result is dramatic. IMAGE data, translated into visuals by computer, shows the superheated gas called plasma streaming from the sun and hitting the earth's outer atmosphere. SEE; accompanying poster issued by NASA.

Note the photo taken by NASA from space. In the center photo of the concentration of NCE plasma is drawn in by the magnetic pole. This area of north America (Ontario, Quebec and the eastern sea board) represents the same foot print as MS.

Most of the plasma is deflected but some starts a reaction with the atmosphere itself. It shows bursts of hydrogen and oxygen coming out of the earth's atmosphere, it is a very small part, a stream of charged oxygen atoms. Each storm accounts for about 100 tons of oxygen expelled into space. The timing is most important, there is a direct input from the solar wind. The earth responds immediately by ejecting a part of the atmosphere. The moment it hits space, this oxygen becomes super-charged in bursts that can also be seen by IMAGE. Some of it loops back into the atmosphere but much gets caught up in the solar wind and is

carried away. It gains **100,000 times the energy** it had when it left the atmosphere so it is very pumped up. When it plunges back into the atmosphere, these strong currents are generated. They **transform the mid-latitudes** from their usual calm state into kind of a maelstrom that has direct effects on our daily lives.

NASA has the ability (with NOAA, NGDX and SOHO satellites) to **predict, monitor and track solar storms** and often publishes their presence in the newspapers as well as its web site, Space Environment Center Space Weather Alerts. NASA will divert shuttle launches and “hide” satellites in the shadow of the earth to protect them. As well engineers have the ability to **shield and protect** satellites from Solar Storms. Therefore we have the ability to inform and protect genetically predisposed MS patients. MS usually affects people between the ages of 20 to 40 years of age. This is approximately 2 to 4 solar cycles depending on when an MS patient is born in the cycle, a solar cycle is 11 years. The **slow accumulation of lesions over several solar cycles** builds to a point of problematic dysfunction and diagnosis. The damage starts in genetically disposed people from the onset of **the first solar cycle in their lives**. The length of a Solar Cycle ends with a period of intense solar storm activity. It is at this time that most of the damage is caused to MS patients.

#### HISTORICAL EVIDANCE;

The length of a solar cycle ends with a period of intense solar activity. It is at this time when most of the damage on earth occurs.

**1859** August 28 to Sept. 2 several solar flares were observed. Then, on Sept. 1, the sun released a mammoth solar flare. For almost an entire minute the amount of sunlight the sun produced at the region of the flare actually doubled. With the flare came this explosive release of a massive cloud of magnetically charged plasma called a coronal mass ejection. Not all coronal mass ejections head towards earth. Those that do, usually take three to four days to get here. This one took all of 17 hours and 40 minutes. Not only was this coronal mass ejection an extremely fast mover, the magnetic fields contained within it were extremely intense and in direct opposition with earth’s magnetic fields. That meant the coronal mass ejection of Sept. 1, 1859, overwhelmed earth’s own magnetic field, allowing charged particles to penetrate into earth’s upper atmosphere. The endgame to such a stellar event is one heck of a light show and more, including potential disruptions of electrical grids and communications systems.

In **1881**, another solar cycle reached its maximum, **Solar Cycles are approximately every 11 years.**

A list of major storms includes the years, 1859, 1870, 1881, 1892, 1903, 1914, 1925, 1940, 1958, 1972, 1989, 2000, 2011. Correlation studies of individual patients and the time of diagnosis and symptoms would prove this.

Once again **telegraph lines** in Boston and London operated without batteries as auroral currents began to surge. As solar storm particles arrived at the earth and enter the magnetosphere, they temporarily set up an invisible, circulating flow of **charged particles around the polar regions of the earth**: The Ring Current. This current causes magnetic field fluctuations near the ground, which in turn induce currents in wires (and nerve fiber). It doesn't matter if these wires are under the ocean because **electromagnetic energy can pass through water with little hindrance** (and human bodies). In the Atlantic Cable between Scotland and Newfoundland, voltages up to **2,600 volts** were recorded during the March **1940** magnetic storm.

