1. INTRODUCTION - THE NEW HEALING PARADIGM

Joseph, age 22, is a college student who was exhausted, had trouble sleeping, muscle tension, and often felt depressed, anxious and irritable. Other important symptoms included anger, brain fog, heart palpitations, mood swings, candida infection and a tendency for obsessive and compulsive behavior.

Joseph’s first hair analysis revealed an unusually serious combination of mineral patterns. He was “burned out” with a four lows pattern. In addition, he had low potassium, indicating he was pushing himself to “fit in with the crowd” or perhaps was prone to excessive worrying. His calcium/magnesium ratio was elevated, indicating he overate on starches and sugars. The test also revealed elevated levels of mercury and aluminum. These may easily contribute to many mental and emotional symptoms such as anxiety and memory loss.

After three months on a development program, Joseph reported feeling generally better, with an improved energy level. The goal of the program is always to increase a person’s vitality. His first retest hair analysis showed he was no longer in a four lows pattern, nor was he pushing himself as hard. In addition, he was beginning to eliminate more mercury, aluminum, lead and nickel. In addition to the basic program, he uses a near infrared light sauna almost every day. He also started to meditate to help him remain calm and centered.

Six months later, Joseph reports feeling even better, “making steady progress”. He said he passed through a “spiritual crisis” where he saw how angry and resentful he could be toward his other family members. He said the worst is over and he is a much happier young man.

THE BIG PICTURE

It is often helpful to seek for and contemplate the ‘big picture’ whenever one approaches or studies anything. As this applies to the science of development and healing, in general, I have come to realize that:

• **A tetra is present in all sciences.** This means that four principles are involved. They are 1) love of the Creator or One God, 2) love and service to others, 3) acquiring wisdom or learning, and 4) will or discipline. These are all essential for development science.
• **Development science is, in fact, a universal science and life path, and not a method of healing or even a method of development.**
• **Healing of the body and development of the mind occur, really, as byproducts of following this path.**
• **The principles involved in correcting most health conditions are complex, but similar in all cases.** Development science is totally based on principles of whole system behavior, general
systems theory, cybernetics, biological transmutation of the elements, chaos theory, stages of stress, yin and yang, and others. Dr. Paul Eck found ways to apply them to balance the body chemistry correctly and continuously, over and over, allowing the body to slowly rebuild and restore its enzyme systems. Unfortunately, these principles are not understood or used much in medical care, or in holistic or naturopathic care today. As a result, development seems strange to most practitioners, and cannot be easily “proven”.

- Development requires that one strictly follow certain rules and principles for the deepest healing to occur quickly and safely.
- It also requires more self-discipline than some people have, although once a person adopts the diet and lifestyle, it is not a difficult routine.
- The disease process basically involves: 1) slowing of the oxidation rate, 2) reduced oxygenation and hydration of the tissues, 3) clogging of the system with toxins of all kinds, and 4) ‘rusting’, or the buildup of oxides in the body. Oxides cause oxidant damage.
- Healing consists of reversing the above process – removing the oxides, infections and other toxins, restoring the body’s oxidation reactions, restoring oxygenation and hydration, and balancing the oxidation rate. The latter is often slow and difficult because it requires restoring the activity of millions of enzymes throughout the body.
- Dr. Paul Eck discovered basic ways to do whole system healing, which is the only way to heal the body at the deepest levels. This was his genius. Healing just the digestive part of the body, or the cardiovascular part generally misses the mark. This is the problem with conventional post-modern medical care and much of holistic care as well.
- I have added a few other procedures such as near infrared sauna therapy and coffee enemas that enhance the process tremendously. In fact, they are needed in most cases because the bodies are even more deranged and exhausted today than when Dr. Eck was alive.
- In human beings, one must also heal the mind, emotions and even a person’s spiritual outlook for the deepest healing and for mental development to occur.
- The healing process at the deepest levels involves a fascinating process called retracing. Chapter 45 discusses this in depth. In my experience, any healing system that does not cause a lot of retracing is not at the same level and will not provide the same type of deep changes.
- A new type of life on earth. Most people run themselves down over time. The principles in this book provide a way that a person literally becomes more developed and healthier as time moves on. This is a reversal of the basic path that most people’s lives take today. This opens up many possibilities concerning life extension and anti-aging.

THE ROGUES OR OTHERS

Another part of the big picture is the presence of a group of beings we call the rogues or others who seek to control the people on planet earth. To do this, they poison the air, food and water. They also lie, deceive, steal, murder and rape.

The rogues are very real and this is not conspiracy theory. They are not from this planet and they have much better technology than we do. They are experts at advanced sciences such as microscopic electronics and also witchcraft, brainwashing, propaganda and more. They, with the help of their agents on earth, are responsible for much of the pollution and health problems on earth, as well as some of the social and political problems on earth.

According to the Bible, there exists a fallen angelic being named Satan, who secretly rules the world at this time. The rogue presence is exactly the same idea. Others believe that
the rogues are a kind of disease of our universe. For details, read *The Rogues* at www.drlwilson.com.

**THE NEW PARADIGM OF HEALING**

1. WHOLE SYSTEM THINKING

   The current medical paradigm often views our bodies as a collection of somewhat unrelated parts. Medical specialties are mainly organized around body parts such as lungs or kidneys. This focus is needed for specialized surgery. However, in most other areas of health it misses the many subtle connections that occur in any complex system. This causes unintended consequences, especially with drugs, that increase costs and reduce effectiveness and safety.

   The new paradigm always views the body as *one complex, self-regulating, whole system*. Principles of general systems theory play a prominent role in development, though they were originally developed outside of medicine completely. Switching to a whole systems approach is the most difficult aspect of the new paradigm to understand and put into practice for medically trained and even holistically trained physicians and nutritionists.

2. A STRONG FOCUS ON THE NEWER CAUSES OF DISEASE

   The present medical system is a holdover from the 20th century. It works best for surgical cases and some infections. However, the old allopathic or diagnose-and-treat system of care either ignores or often worsens the major health challenges of this century. These include:

   - *A mineral-deficient and, at times, extremely toxic food supply.* According to the US Department of Agriculture, most food today contains one-fourth to one-tenth the levels of many nutrients as the same food item grown 100 years ago. This is due to the use of hybrid crops, superphosphate fertilizers, pesticides and other modern farming practices.
   - *Diets of refined and often chemical-laden foods.* Most Westernized people eat mainly refined foods. These include bleached white flour, white sugar, canned and prepared items.
   - *Unhealthful lifestyles and eating habits.* Many Westerners live very unhealthful lifestyles. They stay up late, do not rest enough, do not balance activity and rest, and often have horrendous eating habits as well.
   - *Levels of toxic metals and toxic chemicals in the air and water that are up to 1000 times higher than ever before in recorded history.* This is not discussed often on television, but has been well-documented by Dr. Henry Schroeder, MD and others.
   - *Dozens of serious viral and other infections that respond poorly to medical drugs.*
   - *Levels of ionizing radiation never before seen in recorded history.* This silent problem is extremely detrimental for our health. A major source in some areas is radon gas from the earth. However, the entire planet today is polluted due to atom-bomb tests, nuclear accidents, mining of uranium and other metals, medical and dental x-rays and scans, and the low-level, subtle emissions from nuclear power plants around the world.

   Development science is one of the only methods I am aware of that helps with radiation poisoning by 1) restoring vital mineral levels to reduce the absorption of radioactive ones, 2) reducing metals in the body such as uranium, and 3) killing off mutated cells, especially if one uses a red heat lamp sauna daily for several years continuously.
Electromagnetic pollution. The use of cell phones, computers and other electrical devices may cause some health conditions. Reducing air travel and using care to sit as far away as possible from computers, cell phones and portable phones can help minimize this problem.

An extremely yin population. In Chinese medical terminology, this means cool, feminine and expanded. The opposite is yang, which is hard, masculine, hot and contracted. This imbalance is very important today, though it is subtle and not part of the current medical paradigm. The causes for the situation include all of the items listed above.

Bioterrorism, which I believe is real, even if it receives little publicity.

The current drug medical system also creates much more disease for two reasons:

Polypharmacy. This is the indiscriminate prescribing of thousands of prescription and over-the-counter drugs that weaken the body and mind. The trend is driven by relentless and often completely phony drug advertising in all the major media. In 2007, 3.8 billion drug prescriptions were written in America at a cost of $286.5 billion. This is an increase of 72% just in the past decade.

Vaccinations. Current multiple vaccine protocols are nothing short of insane. Statistics are manipulated to hide the fact that autism, ADD, delayed development and many other problems are directly related to the increase in vaccines over the past 40 years or so.

3. WELLNESS-BASED RATHER THAN DISEASE-BASED

The current allopathic model believes that health is the absence of diagnosable disease. To assess health, tests are run to find diseases. If none are found, a person is generally pronounced healthy. However, this model has some serious flaws because people who are supposedly healthy often suddenly develop cancer, heart disease, strokes and other maladies.

The wellness model of health care states that health is not the absence of a diagnosed illness. Instead, it is an entirely different state of being, with its own qualities and even its own symptoms. For example, a very healthy person might react quite vigorously to someone spraying toxic pesticides next door. Those who are somewhat ill and have much lower vitality often do not have the ability to react as vigorously to such a toxic event.

Wellness may be considered a state of high resistance to all disease. This is observed, for example, in wild animals in their natural habits, provided they have enough to eat and are free from too many predators. Dr. Alexis Carrel (1873-1944) was a French surgeon and one of the foremost medical doctors of all time. He won a Nobel Prize for demonstrating that a chicken heart could be kept alive indefinitely by simply removing the waste products from the culture medium, while providing the heart with proper nourishment. In his book, *Man, The Unknown*, Dr. Carrel carefully explained the difference between the old and new health care paradigms. He called the difference natural health versus artificial health.

Natural health is identical to wellness. In contrast, artificial health, he said, is the condition of most “healthy” human beings. People may look well. However, they require the constant assistance of medical exams, tests, procedures, remedies and surgeries because they are prone to hundreds of medical problems. Their “health”, in other words, is false in a way because it depends on the services of an army of doctors. No one, he said, really likes this kind of health. However, it is the only kind most people know and it is all that conventional medicine offers.
Development science easily moves most people from a state of artificial health or outright disease toward a state of high resistance to most all diseases. It does this by focusing heavily on the basic factors of health - diet, the proper drinking water, rest and sleep, other lifestyle factors, nutritional supplements and other simple elements that build health.

4. A THOROUGHLY PREVENTIVE AND PREDICTIVE FOCUS

The present medical system is not primarily interested in prevention or wellness and will never be so. The focus is instead on diagnosis. A diagnosis depends on finding a disease entity. If a disease is not developed enough that it shows up on medical tests, little is done for the patient. In addition, most medical prevention is secondary, meaning early detection of disease entities. Primary prevention is the complete avoidance of disease entities. With the cost and severity of degenerative diseases such as heart disease, cancer, strokes, diabetes and others, early detection is just not a good enough solution, though it is better than nothing.

The new paradigm emphasizes primary prevention and starts with a different premise. Instead of focusing on diagnoses, one looks for telltale signs of stress. This is much more like preventive maintenance of a bridge, an automobile or an aircraft. To locate the stress at the deepest levels, one must read it in the cellular structure of the body. This is similar to taking samples from the inside of an aircraft engine or inspecting its structure with a microscope, as is done commonly with aircraft, in order to detect subtle problems before they become major ones.

The old paradigm mainly uses blood tests and x-rays for detection of disease. However, subtle stress is not usually apparent in the blood because the blood is buffered. This means that chemical imbalances are moderated and altered in the blood. Dr. Paul Eck used to say that blood is maintained at the expense of the tissues. This means that blood is kept in balance, while the tissues suffer. By the time imbalances are found in the blood, often it is late in the development of a disease process. A properly interpreted hair analysis can identify the beginnings of disease often many years in advance of other methods. The imbalances can then be corrected, completely preventing the development of the disease. Until this model of health care is adopted, I fear that our health costs are going to continue to increase greatly.

5. FIRST DO NO HARM

Even the Journal of the American Medical Association published findings recently confirming that post-modern medical care is not only unsafe. It is the third or fourth leading cause of death in America. Other research indicates the situation is even worse. A 93-page review of many studies of the safety of medical care by Gary Null, PhD, Martin Feldman, MD, Debora Rasio, MD, Dorothy Smith, PhD and Carolyn Dean, MD, ND indicates that traditional medicine is the first or second leading cause of disability and death in America. The title of this review is Death By Medicine, published in 2009 by the Life Extension Foundation.

This does not in any way diminish the wonderful responses that can occur with drugs. However, it is important to know that drug medical care is quite dangerous. Development is about the safest method of healing I have seen. Reasons for this are:

- Focusing on diet, a healthful lifestyle and balancing the body is an extremely safe approach.
- The products used are very safe.
- The ability to predict and prevent major illnesses adds greatly to safety.
• Balancing the mind and emotions adds another layer of safety.
• Removing toxic metals to much lower levels than are possible with chelation adds safety.
• Toxic metal removal in the body’s own order and timing is much safer than the use of drugs or even natural metal chelating agents.
• Removing hundreds of toxic chemicals adds more safety.
• Nutrients are never forced into the body intravenously and rarely used in megadoses.
• Monitoring with regular hair analysis retests add another layer of safety.
• Trends or tendencies for 50 or so conditions can be detected and monitored easily, inexpensively and without the need for any invasive procedures.
• Development does not require the use of less safe methods including most drugs, most surgeries, most herbs, ionic footbaths, alkaline water, drinking salt water, chelators of all kinds, and most hormone replacement therapy.

6. AN ABILITY TO CORRECT MANY LATENT OR SUB-CLINICAL HEALTH CONDITIONS AT DEEP LEVELS

Illness develops slowly and insidiously. Often, symptoms only occur in the last stages of diabetes, cancer or heart disease, for example. This is because the body compensates and adapts as it becomes ill. Most symptoms only occur when the body can no longer continue to adapt to its nutritional imbalances, fatigue, and growing toxicity, for example.

The old allopathic paradigm of medical care cannot correct latent or sub-clinical stages of cancer, diabetes, heart disease, arthritis, headaches and most other conditions. Instead, they must usually wait until the patient has symptoms, which is often very late. Development will correct most latent and sub-clinical health conditions, including even emotional imbalances. This is a wonderful benefit, and one that can save billions of dollars as well.

7. LOW COST

Drug-based medical care is insanely expensive. Reasons for this include:

• A sick population, in large part because the medical system does not really heal people at deep levels.
• Toxicity of the drugs, radiation therapy and surgery cause more sickness and disability.
• Dangerous methods cause very high legal costs including malpractice and the use of “defensive medicine”. This is not medical care at all, but rather the use of tests and procedures just to satisfy lawyers.
• A cartel, or small group of organizations, runs the system. Cartels and other monopolies always lead to higher costs and worse outcomes.
• Lack of true primary prevention and prediction of illness causes millions of unnecessary cancers, heart attacks and much more.
• Government involvement, partly as a result of the failures of the medical system, adds billions to the cost in lobbying fees for government officials at all levels of government. It also breeds corruption, waste and fraud, especially in socialized medical programs such as Medicare and Medicaid.
The new paradigm uses less costly methods of assessment, much less costly natural products instead of most drugs, removes causes at deep levels, focuses on primary prevention and is generally much safer. This all adds up to much lower costs.

8. AN INTEGRATION OF MIND AND BODY, RATHER THAN SEPARATING THEM

The old paradigm separates disease entities of the mind from those of the body. A different set of professionals specialize in each of them.

The new paradigm recognizes that all nutritional imbalances affect the body and the brain as well. All toxic metals are neurotoxic as well as physically toxic. All infections can affect the brain as well as the body. In addition, the brain is a biochemical organ. Therefore, a reduced level of adaptive energy, high or low blood sugar, and most other stressors affect the brain as much or more than they affect the body.

This new way of thinking about mental illness results in exciting new ways to correct devastating ailments such as autism, ADD, ADHD, anxiety, depression, bipolar disorder and others, often permanently, without drugs and at a very low cost. Chapters 36 to 43 discuss this very large and exciting area of research.

9. FOCUSED ON CREATING BALANCE AND VITALITY, RATHER THAN FOCUSED ON DIAGNOSIS AND SYMPTOM REMOVAL

Balancing the body and increasing its vitality are not spoken of much within the current medical paradigm, and are rarely taught in medical schools. Many holistic practitioners ignore these concepts as well. In addition, the current medical system lacks the tools to measure vitality and balance at deep levels, and they do not have the means to correct them, either.

Dr. Eck spoke often of increasing a person’s adaptive energy or vitality. Indeed, he considered nutrition to be the science of human energy. He meant by this that nutrition is perhaps the most basic and powerful way to increase enzyme activity or enzyme strength in the body. This, in turn, often furthers healing more than any other single factor. Other sciences use the word vital force to describe the life force that does all of the healing.

One of the most ancient and excellent ways to measure vitality is to assess the balance of the body chemistry. While the concept becomes complex, it is somewhat like the tune or adjustment of a combustion engine. For example, if an auto engine is out of tune, the engine does not produce much horsepower or force. This will happen even if all the parts are in working order.

Assessing the balance of the minerals in the cells is the basis for development science. To my knowledge, it cannot be done nearly as well, if at all, in the blood or urine. These are too subject to fluctuations due to the last meal one had, or how much water one just drank. The hair mineral biopsy, in contrast, gives practitioners a much more definitive view. It works excellently to guide the rebalancing of the body chemistry. When this is done, a person’s vitality improves dramatically, and with this, healing begins in earnest.

The concept of balance is so critical, in fact, that it is the basis for many religions and philosophies. The Taoists chose the symbol of yin and yang to represent balance. The Hebrews chose two equilateral triangles to symbolize balance. Early Christians adopted the symbol of the two crossed sticks, which also represents balance.
Clarifying balance. Balance is not a little bit of this and a little bit of that. Stated differently, it is not moderation in all things. Balance in the new paradigm means moderation in all that is adaptive or helpful for life, and total avoidance of that which is not beneficial or adaptive. Thus, balance is first about wisdom and knowledge. Then, and only then, is it about moderation, timing and other qualities.

For example, the US Food and Drug Administration tells us that some toxic chemicals in our food products are okay as long as there are not too many. This is not really “balanced”. It is often just a compromise arrangement with the food refining industry that wishes to save money on their products by using toxic ingredients. They may not kill us outright, but it is not a healthful approach to food regulation. All toxic chemicals in the food supply harm the body and degrade the food.

Another important example is that many parents and teachers tell young people that a little drinking, a little junk food and a little lying are fine as long as these are “balanced” by fairly responsible behavior. The new paradigm is not supportive of this idea. Alcohol is toxic, as are refined sugars, for example. There is no reason to include them in one’s diet at all. Lying ruins many relationships and has no place in the life of a person of high integrity, except perhaps to mislead an attacker, for example, in order to save a life.

10. A FOCUS ON MENTAL ENHANCEMENT/DEVELOPMENT, RATHER THAN ONLY ON SYMPTOM REMOVAL OR “CURE”

In the current medical paradigm, care ends when a person’s disease entity or symptoms go away, or when nothing more can be done for the patient. The new paradigm allows for healing and care to proceed further. For example:

- Dr. Eck found that his work would improve aspects of a person’s awareness and personality.
- Criminals who followed his method for an illness would, in some cases, return to being law-abiding citizens, even though that was not the goal of the program.
- Children’s grades would improve from Cs to As on his program, even though the child was only following the program for the correction of perhaps allergies or an infection.

This has to do with personality integration or perhaps Abraham Maslow’s concept of self-actualization. It also has to do with development, a topic discussed in more detail in Chapters 10, 13 and 40. Development science, especially with the use of a near infrared sauna and coffee enemas on a daily basis, promotes the opening of the vital energy centers of the body, also called the chakras in Sanskrit and Eastern literature. In fact, the process occurs quite naturally using these methods. This is a great hidden benefit, as the process of opening these centers also promotes health and long life. The chakras are small, funnel-shaped vortices of energy that help maintain life and health in the body. Development can help them to grow into large, beautiful centers of high frequency energy that greatly enhance human functioning in many ways. This is the fullest development of a human being and something that is rare on this planet.

Another way that development can assist people is to help them release certain burdens or obligations that involve impaired health. In some circles, these are called karmic burdens because they have to do with old agreements that must be fulfilled. I have observed that as healing occurs at deep levels, some clients appear to be freed from such conditions or burdens.
**Development happens automatically today.** I have observed with many people that the development of which I speak is not difficult and, in fact, occurs automatically. All that is needed is to use the methods described in this text. These include a simple diet of mainly cooked and selected vegetables eaten in simple combinations, loads of rest and sleep, and either spring water or steam distilled water to drink. Nutritional supplements are needed for a number of years, with most people, but not forever, by any means. The use of a near infrared light sauna daily for at least a few years, daily coffee enemas, if possible, and practicing the Roy Masters meditation daily for a number of years are also most helpful. This is a simple regimen, in terms of both cost and convenience.

**THE PARADIGM SHIFT**

<table>
<thead>
<tr>
<th>The New Paradigm of Healing</th>
<th>Conventional Medicine &amp; Much Of Holistic Medical Care As Well</th>
</tr>
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<tbody>
<tr>
<td>Whole systems behaviors and characteristics are most important.</td>
<td>The focus is most often on individual body organs and systems, rather than the whole human system.</td>
</tr>
<tr>
<td>Designed specifically for the illnesses and challenges of the twenty-first century.</td>
<td>The diagnose-and-cure model is designed for 18th and 19th century problems of mainly acute infections and the need for surgery.</td>
</tr>
<tr>
<td>Wellness-based. The focus is on the qualities and symptoms of health, rather than upon diagnosing and removing disease entities.</td>
<td>Disease-oriented. Health is often assumed to be the absence of a diagnosable disease entity.</td>
</tr>
<tr>
<td>Primary prevention and prediction are most important. This is a principle of “preventive maintenance” used with all complex machinery such as ships, aircraft or automobiles.</td>
<td>Lip service is given to prevention, but it is never the focus. Also, some of the methods used are dangerous, such as vaccination and water fluoridation.</td>
</tr>
<tr>
<td>Able to correct latent or sub-clinical conditions at deep levels, often long before they manifest. This is true primary prevention.</td>
<td>Does not correct most sub-clinical and latent conditions. This causes nasty surprises and adds greatly to the cost of medical care.</td>
</tr>
<tr>
<td>Very low cost due to an intense focus on primary prevention, use of safe remedies, very low legal costs and low-cost assessment methods.</td>
<td>Costs growing fast because the population is becoming sicker, the remedies are often toxic, high legal costs, high hospital costs and lack of a focus on primary prevention.</td>
</tr>
<tr>
<td>The body and mind are always considered together as parts of the whole human system.</td>
<td>The body and mind are almost always treated separately by a different set of doctors. This leads to fragmentation of care and much worse outcomes.</td>
</tr>
<tr>
<td>Increasing vitality or adaptive energy is a key to healing. Balancing the body is one way this is done, as in ancient healing systems.</td>
<td>Vitality and adaptive energy are not mentioned and are not assessed. Balancing the body chemistry is only done on a limited basis such as balancing blood sugar.</td>
</tr>
<tr>
<td>Full human development or self-actualization is the highest priority after saving one’s life.</td>
<td>The system is mainly disease-oriented. Care usually ends when symptoms improve.</td>
</tr>
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</table>
THERAPEUTIC PRINCIPLES

Development science combines many therapeutic principles borrowed from both ancient and modern scientific, physiological and philosophical approaches from around the world. They are all discussed in Chapters 7-14. A few of the most critical ones are:

- **Enhancing adaptive energy or vitality.** As vitality improves, the body can heal ALL types of imbalances and dis-eases.
- **Balancing the body.** This ancient principle greatly improves the body’s vitality by reducing stress on the body in very subtle ways. It involves the principle of yin and yang.
- **Seeking to work with the teleology or healing intent of the body.** This has to do with avoiding toxins, stimulants and other methods of healing that in any way interfere with the body’s own wisdom. It can be a rather subtle therapeutic principle.
- **Replacing less preferred minerals with more preferred minerals in millions of enzyme binding sites.** This is a very precise, gentle and, at times, slower process to restore enzyme strength and vitality in the body. It is quite different from ‘chelating out’ toxic metals, for example, or just feeding a person certain foods and nutrient formulas.
- **Combination therapy.** All development programs involve a combination of therapies such as a diet, a healthy lifestyle, nutritional supplements and more.
- **A holistic approach.** Development always addresses all levels of a person’s being, such as the physical, biochemical, emotional and spiritual. This is not the case with post-modern medical care, which is often quite fragmented and physically focused.
- **Non-toxic therapy.** No drugs or bio-identical hormones are used, unless needed temporarily to maintain life in an emergency.

AN INTRODUCTION TO THE MODALITIES OF DEVELOPMENT

Below are the major parts of a development program. Together they constitute a complete program. Note that only a handful of holistic methods are part of a development program. Adding more modalities, in almost all cases, can negate the program! Other modalities such as most herbal methods, chelation therapy, hormone replacement, homeopathy and others are either too yin or somewhat toxic. Modalities used in development are:

1. **A healthful lifestyle.** Correction of basic living habits is perhaps the single most important recommendation. Most people need much more sleep and rest, and better eating habits. Other aspects of lifestyle are to limit exercise, to avoid toxic exposures and too much sex, and to work on one’s attitudes, beliefs, and thinking habits.

2. **Specific diet.** Following the alkaline mineral cooked vegetable diets for the fast and/or slow oxidizer is probably the most difficult, and a critical part of every development program. Some people object to the strict diet, but eventually our clients realize that the closer they follow the diet, the faster their progress will be.

3. **Specific nutrient supplementation.** I am often asked if one can heal the body without the supplement program. In almost all cases, the answer is no. Supplements are recommended in a very precise and specific way based on hair analysis readings and rarely based on symptoms. However, when used symptomatically, supplements are always recommended in a way that balances the oxidation rate and the major mineral ratios. This is a most important difference
between this science and most other nutritional approaches. It makes development safer and much more effective, as well.

