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MORE MICROBE MALADIES? SOME NEW SURPRISES

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Up until ten or fifteen years ago, it was generally believed that the only thing microbes caused were different types of infectious diseases. However, it is now quite likely that some may play a significant role in other disorders that have no apparent link to any sort of infection. The possibility that peptic ulcer could be caused by a bacterium seemed preposterous when initially proposed. Since then, the crucial role of *Helicobacter pylori* has been proven, and antibiotics are now the treatment of choice.

More recently, as indicated in prior Newsletters, there is mounting evidence that microorganisms may also be responsible for heart attacks and strokes. One clear culprit appears to be *Chlamydia pneumoniae*, which has been identified in the atherosclerotic plaque that can clog up the coronary and carotid arteries.

Cytomegalovirus, herpes viruses, as well as *Helicobacter pylori*, are also believed to cause or contribute to accelerated atherosclerosis. The curious thing is that in most instances, there is no history of any infection, or as in the case of *Chlamydia pneumoniae*, perhaps only a day or two of mild cold symptoms. Scientists suspect that some of these organisms can lie dormant in cells, producing no signs or symptoms, until immune system defenses become suppressed and they are activated. This seems to be the scenario with recurrent herpes simplex infections of the lip and genitalia.

However, chlamydia and some of the other microorganisms implicated in atherosclerosis may behave differently. Although there is no elevation of temperature or other indication of infection, there may be a smoldering chronic low grade inflammatory reaction to their presence. Immune system components released to combat the invader perpetuate the process, and aggregates of chemical complexes resulting from this reaction are picked up by scavenger cells and deposited in atherosclerotic plaque.

It now seems likely that we are also being "bugged to death" in other surprising ways. In addition to ulcers, heart attacks, and strokes, this list may soon have to be enlarged to include some cases of schizophrenia, behavioral and eating disorders, Alzheimer's disease, and possibly testicular cancer.

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Can Schizophrenia Be Due To Infection?

Schizophrenia is a mental disorder characterized by impaired thinking, perception, and expression of emotion. Schizophrenics tend to experience hallucinations, delusions, mood swings and a generally altered view of reality. In some instances, there is a family history that strongly suggests a genetic predisposition. In others, there appears to be some environmental trigger. Although the condition usually doesn't become apparent until the late teens or the 20s, most researchers suspect it starts much earlier, possibly before birth.

Supportive evidence comes from epidemiological studies showing waves of schizophrenia cropping up in England, Wales, Denmark, Finland, and other countries at the same time. What could they have in common? The answer may be that a generationpreviously, these areas had all been subjected to flu epidemics about the time the mothers of these patients were pregnant. A study in *The New England Journal of Medicine* reported higher rates of schizophrenia in children born in crowded areas in cold weather, where one would similarly expect a higher incidence of respiratory infections. A link with polio virus has also been suspected, since the incidence of schizophrenia fell sharply in many countries following the introduction of polio vaccine.

A new Finnish report supports this possibility. Researchers followed up on pregnant Finnish women who had been infected with the polio virus in the 1950's and 60's. They wanted to determine if they were more likely to bear children who would subsequently develop schizophrenia than non-infected mothers. The results indicated that among the more than 13,500 people born during this period, schizophrenia was indeed much more frequent among those whose mothers had been exposed to polio virus five months before giving birth. This would have been during the second trimester, a very important period in activities responsible for the organization of fetal brain functions.

Another virus that has been implicated in schizophrenia is the Borna virus. All of these organisms are believed to infiltrate fetal brain tissue during crucial stages of its development. The resultant immediate impairment may consist only of disruption of neuronal connections with seemingly little significance. Their effects may not become apparent until early adulthood, as the brain starts to reach its full maturity

Patients with advanced schizophrenia often show a shrinkage of certain structures, particularly the cerebral cortex, thalamus, and limbic system. As a result, there is a compensatory increase in fluid filled cavities which can be as much as 50 per cent. A variety of neurochemical communicative processes may be affected without obvious pathologic changes: in some patients, this may be the legacy of a prenatal viral infection.