The March 24, 1940 storm caused a temporary disruption of electrical service in New England, New York, Pennsylvania, Minnesota, Quebec and Ontario. A storm on Feb. 9-10, 1958 caused a **power transformer** failure at the British Columbia Hydro and Power Authority. On Aug. 2, **1972**, the Bureau of Reclamation power stations in Watertown, South Dakota was subjected to large swings in power line voltages **up to 25,000 volts**. Similar voltage swings were reported by, Wisconsin Power and Light, Madison Gas and Electric, and Wisconsin Public Service Corp. **A 230,000 volt** transformer at the BC Hydro and Power Authority exploded, and Manitoba Hydro in Canada recorded power drops from 164 to 44 megawatts in a matter of a few minutes, in the power it was supplying to Minnesota.

Perhaps the most dramatic, recent impact occurred in March **1989** during the peak of the sunspot cycle, when the sun produced one of the most powerful storms ever recorded. On March 13, 1989 Alaskan and Scandinavian observers were treated to a spectacular auroral display. In fact, this display was seen as far south as the Mediterranean and Japan (explaining the reach of MS incidence in the southern latitudes). Although many millions of people marveled at this beautiful spectacle, many millions more were not so happy about it. Hydro-Quebec on Saint James Bay did the best it could to stabilize the **power surges its power lines** received but ultimately failed the challenge. For 9 hours, large portions of Quebec were plunged into darkness. The frequency of transformer failure is higher in geographic regions where magnetic storms are also more common such as the Northeastern US region and Canada, which had 60% more transformer failures. Moreover, the number of failures follow a solar activity **pattern of roughly 11 years**.

Just as good for generating large induced currents as telegraph and power lines are long, uninterrupted segments of **oil and natural gas pipelines** (large steel structures). Currents flowing in pipelines are known to enhance the rate of corrosion over time, and this can have catastrophic effects. On June 4, **1989** a powerful gas pipeline explosion demolished part of the Trans-Siberian Railroad engulfing two passenger trains in flames.

Back in March 13, 1989 only the Toronto Star reported that. “Huge Storms on Sun linked to blackout that crippled Quebec”. The problem is that many of these calamitous events are at the nuisance level, (Hydro- Quebec’s power grid was down for nine hours and resulting damages and loss in revenue were estimated to be in the hundreds of millions of dollars).

A **1994** solar storm caused major malfunctions to two communications satellites disrupting newspaper, network television and nationwide radio service throughout Canada. But now times have definitely changed as we enter the Satellite Era with hundreds of millions of subscribers relying on the flawless and reliable working of satellite technology. November 26, **1982**, GOES-4 satellite’s visible and infrared spin-scan radiometer was disabled for 45 minutes after the arrival of **high-energy protons from a solar flare**. Marecs-B, a marine navigational satellite, was disabled by the strong electrical currents flowing during a week of intense auroral activity in February, 1982. GOES-7 weather satellite lost half of its solar cells during a large proton release by the sun during the powerful March 13, 1989 storm, which cut the operating life span of this satellite in half. January 20-21, 1994, ANIK E-1 and E-2 two Canadian communications satellites were disabled **due to the elevated activity of high-energy electrons in the magnetosphere**. Intelsat-K also experienced a short outage of service during this time. On January 11, 1997 at 6:15 AM EST, AT&T experienced a massive power failure in its Telstar 401 satellite. A few hours before Telstar 401 began to show signs of malfunctioning, the GOES-8 weather satellite experienced its own difficulties. Meanwhile the plasma from a solar storm had just arrived hours before. Satellites and computers work in milli amps.

June 6, **2000** the orbiting **Solar and Hemispheric Observatory (SOHO)** **recorded** a powerful series of solar eruptions including a full-halo coronal mass ejection (CME). The velocity of the ejected material was at least 908km/s, The CME reached earth in a little less than 48 hours. Coronal mass ejections can carry up to **10 billion tons of electrified gas** traveling at speeds as high as 2000 km/s. “Halo events” are CMEs aimed towards earth. As they loom larger and larger they appear to envelop the sun, forming a halo around our star. Whenever space weather

forecasters see a complex magnetic field like the one exhibited by sunspot group 9026 (where June 6th's eruptions occurred) they know that solar flares are likely. In fact, **NOAA Space Environment Center predicted** a possible major flare from 9026.