THE PROCEDURES:

4. **Daily coffee enemas.** The effects of daily coffee enemas are quite amazing. Numerous clients have reported that coffee enemas “saved my life”. In most adults, they are needed for at least five to ten years to detoxify the liver and for many other purposes. They greatly speed up progress, and in some cases healing will not occur much at all without them.

5. **The mental exercise.** The ONLY mental training that I recommend at this time is the meditation or concentration exercise as taught by Roy Masters, and as modified to send energy straight down the body from head to feet in a powerful way. Unlike some mental training exercises and even some prayers, this exercise is safe, simple, grounding and non-denominational. While healing will occur without it, it enhances it greatly and is absolutely needed in some cases. Chapter 44 discusses this fascinating science in some detail. More details are available in the article Meditation For Healing at www.drlwilson.com.

6. **Near infrared sauna therapy.** This is another very safe, very powerful and comfortable healing modality that we find most people desperately need. There is something special about the spectrum produced by the reddish heat lamps sold in the hardware stores that cannot be duplicated by a far infrared sauna, for example. With daily use, the lamp sauna greatly reduces the load of toxic metals, chemicals and infections that everyone carries. It also relaxes the autonomic nervous system, assists cardiovascular health, and can drastically improve circulation, oxygenation and hydration. It is truly an amazing healing modality.

7. **Daily foot Reflexology.** This is another surprisingly safe and powerful therapy that can be done at home. It is described in more detail at www.drlwilson.com and later in this book.

8. **Daily Spinal Twist.** This simple self-chiropractic method is helpful for most people.

9. **Daily ONLY 10-12 ounces of carrot juice, which can alternate with 1-2 ounces of wheat grass juice.** Too much juice is not helpful, but a little is excellent for most people.

HOW THIS BOOK IS ORGANIZED

Seven sections discuss the important areas of development science, including:

I. **Introduction and the basic modalities in development science.**

II. **The theory of development science.** A large set of ancient and modern medical and scientific principles are the basis for this science.

III. **An introduction to the minerals.** This covers the sources, functions, detection and assessment of the major minerals in the body.

IV. **An introduction to hair mineral analysis and its interpretation by the method of Dr. Paul Eck.** Dr. Eck used hair analysis to develop and continuously refine development science. Understanding how to read a hair mineral analysis using his method is essential for success with it. I have added to his knowledge in a few minor areas. To keep his work pure, I have indicated whenever an idea or a mineral pattern was not, to my knowledge, a part of his original work.

V. **Physical health conditions and their assessment and correction with development science.**

VI. **Mental and emotional health conditions and their correction with development science.**
VII. Therapeutics, retracing, business, legal and other aspects of development science. This text is not a therapy manual, as that would require a much larger book. However, this section introduces important therapy concepts in development science.

Appendices include a glossary of important terms, a Mineral Reference Guide, two journal articles about development science, information about other healing techniques, references and suggested reading.

NEW TOPICS NOT INCLUDED IN THIS BOOK

Nutritional balancing is a rapidly evolving science of health and healing. Rather than rewrite the entire book for the 2014 second printing, I will instead list below new topics that are the subject of important articles at www.drlwilson.com, the web portal for development science. For a much fuller understanding of development, please read the following newer articles at the website, and others that are written on a weekly basis.

**Health Conditions:**
- Sexual Fluid Craving
- Masturbation
- The Sexual Order,
- How To Be Beautiful
- Weight Gain And Loss
- Metabolic Syndrome
- Cancer And Alternatives
- Cellulite, Melasma
- Contraception
- Marathon Running Kills
- Trauma Release, Trauma Retracing
- Genetics, MTHFR
- Telomeres
- Celiac Disease, Colitis
- Morgollons’s disease
- Pregnancy And Prenatal Care, The Baby Manual
- Superbabies
- What The Children Want
- Biological Dentistry
- Seizures
- Entity Attachment
- Autonomic N.S. Health

**Biochemistry:**
- Omega-3 Fatty Acids
- Trimethylglycine
- Methylation

**Foods And Diets:**
- pH Balancing
- Electron Transport
- Pyroluria, Valence

**Medical System Topics:**
- Breathing For Health
- Loosening The Body Structure
- The Spa Morning Routine

**Biochemistry:**
- GAPS Diet
- Weston Price Diet
- Paleo Diet
- Mediterranean Diet
- Macrobiotics
- The HCG Diet
- Kosher Eating
- Fermented Foods
- Raw Food Diets
- Kombucha Tea
- 50 Reasons For The Cooked Vegetable Diet
- Modern Mineral Starvation
- Arrowroot Powder
- Sardines
- Fasting, Cleansing Diets

**Hair**
- Analysis/Development:
  - Quantifying The Hair
  - Analysis Patterns
  - Retest Patterns
  - Down Energy
  - Why Development Is Not Do-It-Yourself

**Other:**
- Rape, Healing Rape
- Homosexual Marriage
- Victimhood & How To Stop It
- Justice, Equal Or Social Psychotronic Warfare
- Prayer, Meditation
- Healing For Dogs
- Energy Vampirism
2. THE HEALING LIFESTYLE

Shawna (age 3), Alexa (age 4), and Rachel (age 10) received the finest of orthodox as well as holistic health care, since their father is a wonderful holistic medical doctor. However, all the children had migraines that were responding poorly to many types of treatment. Hair mineral analyses on all three revealed very slow oxidation and extreme copper toxicity. The oldest had a copper level of 44 mg%, or about 18 times normal. All three were placed on a slow oxidizer diet. Also, they each took several nutritional supplements to balance their body chemistries. On the first retests, Shawna's copper level almost doubled. This indicates an increased rate of elimination of copper through the hair. As their copper levels decreased, all three children's headaches went away, as did several other problems including recurrent infections and fatigue.

An extremely healthful lifestyle is the most basic healing modality in development science. Lifestyle, by its nature, is entirely a whole systems aspect of health. For example, sleep affects every aspect of human functioning, as do activity and eating habits.

SLEEP AND REST

The single most important aspect of balancing the lifestyle is resting more. Rest and sleep are critical activities. They are times for regeneration, healing and development of the mind and body. Rest and sleep are never a waste of time, even though a few people use them as escapes. Even this is far better than most other escapes such as drinking alcohol, smoking or even staying up watching television or spending too much time with friends.

Sleep at least 8 or more hours every single day. If you require an extra hour to fall asleep, then go to bed an hour earlier to be sure you sleep eight full hours. Many people have a “sleep deficit”. This means even more sleep is needed for a while until the body rests enough.

Go to bed each day ideally between 8 and 9 PM. The hours before midnight are much more restful for most people. The reasons for this are complex. The natural sleep cycle is from sundown to sunup, so going to bed very early and rising early are often helpful for one’s health.

Napping is excellent and often necessary while healing yourself. When possible, plan your day so you can nap for an hour in the afternoon or another time. This can often be arranged if one plans carefully. For example, during your lunch break, eat first and then rest for 15 minutes when possible. If there is no bed or couch, you may be able to sit comfortably in a car for 15 minutes and take a short snooze. At one of my jobs, a man sitting near me ate his lunch at his desk, then put his head against the high back of his chair and took a 15-minute nap.
When driving, if you feel tired, try to stop your car safely off the road, lock the doors, roll up the windows and nap for 15 to 30 minutes. You will often wake up refreshed and have a much safer trip as well. Even if you don’t sleep, just resting and closing your eyes are excellent.

**While healing, expect to be more tired at times.** The body may be restoring an organ or gland, perhaps, or making some other shift in the body. *Please honor this call for rest as best you can. If possible, anticipate and look forward to these times of fatigue, as they indicate healing in progress. Plan to rest more when beginning a development program.*

**DRINKING WATER**

> *The correct type and amount of water for drinking can be a critical factor in healing.*

This is usually overlooked by most doctors, I find, or their advice is not correct.

**Most adults need 2-3 quarts of preferably good quality spring water daily.** Three quarts is about three liters, 108 ounces or about 12 medium-sized glasses daily. Children need less, depending on their size.

Somewhat like a whole food, natural spring water seems to have certain properties that are missing from “processed” waters of all kinds. These are likely subtle physics properties such as spin, moment, valence and others that become damaged by processing. For this reason, mainly, spring water seems to be the best overall drinking water for most people. While Evian water is good, European spring waters are generally not as good as American, Canadian or some Asian brands of spring water.

**Carbon-only filtered tap water.** A second-best drinking water, surprisingly, is often carbon-filtered only municipal tap water. This is not as pure, but it seems to work better than many other types of water. For example, multi-stage filters can remove many more contaminants from tap water than a simple carbon or sand filter, but they seem to damage the ability of the water to properly hydrate the body. If you must use tap water, change the filters every few months. A carbon block filter is better than a simple carbon filter, though either will work.

**Reverse osmosis (RO) and deionized water.** RO water, often called “drinking water” or “purified water” in the markets, is mineral-free and therefore very yin. Also, passing the water over a plastic membrane appears to negatively affect certain properties of the water. As a result, it does not hydrate the body nearly as well, in my view. *Please avoid it.* Deionized water is treated electrically to remove even more minerals. It is also not recommended.

**Well water** is extremely variable and often toxic today. I find many problems with those who drink their supposedly clean well water. Most is not good for drinking, even if it is “approved” by local authorities. Artesian well water is often better.

**Alkaline water.** Naturally alkaline spring water is fine. Machine-made alkaline water is not recommended. Very alkaline water (pH of 8.5 or higher) is too yin, no matter what other benefits it has. Also, the alkaline water machines often add a little platinum to the water, which is toxic. Some alkalines water machines also add coral calcium to the water, adding some toxic metals. Toxicity develops slowly and insidiously. It is far better to alkalinize the body using a diet high in steamed vegetables, along with targeted supplements and lifestyle modifications as discussed in this volume. Letting go of anger and resentment also helps the body become more alkaline. *Never drink alkaline water for more than a few weeks.*

**Designer waters.** These are bottled products sold in supermarkets and health food outlets. Most begin as tap water, as this is cheaper. They are usually filtered by reverse osmosis,
which is not good at all. Then the water is altered, declustered, prayed over or placed in electronic machines to supposedly improve it. So far, I have not found any that are worth the extra money or are better than a good quality spring water.

**Adding minerals to your water.** I find that this does not work well. Most of the mineral solutions are not the correct balance of minerals, and some contain toxic metals.

**Drinking salt water.** Please do not drink salt water, as some recommend today. This is a slightly toxic habit that subtly unbalances the minerals in the body.

**Plastic containers.** Some people do not like spring water because it comes in plastic jugs. However, the chemicals in the plastic do not appear to be a serious problem, in my experience. Spring water can often be delivered, to avoid the problem of new plastic containers.

**Do not drink water with meals.** It dilutes the digestive juices. Wait at least an hour after meals to drink water, and stop drinking 10 minutes before eating your meal. A simple way to drink more water is to have up to 6 or even more glasses in the morning upon arising. This will also usually cure constipation, especially if you warm the water before drinking it.

In hot or dry climates, or while traveling on airplanes, drink more water. If you talk a lot or sweat heavily, you probably also need to drink more.

During some healing reactions that involve toxin elimination, drinking more or drinking some distilled water for a few days to a week, perhaps, can help release toxins faster and provide symptomatic relief. Distilled water is otherwise not recommended, as it is mineral-deficient water and thus very yin in Chinese medical terminology.

**Water substitutes.** The only substitutes for plain water are mild herbal teas such as chamomile, mint, strawberry and others. One cup of coffee or up to two cups of green or black tea daily are fine, but more than this is not good and no substitute for fresh water. You may enjoy water more by heating it and drinking tea, but do not put ice in it, as the cold temperature is quite hard on the stomach. This bad habit is almost universal in restaurants, often to help disguise the foul smell and taste of their tap water. A simple carbon filter would serve the customers much better.

**Dehydration.** Using any caffeine or alcohol tends to dehydrate the body. Eating any sugars or sweets, including fruit or fruit juices, also tends to dehydrate the body. All of these substances have a diuretic action. This is why water only must be your main beverage.

**Ozonating your water.** This is an excellent idea, if desired. It will enhance most drinking water. Simply place a tube in a jug of water and bubble ozone through it. It must be consumed quickly, however. It loses its potency in a few minutes as the ozone bubbles out. Ozone generators are sold through the internet.

To summarize, drinking water is a very important aspect of development science. Begin each day by drinking as close to one quart as possible of spring water or carbon-only filtered tap water. Many people either do not drink enough water, or they drink an improper type of water. Still others dehydrate the body by consuming caffeine, alcohol or sugars, including fruit. For much more on the important subject of water, see *Water For Drinking* at www.drlwilson.com.

**EATING HABITS**

**Eat at least three regular meals every day.** However, one may eat four or five smaller meals to obtain enough cooked vegetables and some animal protein daily, and to help maintain a healthy blood sugar. More frequent and smaller meals also help reduce stress on the adrenal
Have sit-down meals, even if they are light, simple meals. Do not snack all day while working, driving or standing around. Also, rest at least several minutes before and after eating. Skipping meals for any reason leads to poorer overall nutrition, stresses the adrenals and usually does not enhance weight loss. To lose weight, eat more vegetables and eat less starches of all kinds, including fewer starchy vegetables such as sweet potatoes.

Eat slowly and chew each mouthful at least five or more times. Chewing 15 to 20 times is actually wonderful for one’s health. An old saying is “Drink your food and eat your beverages”. Though a bit of an exaggeration, the principle is excellent. It means to chew your food until it is a liquid and to sip your beverages slowly, almost like eating, instead of guzzling them. This applies most to animal milks, which really are concentrated foods to a large degree. It applies less to water or tea, though the principle is not a bad one. If you wish to lose weight, thorough chewing will lead to eating less food and some quick weight loss in many instances.

Eat quiet meals sitting down. Resist the temptation to bolt your food, eat on the run or eat standing in front of the refrigerator or at a counter. Find a peaceful, quiet place to eat. Try to avoid noisy environments such as crowded bars with televisions blaring or noisy music. Also avoid eating while driving or at your desk talking on the telephone. Quiet music or even quiet television is fine at mealtime if it helps you relax.

For children. Quiet music at mealtime may help children calm down. Television is usually not good. Help children to relax at meals by avoiding any loud conversation or harsh discipline while dining. However, it is important to insist upon decorum at meals. Send a child to his bedroom if he is making the meal miserable for everyone.

Meals should be enjoyable social times of conversation and togetherness. Do not let soccer practice or other activities take precedence over family meals. Restructure mealtime or skip the lessons at this time of day. Making meals special by lighting a candle, dimming the lights, saying grace and other methods can also help set the tone for peaceful, enjoyable meals.

HAND AND FOOT REFLEXOLOGY

This ancient method of acupressure balances the energy in the acupuncture meridians. It is simple, safe and often surprisingly helpful to relax the body, reduce aches and pains, and more.

Cranial adjustment. I am told and have experienced that a particular reflexology technique adjusts the cranial system enough to promote aspects of mental and spiritual development. For best results, do this once daily, spending at least 5 minutes on each foot.

First rub the entire foot lightly, rubbing more on any spots that are painful or tender. This will often cause the pain or tenderness to diminish. Then move to the third and then the fourth toes. Hold one of these toes firmly and twist it gently as far as you can in one direction. Hold this twist for at least 10 seconds. Then twist the toe in the other direction, again holding it for at least 10 seconds. At the same time, or afterwards, if you prefer, look for tender spots on these particular toes and rub them firmly. Then repeat the same thing on the other foot. Using the hands is possible if you cannot do the feet, but it is perhaps less effective.

AVOIDING TOXIC EXPOSURES

A healthy lifestyle means moderation in all good things, and avoidance, if possible, of all that is toxic. Poisons are poisons. They are rarely ever helpful or needed.

Medical and dental toxins. Facts I have learned as a clinician for almost 30 years are:
• *Amalgam dental fillings.* Also called silver fillings, these are about half mercury and may contain copper, cadmium and other toxic metals. Have these removed as soon as possible, unless you have active cancer. If you have cancer, wait until it is thoroughly stabilized before doing amalgam removal. The vapors released during amalgam removal can kill a cancer patient. Other dental toxins that are less common are nickel crowns and some dental wires and appliances made of toxic compounds.

• *Prescription drugs.* Most are not that safe or even that effective in the long term. Use only as needed. This includes bio-identical hormones and many herbal therapies, unfortunately. Many have side effects that are not listed on any label. Even very good doctors are often unaware of side effects, especially combinations of drugs.

• *Newer drugs may be even worse.* Their long-term effects have not been researched as well. Therefore, look for natural alternatives if you are told you need drugs such as antibiotics, natural hormones, cholesterol-lowering drugs, especially statins, and most others. Type in *Beer’s List* on your internet search engine for an updated list of the most toxic drugs.

• *Drugs and development.* Most drugs interfere with and may even stop mental development.

• *Over-the-counter or OTC drugs* are often as bad or worse than prescription drugs, especially if used daily. Especially avoid steroid creams, cortisone-containing nasal sprays, contact lens solution with mercury, and daily use of pain killers and anti-inflammatories. These include Aspirin, Tylenol, Aleve, Excedrin, Anacin, ibuprofen and dozens of other brands. Heavy advertising fools people into thinking they are safe when used daily, which is not true.

• *All vaccines can be highly toxic* and, in my view, are unnecessary and to be avoided. Childhood illnesses, including diphtheria and others, can be handled naturally without a problem in almost all cases. The risks of the vaccines are much worse than any possible benefit most vaccines provide. An excellent resource is a DVD by Mary Tocco available at [www.marytocco.com](http://www.marytocco.com). Another excellent website is [www.vaclib.org](http://www.vaclib.org).

• *Surgery.* Surgery is great, when needed, but causes toxicity due to anesthetics and many other drugs used with it. Before surgery, taking zinc, and vitamins C and E may reduce problems.

• *Medical dyes or contrast media.* Avoid these whenever possible. They occasionally cause kidney or liver failure in a sensitive person.

• *Blood transfusions are horrible today.* Most blood is contaminated with infections and cannot be cleaned up. Blood products can be used that are not whole blood, however.

• *Visiting the hospital.* Even spending time in hospitals visiting the sick is not particularly safe. Wash your hands often after such experiences and minimize them.

• *Other medical dangers* include all x-rays unless absolutely needed, angiograms, liver biopsies, spinal taps, radioactive iodine treatments and all radiation therapy. MRIs and PET scans are better, but still disrupt the body’s energy field and should be minimized.

• *Remove leaking breast implants and unneeded pins and other metallic objects from the body.*

**Contact and airborne toxins.** This is another major area of toxicity today:

• *If possible, reside and work in clean, safe, comfortable and natural surroundings.*

• *Live in a house rather than a condominium or apartment, if possible, to reduce stray electromagnetic pollution and noise.*

• *Try not to work under fluorescent lights all day, though they are often mandatory at many jobs.* In this case, adding a small lamp that is full-spectrum at your desk may help.
• **Try not to handle metals or chemicals any more than necessary.** Wear gloves and wash your hands frequently if your job requires handling toxic materials.

• **Ventilate your home or work area as much as possible so you can breathe pure air.**

• **Stay out of new cars, new houses and away from new building materials unless they are non-toxic or low toxicity.** Toxic home materials include new carpets, drapes, plastic or fiberboard items, and even clothes made of synthetic fabrics. Pure silk, wool, cotton or hemp are best for clothing. Also, use only all-natural or non-toxic cosmetics, cleaning products and skin care products. If you are not sure about cosmetics, which are often loaded with toxins, go to [www.cosmeticsdatabase.com](http://www.cosmeticsdatabase.com). They review over 25,000 products.

• **Lawn and garden pesticides and other chemicals are among the most toxic people handle.**

• **Occupations that are quite toxic include all the building trades, mechanics and a few others.**

**Sunbathing.** A little sun is good for most people. Sit or lie outside for about half an hour in the middle of the day or preferably up to one hour in the early morning or very late afternoon. More sun than this is not healthful. The sun will not provide enough vitamin D3 today, so everyone needs to take it, even sun worshipers. If you must be outdoors all day, use a natural sun screen with a high SPF. However, most are a little toxic so use them only if needed.

**PERSONAL HABITS**

Personal habits have a powerful impact on one’s health, though it is subtle in some cases. They include how one dresses and speaks, the friends one keeps, and how one acts in social, sexual, intellectual and other situations. These define who you believe you are in many important ways and influence where you live, work, play and much more.

**Dress modestly and always keep warm.** Wear socks, long sleeve shirts, slacks, long dresses, and sweaters if needed to stay warm at all times. Feeling chilly intensely stimulates the sympathetic nervous system and slows or stops healing. Dressing too lightly is more common among fashion-conscious women and young people, but affects everyone at times.

**The company you keep.** Always treat the self-body, mind and spirit-as the temple of the living God. This means to always comport yourself with poise and dignity. The current culture does not encourage this, so it may mean bucking the trends and the fashions. It does not mean being aloof or ‘stuck-up’. It means that basic decency and respect for yourself and others are always in order.

A difficult situation, for example, are co-ed college dorms in which young women share bathrooms with young men who are so hormone-driven they really are not aware of the effects of their actions on the women. This is one reason why a longer courtship period and traditional marriage is still a wise choice for many women and men, even if it ends unhappily. Alternatives are being developed, but are not well-developed for the most part. Such alternatives must involve detailed legal contracts that share some of the clauses of the marriage vows for them to work well.

**People to beware of.** Watch out for work associates and so-called “friends” who act selfishly or think it is okay to lie. If possible, avoid them completely. They are not really friends in most cases, and will often lie to you as well. Also avoid parties, bars, restaurants and cocktail lounges where it is easy to slip a drug into a drink or even into your food. A wonderful habit to establish is to learn to enjoy your own company, and perhaps curl up with a book or listen to peaceful, quiet music. This can help avoid being drawn into toxic social settings.
Also, be careful about inviting people into your life because they seem to offer you love, success or fun of some kind. Many will not likely bring real positive energy into your life. This sounds harsh, but anyone reading this book is way ahead of the norm in terms of awareness, and therefore needs to be even more discerning. Spend time around those with very high moral standards. They may seem boring, perhaps, but they are far ahead in the spiritual realm and their health will usually reflect this as well. Balance, in this case, does not mean a little of the good and a little of the bad. It means exercising wisdom at all times.

**WORK AND RECREATION HABITS**

**Relax and take breaks.** Keep a relaxed pace, even at work and in other activities you adore. If you sit at a desk, stand up every 20-40 minutes, move around, stretch gently and breathe deeply. Watch how cats and dogs stretch often and gently. This is not the same as vigorous stretching, which can easily cause slightly torn ligaments.

**Computer issues.** All computer screens and other parts of the machine give off harmful electromagnetic fields or EMFs. Sit as far away from computers as possible. Enlarge the typeface so you can sit further away. Use a remote keyboard with a laptop computer so you can sit further away. This is quite important if you use a computer for any length of time. Stand away from your computer at least hourly and more often, if possible. When you get up, ideally go outside in the sun for a few minutes, or at least leave the room and walk around. The sunshine will actually negate some of the harmful computer EMFs.

If possible, run a ground wire from the middle screw on an electrical outlet or other ground terminal to your body. An ordinary lamp cord will do. You can just tuck the end into your sock, for instance, to make contact with the body. This actually helps some people a lot to reduce the effects of some computer EMFs. A single reddish, 250-watt heat lamp from the hardware store shining partly on you may also reduce the effects of electronic devices on the body. This is an infrared bulb, but they are usually just labeled as a heat lamp. It is the same lamp recommended for saunas. Also, if you have difficulty sleeping, stay off the computer and away from other EMFs at least two hours before bed. Many gadgets are sold to reduce electromagnetic stress. Some work better than others. None seem to reduce it completely, however, so take precautions.

**Televisions and cell phones.** Sit back from all televisions. So-called ‘backlit’ large-screen TVs emit the least harmful EMFs. Spend as little time as possible on cell phones and portable phones, and try to use a headset or a speakerphone to keep the rays away from your head. Phone calls of up to five minutes should be okay. The best headsets are those that conduct the sound through a hollow tube, rather than with wires. Some devices may reduce EMFs from cell phones, but I have not found any that work completely. If they did, there would likely be no signal emitted from the device. If you cannot use a headset on your phone, a Bluetooth device is better than nothing, by far. Just carrying a cell phone should not be a problem.

**Where to live and work.** Rural areas are often healthiest due to a higher oxygen level, less noise, reduced electromagnetic stress and, at times, safer neighborhoods. Wherever you live, note if you are near cell phone towers or a major power generating station, as these emit powerful negative electromagnetic fields. Locating cell phone towers is often next to impossible, as they can be disguised as trees, posts and other common objects. The best way is to buy a simple electromagnetic field meter or detector that costs less than $100.00. This is an investment I would make if I were buying a house, especially in a city environment. Walk
around the neighborhood with it and check your indoor environment periodically. If you drive around, note that your car also emits EMFs and may skew the readings.

**POSTURE**

Poor posture interferes with breathing, digestion, spinal and hip alignment, and even contributes to depression in some cases. Many health authorities advise a stiff “military posture”. This is not helpful. Here is a simple way to visualize an excellent posture:

- *Imagine a wire tied or screwed into the crown of your head.* The crown of the head is not the middle of the skull, but instead nearer the back of the head. Try to feel this place on your head with a finger, so you are clear where it is. Ask someone for help if you are not sure.
- *Now imagine you are suspended from this wire.* If the spot is correct, when you lift your head by this point, your face will be vertical and the head will be perfectly level, not tilting forward or backward.
- *Now imagine the entire body hanging loosely from the wire attached to the crown of the head, like a rag puppet.* Your shoulders, for example, will sag a little, but will not be too rounded. Your arms will hang limp and will swing freely when you walk. Practice walking around the house like this as often as possible. Visualize this often while walking or even while sitting. It may seem odd at first. However, with a little practice it will help remind you how to sit or stand in a relaxed, healthful posture.

**HABITS OF THOUGHT**

Thoughts directly affect the body far more than one may imagine. Here are a few basic principles of correct thinking.