Further support for an infectious role comes from studies suggesting that certain cases of schizophrenia may result from disturbances in immune system function similar to those seen in rheumatoid arthritis and multiple sclerosis. In these autoimmune diseases, the immune system mistakenly attacks normal cells since their appearance may have changed as a result of some infection. In such circumstances, there is an increase in substances known as heat shock proteins, whose purpose is to help protect central nervous system and other cells from damage. (*Continued on Page 3*)

Several years ago, researchers noted that some schizophrenics had increased levels of antibodies to these heat shock proteins. It was suggested that these antibodies, which reflect a response to some prior infection, might harm central nervous system structures. These same antibodies have also been found to be increased in multiple sclerosis patients. In this disorder, symptoms are due to damage to the protective myelin sheath around nerves, which are believed to result from aberrant immune system responses. A German study has recently reported that 33 percent of schizophrenic patients had increased antibodies to two types of heat shock proteins, more than ten times greater than the three percent seen in healthy controls.

It is quite possible that any type of significant prenatal insult may result in some manifestation of schizophrenia if it occurs during a crucial period of brain development. Rubella infection, diabetes, poor nutrition, and pregnancy complications have all been implicated. It seems most likely that schizophrenia is determined by a genetic predisposition coupled with environmental factors. Some of these may be much stronger than others, and in certain instances, a combination of seemingly insignificant insults may be responsible.

Schizophrenia, autism, depression, and other affective disorders have all been observed to run in families, and the focus in recent years has been on genetic factors in mental diseases. There is evidence that faulty DNA is partially responsible for the development of anxiety and panic disorders, as well as schizophrenia in some patients. If heredity alone were to blame, then identical twins would develop schizophrenia with a high degree of concordance. However, when one identical twin has schizophrenia, it will eventually occur in the other only 40 percent of the time.

Decades ago, because of Freud's influence, schizophrenia was often attributed to poor parenting, and mothers were even called "schizophrenogenic". Obsessive-compulsive disorder was also blamed on being too strict in toilet training, but it now appears that aberrant responses to infections are much more likely to be responsible.

Obsessive Compulsive Disorder, Anorexia, Alzheimer's, Testicular Cancer?

All of the above have now been linked to infections. Obsessive-compulsive disorder (OCD) may occur in children following a streptococcal infection that was manifested as only a minor sore throat. For some reason, the organisms may be able to camouflage themselves against immune system attacks, and the resultant antibodies can subsequently damage neuronal structures. In one experiment, 28 OCD children with elevated levels of streptococcal antibodies had their blood plasma replaced with healthy donor plasma. The theory was that this would remove the trouble-making antibodies. Sure enough, over the next month, the frequency of tics was cut in half and OCD symptoms were reduced by 60 per cent. Anorexia and other eating disorders have also been observed to start or significantly worsen after a strep infection.

In some instances, Alzheimer's disease may result from inappropriate responses to otherwise trivial infections. *Chlamydia pneumoniae*, a common cause of upper respiratory infections, was found in the brains of 17 out of 19 Alzheimer's patients, but only 1 of 19 dying from other causes. Serologic studies also show a high incidence of herpes simplex virus type 1 infection in Alzheimer's patients. Patients with some types of testicular cancer have been found to have increased levels of antibodies to cytomegalovirus or the Epstein-Barr virus implicated in chronic fatigue syndrome and infectious mononucleosis.

New advances may uncover more unsuspected links. Polymerase chain reaction techniques allow microbiologists to keep replicating a small bit of genetic material over and over until it is large enough to study, and show the lingering traces of an unsuspected infection. Refinements in electron microscopy now make it possible to detect the "footprints" left by infection in the cerebrospinal fluid. Further research may lead to the development of vaccines and new antibiotics that might be as effective for mental illness as they have been for peptic ulcer.