If there are thousands of working satellites in space, why is it that a specific storm only seems to affect a few of them, if any at all? Despite the dramatic consequences for Telstar 401, no military satellites were apparently affected by this particular storm, and Hughes Space and Communications which manufactured over 40% of the commercial satellites now in orbit, had not received any reports of any anomalies related to the storms among other satellites of similar type. If solar storms are so potent, why don't they take-out many satellites at a time? Solar storms are at least as complex as tornadoes, and we know that tornadoes **can flatten one house while leaving its neighbors untouched**, but that doesn't persuade us to deny the existence of tornado damage. We can see tornadoes coming with our eyes. Not so for solar storms: **The ultimate Stealth Bombers of the solar system.**

The **most destructive ingredient** of solar storm activity for satellites seems to be in **the high-energy electrons** rather than the other types of particles. These electrons do their damage by producing "**deep dielectric charging**" in **unprotected parts** of the satellite. Data taken by the SAMPLEX satellite of the energetic electrons near geosynchronous orbit, against the times when the Anik satellites were affected, shows that the failures happened near the peaks of this activity. Data provided by Rice University and NOAA and NGDC scientists show that satellite surface charging "anomalies" detected by the GOES-4 and GOES-5 spacecraft in geosynchronous orbit, correlate very well against a period when electrons were injected into this orbit due to the passage of a disturbance from the geotail region **into the inner magnetic field regions around the earth**. Some satellite designs, or satellite orbital locations, seem to have a higher risk for solar storm affects than others.

Of particular concern are the so called "phantom switches" where data bits are switched from '1' to '0' or vice versa because of a discharge in the electrical device caused by a high-energy particle strike. A nearly perfect correlation can be found between specific bit-switches and energetic electron enhancements detected by the GOES-7 and METEOSAT-3 satellites. The switches seemed to happen most often during periods when the electron impacts remained high for several days at a time. It isn't a single intense storm that seems to do the dirty work, but a sustained period of high electron 'storm' activity near the spacecraft.

Solar activity doesn't have to take a direct swipe at a satellite to do it harm by throwing high-energy particles at it. For satellites during heightened solar activity, the earth's atmosphere can puff up like a balloon and offer increased atmospheric friction. The premature demise of such satellites as the Solar Maximum Mission (SMM April 1990) and Skylab (July 1979) is the result. During the March, 1989 storm, US. Space Command had to post the new orbital elements for over 1000 objects whose orbits had been affected by the momentarily increased air resistance hundreds of miles above the earth's surface.

So, why not make all satellites 'radiation hardened' or equip them with lots of **radiation shielding**? In a word 'Cost'. **Shielding** is dead weight, and it costs just as much as million-dollar technology to put into space. So, satellites are designed with the minimum amount of shielding that the engineers think they can get away with to keep the satellites functioning without breaking the bank. There is nothing wrong with this approach if you can accurately predict what the typical environment will be like during the satellite's lifetime. If you guess wrong, the shielding is inadequate and your satellite is lost.

### HUMAN FACTORS:

Schumann Resonances, a plausible biophysical mechanism for the human health effects of Solar/Geomagnetic Activity

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9/8/2001

#### Abstract

A large number of studies have identified significant physical, biological and health effects associated with changes in Solar and Geomagnetic Activity (S-GMA). Variations in solar activity, Geomagnetic activity and ion/electron concentrations are all mutually correlated and strongly linked by geophysical processes. A key scientific question is, what is it in the natural environment that causes the observed biological and physical effects? The effects include altered blood pressure and melatonin, increased cancer, reproductive, cardiac and neurological disease and death. Many occupational studies have found that exposure to ELF fields between 16.7 Hz and 50/60 Hz significantly reduces melatonin levels. They are also associated with the same and very similar health effects as the S-GMA effects. The cell membrane has an electric field of the order of  $10^5$  V/cm. The ELF brain waves operate at about  $10^{-1}$  V/cm. Fish, birds animals and people have been shown to respond to ELF signals that produce tissue electric gradients of ULF/ELF oscillating signals at a threshold of  $10^{-7}$  to  $10^{-8}$  V/cm. This involves non-linear resonant absorption of ULF/ELF oscillating signals into

systems that use natural ion oscillation signals in the same frequency range. A long-lived, globally available natural ULF/ELF signal, the Schumann Resonance signal, was investigated as the possible plausible biophysical mechanism for the observed SGMA effects. It is found that the Schumann Resonance signal is extremely highly correlated with S-GMA indices of sunspot number and the Kp index. The physical mechanism is the ionospheric D-region ion/electron density that varies with S-GMA and forms the upper boundary of the resonant cavity in which the Schumann Resonance signal is formed. This provides strong support for identifying the Schumann Resonance signals as the S-GMA biophysical mechanism, primarily through a melatonin mechanism. It strongly supports the classification of S-GMA as a natural hazard.