1. **The Ten Commandments and the golden rule are still valid today.** These may be out of fashion, but they are very true nevertheless. They are a good guide to basic behavior and thinking. The golden rule is so named because it works beautifully in many situations.

2. **Take full responsibility for your life, rather than play the victim.** Victims, by definition, are powerless and out of control of their lives. They have handed over their power to others. Most victims are angry and resentful. In addition, victims are usually unforgiving. Sooner or later, this combination of feelings and attitudes always causes physical and mental illness. It is a very important principle.

   In contrast, taking responsibility for everything in your life empowers you. If a problem develops, you may have helped create it and you can definitely help solve it. It may take a while to explore your new choices, but you have the ability to make them. Also, as a fully empowered being, you have the power to forgive and move on, so letting go of anger and resentment are much easier.

   When victim feelings arise, which they will, it is easy to say, “but I can’t help the way I feel”. A principle is that you can and do control your thoughts and feelings. However, it often takes catching yourself in victim thinking many times to remove this weed from your mental garden. Anything that helps remind you not to play the victim is helpful such as books, films and other methods. Set your intention clearly and you will slowly climb out of the victim error.
3. **Think wholesomely.** This means to watch your lower impulses at all times. These include anger, rage, lust, greed, selfishness, desire to control others or the idea that others are here to serve you. The lower impulses or desires have plagued humanity forever and are discussed in all the major religions and philosophies. They are ‘natural’, but not helpful in the slightest. They must be controlled in some way, whether by laws, morality, fear of punishment or other methods.

In some circles today, controlling your emotions and thoughts is considered repression or “not expressing who you really are”. This, I maintain, is always a lie. We live at many levels. We choose our altitude, so to speak, by our attitudes. Everyone, without exception, has lower impulses and ambitions. These are always unhelpful and always cause physical or mental illnesses of every kind imaginable.

To help overcome unwholesome thoughts and feelings, substitute more wholesome ones. Also, gently let go of friends and even work situations that expose you to those who are coarse, angry, negative, selfish or engage in unwholesome behaviors. Plenty of people are seeking a pure, wholesome life and one can substitute new friends for the old ones.

4. **Think in a positive direction.** This means to look on the bright side of things, as much as possible. It does not mean to ignore the obvious or to believe things will work out when all the facts argue against it. It just means to avoid inferring and implying negative outcomes when you really don’t know the truth. Those who tend to think all is black are not really seeing the hand of the creator in their lives, generally, or they are depressed or ill in some way.

To help think in a positive direction, looking at things from a spiritual perspective is helpful, though not needed in some cases. Those who only think physically, for example, will eventually become depressed because all material things fall apart eventually, from the body to the house, and so on. This is tricky, because one wants to be realistic, and yet not negative. Material thinking often seems more realistic, but it is not necessarily the case.

Miracles do happen if one can allow them into one’s thoughts. Appearances are not at all the same as reality. For example, the recent worldwide recession has affected many, but the effects are not all negative, though you will rarely hear about the positive effects on the news. People have slowed down and are saving more money. They are spending more time with family and less time traveling aimlessly, for example.

Another way to assist in thinking positively is to cultivate friends and colleagues who tend to be happy and more upbeat. Let go of the naysayers in your life if you can. If it is a partner or a child, work with them on this issue. To clear deeper causes of negativity, I highly recommend the Roy Masters observation exercise each and every day. It can help anyone sort out facts from false perceptions. This brings about an honest positivity after a while.

Thinking positively does not mean that everything that comes out of your mouth must sound lovely. You can learn to speak the truth clearly and as objectively as possible, though it may sound negative. If someone is not telling the truth, there is no point in keeping silent or faking your feelings. Speaking the truth is never negative; it is simply the truth.

Thinking positively is also not “positive thinking”. This style is very popular in some circles. Everything is presumed to be positive, no matter what it is. If a war breaks out, these people say it is for the best. This is usually pure speculation, which is dangerous and often a denial of reality. If a war breaks out, it is fine to say “I don’t know why this is happening, but I hope and pray that it is over soon”. In other words, do not waste your energy trying to turn everything that happens into something positive.
5. **Let go of grudges and resentments.** Holding on to grudges and negative thoughts toward others is associated with chronic degenerative diseases such as diabetes, cancer, heart disease and many others. Learn to let go and forgive, even if it hurts and you feel terribly alone or cheated by life. Many methods can help you let go of resentments. The most important is to commit to forgive “seventy times seven times”, as the bible recommends. Make it a major principle in your life. Catch yourself if you ever wish harm on anyone. Catch yourself when you think or say negative things about anyone. The Roy Masters meditation is most helpful at times to dig up hidden resentments that often control us.

Letting go of grudges and resentments does not mean to ignore the lessons learned, and it does not mean to give people a second chance. This behavior can be dangerous, as some women know. Forgiving just means moving on and letting others go their way in peace, and that is all.

6. **Cultivate gratitude.** Gratitude is one of the healthiest attitudes. It is the recognition that all of life is a gift, even seemingly adverse circumstances. Therefore, you can be grateful for whatever comes your way. It is really a very simple idea.

Gratitude is not about making up “positive” reasons for difficult situations. For example, one might rationalize that cancer arose so one can learn to eat better. That is purely rationalization and is not really gratitude. It is fake, in that one feels bad and is trying to make the best of a bad situation. A gracious attitude about a cancer might be, “I don’t know why the cancer arose in the body, but I am grateful for the years and the love I have had on this earth so far. Perhaps I can overcome this condition and live even longer to receive even more of life”.

This perspective will help you through health challenges more than any other. If you cannot see or feel gratitude to this extent, make a list of at least five people, places or things for which you are grateful each night before retiring. Review the list often. Practicing gratitude as much as possible can cause more healing of the liver, in particular, than most other therapies.

7. **Think in a broad-minded way as much as possible.** Most people think in surprisingly narrow-minded ways. This is new for America, which formerly was known as a very open-minded place. This appears to be changing as people’s health declines and as the level of freedom declines. Freedom means giving freedom to others as well, so when general freedom declines, many people become narrow-minded in regard to others as well.

To help think in a broad-minded way, one must hear and read both or many sides of an issue. Also, never become a one-issue person. Life is complex and most issues are not all black and white. Also, do not believe the mainstream media. They can be quite biased, especially NBC, ABC, CBS and National Public Radio. Become a detective in everything.

**EXERCISE**

Mild and gentle exercise is the only type recommended while on a development program. Exercise only to flex and tone the body, and little else. This is difficult for some doctors and laymen to embrace. Reasons for limiting all activities include:

- **Dr. Eck found that most people are exhausted.** This is evident on most hair mineral analyses.
- **Exercise most often acts as a stimulant that only makes one feel better temporarily.** It can easily become an addiction.
- **Exercise uses up vital nutrients, and stresses the adrenal and thyroid glands.**
Many have structural or chiropractic imbalances that become worse with too much exercise. Sauna therapy provides many of the benefits of exercise and more. These include enhancing oxygenation and circulation, relaxing the nervous system and gently massaging the internal organs. Sauna therapy offers many of these, and more, without the negative effects above.

**Weight loss and exercise.** Contrary to popular teaching, on a development program weight loss will occur faster and more easily without much exercise. We have proven this over and over again with many overweight people who are willing to just follow the program and walk 10-20 minutes several times a week.

**Walking is usually best.** Depending on your age and health conditions, 10-30 minutes of gentle walking or gentle bicycling several times a week is plenty of exercise. Suggested alternatives are 15 minutes of gentle rebounding on a mini-trampoline, gentle weight lifting or gentle sports such as golf, croquet and others. Other types of exercise are not generally better than these. See below for cautions about other types of exercises.

**How to walk properly.** The following will turn your daily walk into a fabulous therapy:

- With each step, send your energy forcibly downward into the earth. You may wish to imagine you have weights on your legs, or a giant magnet pulls each foot in turn deep into the planet. Some people imagine they have suction cups on the bottoms of their feet that they compress with each step. You might simply imagine the earth is soft and you are sinking in.
- Point your toes slightly inward. This will help keep your spine aligned.
- Be sure to stand tall and relaxed, as described in the posture section.

**Building strength.** It is not necessary to become extremely fit or buff beyond what you need for your daily activities. However, if you desire to build strength, do not work out hard and often. New research shows this is not necessary or even helpful. Instead, read *The Slow Burn Fitness Revolution* by Frederick Hahn, Michael Eades, MD and Mary Dan Eades, MD. This book can help you to be stronger with just one one-hour workout every five to seven days.

**Exercise hazards.** Warning: For those who want to lose weight, the common practice of combining heavy exercise with little food is a prescription for total breakdown of the body. General cautions include to avoid overdoing or pushing yourself to exhaustion. This is never helpful, and will slow or stop your healing process. Avoid aerobics and all vigorous workouts, simply because it is almost impossible to tell when you have done enough due to the fast-paced music and peer pressure to keep on going. Be very careful with this, especially those with an unbalanced body chemistry. Avoid all fitness coaches, for example, that continually try to help one increase one’s workouts. This is not helpful in the slightest.

**Swimming:** Only swim in clean lakes, rivers, ponds or oceans away from boat traffic and other hazards. Avoid most swimming pools, except perhaps a private pool of your own. Even here, chlorine and bromine are toxic chemicals used in most pools. Municipal water also usually contains aluminum, copper, toxic chemicals and pharmaceutical residues. A salt water pool is a little healthier in some cases. You can add hydrogen peroxide to a pool or hot tub and it will help sanitize it a little.

**Hot tubs.** These are far worse than swimming pools. Especially avoid public hot tubs at health clubs, hotels, etc. The hot water is a great incubator for infections. Chlorine, bromine, silver cartridges and other methods cannot kill them all, no matter how clean the water appears.
Also, you will absorb chemicals from the water in all hot tubs, even those sanitized with hydrogen peroxide. Instructions how to use peroxide in your hot tub are on the internet. If possible, have a hot bath instead of using a hot tub, as this is far cleaner. Also be careful with jacuzzi or whirlpool bathtubs, as bacteria build up in the pipes inside the tub.

**Hot springs.** A safer alternative is to visit a clean hot spring. The water must flow continuously. Some hot springs are more healthful than others. **Avoid** extreme temperatures and be careful if the water is smelly or cloudy, as it may not be healthful. **Also avoid** taking any type of bath more than twice per week because too much exposure to water makes the body too yin.

**Special cautions with yoga and tai ch’i:** Yoga, in particular, tends to move energy through the body in improper directions. For this reason, we do not recommend it. Also, subtle injuries are very common in yoga and tai-chi classes, especially if the teacher does not walk around during the entire class making sure everyone is doing the poses and the forms correctly.

### A BALANCED LIFESTYLE

Lifestyle is more than just a list of habits to cultivate and those to avoid. It is also about the balance of the healthful items in your life. Here are examples of how to make this balance:

- **People matter.** Thinking about others and their needs is a key to a balanced lifestyle.
- **Thinking about the past and the future.** Without enough thought about the past, you are liable to make the same mistakes over again. Without enough future orientation, you are liable to become depressed and discouraged.
- **Thinking positively and negatively.** Some people are too grounded or negative, while others are upbeat too often, usually because they are out of touch and in denial.
- **Starting and finishing projects.** Starters need to learn to complete what they begin. Finishers must initiate more or little gets done without someone else prodding you all the time.
- **Social time and alone time.** This varies for each person. However, too much socializing and travel is wearing. Too much alone time could be harmful if one misses out on opportunities.
- **Balancing your moods.** This is a more subtle area. All of us go through anger, fear, guilt and other emotions at times. If we can balance these, we will generally stay much healthier than if we dwell on or stay in one mood most of the time. The latter is called neurosis and even psychosis, as it represents a fixation of sorts and not a state of balance.
- **Healthful activity must be balanced with adequate rest.**
- **Work needs to be balanced with caring for the body and with time for rest and relaxation.**
- **Loving the self and loving others.** It is important to balance your own need for rest, proper nutrition and every other aspect of a development program, and the needs of those around you. Self love is essential for success with this program and for all healing, in fact.

Making a healthy balance in these ways will avoid many mistakes that most people make that lead to all kinds of illness, depression and other types of problems.

### SEXUAL ACTIVITY

This area is critical today, mainly due to the extreme prevalence of STDs. The consequences of a single slip can last for years, or even a lifetime. Unfortunately, the women often end up with the babies, the birth defects, the guilt, the shame and tied to men whom they
really don’t need in their lives. Also, sex affects women emotionally much more than it affects most men, a fact that most do not realize. For all these reasons, women must be the ones to take the most precautions. Never assume your partner is free of STDs or telling the truth about sexual matters. It is often not hormonally normal to be totally honest in this area for either men or women. A longer article on this subject is available at www.drlwilson.com. The following will help keep you safe:

- **Do not marry or even date anyone who does not share your moral values.** If you are not sure of your morals, start thinking about them now. Read the Ten Commandments of the bible, read other books, talk to the most responsible and loving adults you can find, and figure out your values. Values are real, and may determine your future as much as any other factor.
- **Avoid all social situations and substances that compromise your mental acuity.** This means no alcohol, no drugs and no hanging out at bars, cocktail lounges and crowded places like discos, concerts, and even most sports events, if possible. Try not share an apartment or dorm room or even dorm floor with the opposite sex, even a “friend”. It is just not wise. It is not the same as sharing with another person of the same sex.
- **Women should test their suitors.** This means women should spend time with men who are not swayed by body parts, sexual jokes, sexy clothes and the like. Men, there is nothing wrong with testing your ladies the same way. These days, plenty of young women are promiscuous and not worth the trouble for a man who wants to live healthfully and happily.
- **STDs.** These are everywhere, especially among “aggressive” and “social” young men and women. Do not underestimate this. They are not “benign” infections, as many doctors tell you. They weaken the body, especially those of women, and they can cause infertility and other diseases including cancer.
- **Refuse Gardasil and other vaccines against STDs.** These are not very helpful and have killed or maimed thousands of young people.
- **Rules to avoid STDs.** No kissing on the mouth and no lying in bed with boys, even to watch television or a movie, or to look at photos on a computer. A wandering hand can get a lady all heated up and next thing she knows has had sex with someone with no protection at all.
- **Sex is not love.** Sex can be part of a loving relationship in marriage, but love is not about sex at all. Older people know this is the absolute truth.
- **Sex is not a “need”.** It is a hormonal drive to reproduce that is glamorized and over-rated by the media, and used by advertisers and others to sell every imaginable type of product.
- **Sex and hatred.** For women, particularly, sex is an emotional involvement that often causes severe hatred of men later when the relationship doesn’t work out. Girls and women must understand this well or they all tend to fall into the same trap of thinking men “love” them when it is mostly sexual interest driven by hormones that the men do not understand at all.
- **Wait for marriage for sex.** The advice is old-fashioned, but it saves women and some men from hardship and prevents unwanted pregnancies, abortions, many infections and more.
- **Safe sex.** There is no such thing, not even kissing on the mouth! All can spread STDs. Do not kid yourself, your friends, your children or partners. Sex is not a safe activity if you wish to avoid spreading infections. Condoms may be helpful if they are fresh, and better if two are used at one time. However, they are not guarantees for preventing either pregnancy or diseases. An old-fashioned idea for women, mainly, that may help a little is washing or douching the genital organs, inside and out, after intercourse with plenty of soap and water.
• **Sex and spiritual development.** For most men and women, avoiding the loss of sexual fluids is important. Later in spiritual development, it is not as critical. This does not mean no sex. It means more playing rather than a lot of intercourse and orgasms, which I know some will find difficult or impossible, they believe.

• **Birth control.** The pill, the patch and newer IUDs are extremely toxic and dangerous drugs that cause cancer, strokes and heart attacks for women. Smart women avoid them. A diaphragm is better, but somewhat less effective and less spontaneous. Condoms are best if two are used, if they are new and fresh, and only when used correctly.

### OTHER ASPECTS OF LIFESTYLE

A few simple techniques can be made part of a healthful lifestyle to rapidly improve health, increase relaxation, induce sleep and more. These include:

**Deep breathing.** Take full, deep breaths as often as you can to enhance oxygenation of the body. Two excellent methods are:

- **The three-part yoga breath.** As you count 1, 2, 3, fill your abdomen, pushing the abdomen out. As you count 4, 5, 6 fill the mid-chest, pushing the ribs out to the sides. Finally, as you count 7, 8, 9, fill the upper chest, lifting the chest slightly right up to the neck. Hold for several counts and then exhale slowly, also to a count of 1 through 9. You can begin the exhale from the chest and move downward, or begin the exhale in the abdomen, pushing it in, and move up the body. Repeat the exercise often so it becomes easy.

- **Toe breathing.** Lie down comfortably. Focus your attention on your toes or even just below your feet. Now imagine large holes in the bottom of your feet and toes. Inhale gently as though you are sucking air up through your toes and feet to your lungs. Hold the breath for several counts. Then exhale gently, imagining the breath flowing down the front of your body from the lungs to the feet. Repeat this often until it becomes a habit.

• **If possible, buy an air ionizer/ozonator.** Recommended brands are Better Living or Ecoquest. Keep it in the bedroom at a medium strength of ozone. This has many benefits, but the most important is it will enhance oxygenation of the body in a gentle way. Keeping it in the bedroom assures that you will breathe the ozone all night long.

• **Gentle chiropractic.** Gentle chiropractic or other manipulation of the vertebrae can be extremely helpful while a person is on a development program. Rough chiropractic is not as helpful and not recommended.

• **Bodywork.** Techniques like Rolfing, structural integration and even deep massage techniques are very helpful for many people. One can have a treat once a month, if possible, especially if the body is changing quickly or one is under a lot of stress.

• **Chi machines.** Moving the spine to keep it flexible is very helpful for most people. A short walk is excellent. If walking is not possible, or if time is short, use a chi machine. These start at about $140.00 or perhaps less at a resale shop. It is a simple box on which one places the ankles. The machine slowly and gently moves the spine back and forth to induce relaxation. This helps many people to sleep better and has other benefits as well.

• **Rebounding.** This simple, safe form of exercise promotes lymph drainage.

• **Use an inversion table.** This device gently turns one upside down, expanding the spaces between the vertebra. It can help undo the continuous effects of gravity on our bodies.
3. **THE RAPID DEVELOPMENT DIET**

John, age 25, injured his Achilles tendon. Surgery was performed to correct the problem, but the wound would not heal correctly. To induce healing, a second surgery was performed and this failed as well. John was scheduled for a third surgery when he heard about development science. While waiting for his hair analysis results, his doctor advised the diet discussed in this chapter. She guessed he was a slow oxidizer because he was often fatigued, depressed, and seemed very lazy. John enthusiastically started the new diet. Within two weeks, and before he even started his supplements, the tendon wound healed sufficiently that the surgeon cancelled the third surgery. This case is an example of the incredible importance of diet in a few cases and how easy it can be in some instances to avoid surgery.

**NOTE:** We continue to research and improve the development diet. For the latest update, check the article entitled *Food For Daily Use* at www.drlwilson.com.

**SIX DIETARY RULES FOR RAPID DEVELOPMENT**

1. **Eat lots of well-cooked vegetables with breakfast, lunch and supper.** Eat three meals a day. *Do not eat* just grains and meats, or mainly chemicalized food such as fast food, or raw vegetables (salads).

   Adults need 2-3 cups of well-cooked vegetables with each meal. It is best if they are fresh and not canned or frozen. Interestingly, canned vegetables are testing better than frozen ones. Organically grown and locally grown are usually superior, as well.

   Vegetables need to be pressure-cooked for *no more* than 3 minutes or steamed, boiled or slow-cooked for no more than about 45 minutes. Do not fry, broil, roast or bake vegetables. Also, preferably do not stir-fry or sauté vegetables. These produce toxic chemicals.

2. **Eat only whole, natural foods.** This means: NO protein powders, NO green drinks, smoothies or shakes, NO juices except 10-12 ounces of carrot or wheat grass juice away from meals, NO eggs whites only, NO Egg Beaters and NO food bars. See the references at the end of this article for the reasons for these restrictions.

3. **Eat animal protein twice every day.** For rapid development, do not eat a vegetarian diet. Animal protein includes red meat such as lamb, goat, organic or grass-fed beef, dark meat chicken, sardines, eggs and a little goat yogurt.

   However, limit the portion size for adults to 4-5 ounces or 110-140 grams of animal protein per serving, and no more.

4. **Eat warming foods only.** All food tends to either *warm* the body or *cool* it down. These are physics qualities. Warming means faster motion of the atoms and molecules. It is also more compact, with more inward and downward movement of subtle energy. Some teachings use other equivalent words such as yang and yin in Chinese medicine and Macrobiotics.
Warming foods includes meats, eggs, cooked vegetables, and whole grains. Cooling foods are fruit, raw vegetables, juices, all food powders, and sweets of all kinds. These slow down or stop development.

For this reason, do not eat sugar, honey, maple syrup, agave nectar, coconut products such as coconut water, coconut cream or coconut milk, soda pop, fruit juice or much fruit or milk. Also, do not eat sweetened foods such as cookies, cakes, ice cream, pastries, all desserts, and many breads.

5. Do not drink any liquids with meals. Have drinking water before your meal, then wait five minutes or longer before you eat your meal. It also means take your supplements before your meal if you need to have some water to swallow them. Then wait five minutes and then eat your meal. However, it is okay to take supplements during or right after a meal.

Do not have smoothies, shakes, protein drinks, superfood drinks, frappes or any other drinks that combine water or other liquids with food. This is much harder on digestion and too yin. If you have carrot juice, have it alone. Then wait at least half an hour before eating a meal.

6. Use sea salt with all meals. Preferable brands are Hain and Hawaiian Bamboo Jade. Use sea salt to taste, including on meats. It is an important product for development. Sea salt in moderation does not raise blood pressure or cause other problems.

AVOID standard table salt, which is a processed and toxic product. Also avoid salt substitutes such as potassium chloride.

WHAT IS DEVELOPMENT?

Development is the expansion of the energy field of a human being. It is also the unfolding of the full genetic potential of a human being and the primary goal of development programs. This is different from other healing programs and requires a different diet.

Certain foods contain the right chemicals needed for development. These foods are needed on a daily basis. This article discusses these foods. For more details, read Introduction To Development at www.drlwilson.com. We continue to research diet, so this article will be updated periodically. Please check it every six months.

THREE ARTICLES ABOUT THE DEVELOPMENT DIET

In addition to this chapter, two other articles at www.drlwilson.com discuss the development diet. They are: Foods For Occasional Use and Forbidden Foods.

FAST AND SLOW OXIDIZER DIETS

The dietary principles for fast and slow oxidizers are similar. However, they differ in the following ways:

Slow oxidizer diet. When the oxidation rate is slow, one needs less fat and more starches in the diet. There should be enough fat and oil in the development diet without adding extra fat. High-fat foods in the development diet are:

- Almond butter- very important! Do not skip this for any reason. If you don’t like it, disguise the flavor. Organic almond butter is more costly, but better.
- Sesame tahini
- Oil found in blue corn chips
- Sardines
- Meats (mainly lamb, dark meat chicken, and organic ground beef. Wild game and
turkey have a little fat, but not much)
- Eggs (specifically runny egg yolk)
- Goat yogurt
- Possibly a small amount of butter or vegetable oil used in cooking.

**Fast oxidizer diet.** Fast oxidizers require one to two tablespoons of additional fat or oil
with each meal. They also require less starch in the diet.

Excellent extra fats are runny egg yolk, cream, butter, animal fats, and a little vegetable
oil such as olive, sunflower, safflower or other vegetable oils.

*Vary the type of extra fat or oil you eat.* For example, do not just have olive oil or butter three times a day. This will unbalance the body and will slow development.

Chicken skin is not that good as an extra source of fat. Do not eat it at all if the chicken
is roasted because it is then toxic.

**Carbohydrates or starches.** Fast oxidizers require less carbohydrate than slow
oxidizers. However, both slow and fast oxidizers need at least a few blue corn chips every meal.

We wish that other grains supplied the same nutrients as blue corn chips, but they do not.
We also wish that blue corn cereal or blue corn tortillas were as good as the chips, but they are
not. Skipping the blue corn chips slows development a lot.

However, do not overdo on corn chips, which is easy to do. Limit the number to about 8-10 per meal. If you are still hungry, add more vegetables to your diet rather than fill up on corn chips or other grains.

**VARYING THE DIET DEPENDING ON ONE’S SIZE AND LIFESTYLE**

The portion sizes recommended below are average sizes. If you are very small or very
large, you can adjust the portion size accordingly. However, we find that most adults need
several cups of cooked vegetables three times per day, regardless of their size or weight.

**II. DAILY FOODS**

**COOKED VEGETABLES**

- Eat 2-3 cups or 500-700 ml (volume) of cooked vegetables with each meal, three times
daily. Measure the amount of vegetables you eat in the cooked state, not the raw state. This
amount is needed to remineralize the body. *This is the most important part of the diet, and the
one with which most people have the most difficulty.*

Food is much less nutritious today than it was 100 years ago. This is why many more
cooked vegetables are needed today. For details, read *Everyone Is Depleted And Toxic* at

*Cooking.* *Vegetables must be cooked until they are soft, not raw, crunchy or al dente.*
Otherwise, the body cannot absorb enough minerals from them. However, do not overcook
vegetables. When properly cooked, vegetables should retain their color but be soft.

This requires about 3 minutes or a little less in a pressure-cooker or 30-40 minutes in a
steamer or crock pot.
Never pressure cook vegetables for more than 3 minutes. This just overcooks them and destroys the chemicals in the food that development requires. If the vegetables do not pressure cook in 3 minutes, they need to be sliced thinner.

Also, we no longer recommend stir-frying or sautéing vegetables, except occasionally. The reason is that stir-frying produces advanced glycation end products, which are toxic chemicals. We only suggest steaming, pressure-cooking or crock pots for cooking vegetables.

Preferred Vegetables. Eat almost exclusively the preferred vegetables listed below. There are about 28 of them. If you cannot obtain all the preferred vegetables, just do your best and eat plenty of the ones you can get.