EMF Exposure And Stress In Cows

The steadily increased use of electric power throughout the world has resulted in an electromagnetic environment thousands of times greater than natural levels. This is particularly true in highly industrialized locations, especially where there is increasing proliferation of high frequency transmitters for mobile communication and microwave devices. It is important to note that these latter energies have no counterpart in nature. Even at very low levels, it has been demonstrated that they can exert significant biological effects.

Most of the interest thus far has focused upon possible increased risk of various types of malignancies, including leukemia from high power lines, brain tumors from cell phones and breast cancer due to disturbances in melatonin production. While all of these have been the subject of ongoing debates, there is little doubt that electromagnetic fields can influence endocrine, immune and nervous system responses, as well as behavior and psychological functioning. Relatively little attention has been paid to effects on pets and farm animals, who may also be exposed to these forces. One study reported that animals with increased exposure to low-frequency magnetic fields had an incidence of breast cancer seven times higher than controls in locations with less ambient electromagnetic pollution. Another found that sheep grazing in close proximity to a high-tension mast had impaired immune system responses. Dairy cows with increased exposure to magnetic fields have shown a reduction in milk production and changes in the composition of the milk.

Many of these and other effects of electromagnetic fields are reminiscent of the effects of chronic stress in animals, such as; frequent fertility problems, increased rates of spontaneous abortion, and a reduction in milk production. It is well known that animals have much keener senses of smell and hearing than humans. It seems quite likely that they may also be much more sensitive to weak electromagnetic fields and other subtle energy stimuli that may have significant effects on mood and behavior.

A farmer sought assistance from a veterinary consultant because he had been having strange problems with his herd of dairy cows. His farm was situated near a TV transmitting antenna, and difficulties started shortly after several mobile radio communication transmitters were also installed. Since then, the farmer, as well as family members, began to experience increased irritability and minor health problems. They did not make any connection until they noted the appearance and behavior of cows grazing in close proximity to these transmitters.

Most of the cows in this herd displayed evidence of marked conjunctivitis, with redness, itching and a heavy flood of tears. Several animals were pushing their heads against the chest area of neighboring cows in an apparent attempt to turn their heads away from the transmitting antenna. One particular cow exhibited very bizarre behavior by shuffling backwards and forwards and moving her head continuously. This was followed by a resting phase and resumption of this abnormal pattern which often lasted more than a half hour. To determine whether this was due to the transmitter, this cow and a normal cow were relocated to an identically partitioned stable which housed another herd approximately 20 kilometers away from the transmitters. After five days in the new stable, the affected dairy cow showed no evidence of previous abnormal behaviors. After two weeks both cows were again relocated to the original stable. Within a few days, the previously affected cow again started to show the same behavioral abnormalities.

After this experience was reported, many more farmers have come forward describing similar cases, and various tests are under way to clarify possible health effects. One will involve periodically switching off mobile radio transmitting antennas for set periods of time to determine if this results in concomitant disappearance of abnormal behaviors. If so, it is likely that current safety limits for exposure to electromagnetic fields will need to be revised, especially since there may be serious long term consequences for meat eaters.

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The farmer who originally called attention to possible behavioral abnormalities from exposure to communication transmitters also reported more serious long term problems. Cows and calves that were put out in pastures close to the farm only grazed for a few minutes each time, and then "took cover" from the transmitting tower in or behind some out building. Cows that had calved three or four times often showed a rapid decline in health. When they tried to get up, their hind legs would tremble and were obviously weak. Because of a progressive decline in strength, getting up became increasingly difficult, and the animals eventually died. An autopsy of one four-year old cow that had shown this sequence of events revealed death from acute heart and circulatory collapse. Acute and/or chronic inflammatory changes were seen in various organs, often with evidence of hemorrhage. There was absolutely no indication as to what was responsible for these pathologic findings.