Normally the earth's atmosphere protects life on earth from the effect of these storms of high-speed negatively charged electrons (NCE) and protons, Most all the protons are removed or neutralized by the upper atmosphere but the negatively charged electrons are not and are not slowed by atmospheric conditions, in fact they use water molecules as conductors and are able to reach thousands of feet into the oceans. Recently two factors are taking place that correlate to the increasing rate of MS. One is the depletion of the ozone layer over the northern hemisphere and the second is the strengthening of the magnetic poles, both are circulatory phenomena that affect the planet earth's ability to protect us from these solar storms. As well, the number of large steel urban centers are also on the increase. By the nature of their construction modern cities have their buildings cast in concrete and steel which are grounded and make excellent antenna for the electrons to attract to. The magnetic poles as well as large steel structures ground or draw in, these electrons in a similar way as to lightning finding a ground and striking the earth. The erratic behavior of the grounding of the electrons is due to their search for a suitable ground and this will explain the erratic nature to MS.

If two people with MS were to live in close proximity to one another and one went on a trip while an electron/solar storm was passing by the earth's atmosphere and it's "grounds" (the magnetic poles and large steel structures), the person remaining close to the effective "grounding" would experience an MS exasperation while the other may not, further explaining the erratic nature to MS. As well the strength and location of the storm implies the regions and the distance from the magnetic poles that will be affected, further explaining the erratic geographical nature.

It is well documented that the indigenous people of northern Canada have, until just recently, had near zero incidence of MS. This genetic resilience can be explained by selective breeding. An unpopular subject but, none the less, tribal and

nomadic populations, in historical nature, have been known to limit disabled and cognitively impaired members of their tribe from marriage and copulation, as a survival tactic. Often sick, impaired or elder persons of the tribe were left behind as the tribe moved on to find seasonal food supplies. If practiced over many generations it would remove the genetic disposition from the bloodline. On the other hand **white European** populations, of modern times, with a more liberal view towards mixed blood lines and their ability to farm, settle and care for the disabled, made it impossible to eradicate the genetic disposition from within their blood lines. With the increased tolerance towards inter radical marriages within the indigenous populations of the northern hemisphere and their increased ability to settle and care for their sick and disabled, European bloodlines are returning the genetic disposition into these indigenous populations. This mixing of bloodlines would explain the sudden appearance of MS in their populations.

Multiple sclerosis, like many other diseases of modern man (a reference to our changing atmosphere condition and our choice to live in urban centers), is a disease quite simply caused by an overactive and misdirected immune system. For reasons which are unclear (the presents of solar clouds), the immune system reacts against the protective insulating cover (myelin) of the central nervous system (the brain and spinal cord). White blood cells called lymphocytes attack myelin as if it were some invading organism or foreign substance (the presents of the high speed electrons flowing through the nervous system).

When the body's immune system fails to control itself and lymphocytes attack normal body tissues, the disease process that ensues is called an autoimmune disease. Other autoimmune diseases include; rheumatoid arthritis, systemic lupus erythematosus (SLE), and even some forms of vascular disease. The typical western medical response to these autoimmune diseases, including multiple sclerosis, is to administer potent medicines designed to turn off the over activity of the immune system that characterizes these illnesses. Unfortunately, these potent immuno suppressant drugs are fraught with other sometimes life threatening side effects.

Somehow in the case of MS the lymphocytes get their signals crossed. It's as if they receive a message, which directs them to attack the brain and spinal cord. But what are the messages, which control or confuse lymphocytes? The presents of the high speed negatively charged electrons concentrated in the large nerve centers.