A medley or mixture. At each meal, eat a mixture of 10 or more of the preferred vegetables. This is new and replaces an older recommendation to eat between about 5 and 9 different vegetables per meal.

We suggest eating some carrot, rutabaga and daikon with each meal. Also, try to have at least 3 kinds of onions per meal. The other vegetables can be rotated.

Fresh, organically grown vegetables are best. Commercially grown ones are okay, too. The next best type right now are canned vegetables. Frozen vegetables appear to be least helpful for development, so do not eat them, if possible.

Salads and other raw vegetables are not recommended because they are much more cooling and the body cannot extract much nutrition from raw vegetables.

Drinking the water in which you cook vegetables. If you pressure-cook vegetables, drink the water in which you cooked the vegetables. Drink it 10-15 minutes before you eat your meal, or at least an hour after the meal, however, so as not to dilute the digestive juices.

How often to cook. Ideally, cook vegetables for each of three meals. However, it is okay to cook vegetables just once or twice daily. They will keep throughout the day. Ideally, do not keep them overnight, although leftovers for one day are okay.

Preferred vegetables. Eat mainly the preferred vegetables listed above. Do not eat a lot of any other vegetables, including greens. They do not provide enough of the chemicals needed for development.

Pureeing. You may puree vegetables after cooking them to make it easier to eat 2 cups of them or more. To do this, after cooking vegetables, pour off the water you cooked them in so you can drink it. Then, to puree the vegetables, use an electric hand blender. It looks like a stick with a cord at one end and a blade at the other end.

Do not use a regular blender because they require adding water. This is not good because the water dilutes the stomach acid. The hand blender does not require adding water to the vegetables.

Peeling. Do not peel vegetables such as carrots, even if they are not organically grown. Clean them with a vegetable brush. However, remove the outer dried skin of onions and garlic.

The list of preferred vegetables:

Root Vegetables:
- Red onions
- White onions
- Yellow onions
- Sweet onions
- Gold pearl onions
Red pearl onions
White pearl onions
Boiler onions
Cipolline onions
Bulb onions
Green onions or scallions
Shallots
Leeks
Rutabaga
Daikon or white radish
Carrots (standard orange carrots only)

**Cruciferous vegetables:**
Red cabbage
Savoy cabbage
Brussels sprouts
Broccolite, brocolini or baby broccoli (but not regular broccoli).
White cauliflower
Orange cauliflower
Purple cauliflower
Cauliflower stems and leaves (sliced finely so they cook).

**Other.** Green beans, and a small amount of golden beets, celery, garlic and ginger.
For celery, have only about half an inch of a stalk twice a week. For golden beets, have a thin slice twice a week – about the size of a quarter coin. For garlic, have 2 little cloves per week. For ginger, have 2-3 small slices per week.

Here are more notes about certain vegetables:

**Brussels sprouts.** We are not sure why these are so named, as they are not sprouts. They are fully grown vegetables with many healing properties.
If they are available, eat at least one or two medium-sized Brussels sprouts every day.

**Cabbage, red and Savoy.** These are excellent for development. As with all vegetables, look for smaller heads of cabbage because they are more warming. Also, keep cabbage and all vegetables in plastic bags from the supermarket to help preserve their freshness.
Adults can have about 1/2 of a leaf of each one (red and Savoy cabbage) every day, at least. It should be soft, when cooked, and not crunchy.

**Carrots.** Smaller is better, but do not buy the peeled, so-called “baby carrots”. In general, carrots and other vegetables that are sold loose are better than those sold in plastic bags.
For cooking, cut carrots into pieces that are about ¼ to ½ inch or 1 cm long. If the carrot is thicker than about 1 inch or 2 cm, slice the carrot longitudinally or the long way, as well. This way it will cook in a steamer or pressure cooker at the same rate as the other vegetables. Be sure to have carrots at least once a day.
**Cauliflower.** The best types are the orange and the purple cauliflower, even if they are not organically grown. Next best is white cauliflower. Green cauliflower is not recommended. Have some cauliflower every day and ideally with every meal.

Think of cauliflower as two vegetables: 1) the cauliflower, and 2) the stems that are around the cauliflower. Both contain the chemicals needed for development. The stems must be sliced thin or they won’t cook through.

**Daikon or white radish.** Have a little daikon preferably with each meal, or at least once a day. Don’t substitute the common red radish or any other for daikon.

**Garlic and ginger.** Eat these only about twice a week, and only a very small amount. Garlic cooks quickly and should not be cut up. Ginger cooks slowly and needs to be sliced very thin and cut up some more in order to cook correctly.

**Golden beets.** These are helpful for development, but only a little is needed – about 1 thin slice of a medium-sized golden beet twice a week. Avoid red beets, which do not contain the chemicals for development.

**Green beans, also called string beans.** This is an excellent vegetable to speed up development. Have a few green beans every day.

If possible, buy them loose and not in a plastic bag. The bagged ones seem to be affected by the plastic in the bag.

Cut them into about 1-inch pieces or 2 centimeter pieces. This is about right so they will cook at the same rate as the other vegetables. When cooked properly, they should be soft, not crunchy.

**Green onions or scallions.** This is an excellent vegetable for development. Have some daily.

**Leeks.** This is an excellent vegetable for development. Have some every day. Eat the whole leek – both leaves and stem.

Leeks often contain some dirt where the stem becomes the leaf. This is unavoidable and you may have to wash this part when you cut a section of it to eat.

**Onions.** Onions are very important for development. They contain a number of chemical compounds that speed development. Without them, development proceeds slowly. Please eat them all, if you can find them. We suggest eating a little of three or more types of onions with each meal.

To extract all the minerals and other chemicals from onions, they must be cooked until soft. Small chunks cook well in 3 minutes or a little less in a pressure cooker or about half an hour or less in a steamer.

**Rutabaga.** Slice rutabaga thin so it will cook through. When cooked correctly, it is sweet and delicious. When not thoroughly cooked, it is has a somewhat unpleasant taste so you will know to cook it more or slice it thinner. It is very helpful for development, so eat some every day if you can find it in your area.

**Other vegetables** do not contain as much of the chemicals needed for development, or they are too cooling. Eat them only occasionally.

**Shopping.** Shop for vegetables at least once a week. When there is a choice, buy smaller sized vegetables. These are more warming. Vegetables are usually better if they are bought loose, rather than in sealed plastic bags.
Storage. When you bring vegetables home, rinse them off in clean water. You can use a little soap or peroxide with it, if you wish. Then put them into clean plastic bags – the kind that one uses at the supermarket when one buys loose vegetables. Store them in the refrigerator. The author stores vegetables in the bins in the refrigerator door. He removes the bins and puts them on the counter when it is time to cook. This is easier than lifting a heavy bottom bin.

Note for vegetarians (which we do not recommend): If you don’t eat meat, then you need to eat more green vegetables to obtain iron.

PROTEIN FOODS

Protein foods that are needed for rapid development are:

Dark Meat Chicken (thighs or legs). Eat three or four 4-5 ounce portions weekly. Natural or free range chicken is generally best. Foster Farms in the USA is a good brand.

Lamb. Lamb loin chops are best, but any cut of lamb will do. Most lamb is pasture-raised and okay. Eat two 4-5 ounce portions per week. For lamb chops, put one or two cuts in the lamb and then cook it for about 1.5 minutes in a pressure cooker. Thicker pieces will take longer than thinner ones. Lamb and chicken should be juicy, but not raw. Do not drink the water in which you cook chicken, lamb or beef. It is somewhat toxic.

Roasted almond butter. We suggest almond butter, but recently (2019) most almonds are contaminated, including organic almonds. For now, it may be best to skip this food.

Roasted sesame tahini (sometimes called sesame butter). Eat 1 tablespoon of roasted sesame tahini daily or two tablespoons of hummus daily (which contains sesame tahini). Only have sesame butter or hummus made with white sesame seeds.

Sardines. These are excellent for development, and the only canned food we suggest. Eat three or four 4.25 to 4.5-ounce cans of them weekly. If you will not eat sardines, you must take a supplement of about 1000 mg of EPA and DHA weekly and 5000 IU of vitamin D daily.

Sardines in the can are already cooked and should not be cooked more. You can eat the olive oil found in some cans of sardines, although elsewhere we suggest not cooking olive oil. The olive oil in sardine cans was not exposed to the air and is safe. Avoid Asian sardines.

Grass-fed, organic and heirloom beef. This is a newer recommendation. A little properly cooked, grass-fed beef is an excellent food for development. If possible, eat beef from an heirloom variety of cow such as criollo beef. It offers superior nutrition and speeds up development.

Eat two 4-5 ounce portions of grass-fed or organic beef every week. Regular feedlot beef is less nutritious and irritating for the body. Avoid it or eat it only occasionally.

Beef must be cooked by braising. Cooking instructions are in a section below. A little beef jerky is okay provided it is not full of chemical additives and provided you chew it thoroughly.

Eggs. Eggs in moderation are helpful for development. Cage-free, free-range or organic eggs are best. Adult women may eat up to 6 eggs per week. Adult men may eat up to 8 eggs per week. Store eggs in the refrigerator.

Eggs must be cooked so that the yolk is runny. Possible methods are:

1. Soft boiled for 3 minutes.
2. Poached.
3. Scrambled, but only if they are eaten when mushy, not hard.
Never eat hard-boiled eggs or eggs that are hard such as in quiche, cake, pastries or other dishes. These are very difficult to digest.

**Wild game.** Caribou, elk, and deer are good. Do not eat duck, goose, bison or buffalo. These are a little toxic.

**Plain (meaning unflavored) goat yogurt.** This is helpful for development. Eat 8 ounces per week.

All other dairy products such as cows milk yogurt and kefir, cheese and milk do not contain the chemicals needed for development. They are also cooling foods. For this reason, avoid them or have them only occasionally. Never have a total of more than 4 ounces of all dairy products in one day, including butter.

**OTHER PROTEINS:**

**Goat meat and turkey** – These are foods for occasional use and are optional. Have a portion of each at most only once or twice weekly.

**Beans or legumes.** These do not contain the chemicals needed for development. Therefore, avoid them or eat them only occasionally. They include black beans, pinto beans, kidney beans, black-eyed peas, and others.

**AVOID**

**Organ meats.** These are too high in toxic meals.

**Pig products** (such as pork, ham, bacon and lard). These often contain parasite eggs, even if well-cooked. This meat also slows development.

**Processed meats, such as salami and bologne.** These contain chemical additives.

**Lentils.** At this time, lentils are not working well and we suggest avoiding them.

**Protein powders, protein food bars and protein drinks.** These are cooling foods and usually very bad food combinations. Avoid all of them.

**Portion size.** A serving of protein food for adults is 4-5 ounces or about 100-150 grams of protein food (not grams of protein) per serving. This is less than some people eat.

**Cooking proteins.** Lightly cook all protein food except cheese, yogurt and kefir.

**Salt.** When you eat protein foods, sprinkle a little sea salt on them. It helps with digestion.

**GRAIN FOODS**

**Blue or purple corn.** Blue corn tortilla chips (or blue corn dippers or blue corn taco shells) are the best grain food for development. If you can get them where you live, this is best. Otherwise, look for yellow corn chips. These are not as good, but have some of the chemicals needed for development. Other grain foods are occasional foods and are not required for development.

Adults need about EIGHT TO TEN blue corn chips or dippers with each meal. They are easy to overeat, so count them out. If you are still hungry, add more vegetables or protein to your diet rather than eating more corn chips. For details, read Blue Corn at www.drlwilson.com.

**AVOID RICE AND WHEAT.** All rice, even organically grown rice, is somewhat toxic. We don’t know exactly why this is so. However, at this time avoid eating rice, rice noodles, rice crackers or rice cakes. Wheat is hybridized, irritating and an allergic food.

**Avoiding all grains.** Do not avoid all grains unless you don’t tolerate them. When you can eat them, have the blue corn chips. They contain chemicals needed for development. If you
cannot eat any corn, have some oats, millet or quinoa. However, these are low in the chemicals needed for development, so do not eat them too often.

**AVOID:**

- Blue corn chips made with coconut oil. Coconut products are too cooling and slightly toxic. See below if you have difficulty eating blue corn.
- All wheat and spelt products and all refined grains. Wheat is an irritating food today due to hybridization.
- All raw grain products such as granola, muesli and trail mix. Some food bars also contain raw grains.

**FATS AND OILS**

For slow oxidizers. Do not add extra fat to your daily diet. There should be enough fat and oils in the daily diet. Foods that contain fat that are excellent for slow oxidizers are lamb, sardines, eggs, blue corn chips, dark meat chicken, almond butter, tahini and grass-fed or organic ground beef. Please eat these foods or your diet will be too low in fat and unbalanced for development.

For Fast Oxidizers. Add 1 or 2 tablespoons of extra fat per meal. Acceptable fats and oils are butter, cream, tallow, lamb fat, olive oil (but do not cook olive oil because it turns toxic), and a little of other vegetable oils.

AVOID coconut oil and avocado oil. They are too yin. Vary your extra fats and oils.

**FRUIT AND SWEETS**

These slow or stop development. They are very cooling foods and too high in sugar. We suggest avoiding all fruit, fruit juices, and all sugars, including honey, maple syrup, agave syrup, rice syrup and other sweets. An exception is if you want to have a few botija olives per week, this is okay, although not required.

**NATURAL SEA SALT**

This is an excellent product for development and required on the diet. You may have sea salt to taste.

Preferred brands are Hawaiian Bamboo Jade and Hain sea salts. The latter is sold via the internet. Celtic Salt is not quite as good because it is from a contaminated area of the ocean. For details, read *Salt* at www.drlwilson.com.

**BEVERAGES**

**Drinking water.** The best types of water to drink are natural spring water or carbon-only or sand-filtered only tap water if it is safe to drink in your area. Sparkling water (with bubbles) is okay.

Avoid distilled water, de-ionized water, and reverse osmosis water, as these contain very few minerals. Do not add minerals to water because it tends to unbalance the water.
Avoid alkaline waters. These are any waters with a pH above about 8.8. These waters will make you feel better for a while. However, they unbalance the body. For details, read *Water For Drinking* at www.drlwilson.com.

**Bone Broth.** This is a good source of minerals. However, the only type that is acceptable at this time is beef bone broth. The others may be contaminated with lead. Cook the bones for only 3-4 hours. For details, read *Bone Broth* at www.drlwilson.com.

**Carrot Juice.** This is a good source of minerals and other nutrients. Adults may have 10-12 ounces of carrot juice daily. As an alternative, you may have 1 or 2 ounces of fresh wheat grass juice up to twice per week.

However, do not have more juice than this, because juices are raw food and very cooling foods. Do not have fruit juice, which is even more cooling.

**Tea and coffee.** One cup of regular coffee and one cup of herbal tea daily is okay, but not required. Good teas are chamomile, hibiscus or lemon grass.

**AVOID green tea.** It is too stimulating and interferes with a development program.

**AVOID** soda pop, alcohol, kombucha tea, other juices, alcohol and other beverages.

### DAILY FOOD FOR BABIES AND CHILDREN

It is very important to feed children and toddlers the same diet as for adults. Do not give children fruit, cereal, grains, juices, soft drinks or junk foods!!!!

**Cream.** Fresh heavy cream is an excellent fat, especially for children, who usually love it and will eat vegetables if you put some cream on them.

Cream is best unpasteurized. However, it is okay if you can only buy pasteurized cream. Organic cream is usually better than standard cream.

**Food for babies.** If a nursing mother is following a development program, with supplements, their babies should do very well on mainly breast milk until age 3 or even a little longer if they desire it.

All babies also benefit from ¼ to ½ of a runny egg yolk from an egg that is soft-boiled for 3 minutes starting around the age of 6 to 8 months.

Occasionally, a baby will need a few well-cooked vegetables and perhaps a little shredded meat after the age of 1 year. *If a nursing mother is not following a complete development program, her baby will need supplemental food, usually starting at 6 to 9 months of age.*

If a baby cannot get breast milk or perhaps goat milk, use home-made formula. For the recipe, read *Baby Formula You Make At Home* at our website. Avoid all commercial baby formula. For details, read *The Baby Manual* at www.drlwilson.com.

### III. OTHER TOPICS

#### COOKING

*April 2019 - New recommendation: Do not drink the water in which you cook beef or chicken. It contains a toxin. Using tap water to cook these meats is fine.*
Reasons for cooking food:
- Proper cooking does not damage food very much. However, it greatly increases the availability of the minerals in food by breaking down tough vegetable and other fibers. The latter is far more important.
- Cooking kills harmful bacteria and other germs.
- Cooking adds warming energy to food that is very important for development.
- Cooking concentrates vegetables, allowing one to eat more of the them.
- Cooking makes some foods much easier to digest.

Acceptable methods of cooking are pressure-cooking, steaming, and crock pots. Less desirable methods of cooking are stir-frying or sautéing, frying, broiling, roasting, grilling and baking. These cooking methods produce advanced glycation end products, which are highly toxic chemicals that damage the body. Ideally, do not use the less desirable methods.

Do not cook often with oil, as this tends to produce toxic chemicals. Do not bake vegetables in olive oil. This generates toxic chemicals that are very hard on the liver. Avoid microwave ovens.

Pressure-cooking. This is best for vegetables, but not for meats. The advantages of pressure-cooking vegetables are:
- It increases the warming quality of the vegetables.
- Cooking is very fast, which helps retain nutrients and is convenient.
- Food tastes good, cleanup is easy, and it does not require fat or oil.

How to pressure cook vegetables. Rinse off vegetables. Then cut them either into:
- Bite-sized chunks (onions, carrots, broccoli, cauliflower, cabbage, Brussels sprouts, leeks and shallots)
- Thin slices (daikon, rutabaga, cauliflower stems, celery, golden beets, and ginger)

All vegetables can then cook together and will be ready in less than 3 minutes. Never cook them longer than this.

Use a timer the measures seconds to avoid overcooking food in a pressure cooker. When properly cooked, vegetables should retain their color, but be soft. If they turn grayish and look raggedy, they are overcooked. Pressure cooking grains takes longer.

Some foods are too delicate to be pressure-cooked, including ground beef, and ideally chicken, and fish. For more details, read Pressure-Cooking at www.drlwilson.com.

Cooking grass-fed or organic ground beef. (We suggest avoiding regular beef, which is an irritating food for many people). Meat is actually a delicate food, and certain zinc compounds are destroyed if it is overcooked. We suggest cooking meat by braising:
1. Put about half an inch of water in the bottom of a pot or frying pan and bring to a boil.
2. Add the ground beef in the form of a patty that is no more than ¼ inch thick.
3. Cook on one side for about 10 seconds. Then turn it over and cook it on the other side for about 10 seconds. Then remove from the water, add a little sea salt, and eat. The meat will be rare or raw in middle and that is okay. It should not be cold in the middle. Take GB-3 with your meat.

Eating habits. Eat slowly, chew thoroughly, sit down when eating, and eat in a relaxed, quiet environment. Ideally, rest a few minutes before your meals, and rest at least 10 minutes after each meal. Avoid eating while driving, when upset, or in noisy places.

Order of eating foods.
1. Drink water up to 5 to 10 minutes before eating meals.

2. Protein. Begin most meals with some protein. It is the most difficult type of food to digest. The stomach needs more time to work with it.


4. Blue corn chips or other starch. Wait about 5 minutes after eating cooked vegetables and finish the meal with about 5 medium-sized blue corn chips. If you cannot get blue corn tortilla chips, you may have yellow corn chips or a small portion of another grain or starch.

Proportions. 70% of each meal by volume (not calories) should be cooked vegetables. About 15% of so should be protein food. Fast oxidizers need one or two tablespoons of fat in addition to that which is in their food. Slow oxidizers should not need additional fat.

Food combining. The basis for each meal is cooked vegetables. With this, you may have one protein food and one type of grain food.

For example, do not mix meat and eggs at one meal, as these are both proteins. Also, do not mix rice and corn tortillas at the same meal, as these are both starches.

Fermented foods. Fermented foods do not contain the chemicals needed for development. In fact, they interfere with development - they are all cooling foods because they are raw and ferments are cooling. Many of them also contain aldehydes, an important class of liver toxins. Those allowed as occasional foods only are a little sauerkraut, miso, yogurt, kefir and raw cheese.

When to add sea salt. We suggest cooking food before adding salt. After cooking, add some sea salt to taste.

Seasonings and dressings. Refrain from putting a lot of dressings, sauces, relishes, sweeteners or spices on your food. A little is fine to flavor the food. Too much has a cooling effect, is toxic, and will upset digestion.

Toppings. These are not needed. However, simple, tasty toppings are almond butter, a little pesto sauce, a little hummus, or some grated cheese. For children, cream is delicious mixed with cooked vegetables.

If you want something fancier, you can make Chinese-tasting vegetables such as chow mein or Thai-tasting vegetables with a little peanut sauce or curry. Another set of toppings are Indian-tasting vegetables with a little mokni, vindaloo, sag or other herbal sauces as toppings. These are sold in health food stores.

Number of meals. Eat at least three meals daily. Do not skip meals. It is difficult to obtain enough nutrients eating three meals daily. It is even less possible if you skip meals.

If you are not very hungry, eat by the clock, if needed. Do not wait until you are hungry, as some health authorities suggest. If you are not hungry, still try to eat at least three meals daily.

Food Rotation. Rotate your vegetables among the preferred vegetables listed earlier in this article. Also, rotate your proteins.
Also, rotate the brands of spring water you drink and rotate the brands of blue corn chips. We also recommend rotating the brands of sea salt. Rotating your food gives you more nutrients.

**Leftovers and freezing food.** Freshly cooked food is best for development. You may have one day of leftovers. Do not prepare several days worth of food at one time. Freezing cooked food reduces its benefit for development. Also, do not buy a large quantity of meat and freeze most of it. If your meat comes frozen, keep it frozen until you are ready to eat it. Do not refreeze meat.

**Soups and purees.** Thick soups or purees are excellent ways to incorporate lots of vegetables into your diet. Do not eat watery soups because the water will dilute the stomach acid and interfere with digestion. For more details, read *Soups, Purees, Juices and Smoothies* at [www.drlwilson.com](http://www.drlwilson.com).

**Snacks.** Ideally, do not snack, as it is hard on digestion. It would be better to have another small meal instead of snacking.

If you must have a snack, it can be a few blue corn chips, leftover vegetables and protein, a little almond butter, hummus, a few sardines or a piece of chicken.

**Eating out.** The rules are:

1. Eat in restaurants that serve fresh cooked vegetables and fresh meats. Chinese, Thai and East Indian restaurants often serve the most cooked vegetables. Mexican restaurants are not as good.
2. Ask the waiter to take away the bread.
3. Ask for triple portions of cooked vegetables and ask for the preferred vegetables (see the VEGETABLE section of this article above).
4. Avoid fast food restaurants and most chain restaurants. The food quality is poor.
5. We don’t recommend eating out too often. If your work requires it, learn which restaurants are best and how to ask for exactly what you want.

**References:** The following articles at [www.drlwilson.com](http://www.drlwilson.com) contain more details about this diet: *The Food Situation*, *Organically Grown Food*, *Beef*, *Flawed Studies Of Organic Food*, *Genetically Modified Food*, *Food Faddism*, *Food Basics*, *Yin And Yang Of Foods*, *Fifty Reasons For the Cooked Vegetable Diet*, *Microwave Ovens*, *Vegetarian Diets*, *Fruit-Eating*.

**COMMON MEDICAL MYTHS ABOUT FOODS AND NUTRITION**

- **Just eat a balanced diet.** This idea is extremely vague and does not mean much. To some people, it just means eating a few vegetables with your ice cream and pizza.
- **Drugs and surgery are better than diet or supplements for serious conditions.** This could not be more wrong. Drugs are needed in some situations, especially surgery. However, a development program is better for many serious conditions such as many cancers, heart disease, diabetes, infections and many others.
- **Nutritional therapy can’t be too good because there are no double-blind studies.** The reason for this is that it is hard to disguise a carrot or a piece of meat. However, there are other types of studies that clearly show that diet matters and can help prevent and heal illness.
• **Food alone is adequate to meet our nutritional needs.** This 100-year-old allopathic and homeopathic idea is so incorrect it is shocking that it is still taught in medical and other healing schools. Today’s food is so deficient in some nutrients that even eating very carefully rarely supplies all that our bodies require.

• **Just eat according to the four food groups or according to the government’s food pyramid.** These are allopathic or ‘dietetic’ ideas that, in my experience, have little basis in fact or reality. In fact, they often lead to worse eating habits such as living on excessive starches.

• **Vitamins and minerals are only helpful to correct deficiency diseases such as scurvy.** This 100-year-old concept is still taught in some medical schools, but contains no truth at all. Anyone offering this advice has not researched the subject thoroughly.

### COMPARING THE DEVELOPMENT DIET WITH OTHER DIETS

**What about the Weston Price diet?** We have great regard for Dr. Price. However, he lived 100 years ago, when the earth was cleaner. Also, the foundation that bears his name has changed his teachings. High fat and a lot of fermented food are dangerous. We suggest:

• **Avoid all wheat and spelt products.** Wheat is very hybridized and irritating today.

• **Only eat grass-fed beef, and only three 3-4 ounce portions weekly.**

• **Eat 6-9 cups of cooked vegetables every day.** This is the only way one can obtain many phytoneutrients, such as vital minerals and vitamins needed to nourish and detoxify the body.

• **Eat little raw food.** Raw food is extremely yin. Also, it harbors parasites, fungi and bacteria.

• **No organ meats.** These are more toxic and can harbor more parasites than other meats.

• **Little or no fermented foods.** Most contains toxic aldehydes and is quite yin.

• **Avoid all fruit and fruit juices.** Fruit is hybridized, yin and contains toxic potassium due to the widespread use of N-P-K fertilizers that did not exist when Dr. Price lived.

• **Avoid most fish and all shellfish except 3-4 cans of sardines weekly.** Too much mercury!