As previously noted, increased exposure to electromagnetic fields is also associated with an increased incidence of spontaneous abortion. Examinations of aborted fetal material did not disclose any indication of the usual pathogenic causes. The answer in both instances may be that exposure to electromagnetic fields was responsible. These effects on animals could also have secondary health consequences for humans. When farmers detect possible early signs of electromagnetic field effects in their cows, such as abnormal behavior or a worsening general condition after calving, they have two alternatives. One would be to move the animal to another low exposure location in the hope that health will improve. The other is to have the animal slaughtered, which may well be its ultimate eventual fate anyway. There is now considerable concern that such animals pose a health threat for human consumption. There is no apparent danger from infection due to transmission of pathogenic bacteria or viruses. However, the consumption of meat from animals subjected to other severe types of stress can result in cardiovascular disease, impotency, and fatigue.

Eating Stressed-Out Meat Is Hazardous

Vegetarians will love this one, as will those who believe that "You are what you eat". But why should eating meat from animals who have suffered from increased exposure to electromagnetic fields pose any health hazard? After all, the FDA has approved the use of irradiation to preserve the shelf life of certain foods. The potential harm is not from biologic or electromagnetic contamination, but rather changes in the chemical content of meat that often result as a consequence of severe stress.

When a cow, pig, chicken, turkey or any domestic farm animal is under severe stress due to fear or pain, increased levels of stress-related hormones like adrenaline and cortisone are found not only in the blood, but also in body tissues. Other chemicals which stimulate the production of pheromones to transmit subtle warning signals can also be detected. Primitive man and kosher butchers sacrificed animals by blood letting, so that they lapsed into a painless coma before perishing. As a result, the hormone content of this meat was much lower. Modern slaughtering practices tend to cause extreme fear in animals, resulting in the production of abnormally high amount of these hormones and other compounds. There is good evidence that these chemicals remain in the tissues, and can have significant physiological effects when consumed.

The following is not a very pleasant scenario, and animal rights activists will rightfully be up in arms, but these are the distasteful facts. When laboratory dogs are subjected to severe stress and are slaughtered under stressful circumstances, stress-related hormones and chemicals are retained in their tissues. If their meat is fed to a colony of rats, the females will cease to reproduce for the next two weeks, males have less sexual arousal and are no longer attracted to females in heat, and females stop reproducting for two weeks. A control colony of the same strain fed on meat from dogs slaughtered by painless blood loss maintained normal reproduction rates. These observations may have important implications and could explain certain trends.

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There has been a progressive increase in impotency not attributable to diabetes, medications, and other known medical causes or psychological problems. It is believed that about half of unexplained impotency may be related to the high hormone content of meat. This may also be responsible for the tendency for girls to begin puberty at abnormally early ages and increased breast development in teenage boys.

A recent survey in Utah of over 600 teenage boys and girls confirmed a continued marked increase in early onset of menses. In more than two out of three girls, this now occurred at age ten or less, whereas fifty years ago, only a third would have fallen into this category. Ninety per cent of the boys in the study were found to have increased breast development. In half of these, the enlargement was 200 percent greater than normal. Gynecomastia can be extremely embarrassing for teen age boys, and may necessitate surgery because of this and associated psychological problems.

This is not meant to imply that eating meat from severely stressed animals is the sole cause of the above problems. Farmers often use antibiotics, growth hormone, testosterone, and progesterone and other hormones to fatten up their livestock. However, these are generally withheld for some period prior to slaughter to prevent significant amounts from being retained in tissues.

Fish eaters and vegans are not necessarily immune from contaminants that can produce similar effects. Women who ate fresh water fish from Lake Ontario had shorter menstrual periods, more difficulty in getting pregnant, and high concentrations of PCB's in their breast milk. Lake Ontario fish contain more than double the amount of dioxin, mirex and PCB's than fish from the other Great Lakes and these toxins interfere with the reproductive cycle. Fruits and vegetables, especially from other countries, can be heavily contaminated with powerful pesticides that can have similar effects. The only escape appears to be to grow your own organic foods, and to carefully monitor the chemical content of any water used.