Lymphocytes receive direction from a group of chemicals called Prostaglandins, so named as they were first isolated from the prostate gland. Prostaglandins can be conveniently divided into three main groups, (PG1, PG2, PG3). These three groups

of Prostaglandins are all derived from a special type of dietary fat called essential fatty acids. These dietary fats are not produced in the human body. They are called essential because without them we couldn't survive. The two essential fatty acids important in the production of Prostaglandins are linolenic acid and linoleic acid, also known as omega 3 and omega 6 fatty acids, respectively.

The roll of Prostaglandins 1 and 3 is to moderate or tone down the immune response. Prostaglandins in group 2, on the other hand, signal the lymphocytes to become more active in the immune response. In normal situations, a balance is achieved but with the presents of the high-speed electron running through the nervous system this balance is thrown out of proportion. Under the influence of Prostaglandin 2, during a solar storm and the presents of negatively charged electrons in the body, the white blood cells are over activated and produce free radicals, triggering the autoimmune system to attack itself or as the case with MS the invisible and undetectable electrons. Interestingly, the cerebrospinal fluid, the liquid covering the brain and spinal cord, has been shown in patients suffering from MS to contain significantly less linoleic acid than in non-afflicted individuals. Showing an ability of linoleic acid to neutralize the electrons. The linoleic acid acts like an electrical capacitor to store up and neutralize the damaging effects of the electrons which otherwise shoot along the human electrical system. Damage can occur in two forms. 1) Triggering the autoimmune system to attack its self. 2) The negative electrons over load or short out the nerves system. The first results in demyelination, the second results in damage to the nerve fiber or neuron.

#### CONCLUSION:

We have the ability to determine the genetic disposition to MS. We have the ability to predict, monitor and track solar storms. And we have the ability to shield the people that are genetically susceptible. Therefore: we have a prevention and treatment for Multiple Sclerosis.

**Shielding and information is the prevention, from the onset and advancement for MS** as there is no cure for the genetic disposition or the opportunity of elimination of solar storms from our atmosphere. The required information can be published or broadcast by NASA with advanced warning, usually several days. Shielding can be provided, by wearing protective garments over the vulnerable areas of the body, the large nerve centers, were concentrations of electrons will assemble, in the brain and spinal cord. Protective shielding can be provided by, “a lead woven fabric” protected from touching the skin, sown into hats and vests. These protective garments would be worn during the extent of the effects of the solar storm, usually 2 to 7 days. It would also be possible, although expensive to

shield the homes of MS patients, requiring them to stay indoors during the height of the solar storm.

Solar **Coronal Mass Ejections** (CMEs) and their effect on human life will be an exciting new field of medical research. CMEs will have an effect on many diseases such as, MS, ALS, Alzheimer's and Aging to name a few. **CMEs and (NCEs) are the ultimate stealth bomber.** The human body, after millions of years of evolution, does not needlessly attack itself. The free radicals are attacking the presents of the NCEs.

There are many correlation and epidemiological studies between incident rates of MS and solar cycles that can be done. There are studies of the effects and strength of the human "electrical system" to be done. Laboratory studies on the effects of high-speed **Negatively Charged Electrons** (NCE) on the human (mice) nervous systems that could be done. An informative collection of CME data and distribution network must be established, perhaps by NASA. Protective garments must be developed and protected against exploitation. Education must be developed to combat fear and anxiety. We can beat this problem and improve the lives of millions of people worldwide. **MS is protectable.**

My awareness to the issues involved with MS, derive through my wife, whom was diagnosed with MS more than eleven years ago. Learning about the disease was necessary to be an understanding caregiver and loving husband. Watching the advancement of the disease has been frustrating and challenging but has also created a learning environment that has provided the information required to write this thesis. I believe I have identified the environmental cause for MS and in doing so have a solution that has the ability to protect MS patients from the onset and advancement of the disease. Close scrutiny of the geographical foot print of MS will collaborate and provide an exact match to the geographical foot print of the effects of the NCEs striking the earth.

This papers intent is to open up a dialog and research on these discoveries. It is important to understand that it may take an open mind to this thesis but remember conventional medical research is not working. Scientists still do not know the cause for MS.

We need to help MS patients in every way that we can. It is my wish that someone will pick up this work and continue to prove out this theory and develop protective systems for those affected.