• **Avoid all pig products.** Pigs are more yin today, and contain trichina cysts, even if cooked.

• **Cod liver oil does not provide enough vitamin D or omega-3 fatty acids.**

• **Soaking grains is not needed.** Soaking makes grains more yin, which is quite harmful, today.

• **Avoid all coconut and avocado products.** They are nutritious, but too cooling.

• **Avoid all sweets.** Honey, maple syrup, agave nectar, almond milk and others are all too yin.

• **Limit dairy and especially raw milk consumption to 4 ounces daily.** Milk is quite cooling.

• **Avoid nuts and seeds, which are too cooling.** Two tablespoons daily of roasted almond butter is required, however.

• **A small amount of blue corn tortilla chips are required for development.** Other grains are not required.

• **Minimize or avoid raw salad.** People cannot extract enough minerals from salads, and they are too cooling. Also, raw salad in restaurants are not clean, in many cases.

• **A number of supplements are needed today that were not needed when Dr. Price lived.**

**The paleolithic diet.** This is similar to the Weston Price diet. It allows fruit, salads, nuts, and seeds, and does not emphasize cooked vegetables nearly enough.

**The Mediterranean diet.** This diet allows too much fruit, grains, dried beans and raw foods, and does not suggest enough cooked vegetables.

Articles about many popular diets are at [www.drlwilson.com](http://www.drlwilson.com).
Maggie, age 11, easily became angry. She often talked back to her parents. She had difficulty in school with anger and was generally difficult to be around. Her diet consisted of mainly refined, sugary foods. She ate almost no vegetables and didn’t like them.

Maggie’s parents agreed to put Maggi on a development program. They gave her the nutritional supplements, but would not change her diet. Maggie was difficult enough to handle without forcing her to stop eating her favorite junk foods.

Maggie’s hair analysis revealed typical patterns seen in preteen and teenage girls such as a slow oxidation rate, poor eliminator patterns and copper toxicity. Within several months of taking supplements, Maggie’s temperament improved a lot. She became calmer, more responsive and able to engage in pleasant conversation.

The point of this case is that rarely significant healing can occur due only to taking the development supplements, without improving the diet. However, we want to emphasize that this is uncommon.

Food supplements include hundreds of extracted and isolated nutritional substances. They often supply nutrients in doses above the minimum daily requirements (MDRs). The MDR of most nutrients are too low. Even so, most Americans, for example, eat diets that don’t even supply these paltry amount of nutrients.

WHY EVERYONE NEEDS FOOD SUPPLEMENTS TODAY

- Development. This is the growth of the human energy field and is fulfilling the complete genetic potential of a human being. Development is the birthright of every human being. Yet it is rare today, in large part because it requires excellent nutrition that few people achieve. Promoting and supporting development is the goal of this book and of the programs that we set up for people.

  Development requires eating 6 to 9 cups of the preferred cooked vegetables. They must be cooked until they are soft, but not overcooked, in order for the body to absorb the nutrients they contain. Rapid development also requires supplementary nutrients. These include calcium, magnesium, zinc, kelp, trimethylglycine, a digestive aid, omega-3 fatty acids and vitamin D. It also requires a metabolic pack to balance the oxidation rate and a product to balance the sodium/potassium ratio on a hair mineral analysis. Some people also
need adrenal, thyroid and/or kidney glandular substance, lecithin and at times, one or two
other nutritional supplements. Without these, development occurs very slowly.

• Genetic nutrient deficiencies. Some people need more of certain nutrients due to their
genetic makeup.

• Congenital nutrient deficiencies. These are deficiencies present at birth, but they are not due
to genetics. The causes are deficiencies in the mother that are passed to the child. This is an
extremely important problem because most mothers and mothers-to-be are malnourished.
That is our starting point and it is correct. Bringing up a woman’s nutrient levels requires at
least a few years! In this regard, standard prenatal care is much too little, and much too late.
Failing the babies and children in this way is a major shortcoming among medical and
naturopathic/holistic practitioners.

• Food is not enough. According to government statistics, most people’s diets do not even
supply the insufficient government-recommended daily allowance or RDA of nutrients such
as vitamins A, B, C, D, E and K. Also, most people do not get enough calcium, magnesium,
zinc, iodine and other nutrients, regardless of diet. The reasons are:
  - Depleted soils upon which our food is grown.
  - Use of hybrid seed varieties that yield more tonnage of crops per acre, but each plant
    contains many fewer nutrients.
  - Use of superphosphate or N-P-K fertilizers. These are growth stimulants that stress
    plants and unbalance them, damaging their nutrient qualities.
  - Transporting food long distances. Food loses nutrients during transport.
  - Food processing. This often further depletes the nutrients in foods. Among the worst
    are refining of wheat flour into white flour and refining sugar cane into white sugar. Canning
    and freezing food, and packing food in plastic also deplete some nutrients.

• Biochemical individuality. Even if one eats the recommended daily allowance of every
nutrient, it may not be enough for optimum health. This occurs because a person’s
nutritional needs depend upon one’s lifestyle, age, digestive ability, stressors and more.

• Impaired nutrient absorption. Even if a person ingests enough nutrients, many people eill
remain deficient due to impaired digestion and absorption of nutrients. This can be due to a
low levels of digestive enzymes, intestinal infection with candida albicans, parasites or other
microorganisms. It can also be due to a “leaky gut” or an unhealthy lifestyle.

  This sets up a vicious cycle of nutrient deficiencies. For example, low zinc causes
reduced digestive enzyme production. This, in turn, worsens a zinc deficiency due to
impaired absorption of zinc from food. This further reduces digestive enzyme production in
a powerful vicious cycle. To counteract this vicious cycle, everyone on a development
program receives a digestive aid and supplementary zinc.

• Stress. This greatly increases the need for nutrients such as zinc, magnesium and B-complex
vitamins because these are used up much faster when the body is under a lot of stress.

• Special times in life. Pregnancy requires more nutrients including calcium, omega-3 fatty
acids, trace minerals and more. Breastfeeding requires even more extra nutrients. Of great
importance is omega-3 fatty acids and vitamin D. However, at least 50 nutrients are required
in larger amounts. Otherwise, the baby will often reject the breast milk at age 6 months or
so. Childhood is a time of rapid growth of the body and brain. This requires extra amounts
of dozens of nutrients such as calcium, zinc, chromium, manganese, all the vitamins, omega-
3 fatty acids and many other nutrients. Aging is another time in life when extra nutrients are
needed. As one ages digestion weakens, reducing the amount of nutrition one obtains from
one’s food. Many, if not most people die of malnutrition, although it may be called heart
disease, cancer or something else.

- Therapeutic use. Precise amounts of certain nutrients, when combined properly, are amazing
therapeutic agents. They can help remove toxic metals, balance the oxidation rate, balance
mineral levels and ratios, provide methyliating agents and anti-oxidants, and much more.

- Symptomatic use. Food supplements can be used to alleviate symptoms. However,
development programs rarely use nutrients in this manner because treating symptoms is not a
whole-system method and tends to unbalance the body.

THE WAR AGAINST FOOD SUPPLEMENTS

Food supplements are at the center of a political battle today. Forces opposing them
include the drug companies. They understand well that food supplements could largely replace
patented drugs that typically cost hundreds of times as much and are much less safe. In many
cases, the food supplements are also just as effective or more so than patented drugs.

The large drug companies are firmly aligned with socialist and totalitarian forces within
the governments of the world that do not want people to be healthy and do not want people in
control of their health. Methods they use in their attempts to ruin the supplement industry
include:

- Phony ‘studies’ indicating the supplements don’t work or are dangerous.
- Press releases and other public announcements denigrating supplements.
- Hundreds of websites whose goal it is to damage the reputation of food supplements.

They also influence popular websites such as Wikipedia, Facebook, Twitter and others.

- The American Food And Drug Administration formerly evaluated only the safety of
food and drug products. This was changed about 40 years ago so that now they also evaluate the
effectiveness of products. The problem is that effectiveness is not nearly as easy to check and
this agency is corrupt, yet it has total control over product regulation. There is little one can do if
the all-powerful FDA decides to ban a product. This is an example of a regulatory agency gone
bad. Just a few of the laws and regulations used to ruin the supplement industry are:

- Requiring extensive and costly double-blind studies that few supplement companies can
afford. This is necessary for drugs because they are dangerous products. It is incorrect to
require them of the much safer supplement products.
- Elaborate and costly labeling rules – and changing the rules often, which costs
supplement companies even more money.
- Unnecessary “good manufacturing” regulations.
- Prohibiting supplement companies from making claims for the benefits of their
products, even when the benefits that are well-proven in large studies.

To learn more about the worldwide scheme to stifle the supplement industry, look up
Codex Alimentarius on internet search engines. The foremost group in America that lobbies on
behalf of consumers in the thankless task against the drug companies and the socialists is the
National Health Federation. We strongly suggest that everyone join this superb organization.

PRINCIPLES OF SUPPLEMENTATION IN THE DEVELOPMENT PROGRAM

Development programs use supplements in a unique and unusual way. The principles of
supplementation are:
• Take into account other supplement properties besides their symptomatic effects. These subtle qualities include such things as being more yin or more yang, animal quality versus vegetable quality, sympathetic versus parasympathetic in their effects, highly dosage-dependent in some cases, and some supplements have a different action when combined in certain ways with other supplements or foods.

Some supplements mainly nourish the body, while others strengthen particular body systems. Others can balance mineral ratios and patterns. Many others simply address symptoms and therefore have a greater tendency to unbalance body chemistry.

• The need for a clinical and empirical approach. Most doctors prescribe supplements based upon theoretical and other scientific studies. However, there is also an empirical or clinical aspect as well that is ultimately the most important.

• The need for testing to assess needs. Often, food supplements are recommended without much testing. Development programs depend upon hair mineral testing. Other testing methods are not nearly as accurate for this purpose, in our experience. The test must also be done at a lab that does not wash the hair at all, and must be interpreted correctly.

• Make sure that supplements are used in a way that also balances the oxidation rate and the sodium/potassium ratio on a properly performed hair mineral analysis. Otherwise, the supplement will often do more harm than good with a development program.

• The dangers of symptomatic supplementation. These include:

  o Failure to raise overall vitality and balance the forces of yin and yang.
  o Worsening vitality by unbalancing mineral levels, ratios and patterns.
  o Symptomatic remedies often negate each other to some degree.
  o Masking or obscuring deeper imbalances in the body.
  o Toxicity, especially with some herbs, fulvic acid, bentonite and other products.
  o Synthesized, broken up and raw food products tend to be too yin, especially if used in large quantities. This is a subtle type of problem with all nutritional supplements. Among the most yin are supplements of vitamin C, MSM, amino acids, fruit-based drinks, and most powdered products. Somewhat less yin and therefore among the least harmful in this regard are mineral supplements and animal-based glandular products.
  o Too many supplements can confuse the body, interfere with digestion of food and have other subtle negative effects.

OTHER RULES OF SUPPLEMENTATION

1. Never give more supplements than are absolutely needed. Extra supplements, even the best of them, are usually not helpful in development science. In fact, extra supplements often diminish the effectiveness of the program. Development practitioners lose a client now and then because the client believes the practitioner “forgot” an important supplement.

2. Megadoses of supplements are not better. Higher dosages of supplements often unbalance body chemistry, are very yin, and have drug-like toxic effects. They may be helpful in rare situations, but this is all.
3. **Always take supplements with food, and for adults, take them preferably three times a day.** We give supplements twice a day for children. This is optimal to keep the body chemistry balanced during the day. Fewer doses can be used, but this tends to reduce the healing and developmental effects. We do not recommend taking a double dose at one meal and then skipping the next dose.

   Rarely, a person requires or tolerates only one dose of supplements per day, or fewer. These are very sensitive individuals or those with unusual imbalances. If the cost of the supplements is an important issue, the program can also be reduced to just once daily, but progress will be slower.

   Years ago, Dr. Eck suggested taking a day off the supplements each week. We no longer recommend this method.

4. **Supplement program design involves a set of formulas that are often used together.** There can be overlap in the sense that the same nutrient, such as vitamin C, can appear in several formulas. This is intentional and not an oversight.

5. **Do not take other supplements than those recommended without first checking with your practitioner or Helper.** The program is quite delicately balanced for each person. Taking random vitamins, minerals, herbs or other products will usually negate some or all of the benefits of the program.

6. **Program updates are critical, and may be needed at any time.** This is one of the two main reasons for problems on a development program. (The other problem is not following the diet or other aspects of the program correctly.) A person’s metabolic patterns can even shift within a week or less of starting a program. The person must then contact their Helper and request a program review. Otherwise, the program stops working and one often feels worse.

**SUPPLEMENTS USED COMMONLY WITH DEVELOPMENT PROGRAMS**

1. **A METABOLIC PACK.** This is a formula designed to balance the oxidation rate. At this time, we use three products from Endomet Labs: *Megapan* speeds up the oxidation rate, *SBF* slows an overly fast oxidation rate when the sodium/potassium ratio is less than 2.5, and *Stress Pak* slows an overly fast oxidation rate when the sodium/potassium ratio is above 2.5.

2. **THYROID, ADRENAL AND KIDNEY GLANDULAR PRODUCTS.** Those with a slow oxidation rate but not a sympathetic dominant pattern usually receive an adrenal glandular product. Slow oxidizers with a sympathetic dominant pattern receive a combination of thyroid and adrenal glandular in a product called Thyro-complex from Endomet Labs. We also sometimes recommend a kidney glandular product to help remove toxic metals from the kidneys.

3. **MINERALS SUCH AS CALCIUM, MAGNESIUM, ZINC AND LIMCOMIN.** These are needed to offset deficiencies in the diet. Also, zinc and a formula called *Limcomin* from Endomet Labs are important to either lower or raise the sodium/potassium ratio.
4. TRIMETHYLGLYCINE or TMG. This was added to the program in mid-2013. TMG is a powerful methyl donor. Methylation is one of the most important biochemical processes in the human body. It consists of the addition of a methyl group (CH₃) to many chemical compounds. This converts them to other compounds that are needed in the body. Women take 1000 mg daily. Men usually take 3000 mg daily. Babies and most children do not need TMG. Methyl groups are involved in many biochemical pathways:

- Lowering homocysteine. Homocysteine is a harmful amino acid that has been linked to inflammation of the arteries and cardiovascular disease. TMG and folate tend to lower it.
- Liver detoxification in the P450 detoxification system. This is a very critical activity and one that is sluggish or functions poorly in most people today thanks to nutritional depletion and metal and chemical toxicity.
- Alleviating some types of depression. This occurs because TMG increases the body’s production of SAMe or S-adenosyl methionine. This can reduce some types of depression.
- Reducing the chances of contracting diabetes. This is because methylation is required for insulin production and release.
- Avoiding genetic problems. Methyl groups are needed for protein biosynthesis. When methyl groups are in lacking, more transcription errors occur.
- Balancing the autonomic nervous system. TMG seems to have an overall parasympathetic effect on the body. This is helpful for most people today.
- Energy production at the cellular level.

5. KELP. This is a very important food supplement for several reasons:

- A superb natural source of 20-30 essential trace minerals. Kelp is also low in cost and in a food form that is easily assimilated.
- An excellent source of iodine. Most people need more iodine today. The reasons are explained fully in Chapter 17 and are mostly about iodine antagonists in the environment such as fluorides, chlorides and bromides.
- Toxic metal protection. Sea vegetables, as compared with other iodine supplements, all contain some toxic metals because they come from the ocean. However, kelp, more than other sea vegetables, contains a lot of alginates. These chemicals bind and harmlessly remove toxic metals found in the kelp. This is why we recommend kelp, not other seaweeds.
- Less toxic. Kelp is a food that is fairly non-toxic. Other iodine products such as Iodoral, Lugol’s solution, potassium iodide and others will leave a toxin in the liver.

Most people benefit tremendously by taking about six 600 mg kelp capsules daily. Begin with much less and work up slowly to minimize healing reactions this product can cause. If you use tablets, you must take at least 12 to 15, as most tablets are quite small. Another option is about 1-2 teaspoons of kelp granules daily. These do not taste very good, but can be cooked into many dishes. Children over age six need some kelp, as well. If kelp interferes with sleep, do not take it in the evening. We do not recommend other iodine supplements.

6. VITAMIN D3. According to recent research, vitamin D protects the body against not only osteoporosis and rickets, but against diabetes, cancer, multiple sclerosis, anxiety and many
other conditions. Research also indicates that most people need far greater amounts of vitamin D than they can obtain from sunlight, enriched dairy products and standard vitamin pills.

Adults need about 5000 iu daily, or even more for a short time, for optimal health. All children over the age of about the age of six also need a supplement. We do not recommend fermented cod liver oil for vitamin D. It is somewhat toxic.

7. OMEGA-3 FATTY ACIDS. These perform a number of critical functions:

- **Cell membranes.** Omega-3 fatty acids help keep cell membranes flexible and able to transfer nutrients and waste products in and out of the cells correctly.
- **Skin.** They help keep the skin and mucus membranes moist and assist their functioning. Many rashes and other skin problems today may be due to fatty acid deficiencies.
- **The nervous system.** They help with nerve transmission and vital nervous system activities. Extra amounts are helpful for ADD, autism, delayed development, cancer and other nervous system disorders, particularly in children.
- **Preventing inflammation.** Inflammation is an important cause of many illnesses today.

Most people are deficient in omega-3 fatty acids due to:

- **Widespread use of omega-6 rich vegetables oils.** The omega-6 fatty acids compete with the omega-3 fatty acids for absorption and utilization in the body.
- **Livestock are fed diets of mainly corn.** The grains are much lower in omega-3 fatty acids than the natural diet of these animals, namely grasses, leaves and small insects.
- **Insane laws in most states require dairy products to be pasteurized and homogenized.** This damages the omega-3s left in dairy products today.
- **Vegetarian diets tend to be low in omega-3 fatty acids, unless one uses flaxseed or hempseed oil liberally.** Most omega-3s come from flesh foods, fish and dairy products.
- **Overcooking destroys omega-3 fatty acids in all cases.** Fats such as butter and cream should ideally be eaten in the raw state. Eggs, meats and most vegetables, should be cooked only lightly to preserve their fatty acids.

To obtain more omega-3 fatty acids from the diet, eat 3-4 cans of sardines weekly. Other dietary sources are unreliable because the amount varies depending on where and how the food was raised. The best supplement, in our view, is fish oil, although some doctors prefer other sources. Capsules are usually better because the oil rapidly goes rancid if it is not encapsulated. Babies and children need omega-3 fatty acid. An omega-3 supplement should be a major part of prenatal care. The fact that it is not is another indicator of the stupidity of current prenatal care. Here are simple rules in this regard:

1. All pregnant women and mothers-to-be need to supplement with omega-3 fatty acids.
2. Fortify all baby food and formula preferably with fish oil, although flaxseed or hempseed oils are okay, too. Do not trust labels that state that baby foods or formula are enriched sufficiently. The oils could be of poor quality and it is not worth risking a deficiency.
3. Avoid vegetarian diets for children. Please do not allow children and young teens to be vegetarians, even if parents must conceal shredded meat such as dark meat chicken in soups, tomato sauce or even smoothies, if necessary. An alternative is to feed children certified raw
(not pasteurized), organic butter, cream, milk, or full-fat organic raw cheese, yogurt or kefir. Lightly cooked eggs with the yolks still runny are also excellent for children who will not eat grass-fed and free-range meats and fish oil.

4. To have healthy children, keep them away from junk foods and never reward them with sweets or other poor quality foods. Do not feed them most cold cereals, potato chips (though blue corn chips with sea salt are quite good), French fries, ice cream, most sauces like ketchup, most salad dressings, cookies, cakes and other baked goods, or other sources of refined vegetable oils. Most of these are also overcooked and contain many harmful chemicals.

8. OX BILE AND PANCREATIN. This is a powerful and more yang digestive aid. We find that everyone benefits from a digestive aid today due to stress, nutritional deficiencies and weak digestion.

9. DRIED VEGETABLE CAPSULES. While not a substitute for fresh vegetables, these will help most people overcome certain deficiencies. Almost no one eats enough vegetables today. We prefer the capsules over “green drinks” or “superfoods” that also contain dried vegetables. The reasons are:
   • *Freshness*. The capsules keep out most of the air and preserve the vegetables better. Once in a while, green food products are sold frozen and this is better. Kelp, of course, is a dried vegetable. Its high salt content preserves it well, so it does not need to be kept frozen or refrigerated.
   • *Too yin*. Powders are often consumed in sweetened smoothies or drinks that are very yin.
   • *Adding water or juice to the dried vegetables in smoothies impairs their digestion.*
   • *Difficult to digest*. Concoctions with powders and sugars are much less helpful for the digestive tract than eating the vegetables in their natural state as much as possible.

10. OTHER SUPPLEMENTS. These are:

   • *Lecithin*. Added in March 2019, this is very helpful for anxiety for many people.
   • *Garlic*. This can help symptoms of chronic yeast, other infections, and high blood pressure.
   • *Tarragon*. A teaspoon daily on food helps move the body out of four lows. Do not use much tarragon if you do not have a four lows pattern. Tarragon may supply extra rubidium.
   • *Coenzyme Q-10*. This may help anyone over the age of about 60, or plus those of any age who feel they must take a statin drug, or if very low energy or heart disease are present.
   • *Magnesium*. Extra magnesium is safe and helpful for some cardiovascular conditions and some cases of constipation.
   • *Red rice yeast*. *This helps lower an elevated cholesterol and has many fewer side effects than any statin drug.*

USING EXTRA SUPPLEMENTS WITH A DEVELOPMENT PROGRAM

Some people ask if they can add other supplements to a development program. They believe we have forgotten one or more supplements, which other doctors or authorities highly praise. Among the most common ones are anti-oxidants, herbs, homeopathy, green tea, green superfood capsules or powders, protein drinks, isolated amino acids, and a few others.
We have not forgotten about these products. We are aware of them. Dr. Paul Eck, one of our mentors, worked for a highly respected supplement company before he developed his mineral balancing program. We also research supplements because at least once a month clients ask if they can take extra products. We research each request.

If we are not familiar with a product, we check it to see if it would improve the development program. If it turns out to be helpful, we add it to the program. However, we rarely find a product to add to the program. Problems with taking extra food supplements besides those that we recommend are:

- **Yin.** ALL food supplements are yin, especially herbs, vitamin C, MSM and a few others. Taking more of them can make the body more yin and this is the opposite of what is needed for development.

- **Toxicity.** Most herbs, for example, are slightly toxic. This slows development.

- **Unbalancing the body in subtle ways.** For example, vitamin C and E tend to raise the sodium level. Other supplements are somewhat stimulating, while others have still other effects.

### GIVING SUPPLEMENTS TO BABIES AND CHILDREN

At times, giving supplements to babies and children can be challenging. The following are suggestions to make it easier:

**The basic rule.** Explain to your child that he or she needs to take the supplements. They will make your child stronger, smarter, better coordinated, better looking, and better at everything the child does. Therefore, the question of whether or not to take the supplements is not up for discussion.

However, you can give your child a choice of how to take the supplements. Some children really appreciate this. An older child may want to swallow them, just like the adults. Some children can learn to swallow pills as early as age 6 or 7. For younger children and for those who are not ready to swallow pills, here are suggestions:

- Powder the supplements using a pill crusher from the supermarket or drug store. Then mix the supplements with a little heavy cream. Cream is a good food and it is somewhat sweet so it will disguise the flavor of the supplement.

- If cream does not work, mix the powder with a little almond butter, roasted sesame tahini or hummus. Another idea is to mix supplements into some thick vegetable soup.

- Some children will take supplements if they are mixed into a little carrot juice.

- In a few cases, one may need to mix supplements with other foods that are not part of the development diet such as a little tomato sauce or apple sauce in order for a child to accept the supplements. Always try the first three suggestions above first, however.

**Liquid and chewable supplements.** Some people ask if they can use liquid or chewable supplements. In the future, this may be possible. At this time, we do not have good enough sources of liquid or chewable supplements that we can recommend.

### SUPPLEMENT DELIVERY SYSTEMS

Controversy rages concerning the best way to package and present supplements to the body. The most common ways are:
• **Liquid** supplements. However, these do not hold their potency well and tend to cost more. They would be helpful for babies, children and pets.

• **Capsules** tend to dissolve more easily, but may be larger in some cases than tablets, so they are harder for some people to swallow. Capsules do not require binders and fillers, but some people react to the capsule material itself.

• **Tablets** tend to be the least costly and the easiest to swallow. However, they must be made carefully so they dissolve quickly. They also require binders and fillers to hold them together properly. Grind or chew tablets if you notice them coming through whole in the stool.

• **Powders.** These can be good. However, to take them one may have to mix them into a drink that is usually a bad food combination and mixes water with food items, which is not desirable because it upsets digestion and the drink is usually too yin.

SUPPLEMENT SAFETY

Some medical authorities believe that food supplements are dangerous and should be regulated the same way as drugs. Regarding the possible danger, the annual report by the American Poison Control Centers reveals that the number of reports of harm due to supplements each year is usually zero, or occasionally one or two incidents per year. In contrast, poison control center reports for drug-related problems, including death, number in the tens of thousands each year, and this does not count most problems that arise in hospitals and clinics. The truth is that nutritional supplements are extremely safe, among the safest consumer products on the market.

OTHER SUPPLEMENT TOPICS

**Herbs.** *Please do not use herbs with a development program.* The reasons are:

• **Toxicity.** Most, if not all herbs are naturally somewhat toxic or they would be eaten as foods. Many are stimulants, depressants and have other drug-like effects.

• **Contamination.** Most herbs today have too much toxic metals to be used on a regular basis. Chinese and East Indian herbs are among the worst in this regard. This includes even the highest quality brands of herbs.

• **Quality.** Herb quality varies greatly and it is difficult to separate the advertising from the reality. The quality of chelated minerals and vitamins is easier to control.

• **Cost.** Excellent quality herbs are often high in cost compared to vitamin products.

• **Yin.** Most herb preparations are very yin, and this is definitely harmful.