Foods For Healthier And Longer Lives

On a more optimistic note, there are some foods that do seem to promote health and prolong life. These are not listed in any particular order, and there are some others that might qualify.

Olive oil is consumed in large amounts by Mediterranean people, and is believed to be largely responsible for their longevity and lower incidence of heart disease. In one recent report, heart attack survivors who were placed on a Mediterranean diet regimen had half the death rates of those on ordinary low fat diets. Olive oil contains high concentrations of powerful antioxidants that can block the free radical damage that promotes the aging process.

Garlic is popular in Mediterranean and especially Eastern European cultures, who have touted its health effects for centuries. It also contains antioxidants and other compounds that can reduce risk of heart disease and malignancy. In one study, raw garlic or aged garlic extract supplements were found to block the oxidation of LDL cholesterol, thought to be a major factor in atherosclerosis. In another, 150 patients aged 45 to 80 were followed for four years during which time they received 900 mg. of garlic powder daily, while a control group received an identical placebo. All the participants had evidence of advanced atherosclerosis of the carotid artery as determined by high resolution ultrasound technology, which allows fairly accurate measurements of the degree of atherosclerosis. At the end of the study, the volume of atherosclerotic plaque in the placebo group had increased by 15.6 percent compared to a 2.6 percent decrease in the treatment group. This suggests that garlic may not only prevent, but could possibly even reverse arteriosclerosis. Crushed garlic should "rest" about ten minutes before cooking it to preserve these healthy properties.

Tomatoes are rich in lycopene, the pigment that gives them their bright red color. Lycopene is also a powerful antioxidant, and regular consumption can reduce the risk of prostate and lung cancer by 40 percent and the incidence of coronary artery disease by as much as 50 percent. (Continued on Page 7)

Lycopene also appears to improve mental function in older individuals. The heat processing required to make ketchup releases five times more lycopene than is found in raw tomatoes, and chemically changes it into a more readily absorbable form. Concentrated products like pizza and pasta sauces also have much more lycopene than fresh tomatoes.

Red grapes, including red grape juice and wine also have antioxidant properties. Purple grape juice and red wine have about four times more antioxidants than orange or tomato juice. Some studies show that increased red wine consumption is associated with longevity; excess alcohol intake can be harmful to health and intake should be limited to two drinks a day.

Nuts are an early evolutionary food and one study showed that eating more than five ounces a day cut heart attack deaths in women by 40 percent. It also helped to prevent abnormal heart rhythms in men. Almonds and walnuts have been shown to lower blood cholesterol, and while nuts are high in fat, most of this is in the form of monounsaturated and/or omega-3 fatty acids, which are healthy. Stick to unsalted nuts.

Salmon and fatty fish contain high amounts of omega-3 fatty acids and other compounds that can provide multiple health rewards. These include a reduction of joint inflammation in patients with arthritis, less risk of stroke or heart attack due to clot formation, and less progressive atherosclerosis. In order to derive these benefits you need to eat at least an ounce a day or two servings of a fatty fish a week. Canned salmon is rich in omega-3 as are sardines, mackerel, herring and tuna. It is important to remember that some of these fish may have high levels of mercury, PCB, and other chemicals that are harmful, and eating too much of these could also increase bleeding tendencies in some patients.

Whole grain consumption can lower mortality rates. In one study, middle-age women who ate slightly more than one whole grain food daily had a 15 percent lower death rate than controls eating refined process grains. Dark breads, bran and oat cereals contain compounds that protect against cancer and heart disease and help to stabilize blood sugar levels.

Spinach and leafy green vegetables are very rich in folic acid and other B-complex vitamins which reduce homocysteine levels providing protection against heart attack and stroke. Spinach also contains antioxidants with anticancer and other properties similar to those found in garlic. In animal studies, these ingredients have been found to retard some aspects of the aging process and particularly degeneration of the hippocampus, the portion of the brain responsible for memory storage and retrieval. Some believe these antioxidants may prove helpful in preventing or delaying the onset of Alzheimer's disease or the memory loss associated with stress and depression. Both raw and steamed spinach have powerful antioxidant properties. The downside is that spinach is rich in iron, which can reverse antioxidant effects and contribute to heart and liver disease in certain individuals.