**Protein drinks, smoothies, shakes, and cleansing products.** Reasons we do not allow any of these with development programs are:

• **Horrible food combinations.** Most smoothies and drinks contain a number of ingredients that do not combine well in the stomach. They cause bloating and damage the intestinal lining.

• **Processed and chemicalized.** Many drink powders contain dried milk powder, egg powder, sugar and chemical flavors that are quite toxic, or at least of low quality. They tend to be processed foods that are less nourishing than whole, fresh foods.
• **Extremely yin.** Any food product that is powdered and isolated is much more yin. At the present time, yin means harmful because the bodies are already too yin.

• **Spoiled.** Green superfood powders and other powders can spoil quickly, become rancid and lose their potency.

• **Sugary.** Most smoothies contain honey, sugar, fruit or juice. It is all too much sugar.

**Food bars.** Most of the objections to protein powders and smoothies apply to food bars, as well. Most are too sweet, contain bad food combinations, and many contain foods that are not recommended such as peanut butter, dried fruits, nuts and seeds.

**Food-based vitamins and minerals.** These supplements contain or are made mainly from foods. We like some of them and use them. Others are not helpful for these reasons:

• **The premise that isolated nutrients should be combined with foods is incorrect.** Two reasons for this are 1) supplements are designed to be taken with food, so food is already present with it; 2) the foods used in the tablets often compete for absorption with the primary nutrient, making food-based products less effective. For example, one company sells a zinc liver chelate. However, liver contains a lot of copper that interferes with zinc absorption.

• **Low doses.** The nutrient doses are usually too low, which requires more tablets. This increases the cost and makes supplement programs less convenient.

• **Ignorance and false claims.** Food-based product companies too often lie about their products, suggesting their products are better absorbed or work better, when this is not the case at all. For example, a prominent supplement company advertises that their all-natural vitamin C nourishes the body, while standard ascorbic acid made from corn just stimulates the body. This is simply untrue. Isolated ascorbic acid will lower copper, chelate heavy metals, rebuild cartilage, assist the adrenal glands, and more. Another company claims that magnesium stearate found in some vitamin tablets is derived from hydrogenated, pesticide-laden cottonseed oil. We checked with the manufacturer, and learned that magnesium stearate can be made from palm oil that is not sprayed and not hydrogenated because it is a naturally saturated fat at room temperature. One must be on guard against such false claims or accusations.

• **No metabolic packs.** At present, no food-based vitamin companies offer the correct metabolic formulas for fast and slow oxidizers. Instead, one must combine four or five products. This is quite cumbersome, more costly and not as good.

• **Allergic reactions.** Foods in whole food products can cause allergic reactions. Common examples include fungal-based amino acids, and wheat germ and oat flour that contain gluten. As a general principle, the simpler and less complex the product, the better.

**Probiotics.** We rarely need probiotics with development programs if one eats lots of cooked vegetables. However, they are helpful in a few instances. For example, if one eliminates old antibiotics from the liver, they can kill off the natural intestinal flora. In this case, replacing the flora quickly can be helpful and may stop diarrhea.

**Two problems with probiotics.** 1) As one heals and develops, the body will go through phases in which it requires different intestinal flora or bacteria. It is very difficult to know which bacteria are needed. We find that just picking out a probiotic at the health store can cause problems for this reason. 2) Many probiotic foods are toxic and actually dangerous, even if they
give you energy. For example, kombucha tea and fermented vegetables often contain aldehydes, an important class of liver toxins.

If one needs a probiotic, we suggest miso soup, plain goat yogurt, kefir or sauerkraut. **Do not take other probiotic foods or probiotic pills.**

**Anti-oxidant therapy.** We do anti-oxidant therapy with cooked vegetables. This method is much more yang than isolated anti-oxidant nutrients. Development programs also remove the deep causes of oxidant damage, which are often the “amigos” – oxide forms of iron, manganese and other minerals. Other programs we know about cannot do this.

**Enzyme therapy.** We recommend that everyone following a development program take a digestive enzyme that contains ox bile and pancreatin. The animal-based products are more yang. Otherwise, we do not use large quantities of enzymes for the following reasons:

- **Very yin.** Plant-based enzymes are fungal in origin, which is extremely yin.
- **Not deep enough correction.** While enzymes can be helpful for inflammation and other conditions, they do not correct body chemistry at deep levels.
- **Costly.** If possible, we like to keep the cost of the program low.

**Individual amino acid therapy.** Taurine and lysine are used in some development regimens. We rarely recommend the others because they are:

- **Often of fungal origin, which causes reactions in a few people and they are too yin.**
- **Not needed if one takes GB-3 and eats enough of the right kinds of protein foods.**
- **Costly.** If possible, we like to keep the cost of the program low.

**Intravenous or IV and intramuscular or IM supplementation.** Development programs, so far, do not require IV or IM supplementation. These methods are more invasive. They also often upset body chemistry because they bypass the normal buffering mechanisms of the body that usually regulate how much of a nutrient one absorbs.

**Supplements for vegetarians.** A few clients refuse to take any supplements that contain animal-derived products. This will interfere with the results of a development program. Here are substitute food supplements we can recommend:

- **Instead of a metabolic pack:** take nutritional yeast or a vegetarian multiple, **but only if it has similar ingredients.** One must match the ingredient list as much as possible.
- **Instead of fish oil:** take flaxseed or hempseed oil. Buy it in capsules to keep it from going rancid.
- **Instead of thyroid and adrenal glandular support:** We don’t know a good substitute. Do not substitute herbal products, which are somewhat toxic and don’t work as well.
- **Instead of an animal-derived digestive aid:** one can take vegetable enzymes, though they are much more yin and therefore not as good.
- **Instead of animal fats:** eat almond butter, olive oil, flaxseed oil, hempseed oil or a little palm oil.
- **Instead of vitamin D3:** use vitamin D2 or ergocalciferol, but it is not good and a little toxic.
- **If no animal protein:** eat nutritional yeast, eggs, goat yogurt, beans, seeds and nut butters.
5. DETOXIFICATION

Threats of New York City rescue workers who helped in the cleanup of the World Trade Towers disaster suffered from a constant cough, chronic bronchitis, inability to breathe at times, fatigue, weakness and vision problems. Drugs had been tried with only temporary help. Other methods failed as well. However, over 500 fire fighters who underwent an intense sauna therapy program for a month or more all reported significant improvement in their health. (reported in The Townsend Letter for Doctors & Patients, April 2006)

Detoxification is one of the most critical body functions. This chapter concerns how to enhance this natural body function. A special detoxification protocol was not a part of Dr. Eck’s program. However, he understood it well and I believe he would be delighted that I encourage a detoxification regimen as part of all development programs. Reasons why special detoxification procedures are very helpful today include:

- The eliminative organs function poorly in many people, even in children, due to dietary imbalances, stress, poor health and other reasons.
- The colon, the most important eliminative organ, is often the one in the poorest condition.
- Excessive sympathetic nervous system activity inhibits detoxification in many people.
- Most people’s skin is very toxic and congested, thanks to bathing in fluoride and chlorine, the use of toxic soaps and skin lotions, and even from wearing heavy or synthetic clothing.
- Coffee enemas, and near infrared saunas, in particular, have many subtle and fabulous benefits such as improving liver function, circulation, hydration and oxygenation of the body.

Less safe detoxification methods to be avoided. These include ionic foot baths, most clay baths due to aluminum toxicity, repeated liver flushes with nothing else, fasting for more than a few days, most juice cleanses and cleansing diets, and long sessions in traditional saunas or sweat lodges unless they are supervised very carefully and medically.

WHAT ARE TOXINS AND WHY DO THEY MATTER?

Toxins refer to anything that does not belong in the body. They may be naturally-occurring or man-made. They may come from outside the body or may be generated within. They include some minerals that are poisonous, millions of chemical compounds, living organisms such as bacteria, and some electromagnetic energies such as those used in cell phones.
Environmental toxins. These include all the familiar poisons such as metals, plastics, solvents, pesticides, ionizing radiation, dental amalgams and others. I will not dwell on them further at this time as they have been mentioned in Chapter 1.

Autointoxication. Many toxins are produced inside the body. They are generally ignored by the medical profession, but are among the most important. For example, indols, skatol, and cadaverine are products of the putrefaction of proteins. Alcohol, acetaldehyde and other toxins are produced by the fermentation of sugars by yeast organisms such as candida albicans. Both are common sources of liver toxicity. A foul-smelling stool should make one wonder what toxins are being produced in the intestines. Another critical group of toxins produced inside the body are called endotoxins and exotoxins made by bacteria, fungi, viruses and parasites living inside the body. These may give few or even no symptoms while they slowly poison the blood stream. Cancers also produce endotoxins that circulate throughout the body, regardless of the primary tumor site. Carbon dioxide, lactic acid and other chemicals are also quite toxic and are produced within the body.

Toxins produced when healing occurs. Deep healing programs often produce some toxins when dead and diseased tissue is broken down by phagocytes, lysozymes and other natural methods of tissue destruction. These toxins must be eliminated quickly or healing reactions occur as the poisons accumulate in the tissues. This is an important reason for doing extra detoxification procedures such as sauna therapy and coffee enemas or colonic irrigation.

Mental and emotional toxins. Harmful beliefs, and negative attitudes and emotions can be as deadly as any virus or bacteria. Harmful beliefs include selfishness, negativity, fixations, hatred for anyone or anything, and even excessive seriousness. Toxic emotions include uncontrolled anger, lust, greed, resentment, anxiety, and severe depression.

The philosophy of detoxification. The concept that toxic substances cause disease is very ancient. It is mentioned in Greek and Roman medical texts, and even older writings as well. Ancient Chinese medical books speak of ‘harmful chi’ and contain other references to toxins that cause illness. Herbal medicine and natural healing methods have emphasized toxin removal for thousands of years. Baths, enemas, poultices, emetics, laxatives, purgatives, skin brushing, cleansing diets, sweating and other methods for eliminating poisons are integral parts of these sciences. Traditional or allopathic medical care emphasizes biological toxins such as viruses as a cause of disease. However, they overlook and often deride the broader concept of toxins and their role in all illness. In fact, many of their remedies and procedures such as most drugs and surgery are toxic themselves, and can easily contribute to ill health for this reason.

What parts of the body are mainly involved in detoxification? The entire body is deeply involved. It is not enough to enhance the so-called eliminative organs such as the large intestine, liver, kidneys, lungs and skin. Each cell must continuously eliminate toxins in order to function properly. This depends on the condition of the cell membrane, the mitochondria and most cell structures. Also, the circulatory and lymphatic systems play indispensable roles to carry away cellular wastes. Glands such as the thyroid, adrenals, testes and ovaries must also function well as regulators of the eliminative organs. The autonomic nervous system also plays a critical role. The parasympathetic nervous system enhances the activity of the eliminative organs. Excessive sympathetic nervous system activity, which is very common today, diminishes the activity of these organs.
DETOXIFICATION WITH DEVELOPMENT SCIENCE

One of the key advantages of development is its ability to safely, comfortably, inexpensively and often quite easily eliminate many toxic metals, toxic chemicals, radioactive particles and biological toxins. In addition, mental and emotional toxins are slowly brought up to the surface of the mind for processing and elimination as well. Over a dozen methods are used in a coordinated fashion at the same time to detoxify the body. These include:

1. **Reduce many toxic exposures.** This is done via a healthful diet, proper drinking water and a healthful lifestyle. Chapters 2, 3 and 4 discuss basic ways to do this.

2. **Increase adaptive energy.** This comes from balancing the oxidation rate and the major mineral levels and ratios. It makes far more energy available for detoxification and healing, and is a key difference between development and symptomatic approaches to detoxification.

3. **Increase rest and sleep.** This is also critical for maximum detoxification.

4. **Remove the need for physical and emotional compensations.** Many toxins act as compensatory mechanisms. For example, the “three amigos” (iron, manganese and aluminum, all in biounavailable form) appear to boost adrenal and perhaps thyroid activity in most slow oxidizers. Removing the need for these compensations is what appears to allow the toxic metals and some chemicals to be removed so easily and quickly. It also helps prevent them from re-accumulating, which can happen with other methods.

5. **Balance the qualities of yin and yang.** Balancing these subtle qualities strengthens the body and increases the available adaptive energy. This is discussed later in this chapter.

6. **Balance the autonomic nervous system.** Detoxification is primarily a parasympathetic activity. It involves the parasympathetic organs such as the liver, kidneys and intestines. Any therapy that promotes parasympathetic activity or inhibits sympathetic activity will assist detoxification greatly. These include:

   - **Enemas and colonic irrigation.**
   - **Glandular extracts from the pancreas, liver, kidney, thymus and others.**
   - **Meditation and relaxation therapies, and psychotherapeutic techniques that promote relaxation.**
   - **A healthful diet free of stimulants such as excitotoxins like MSG and aspartame.**
   - **Supplemental calcium, magnesium, zinc, choline, inositol, and sulfur-bearing amino acids can help relax the sympathetic nervous system.**
   - **Removing toxic material from the body that irritates the central nervous system is very helpful.** For example, iron, manganese, aluminum, copper and other metals, when in oxide forms, appear to act as oxidants and irritants that keep the body in a sympathetic state.
   - **Sauna therapy, especially when done upon awakening in the morning or just before bedtime.**
   - **Anti-anxiety herbs and other remedies may also be helpful unless they have toxic side effects.**

7. **Reduce harmful stress of all kinds.** Stress interferes with detoxification for several reasons: 1) The body must use up a lot of energy adapting to stress, 2) stress of any kind activates the sympathetic nervous system, which impairs detoxification and 3) stress depletes many vital nutrients such as zinc and magnesium needed for detoxification, and 4) stress weakens the body greatly, making detoxification much more difficult.
8. Replace less preferred minerals with more preferred minerals. This is an aspect of restoring the body’s enzyme systems. In order for detoxification to proceed rapidly and safely, one must replace the less preferred or toxic minerals in millions of enzymes with the more preferred vital nutrient elements such as selenium, chromium, zinc, magnesium and others.

9. Support the eliminative organs. Development makes use of at least a dozen methods to improve their functioning. These range from improving the diet, drinking the right water and resting more to colon cleansing, saunas and other detoxification procedures.

10. Increase the body temperature to help normalize enzyme activity. Many adults have a low body temperature due to fatigue, illness or decreased thyroid or adrenal activity. Increasing the oxidation rate and the sauna’s heat and infrared rays help normalize this.

11. Deep cleansing of the liver and large intestine with coffee enemas and/or colon hydrotherapy.

12. The use of antagonists. These are specific nutrients or compounds that oppose or compete with toxic substances. They may compete with toxic metals for absorption, for example. Some antagonists replace the less preferred minerals in enzyme binding sites. Still others grab on and dislodge toxic metals from their storage sites in the body. These are called chelators, a special type of antagonists. Another type somehow are able to escort toxic metals out of the body or in other ways facilitate their removal.

For example, calcium, zinc and selenium are cadmium antagonists. Zinc, manganese, vitamin B6 and sulfur, among others, antagonize copper. Administering extra choline may help reduce the effects of pesticides that are cholinesterase inhibitors. Antibiotics and antitoxins may be considered antagonists for bacteria or other toxins. For infections, however, development uses safer and often more effective agents such as colloidal silver and bee propolis.

13. Clearing emotional and mental toxins. In some patients, emotional blocks will stop detoxification almost as badly as will constipation. Methods that can help release them that are part of development programs include reducing the physical toxin level, enhancing overall vitality, improving memory and cognition and what I call personality integration. In addition, counseling, meditation, relaxation methods, biofeedback, hypnotherapy, imagery and other methods may help as well.

14. The right type and amount of drinking water. Distilled water is often called “hungry water”. This means it contains very few minerals. As a result, it holds and helps remove from the body many minerals and other toxic substances. This can be used to assist detoxification, though it is not for long-term use as it will eventually remove too many vital minerals as well.

15. Uncovering layers of toxins. Many toxins are buried deeply within body organs. Development slowly brings up the layers to be uncovered over a period of several years or more. I know of no other method that can uncover and remove these deeper layers of toxicity.

The allopathic concept of identifying a single toxic metal as the cause for a symptom is only partially effective, in my experience. In fact, everyone has most toxic metals in their bodies. In addition, they are layered and often the deeper deposits will not be revealed on any tests, even hair tests, until they begin to be uncovered.

16. Eliminate many chronic infections. Infections produce powerful toxins and they use up the body’s vitality fighting them. Eliminating infections thus frees up a lot of adaptive energy for detoxification. Methods used to eliminate them include:

- Heating the body with saunas or hot baths. This is a simple form of fever therapy.
- Balancing the body chemistry to enhance adaptive energy.
• Removing toxic metals and replenishing missing vital nutrients.
• Coffee enemas and colon cleansing are also very helpful to restore liver function.
• Improving the sodium/potassium ratio, in particular, along with other mineral imbalances.
• Improving circulation, oxygenation and hydration.
• Healing emotional traumas and other issues that weaken the immune response.
• At times, using specific anti-microbial agents such as colloidal silver, bee propolis, extra vitamin C and A, or rarely others.

17. Parasite cleansing. Some people have intestinal parasites that can produce toxic substances in the intestines, and they interfere with proper digestion and absorption of nutrients. These are slowly eliminated on development programs. Only rarely is specific therapy for them required. Methods used to eliminate them with development are:

• GB-3. Pancreatic and liver enzymes in GB-3 digest many of them and weaken them, as well.
• Daily use of a near infrared sauna can be very helpful to stimulate circulation and raise the body temperature. This weakens some parasites.
• Coffee enemas and other colon cleansing can dislodge many parasites.
• Increasing the vitality of the body by balancing the oxidation rate and replenishing many minerals and vitamins helps greatly to make the body less hospitable to all parasitic organisms.
• Herbal remedies may be helpful, but usually are not needed and will not work very well if the vitality is low or if there is too much debris for parasites to feed on in the intestines.

18. Other therapies when needed. Development is not intended as a complete healing system, and I do not know of any such system. All healing arts have their place. Methods such as bodywork, chiropractic, foot reflexology, acupressure, massage, jin shin jyutsu and acupuncture using needles may all assist detoxification at times.

Rarely, a person requires a medical drug for sleep or something else until the body can heal enough that it is not needed. However, the toxicity of drugs, surgery and other medical methods make them unsuitable unless all our other methods are not sufficient.

19. Rare use of natural chelating agents. Chelators are a specific group of antagonist substances. Dr. Eck found that the use of EDTA, DMPS, DMSA and other synthetic chelators tend to reduce the sodium/potassium ratio, a sign of lowered vitality. He advised against the use of these agents for this reason. I have also found this to be true. Other problems with all chelators, both natural and synthetic ones, include:

• Removal of some vital minerals along with the toxic ones. This causes mineral deficiencies.
• Unbalancing body chemistry. Chelation is not that discriminating, so it tends to upset the delicate balance of the body’s minerals. Just “loading” the person afterwards with vital minerals and vitamins will not restore the balance. In fact, replacement of these important elements can be time-consuming and difficult.
• A symptomatic approach. Chelation is a shotgun or symptomatic approach to toxic metal removal. This may be helpful in acute poisoning cases, but it is used for far more than this. It is not necessarily bad, but it is not gentle or discriminating.
• **Redepositing metals in vital organs.** Synthetic and natural chelators can dislodge toxic metals from safe storage sites and a few may then redeposit in more vital areas such as the brain. This can cause some clients to become even more ill.

• **Renal toxicity.** Chelation drugs may be hard on the kidneys, which must bear the burden of eliminating the chelated metals and the drugs themselves.

• **Forcing metals out of the body in an unnatural order.** This is a subtle, but important problem with chelation. The body has its own order of detoxification and healing. Development honors that order and sequence. This may be less rapid, but tends to be much safer and allows healing at much deeper levels as well.

• **Reaccumulation problems.** Because the body’s natural order is not respected with chelation, toxic metals often reaccumulate. This necessitates repeated chelation therapy and negates some of its benefits.

• **Inability to penetrate to the deepest levels.** Most chelators act mainly at the level of the blood and surrounding tissues. They do not penetrate as well into the brain, in some cases, or into deeper tissue layers. Development uses a different and gentler approach, as described above, that can and does penetrate into the cells at much deeper levels.

• **Yin.** Chelators, both synthetic and natural, are quite yin, which subtly unbalances the body.

• **Cost.** Intravenous chelation is much less costly, much safer and more effective than bypass surgery. However, it is considerably more costly than development, especially considering that the latter does much more than simply remove toxic metals.

Most important, chelation is simply not needed most of the time. The only exceptions Dr. Eck employed are vitamin C up to about 1000 mg daily, sulfur-bearing amino acids found in taurine, garlic and black radish, and molybdenum on fairly rare occasions. I have never recommended cilantro extracts, chlorella, bugleweed, yellow dock, isolated alginates or drugs such as penicillamine, deferoxamine, EDTA, DMPS or DMSA, either orally, IV, topically or through rectal suppositories.

**Possible uses of chelating agents in development science.** Intravenous or other chelators may have a place with some advanced cases of multiple sclerosis, lupus, amyotrophic lateral sclerosis and possibly other degenerative conditions that often have to do with metal toxicity. As these conditions advance and worsen, a client’s vitality may become so low that he cannot respond to a development protocol. By using chelation for a while until a person is in better condition, one might save a life. More research is needed on this topic.

**MISCELLANEOUS DETOXIFICATION TOPICS**

**All toxins can remain stored in the liver and elsewhere for years.** This includes all prescription, over-the-counter and recreational drugs, along with toxic metals and toxic chemicals such as anesthesia drugs. Even a parent’s cigarette smoke (contains cadmium and other toxic metals) and residues from contaminated work clothing are stored in the body for 20 or more years, especially if a person’s health is impaired, as is often the case.

Upon undertaking a development program, medications and other toxins from long ago will be eliminated. One may smell or taste them, or even experience their pharmacologic or toxic effects to a slight degree. This happens, at times, because, when liberated from storage tissues, they circulate in the blood a short while until they are excreted through the urine, bile or other routes. This can give rise to odd symptoms. For example, one may suddenly smell...
cigarettes, even though one has not been exposed to nicotine for years. One may experience a caffeine-like rush if a stimulant drug is released, or feel extremely tired if a sedative is released.

YIN AND YANG DETOXIFICATION. All methods of detoxification are either more yin in nature or more yang. This is a vital topic, though a bit esoteric. Before discussing it in depth, here is a brief background on this important healing factor and modality.

What is yin and yang? These refer to specific qualities of life or physical existence on planet earth. Yang is more male, contracted, hot, and centripetal in direction. Yin is more female, expanded, cool and centrifugal in direction. For example, a hot, dry desert climate is very yang, while a cool, damp one is more yin. Similarly, a healthy body should be slender, warm and athletic. This is a more yang condition, for both men and women.

Why is the idea of yin and yang so important? The reasons include:

• Health is more than just filling the body with nutrients and removing toxins. Most illness produces a colder, more expanded, much more yin body. Certain infections such as fungal ones are far more yin and cold than others such as bacterial infections that cause high fevers. In fact, yin is a disease in itself that is very common today.

• A better yin-yang balance greatly increases adaptive energy, restores negative feedback loops, restores some enzyme systems and greatly increases the energy efficiency of the body.

• True fast oxidizers, of which there are few today, are much more yang, while stress fast oxidizers and slow oxidizers are more yin. Very slow oxidizers with low sodium/potassium ratios are extremely yin. This is just one reason why continuously balancing the oxidation rate is vitally important in development.

• Balancing yin and yang is also essential for mental or spiritual development.

Most bodies are very yin today. The reasons for this include:

• Poor overall health and fatigue are the most important factors.
• Higher levels of ionizing radiation are another critical factor today.
• Toxic metals and most toxic chemicals are very yin and prevalent in our bodies.
• Negative attitudes and victim thinking cause a person to be more yin.
• Bodies filled with patent medicines and recreational drugs are far more yin in most cases.
• Electromagnetic fields from cell phones and computers have a very yin effect.
• Diets of refined foods, vegetarian diets, eating fruits and sweets, using alcohol, and taking most medical drugs make people much more yin.

Healing methods must be adjusted to take into account the yin nature of most bodies today. Many healing methods, including vegetarian regimens, acupuncture, acupressure and others were developed at a time when the bodies were not exposed to as many toxins, refined food diets, medical drugs and radiation as they are today. Development, in contrast, is designed specifically for the challenges of the 21st century.

Yin and yang detoxification. Yin detoxification methods flush toxins with cool and watery energy. They work by slowing down an overheated metabolism and include raw food diets, fruit and juice fasts, and vegetarian diets. Other yin detoxification methods are high-dose, and most intravenous and oral supplement therapies, cold baths, some enemas, colonic irrigation, chelation drugs, some cleansing herbs and some acupuncture techniques. Most synthesized supplements and, in fact, all manufactured products such as tablets, powders and liquids are
more yin. Animal-based products tend to be much less yin than synthesized or vegetable-based products, as a general rule.

**Yang detoxification methods heat, activate and contract the body to enhance toxin removal.** These methods include more rest and sleep within limits, hot saunas, coffee enemas, infrared therapy and hot baths. They also include diets with kelp, sea salt, cooked meats and vegetables, especially root vegetables. For a more yang diet, strictly avoid very yin foods such as all sugars, fruit juices, most fruit and most uncooked fruits and vegetables.

**Balancing yin and yang is the reason that I recommend mainly cooked food and more meat.** It is also why raw foods, most fruit, all juices except some carrot juice, vegetarian diets, and nightshade and other vegetables that are really fruits are not recommended. It is also why Dr. Eck found that animal-derived glandulars and animal-based digestive products are important. It is also why some products such as calcium, magnesium and zinc are so important, as these are more yang than other elements. Many more details of the program involve the concept as well.