Blueberries are very rich in anthocyanin, the pigment that gives them their dark blue color. It is an extremely potent antioxidant, and (along with others) makes blueberries the food with the highest antioxidant concentration. Blueberry extracts have been shown to retard the aging process in experimental animals and may prevent the loss of memory commonly seen in the elderly. The problem is that you need to eat a half-cup of frozen or fresh blueberries daily to get the best results

Black and dark green teas are also rich in antioxidant chemicals that prevent heart disease. In one study, drinking one cup of black tea a day cut heart disease by 44 percent. Iced tea should be made from loose tea or tea bags, since instant and bottled products do not provide as much protection.

Some nutritional supplements promise to provide similar health benefits. They may be helpful for individuals who do not eat adequate amounts of fruits, leafy vegetables, fiber and whole grains. However, we are beginning to recognize that the healthful compounds found in natural foods have a synergistic effect that is difficult to duplicate.

Successful Aging: The MacArthur Foundation Study, J.W.Rowe, M.D. and R.L. Kahn, Ph.D., Pantheon Books, New York, 1998, 288 pages.$24.95

Living to 100: Lessons in Living to Your Maximal Potential at Any Age, T.W. Perls M.D., M. Hutter-Silver, Ed.D., and J.F. Lauerman, Basic Books, New York, 1999, 272 pages,$25.00

There are lots of books on how to grow old gracefully, but these are the most authoritative. The authors of *Successful Aging* spearheaded the ten year MacArthur Foundation study exploring the characteristics of successful aging. What they discovered is that life-styles, habits, and mind set are far more important than genes in determining how healthy you will be in your golden years. Regular exercise, strong social support, and mental stimulation are some of the key determinants. The authors of *Living to 100*, with equally excellent credentials, report on Harvard's The New England Centenarian Study. Their presentation, which is filled with case histories, quizzes, and informational sidebars, comes to the same conclusions, and similarly debunks some common myths about the very elderly. Other books on aging explain how growth hormone, melatonin, DHEA, certain herbal preparations, vitamins, antioxidants, and various combinations of all the above will keep you youthful. Both of these offerings discuss these and other nutritional influences in detail without the usual self serving hype.

The bottom line is that many people in their nineties and older are far from being helpless deteriorating invalids at the end of the line. Instead, they are surprisingly robust physically and mentally, and in the case of some centenarians, "often healthier than people 20-30 years their junior. Rather than accumulating damage, they were shedding it like water off a duck's back." Death rates rise steadily from the mid fifties to the eighties, but then mysteriously decline. The chances of dying within a year are the same whether you are 75 or 100! There are now more than 70,000 people over 100 in the U.S., more than three times the number there were in 1980. If the trend continues, there may be 834,000 by the middle of the next century. The detailed Harvard study of 169 centenarians turned up some interesting statistics. Although 80 percent were women, the relatively few males were far healthier and much more mentally alert; the reverse of the pattern seen at age eighty five. Unlike the MacArthur study, there was no consistent exercise, dietary, or genetic pattern that seemed to predict living beyond 100. Some were vegetarians, others ate lots of red meat, and being an athlete or a couch potato didn't seems to make any difference. The only common denominator identified was a superior ability to handle stress. Although centenarians had been subjected to as much stress as others who died at earlier ages, they were more resilient and seemed to bounce back better. A recent California study also confirms that the ability to deal with stress seems to improve with age.

Everyone wants to "live long", but nobody wants to "grow old". However, since these terms appear to be synonymous, achieving such a goal seems like a ridiculous pipe dream. Both these books suggest otherwise. They support Robert Browning's contention in *Rabbi Ben Ezra,*: "Grow old along with me, The best is yet to be! The last of life, for which the first was made." Stay tuned for more.

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