**Most doctors use yin detoxification methods without knowing it.** These methods work to a degree, but yang methods are much safer and more effective in many cases today because the bodies are so yin. For example, vegetarian diets and raw foods are not as helpful as they were 100 years ago, when many of the wonderful books about them were written. Similarly, most herbs are very yin. This is due in part to their nature, and, in part, due to metal toxicity and other problems with them today. For this reason, herbal methods are not as safe or effective today as they were 100 years ago when brilliant people such as Jethro Kloss, author of *Back To Eden*, wrote about them. Chelation therapy, bio-identical hormone therapy, some oxygen therapies and many others are also more yin as well. It means there will often be side effects from them, even if they are not obvious. More information about the yin-yang balance is in an article at [www.drlwilson.com](http://www.drlwilson.com) entitled *Yin And Yang Healing*.

**DETOXIFICATION FOR GENETIC IMPROVEMENT**

The news reports daily that a defective gene is the cause for many health conditions. Much less often reported is that nutrients are required to turn on genes, and that toxic metals and other toxins can block genetic expression. *Epigenetics* is the study of the effect of the environment on genetics. It is the subject of an excellent book by Bruce Lipton, PhD, *The Biology of Belief*. He shows clearly that while genetics affects our bodies, environmental factors such as nutrition and environmental toxins affect the genes powerfully.

Defective genetic expression is often the underlying cause of birth defects and many other genetic problems. These defects are called *polymorphisms* in the field of genetics. This is an important aspect of genetics that is almost totally ignored today. It helps explain why those with a genetic disorder such as Down’s syndrome can often be helped dramatically by development and other natural therapies. By improving the nutritional balance and biochemical vitality of the body, it offsets some of the genetic imbalances. Children with this disorder begin to learn faster and their distinct facial features even change back to normal to some degree.

**Mothers-to-be need assistance.** Epigenetics and polymorphisms also help us understand why all teenagers, especially mothers-to-be, would be very wise to undergo a development program *before becoming pregnant*, or at the very least once they become pregnant. This would help replenish hundreds of nutrient compounds and reduce their body load of toxic metals and
toxic chemicals greatly. This can undoubtedly help prevent birth defects, as well as make childbirth safer and reduce illnesses in their children.

**True prenatal care.** So far, when a pregnant mother follows a development program carefully, compared to their previous pregnancies, the pregnancies and the births have been easier, and the health of the babies better, in most cases, than previous children. This has not been studied rigorously, however, and it needs to be done. I hope that our prenatal care system will change, as it is one of the worst features of traditional medical care. It is simply not enough to make sure a woman does not have diabetes or some other serious disease and then to hand her a simple diet sheet and a pre-natal vitamin that is often not correct for her body type or her needs. This is an important area that I hope others will research, as it has so much to do with the future of mankind.

Also, prenatal care must begin sooner because it takes several years, at least, to improve the health of young women. Ideally, it should begin at birth. However, at the very least it should begin at puberty by teaching girls, in particular, excellent eating habits, healthful lifestyles and how to care for themselves in every way. Today, in contrast, teenage girls and young women are allowed and often encouraged by the media and even parents and friends to:

- **Eat junk foods day and night, much of which is nutritionally bankrupt and contains toxic chemical additives as well.**
- **Stay up late and indulge in other destructive habits such as smoking and drinking alcohol.**
- **Take dangerous medical drugs such as birth control pills, the patch and others.**
- **Adopt loose morals that cause sexually transmitted diseases in at least 25% of young women between the ages of 16 and 25.** Some say that 90% of sexually active adults have STDs.
- **Ignore nutritional testing before or when they become pregnant.** Instead, pregnant women are prescribed a vitamin tablet that is usually of mediocre quality and not based upon their individual needs. All pregnant women can benefit from a development program.

**Born toxic.** Most children born today are deficient in zinc and many other micronutrients. They also have excessive levels of many toxic metals. This is obvious from their hair mineral analyses, even when the baby has never touched regular food. The toxic metals and many toxic chemicals pass right through the placenta from mother to child during pregnancy. This is a major, and generally ignored, cause of autism, ADD, birth defects and many cases of delayed development as well.

These are **congenital** imbalances, meaning present at birth but not caused by defective chromosomes or genes. **Congenital mineral deficiencies and congenital metal toxicity** should become household words because they are so important. When vaccinations, refined food diets, commercial formula and stress are added, many children simply cannot overcome the combination of these insults to their growing and fragile bodies. An entire volume could be written about congenital imbalances as revealed on hair mineral analyses.

**Detoxification programs during pregnancy and lactation.** Initially, I was skeptical about placing pregnant women on development programs. I wondered if the growing fetuses would be adversely affected. However, after almost 30 years of personal experience, as well as checking with other development practitioners, they appear to be very safe.
The safety record with development during pregnancy, to the best of my knowledge, has been 100%, provided the program is followed well. I have helped many pregnant ladies have much healthier pregnancies and healthier babies as well. Another benefit of development for pregnant and lactating mothers is it can improve the quality of their breast milk so that a baby will continue to want the milk for a longer period of time.

**Breastfeeding and detoxification.** Development programs while breastfeeding are excellent, but require extra care in some cases. Occasionally, an infant will develop colic due to one of the supplements or due to the elimination of a toxin that may find its way into the breast milk. This can usually be avoided or mitigated by taking fewer supplement doses or just fewer products. The client may have to try each product one at a time to discover if one or another of them is causing a reaction in a breastfeeding child. Another idea is to take one’s nutritional supplements soon after breastfeeding so the supplements will be thoroughly assimilated before the next breastfeeding. Rarely, a woman must discontinue her supplements while breastfeeding.

**Detoxification in infants and children.** Children do exceedingly well with development programs. Young babies, for example, may need just one or two products, and few need more than three products. Doses must be adjusted based on a child’s age and weight, although children can often take a little more than their weight or height would indicate.

Children are much less toxic than adults. For this reason, most do not require sauna therapy or coffee enemas unless quite ill. However, the number of sick children is growing quickly today. The causes include congenital and genetic problems coupled with the use of vaccines, medical drugs and even random vitamin and natural hormone treatments. Dr. Stephen Edelson, MD, author of *Conquering Autism*, placed children as young as two in saunas with no apparent difficulties. I don’t recommend sauna therapy until at least age 5 or so. Younger children require much closer supervision for all detoxification procedures.

Older children and teens benefit greatly from saunas for many reasons. The sauna clears their teen acne, making for a beautiful complexion. It also relaxes them and removes many toxins quickly. It also seems to enhance their emotional maturing process in some cases, especially a near infrared light sauna rather than any other type of infrared or regular sauna.

**Cautions with detoxification in young children, in particular, are:**

- **Children are growing fast.** *Never deprive them of protein, plenty of cooked vegetables, extra omega-3 fatty acids, iodine in the form of kelp or other source, and other essential foods.* If they won’t eat vegetables alone, cook them in soups, and give them about 2-10 ounces of carrot juice with a little spinach or other greens added. One can also put dressing on them made of plain yogurt, plain cheese, almond butter mixed with a little water, or simply put some butter and a little sea salt on them. They can also be given Veg-Easy or Juice Plus, which are dried vegetables in a capsule. The green “superfood” powders are not quite as good because they must be mixed with something sweet in a smoothie and because, unlike capsules, they may go rancid much faster.

- **Be very careful with all herbal products, as children are much more sensitive to them than most adults.** Too many doctors give babies or children adult doses of vitamins or worse, herbs, many of which contain small amounts of toxic metals. To be safe, avoid the herbs except for those listed as safe in Chapter 4.
• Development supplement programs from the computer at Analytical Research Labs may need more adjustments for some children. This is more advanced training and beyond the scope of this volume. Reasons for this are children’s variable weight and height, as well as other considerations such as a child’s health status and specific mineral patterns.

Detoxification in older or very ill people. This arena also requires extra care. Older people have less ability to remove all toxins due to lower vitality and often due to a more sluggish oxidation rate. Therefore, use extra caution, and go slowly and gently with them. Some older people are much more vital than others, so it must be handled individually. However, few people over the age of about 65 to 70 should be using the sauna more than once daily or doing coffee enemas more than 1 every other day. Many do well on simpler supplement programs. Distilled water is very helpful for them, and Protocol or the Kelley program can help cancers.

DETOXIFICATION CAUTIONS

• Avoid most fasts, especially any over about 2-3 days. These are quite unsafe, in my view. I worked as the medical director at a natural hygiene fasting spa for several years. I found that the bodies are so toxic, so yin and so depleted today that books written about fasting 50 years ago, as most were, no longer apply. Clients who consult me after fasting are often more depleted and worse off than before the fast, although some symptoms may have improved.
  The only exceptions may be a water or carrot juice fast for up to a week to reduce 1) a very high blood sugar, 2) a very high blood pressure or 3) perhaps at the beginning of a weight loss program for some people. However, this is unnecessary and will upset some people’s blood sugar and other aspects of body chemistry.
• Avoid most herbs and herbal cleanses. Among products that can be somewhat toxic are cloves, wormwood, black walnut, yellow dock, bugleweed and other commonly used herbs. Even safe herbs may contain small amounts of toxic metals and other impurities that are hard to trace, but cause problems eventually if used continuously for more than a few weeks.
• Avoid putting salt of any kind into drinking water. This removes some toxins. However, it also unbalances the macrominerals and causes subtle mineral losses that may take months to notice and are difficult to correct.
• Cleansing diets and other cleanses. These are not needed with development and slow a person’s progress in almost all cases. Fruit diets and juice fasts, for example, are okay for a few days, but are very incomplete and cause more nutritional deficiencies. They are also too yin, similar to fasting, and they slow the metabolic rate in most cases. If you must do them, limit them to a few days at the most.
• Clay baths. Some doctors like these. However, clay is high in aluminum and other toxic metals. Once in a while they are fine and will pull certain toxins from the body. Definitely avoid long-term use and preferably use other methods.
• Ionic foot baths such as the Q2, Biocleanse and others are harmful and should be avoided altogether. They may be okay for those who are over 75, but no one else. They definitely remove some toxins, but also appear to cause subtle damage to the body’s energy field.
• Alkaline water. Avoid all alkaline water. Symptomatic improvement may occur. However, two people have contacted me recently who have slowly developed severe metal poisoning from this type of water. See Chapter 2 for more details on the problems with alkaline water.
• **Swishing oil in the mouth.** This Ayurvedic method was great when the world was not totally polluted, as it is today. It will do little for modern toxic mankind, as it is just not powerful enough.

• **Detox foot pads** from Japan. These are an older herbal detoxification method. They are fine, but not very powerful.

• **Chelation.** This has been discussed earlier. It is not needed and usually harmful in subtle ways. All chelators remove beneficial minerals along with toxic ones. There is never any need for a “metal detox” product or program if one is using development science because all the toxic metals will gently be removed in a natural sequence without the problems these products can cause.

**Cautions concerning the detoxification aspect of development include:**

• **Retracing and healing reactions will occur.** If they do not, the program is not working correctly or the client is not following it well. However, they can be intense, on occasion. Chapter 45 discusses this very important topic.

• **Be gentle with children and older people, in particular.** Detoxification causes fatigue, emotional upset at times, and other difficult situations, particularly in those with impaired elimination, which is most people. It is like trying to flush poisons down the toilet, but the toilet is mostly clogged to begin with. Try to flush too much, and it will back up and make a mess. Have patience and go slowly when necessary. Once the body is working better, then detoxification becomes much easier.

• **Much more rest is critical.** This is the single most important rule if you wish to derive the most benefit from a development program.

• **Follow directions carefully.** Many doctors and clients try to speed up their cleansing or healing process by altering the program. Preferably ask about this. Simple changes, such as adding “detox products” or skipping procedures can easily ruin the program by unbalancing it in some subtle way.

• **When a challenging healing reaction occurs, consult someone familiar with them.** Most medical doctors do not understand them and may inadvertently make them worse rather than better. Practitioners must be available by telephone, usually, for this purpose.

• **Healing reactions can mimic diseases, and vice versa.** Most symptoms that arise during development programs are due to healing. In my experience, this is not the case with some other healing methods. At one time, I believed I was healing with a vegetarian regimen, until I realized that symptoms I was told were healing were, in fact, degeneration. Not only did I waste years on the program, but recovery took me over 10 years as well.

  This can be very confusing even for the most seasoned practitioner. Most reactions pass quickly. However, a few will be vigorous and occasionally may take several weeks or longer to resolve. For example, an old ear infection recently left me dizzy and nauseous for several weeks. A retest hair analysis may assist a practitioner to decide if a change in the regimen is needed, or if the symptoms are benign and nothing to worry about. This critical topic is discussed in depth in Chapter 45.
6. MENTAL AND SPIRITUAL DEVELOPMENT

Dorothy, age 35, ate well and wanted to take good care of herself. However, she felt guilty and ashamed because her child has a birth defect. As a result, she races around from doctor to doctor with her 2-year-old. She is always tired, often anxious and has muscle cramps and back aches. Dorothy’s hair analysis revealed a sympathetic dominance pattern, indicating a person who worries or is ‘trying too hard’ in some way. She also had a four lows pattern, another lifestyle pattern that is like a car spinning its wheels in the ice and getting nowhere. On a first hair analysis, it is often associated with someone who is very hard on herself to the point that she harms her health.

Dorothy began a development program and within a few weeks noticed she was much calmer, less anxious, and her muscle cramps subsided. Rebuilding her body chemistry is also allowing her to process her extreme feelings of guilt and shame for the first time since her disabled daughter was born.

Development includes and, in fact, emphasizes the balancing of the nervous system and the total development of the brain and mind. This goes far beyond symptom removal and also beyond focusing on physical and even mental health. It is about developing areas of the brain that most people do not normally use. In part, this is because they are not nourished well enough. It is also because as the nervous system becomes more balanced and more yang in Chinese medical terms, a person begins to change and mature in special ways.

Dr. Eck loved to speak about “enhancing your personality” with development science. He had many clients who functioned much better mentally, thanks to his development program. Just a few of the reasons this occurs include:

- Restoring hundreds of nutrient minerals, vitamins and other substances to the body.
- Eliminating toxic metals and other chemical imbalances that damage the brain.
- Increasing vitality or adaptive energy.
- Relaxing and balancing the nervous system is also most helpful to control emotions and to think clearly and make better decisions. Chapters 36 to 43 explain how this happens in much more detail.

OTHER ASPECTS OF MENTAL OR SPIRITUAL DEVELOPMENT

As wonderful as these healing changes are, I have since learned that there are other ways to facilitate mental and spiritual development, as well. Dr. Eck practiced some of these, but did
not write about them and include them as part of development programs. They are so important today that I want to discuss them in this short chapter on development.

**Grounding and centering.** Walking, gardening and working with one’s hands help to keep a person’s energy centered low in the body and within the body. Many people’s attention is mainly “up in the head”. Women often have this problem even more than men today because men tend to work with their hands more than women. Also, women tend to have higher copper levels that can make them more excitable and emotional. This also tends to keep them “up in the head”. Meditation, relaxation, bodywork such as Rolfing or structural integration, working with one’s hands and living in a quiet, rural setting are helpful to improve centering and grounding.

**Meditation.** Practicing the proper type of observation and concentration exercise is a time-honored way to calm the mind and the emotions, relax the body, increase the ability to concentrate and learn detachment or objectivity. However, most meditations I am aware of do not accomplish all these things and can even make a person worse in some ways. For this reason, I only recommend one particular type of exercise. It is discussed in Chapter 44.

**Writing.** The discipline of making oneself sit still and write articles and papers on various subjects helps hone and focus the mind, and assists in learning to organize ideas and to weigh the relative importance and truth of various ideas. It also helps one learn to express and communicate ideas in ways that others can follow and enjoy. It also helps a person to realize how well he really understands a subject, since it is difficult to write about something that is not clearly known.

Writing does more than this, however. It is a healthy way to express oneself creatively that also produces a product to be proud of that is uniquely one’s own. It is an art, like painting or music, only writing is harder for most people, and a much more useful skill because of the need to communicate in modern society.

**Study.** Mental development also requires reading about and learning specific information, in my view. Dr. Eck, for example, was knowledgeable in many areas such as science, sociology, psychology, history, business and many others. Today, unfortunately, students in high school and college usually do not learn the correct material. The smart ones take courses in advanced calculus that they will never use, while subjects such as basic nutrition, basic physiology, psychology and political science are not required. Below I have listed some of the simple truths that I have tested and used over and over, and continue to question and refine as I learn more each day:

- **Very basic physics.** *Everything in this universe is a form of energy.* Solid matter vibrates at a relatively low frequency, while sound, light and electricity just vibrate at a higher rate. For this reason, every phenomenon is related to everything else and it is all a matter of vibratory rate or frequency.
- **Basic chemistry.** *Everything physical is just an arrangement of the 93 chemical elements.* The most important elements in our bodies are discussed in detail in Chapters 14-18.
- **Basic biology or the science of life.** *Systems theory is the basis of human and animal life.* In other words, life is a specific form of organization composed of various systems such as energy production, movement, elimination, reproduction and others. These work together
and communicate with each other to do all the things that living creatures do. Diseases are just malfunction in the system and are often caused by nutritional imbalances, even though this is not the conventional medical way of looking at it.

• **Basic physiology.** An interplay of opposing forces is the basis for most or perhaps all of our body’s functioning. These forces may be called hot and cold, expansion and contraction of the lungs, contraction and relaxation of muscles, etc. Basic physiology is discussed in some depth in this book.

• **Basic nutrition.** The human body absolutely requires hundreds of chemical substances found in foods and drinking water. This is a basic truth of health and healing.

• **Basic psychology or personality studies.** The mind is the crowning achievement of mankind. It is somewhat like an advanced computer, but even better in many ways. *Thinking is the crowning achievement of the mind.* It is something that computers do not do very well compared to mature human beings. *The mind rules the body.* However, biochemical and nutritional imbalances can give rise to all types of mental and emotional illness. This so because the brain is a biochemical organ as well as a mental and spiritual one. The relationship between nutrition and the mind is the subject of Chapters 37-43.

• **Basic sociology or moral values.** Human beings must adhere to certain rules to live happily with others. This needs to be the most important area of study today for most people. This is why the Jewish and Christian religions, along with good parenting, help many people succeed in life. Chapter 2 of this book discusses this briefly.

• **Basic economics.** Economics is the study of human behavior in society, particularly as it relates to work, money and the way people assign value to all goods and services in society. What is called Austrian economics needs to be taught much more widely. Instead, what is taught in colleges and elsewhere is often a totally confusing mathematical science of macro and microeconomics that bears little resemblance to reality. To learn this important subject, I suggest subscribing to *The Freeman,* a publication of the *Foundation of Economic Education* or FEE (www.fee.org). This organization also offers online education, seminars and more. Authors like John Locke, Ludwig Von Mises, Frederich Hayek and Robert Higgs are also excellent to read.

• **Basic law and government.** *That government is best that governs the least.* This must be clearly understood to mean that laws should apply equally to everyone, meaning everyone must be treated exactly the same regardless of class, race or status. It also means that government must not micromanage people’s lives. The main function of law and government is to protect the people’s individual rights to live as they so choose. Another way to express this is that government is force and is never benign or “good”. *It is necessary, but never good.* This is unfortunately not taught nearly enough today. Another related principle is that power corrupts and absolute power corrupts absolutely. This is why the American founders tried to limit government power in a hundred ways or more.

Another key principle is the American legal idea of natural rights, or rights derived from the Creator of all life. Behind this is the idea that we are all basically gods in the making. Thus, no one has the right to lord it over others for this reason, even if that person is more “educated”, licensed, certified or otherwise feels superior.

• **Basic healing.** This includes nutrition, retracing, the value of rest and sleep and much more that is the subject of this book. *I hope one day the basics will be taught to every high school student.* An important aspect of healing that is rarely discussed but relates to mental
development is the correction of the brain architecture. In many people, the brain is slightly off-center or contorted. This can be due to falls, injuries or other reasons. The brain is actually a “tuning organ”, somewhat like a radio antenna. This is explained in Chapter 39. As a result, structural problems can affect one’s thinking and actions. Reflexology, craniosacral work, bodywork, chiropractic or other therapies can all help correct the brain architecture.

- **Basic spirituality.** *Human beings are not mainly physical, but instead are energetic or metaphysical creatures, for the most part.* The physical aspects of us actually derive from the metaphysical or energetic aspects. In other words, the visible world derives from a finer and invisible world. This is the essence of spirituality. It is not about a particular religion, though religions always talk about it. This means that everyone is “spiritual” whether or not they acknowledge it in daily life and behavior. Another way to say the same thing is that we are all souls who inhabit bodies for a period of time and then move on. This can be proven, but it does not serve certain interests for the people to know this, so it is ignored and even ridiculed in the general society.

- **The subtle bodies.** Human beings have a number of subtle or energy bodies that one can develop during one’s lifetime. Developing the subtle bodies leads to deeper healing and a much longer and usually happier life. Deeply removing toxic metals with development science appears to help the development of the subtle human bodies, something that I did not realize when I first learned this science.

**Wisdom or maturity.** These are the ultimate goals of development science, and the final destiny of all human beings. Western societies tend to value material success above wisdom. Many ancient cultures knew that life is much more than one’s material success. The materialistic focus of the modern world has built a technically advanced society. However, people are so exhausted and ill that it is time for all to slow down and look for deeper values.

Modern school systems do not teach much about wisdom, nor do they teach enough of the subjects listed above. This failing makes them much less useful for the person who wants to develop himself fully and become wise. Young people need to know this and not feel ashamed if they decide not to attend college, for example. It is not necessary, and may even be quite harmful because too many wrong ideas are taught. Also, the moral climate is horrible at most colleges and universities today in America, in particular.

**The long road of development.** Mental and spiritual development occurs automatically as deep healing takes place in the nervous system, particularly if one also works on and practices grounding, centering, the Roy Masters observation exercise, writing and study as outlined above. It is a slow and gentle process that takes a number of years.

As a result of the time and commitment required, many people don’t stay with it long enough, and many look for shortcuts. These include various religious and yoga practices, special meditations and others. These might help, but many actually slow the process by teaching methods and doctrines that are false or simply ones that applied years ago, but are not as important in today’s world. Chapters 10 and 40 discuss mental development in more detail.
7.
A VERY BRIEF HISTORY OF DEVELOPMENT SCIENCE

Joan, age 20, had almost complete alopecia or hair loss. Her first hair analysis revealed a four lows pattern, a sodium/potassium ratio of 0.8 (normal is 2.5) and a mercury level of 0.3 mg% (normal is about 0.02 mg%). She began a program and followed the diet and lifestyle suggestions well. She took her supplements only twice daily, and after two and a half months on this regimen her hair started regrowing all over her scalp. Hair loss is common today among young women, a very disturbing symptom. Copper imbalance, fatigue and, in this case, mercury toxicity may all be involved.

This chapter introduces the history and theory of development science. One can still use development science without understanding its theory. However, the theory is fascinating and is what separates this science from other healing methods. Without the intricate theory behind it, one may think it is just another way to suggest diets and nutritional products, which it is certainly not. It is a separate science, developed over a number of years with painstaking research on hundreds of thousands of people.

The founder of this science was Dr. Paul C. Eck, a very talented doctor and brilliant researcher who lived from 1925 until 1996. Dr. Eck entered a pre-medical program in his teens, but soon left to support his family. He eventually graduated from the National College of Naprapathic Medicine in Chicago, Illinois, USA. This is an eclectic medical college that teaches a variety of healing methods including nutrition and manipulation. Dr. Eck worked in various positions after graduation, including as a researcher for several pharmaceutical companies. He also worked for Sivad Bioresearch, then a leading producer of quality nutritional supplements.

In the early 1970s, he stumbled onto the new assessment method of hair tissue mineral analysis. His vast knowledge of biochemistry and physiology enabled him to help physicians to interpret the new test accurately. He soon developed quite a following among these physicians. Over the next several years he carefully researched minerals in the body and their interrelationships. He painstakingly correlated medical diagnoses with the readings on over 200,000 hair mineral analyses. His work was continually evolving as he began to understand the importance of not just the levels, but also the ratios and patterns on a hair mineral test. Dr. Eck drew on the research of at least a two dozen scientists in developing development science, which he sometimes called ‘mineral balancing’ and ‘the new nutrition’. He also had a deep appreciation of quite esoteric concepts of health such as teleology, the study of healing intent, and cybernetics, the science of communication and control. Three of his most important mentors were George Watson, PhD, Hans Selye, MD and Melvin Page, DDS.
DR. WATSON AND THE OXIDATION TYPES

George Watson, PhD (1912- ) worked as a researcher at the University of California at Los Angeles in the mid-twentieth century. He was researching odor responses when he noticed that one group of volunteers favored certain odors, while another group had an entirely different set of likes and dislikes. He wondered why there were two main groups of responders and began running blood and other tests on what he first called Group I and Group II individuals. Later, he discovered slight differences in serum CO2 and serum pH levels of the two groups. He believed that one of the groups burned fats more efficiently, while the other group burned carbohydrates more efficiently. He renamed the groups fast and slow oxidizers. Dr. Watson also identified a third group he called sub-oxidizers. These were people who did not quite fit into the first two groups. They seemed to have more health problems and did not respond as reliably as the other two groups to his corrective measures. He used the word oxidation because it refers to the burning of calories in the body.

Dietary correction and supplementation. Dr. Watson’s most important work, however, was not theoretical. It was his brilliant way of correcting the oxidation rate using dietary modifications and simple supplement formulas. He found that a high-fat diet slowed the oxidation rate. In contrast, a diet higher in protein and lower in fats and oils enhanced or sped up the oxidation rate.

Dr. Watson also found that nutritional supplements including calcium, magnesium, copper and vitamins A and D in certain dosages tended to slow the oxidation rate. Other supplements such as vitamins B-complex, C and E, and zinc and manganese had an opposite effect of increasing the oxidation rate. It is not clear to me how Dr. Watson came up with his formulas, but they evidently worked well because he has a number of spectacular case histories in his two books. When the oxidation rate was balanced, the person’s energy level improved greatly and a wide variety of symptoms, both physical and emotional, vanished. If, however, the person stayed on one formula and one diet too long, the oxidation rate would overcorrect, in some cases, and other symptoms would occur. He then had to change both the diet and supplements to the other set to bring the oxidation rate back to ideal. Dr. Eck was thrilled to learn of Dr. Watson’s work in the mid-1970s. The main insights were:

- Just two simple diets and two basic nutrient formulas could correct a large number of symptoms when they were administered carefully and precisely. This offered the idea of simplifying dietary and supplement recommendations, which can be very complex and confusing.
- The work implied that there were two basic metabolic types. This idea resonated with Dr. Eck, who was familiar with the ideas of yin and yang, and other systems of metabolic typing.
- The same condition may have different causes depending on one’s oxidation type. For example, there exists a fast oxidizer cause for arthritis and a slow oxidizer cause of arthritis.
- Energy levels rose dramatically when the oxidation rate was balanced.
- Many widely diverse physical, emotional and mental symptoms responded to balancing the oxidation rate.

Dr. Watson wrote two popular books that are a quick, easy read and quite enjoyable. They are Nutrition and Your Mind (1972) and Personality Strength and Psychochemical Energy (1979). Both are out of print, but are often available from used book sellers.
DR. PAGE AND THE AUTONOMIC NERVOUS SYSTEM

Melvin Page, DDS (1884-1983) was a rather colorful, eccentric and very brilliant physician. Over 100 years ago, he figured out how to use tiny doses of natural hormones to correct many illnesses in the body. At the time, hormone therapy was used very little. Dr. Page used body proportions, which he carefully measured, to decide which hormones and how much of a micro-dose of each to give a patient. He was decades ahead of his colleagues. Dr. Page was one of the first doctors to elaborate how the balance of the sympathetic and parasympathetic nervous systems affects health. For instance, he researched the effect of eating even small amounts of refined sugar on the autonomic nervous system. He discussed how it damages the body through its effect on the nervous system. This was pioneering work.

Dr. Page’s work caused Dr. Eck to pay much more attention to the autonomic balance of the body and its correction by natural methods. This is very central to development science. Few methods exist that can measure the activity of the autonomic nervous system as well as Dr. Eck’s hair analysis patterns. Some doctors use heart rate variability testing for autonomic assessment, which I have found often agrees with hair analysis assessment. However, it does not, to my knowledge, detect causes for autonomic imbalances the way a hair analysis often can. Also, I do not believe it detects some subtle autonomic patterns such as sympathetic dominance, four highs and four lows patterns.

Dr. Page wrote Degeneration, Regeneration and co-authored Your body Is Your Best Doctor with Leon Abrams. In his books, he describes his many insights about micro-hormone therapy, balancing body chemistry and the autonomic nervous system.

DR. SELYE AND THE STRESS THEORY OF DISEASE

Hans Selye, MD (1907-1983) was one of the most brilliant researchers of the twentieth century. Dr. Selye was from Vienna and moved to Montreal, Quebec, where he did amazing animal research on stress, as applied to biological systems. He borrowed many concepts from engineering and from general systems theory, described in the next chapter. His work is still not appreciated today, nor is his work used much by anyone today except practitioners of development science. His most important breakthroughs include:

• Formulating a unified theory of health and disease called the stress theory of disease.
• Realizing that animals and human beings respond to attack or the threat of attack in precise, mathematical ways that he termed The General Adaptation Syndrome or G.A.S.
• Applying systems theory and cybernetics principles to human health. He helped popularize words such as feedback loops, homeostasis and of course, the word stress as it applies to biological systems.
• Recognizing the great importance of the adrenal glands for the stress hormone response.
• Discovering how the stress response is mediated through the central nervous system, particularly the sympathetic branch of the autonomic nervous system. This is the main aspect of Dr. Selye’s work that has entered mainstream physiology textbooks. However, it is only one of his many brilliant discoveries.
• His monumental discovery of the stress theory of disease renders untrue the concept that humans and animals are plagued by thousands of diseases. Instead, he showed that most of them can be classified as variants of one of his three stages of stress. This effectively unifies
medicine in a completely new way and makes obsolete much of the allopathic theory of ‘disease entities’.

THE GENERAL ADAPTATION SYNDROME

The general adaptation syndrome states that all living organisms respond to most attacks in similar ways, regardless of the kind of attack. For example, the stressor could be a chemical toxin that one inhales, a viral infection in the body, a physical stressor such as extreme cold or heat, or a loud noise or electric shock. The type of attack matters little in most cases. Also, the species of animal or human does not matter. In fact, since then it has been discovered that even some plants seem to have a similar type of stress response, though they lack a central nervous system. All seem affected in similar ways. This was groundbreaking science, to say the least.

The only reasons Dr. Selye is not honored as one of the most brilliant scientists of modern times are 1) inertia of the medical profession, 2) the complex nature of his work, and 3) some deliberate efforts to ignore his concepts because they threaten the allopathic medical model. To his credit, Dr. Eck saw the brilliance of Hans Selye and spoke of him often with great admiration. Dr. Selye’s achievements were nothing less than incredible. He authored over 1500 scientific papers and wrote 32 books on stress and the general adaptation syndrome. Among the most interesting is *Calciphylaxis*, an entire book on what Dr. Eck called the ‘calcium shell’ and its development. He wrote two popular books, *The Stress of Life* and *Stress Without Distress*.

THE NUTRITIONISTS

In addition to the above influences, Dr. Eck was a prolific reader and was heavily influenced by the pioneers of scientific nutrition who lived in the twentieth century. Among the most important were Adelle Davis, Dr. Roger Williams, Henry Schroeder, MD, Roman Kutsky, PhD, Carl Pfeiffer, MD, Robert Atkins, MD, T.L Cleave, Bernard Jensen, DC, ND, Max Gerson, MD, Linus Pauling, PhD, Abram Hoffer, MD, Ross Hume Hall and others. He also was influenced by the older traditional naturopaths, hydropaths and herbalists such as Jethro Kloss and many others. Dr. Eck became convinced they were onto something, although mainstream medicine ridicules them terribly and still gives them little credit for their stupendous discoveries about the importance of vitamins, minerals, herbs and lifestyle to achieve and maintain optimum health.

THE GRAND SYNTHESIS OF DR. ECK

Dr. Eck realized that in some way Drs. Watson, Page and Selye were talking about the same thing. He combined their ideas, changed some of their esoteric language, though not much, and added much more to it that he discovered from hair mineral analysis research. He then synthesized and integrated it into a practical science of health that anyone can learn. I call this the grand synthesis of Dr. Paul Eck. It includes:

- **Nutrition is the answer.** Dr. Eck recognized the importance of diet and nutritional supplements as keys to overcoming the effects of stress and balancing body chemistry.
- **Hair analysis.** Dr. Eck took the work of Drs. Watson, Page and Selye a step further by figuring out a method to assess the stage of stress, the balance of the autonomic nervous
system, the oxidation rate and much more using the inexpensive, non-invasive hair mineral test. This was quite a task that required a number of years of research. Hair mineral analysis was quite new at the time and poorly understood. He worked out ideal mineral levels and ratios, identified many mineral patterns and put this all together with little assistance.

- **Empirical correction with patients.** Dr. Eck was a superb clinician and never let theory override actual results. He constantly updated his computer programs and recommendations based on patient feedback.

- **Extending Dr. Selye’s work and making it practical.** Dr. Eck realized he could move people from a less healthful stage of stress to a more healthful one using Watson’s dietary method and his supplementary nutrient formulas. He modified these to make them even better.

- **Minerals and their vital place in nutrition.** Simple, non-patentable chelated minerals are often much less glamorous than other nutrients such as vitamins, herbs and amino acids. However, Dr. Eck placed them first, a concept that is just now finally catching on among some nutritional authorities. Minerals, he said, are the *stepchildren of nutrition*. He meant they are too often ignored when they need and deserve much more attention. Mineral deficiencies, biounavailability and excesses lead to most of our health problems, he found. Minerals cannot be made in the body and must come from outside, unlike hormones, many vitamins and some amino acids.

- **Supplement program design.** Dr. Eck’s supplement programs are amazing in their simplicity. I am continuously impressed how well they work with fewer and far simpler products than what most doctors are using today.

- **The critical role of toxic metals in human health.** This was a great focus of Dr. Eck’s, and is still not well accepted by most doctors or nutritionists. He understood how they replace vital or preferred minerals in enzyme binding sites, a concept he learned from the late Henry Schroeder, MD. He also saw from hair analysis research how they interact with the sympathetic nervous system and the overall mineral balance of the body. This is far beyond just viewing them as poisons to be chelated out, which is the way most doctors view them.

- **Copper imbalance.** Much of what is known clinically about copper imbalance is due to Dr. Eck’s research. He found it fascinating how one mineral could affect people in such varied and profound ways from causing birth defects to aggravating cancers.

- **Adrenal burnout syndrome.** The causes, symptoms and correction of this common health condition today were elaborated by Dr. Eck almost forty years ago.

- **Understanding emotions and behavior from a hair analysis.** Dr. Eck found startling connections between mental health and specific minerals, the stages of stress, the oxidation types and the levels, ratios and patterns on a hair analysis. This is a separate subject worthy of several volumes all its own. It has far reaching applications in the fields of mental health, education, child development, criminal justice, child protection and other areas of social as well as medical sciences. Eight chapters of this book are dedicated to this enormous subject that he researched and helped to popularize.

- **Measuring parameters of the stress response.** He realized that hair analysis patterns were stress patterns of the body, rather than diagnosable conditions. This may sound unimportant, but it is quite a breakthrough that unifies medicine and the stress theory of disease.

- **Trends or research associations versus diagnoses.** Dr. Eck made use of trends or tendencies on hair mineral analyses. This is very different from diagnosing disease, and often far more useful in clinical practice. These trends can often predict future illnesses with amazing accuracy, and can do so years before problems are revealed on other medical tests.
• The importance of cell permeability and the ability to measure it quickly, though roughly, from a hair analysis. This is another breakthrough gleaned from hair mineral analysis that will be appreciated as scientists and doctors begin to realize its importance.

• Natural medicine principles. Dr. Eck’s work incorporates principles from most of the healing arts, both traditional allopathic medicine and many others. The ability to unify health care in this way is extremely unique and helpful for healing.

• Importance of congenital, rather than inherited genetic reasons for disease. Dr. Eck warned about the dangers of passing toxic metals and nutrient deficiencies from mother to child many years before this was formally recognized. He could read the evidence clearly on mothers’ and childrens’ hair tests. Medicine still confuses genetic and congenital causes of disease because so far they refuse to employ the hair mineral test to detect congenital toxic metals and many other congenital imbalances that can easily mimic genetic disorders.

• Ideal or optimum values, not reference ranges. Dr. Eck pioneered the newer, non-allopathic concept of using optimum or ideal test values. Almost all doctors still work with reference ranges, an older allopathic concept for evaluating tests. The idea of optimums or ideals is still very foreign to medical care, including holistic care in most cases. This is a far more important concept than most people realize.

• Design of a very easy-to-read and calibrated hair analysis chart. This innovation is not appreciated by most doctors and clients until they attempt to read the hair charts from other laboratories. Dr. Eck, unlike most laboratory owners, was a true teacher in this regard.

• The benefit of a very wide knowledge base. Dr. Eck trained in structural manipulation and bodywork, and had met Ida Rolf, the founder of Rolfing. He had a deep appreciation for the way that many therapies from chiropractic and electro-diagnostic and treatment machines work, and how many natural and drug therapies could benefit health. He used all of his background to help him in his research and in the design of his corrective programs.

• Exercise dangers. Dr. Eck was among the first to warn against too much exercise for most people. Exercise may feel good and is socially acceptable, but is stressful for the body. Recommending vigorous exercise can be like sending a car onto a fast highway when the steering and brakes hardly work at all. Traditional doctors use costly and sometimes invasive “stress tests” to assess exercise capacity. However, even these are usually not as helpful as a much less costly hair analysis to assess a person’s capacity for activity. Dr. Eck was also one of the first to speak and write about “exercise addiction”, years before it became a well-known phenomenon.

• Bioavailability of minerals. Dr. Eck remains one of the very few scientists who understood and taught about the problem of mineral bioavailability. This concept is so basic to development that it cannot be overlooked. Without it, the hair test and the corrective measures make little sense. Dr. Eck elaborated the reasons for calcium, magnesium, copper and other mineral bioavailability, some of his most advanced work.

• Blending East and West. Dr. Eck knew about acupuncture principles such as yin and yang, as well as others. He incorporated some of these ideas, but without sacrificing Western scientific methods such as the use of modern spectrographic methods for measuring minerals. His blending of theory and practice, allopathic and natural healing, and Eastern and Western healing philosophies is an incredible legacy.

• A quality businessman. I was impressed that Dr. Eck, unlike many in the medical field, maintained very high standards of integrity, and his lab continues this way today.
• **Shared freely.** I have studied with many doctors in my career. Many kept the best part of their work secret for various reasons. Dr. Eck shared freely. Most of the doctors whom he taught still give him little or no credit for the brilliant insights they claim as their own.

• **A fine person.** From humble beginnings, Dr. Paul Eck was a true friend to me and to thousands of others. He only regretted that he did not have more time for teaching and for his four children who survive him.

**IDEAS DR. ECK RESPECTED, BUT DECLINED TO USE IN HIS WORK**

As important as the insights of Dr. Eck were the ideas he rejected or at least felt did not fit into development science. These include:

• **Most pharmaceuticals.** While he knew that drugs may be needed, at times, he also saw the harm they do in many cases. Using development, very few drugs are ever needed. When they are, it is mainly for emergencies, surgery or very short-term therapy.

• **Bio-identical and other hormone replacement therapy.** Dr. Eck was extremely wary of this popular method of healing. It is almost never needed if a person will follow a development program. Exceptions are the use of insulin, thyroid hormones and others in a few cases if the organs are irreparably damaged or have been surgically removed.

• **Chelation therapy.** Dr. Eck found that chelating drugs adversely affect the sodium/potassium ratio on a hair analysis. This lost him a lot of support among the chelating doctors. Synthetic chelators are very rarely needed or helpful at all if one understands development science methodology for the release of all the toxic metals. Development is much safer, less costly, gentler and more effective in most cases.

• **Most natural chelators.** He did not like natural chelators such as chlorella, cilantro, zeolite, high-dose vitamin C, bugleweed, yellow dock and others. These, he found, were not needed and somewhat toxic in all cases. He used molybdenum in small doses as a copper chelator. However, it was reserved as an additional product and used only for difficult cases. Many doctors, he said, are anxious to chelate toxic metals without realizing the harm this can cause.

• **Vegetarianism and raw foods.** Dr. Eck understood deeply the problems with vegetarian diets and did not fall for the popular arguments in favor of them, as do some holistic doctors today. He called anyone who eats meat less than three times weekly a vegetarian, and learned how to identify some of these people from a hair analysis. He also advised against the all raw food diet, the Fit For Life diet, and similar popular ones.

• **Most exercise regimens.** Dr. Eck found that most people are in the exhaustion stage of stress. Heavy exercise may feel good, but it can be dangerous. At best, it slows one’s progress toward health. Even for weight loss, we find that exercise should only be gentle and mild.

• **Mineral replacement therapy.** This is the use of hair analysis or other tests only to assess mineral levels. Then one supplements the minerals that are deficient and avoids the minerals that are elevated. This is still the main way that hair analysis is used today. Dr. Eck experimented with it and found it only marginally effective. The reasons have to do with the bioavailability of minerals and other complex factors having to do with body chemistry.

• **Symptomatic nutritional therapy.** Dr. Eck discovered that if one corrects the oxidation rate and the major ratios on a hair mineral test, most symptoms go away on their own. He avoided most symptomatic therapy, though it is an extremely tempting way to use nutrients
and other remedies. Problems with all symptomatic approaches is they mask deeper problems and rarely correct the causes of imbalances at the deepest levels.

- **Extreme caution with herbs.** He advised great caution with herbs, although a few of them are used in development programs. Most herbs have drug-like effects or they would be classified as foods. Also, most herbs work symptomatically and at much more superficial levels than development requires. Herb quality is also quite variable today. All Indian and Chinese herbs may be contaminated with toxic metals, in my experience.

- **Megavitamin or orthomolecular therapies.** Development is an orthomolecular approach that is not based on symptom correction. Dr. Eck deeply appreciated the work of Dr. Hoffer and others, but questioned the continuous use of high-dose vitamin therapy. It is hardly ever needed if one correctly recommends nutrients based on the hair test.

- **Washing hair samples at the laboratory.** Dr. Eck rejected the still-popular idea that human hair samples must be washed at the laboratory before analyzing them. Studies conducted by Dr. Raymond Leroy and others show clearly that washing the hair at the lab ruins the accuracy of the hair test, especially for the more water-soluble minerals.

- **The use of reference ranges in hair analysis.** This is the industry standard, but it is an allopathic concept that does not work as well as ideal or optimum hair mineral values.

- **Caution comparing hair tests with blood, urine, saliva and other testing methods.** Dr. Eck was careful to explain to practitioners that blood tests often do not match hair tests because they measure different body compartments and often measure very different parameters of health. Practitioners often become confused when trying to compare various types of tests.

- **Single-element therapies.** Dr. Eck realized that health is due to a combination of factors. For this reason, he endorsed the idea of combining a healthful diet, an excellent lifestyle, nutritional supplements and perhaps other natural therapies to obtain the best results. He knew that single-element therapies always tend to be less effective for deep correction.

- **Nutrient pills as substitutes for real food and a healthful lifestyle.** Many doctors load the patient with supplements instead of insisting on a healthful diet and lifestyle. This was not Dr. Eck’s approach.

- **The need for intravenous and intramuscular supplements.** Dr. Eck did not use these therapies, though they can be helpful for a short time. However, they tend to unbalance the minerals in the body in subtle ways, slowing or stopping deeper healing.

- **Food-based products.** Dr. Eck rejected the notion that all supplements must be food-based. I have tested this extensively and found that Dr. Eck’s simple formulas, which include many, but not all food-based products, work far better than purely food-based supplements.

- **False or misleading nutritional promotion.** Dr. Eck was a man of great integrity. He hated the snake oil salesmen and health product peddlers who lie or bend the truth to promote their wares. He never did this, and his lab continues today to promote in a very ethical manner.
Mrs. Gray, age 51, was doing well on a development program. One day she called quite frantic, however with a severe sinus infection. She worked as a school teacher and refused to take time off from work. Antibiotics from her medical doctor had little effect, and the same was true of some colloidal silver she had tried. I suggested shining a single, red, 250-watt heat lamp of the type used in a near infrared sauna on her sinuses five or more times daily. She was to use it for only 5 minutes each time, shining it as close as she could to her sinuses, without burning herself, of course. Longer than 5 minutes is not healthful on the head area. The lamp and a portable clamp-on socket cost about $20.00 at many hardware stores. She called back in two days to say she was feeling much better. In a week, the infection was completely gone.

This chapter and the next six discuss the scientific and theoretical basis for development. The material is not necessary just to use the science. However, it is what distinguishes this work from most other healing approaches. The chapters are organized as follows:

- **Chapter 8 (this chapter) contains:**
  a) Basic science principles: teleology, general systems theory, cybernetics, holography and fractals.
  b) Preferred minerals and the concept of enzyme activity.
  c) Eastern principles of yin/yang balance (from traditional acupuncture), Ayurveda (the three doshas, for example) and dietary concepts of yin and yang from macrobiotics.

- **Chapter 9: Other basic principles of development science**, including Western medical sciences, vitality or adaptive energy, metabolic typing, retracing, biochemical individuality, wellness, orthomolecular medicine, predictive medicine, and restorative or functional medicine.

- **Chapter 10. More advanced development principles:**
  The mineral balancing system
  Biological transmutation of the elements
  The homeopathic principle of pleomorphism
  Mental and spiritual development
  The chakra system and development

- **Chapter 11. Understanding stress and the autonomic nervous system.**
Chapter 12. The Oxidation Types - Theoretical Considerations


TELEOLOGY

Teleology means healing intent. It is the idea of an intelligent design that is responsible for much of the healing and regeneration of the body. All healing arts use it, without exception. The major thrust of development is to get out of the way of this healing intelligence or life force. The practitioner seeks to discover all that is blocking healing, rather than substitute his own inferior wisdom for that of the body. One also seeks to avoid unbalancing or diminishing the teleological force at work in the body. Drug therapy, in contrast, may produce wondrous symptomatic effects. However, it also often upsets the life force or healing intent of the body, negating some or all of the longer-term benefits.

GENERAL SYSTEMS THEORY

A system is a group of items, all of which affect each other. This rough definition will suffice to introduce the most important difference between development and most other healing methods. In the late 20th century, great minds realized the importance of viewing many complex phenomena as systems. Among the pioneers was Ludwig Von Bertalanffy, author of General System Theory, Foundations, Development and Applications (1968). Another pioneer in a more practical way was Richard Buckminster Fuller.

While we take the word system for granted, it is actually a newer word in common usage. Traditional doctors speak of body systems, but their understanding is still very limited. If they really thought in systems terms, many fewer drugs would be used due to “adverse effects”. These are simply other whole systems effects that are harmful. Nutrients would be used instead, as they have many fewer ‘side’ effects. Knowing the basics of systems theory is a key to understanding development science.

Open and closed systems. Open systems are those in which the boundaries and all the parts are not known. A prime example is our universe. We don’t know its extent because we don’t know its boundaries. Also, we don’t know much about many of its features or parts. Open systems are exciting on a theoretical level, but very difficult to work with.

Closed systems are those in which all or most of the parts are known, and often facts are clear about the boundaries of the system. Living organisms are generally considered closed systems. This type of system is much easier to study and analyze, which is fortunate for us.

In fact, human beings are open systems to a degree. The more spiritually developed a person is, the more he or she is not ruled by the whims of the body. This is the open nature of human beings. However, for the most part, humans are considered closed systems.

Complex, self-regulating systems. Complex systems have millions of parts that interact in extremely complex ways. Self-regulating systems are those that have so much feedback in them that they self-correct to maintain equilibrium or homeostasis. Human beings are best described as closed, complex, self-regulating systems.
Local and systemic events within systems. Systems always experience two general types of events, local and systemic. To understand systems well, one must distinguish between them. Local events within a system are those that have little effect on the whole system. In a human body, a local event might be a broken finger, perhaps. While the pain may affect the whole person, the damage and disability are limited.

Systemic events are those that affect the entire system, or at least most of it. Systemic events include fatigue, what a person eats, one’s lifestyle, exercise habits or generalized infections.

Traditional medical care often confuses the two types of events. For example, they treat most cancers as primarily local events, when this is never the case. They also often treat minor or more local events such as a sore throat as major systemic events requiring toxic, whole body interventions such as antibiotics. These can cause significant system-wide side effects. Even high blood pressure can be mainly a local event, for example, due to cadmium toxicity in the kidneys. If one knows this, there is no reason to give systemic drugs such as beta blockers or calcium channel blockers that can have system-wide adverse effects.

LAWS OF SYSTEMS. Basic laws of all systems that are related to healing include:

#1. The behavior of the whole system is greater than the sum of the behaviors of all the parts. This is the most difficult principle to comprehend and appreciate. Our education system, including medical schools, rarely teach it. It applies when human beings think they understand a system such as our physical environment or our bodies, but in reality they only understand a fraction of it. They are shocked when the system reacts in an unpredictable way. The Soviet Union and Nazi Germany are examples on a governmental level. These societies decided they could control everyone’s behavior by force and create a smooth-running society. Instead, their actions led to horrific wars and the nations ended up in ruins. They lost out to another systems principle, the one that follows.

#2. One cannot predict the behavior of the whole system just from knowing the parts. This can mean that any focus on parts, whether they be organs, minerals, vitamins, diseases or others will not tell us too much about the total body system. For example, the body’s response to an intervention such as a drug therapy or a diet is unpredictable, especially if one does not remain focused on the whole systems aspect of the body.

This is actually a great spiritual truth found in the bible and other spiritual teachings. It may be stated that God (the whole system) is in charge, not the parts (human beings or anything else). The ancients figured out this principle thousands of years ago.

#3. If one knows some of the behaviors of the whole system and most of the parts, one can infer or figure out the behaviors of the rest of the system. This principle is critical for development. When dealing with a complex, self-regulating system such as the body, the best we can do is to identify some behaviors of the whole system. Then we can use these, along with partial knowledge of the parts, to predict other system behaviors and modify them.

As a simple example, a whole system behavior is the need for enough rest. If one knows that human beings need at least eight or nine hours of sleep nightly, and if the body does not get the rest it needs, the brain will not function correctly, digestion will be weaker the next day, and
so forth. The point is that by focusing on whole system behaviors, we can learn a lot about the behavior of the parts of the human system.

**What are whole human system behaviors?** Simple ones are *diet* and *lifestyle*. Others are *patterns of thinking and attitudes*. By knowing these, we can predict a lot about the behaviors of various parts of the human system. I am continually amazed that most medical doctors and even some naturopathic doctors don’t ask about these simple whole system behaviors. They could learn so much, so fast about a person and his likely health conditions.

More subtle whole system behaviors on a hair mineral analysis are the *oxidation rate*, the *stage of stress* and the *sodium/potassium ratio*. Dr. Eck understood that these are far more important than individual minerals or toxic metal levels, for example. One can measure hundreds of other health parameters such as blood sugar, blood pressure and others. However, these are much more local than the oxidation rate or the balance of the sodium/potassium ratio in the hair.

**Implications of systems theory for healing include:**

- *A client’s entire life needs to be viewed as a system.* This means that one’s diet, job, relationships, health program, lifestyle, attitudes, emotional control and spiritual outlook all fit together and are never to be viewed only as isolated parts or events.
- *The body must be approached as a system.* This means that all its organs affect the others and none are merely local parts.
- *Symptoms such as fatigue or low blood sugar have important systemic aspects and therefore must be viewed as systemic events rather than local ones.* In other words, fatigue is not just a simple symptom to be “fixed” with a drug for narcolepsy or a cup of coffee.
- *Therapies and procedures of all kinds must be viewed systemically as well.* This means asking what are the overall effects, also called “unintended consequences” of a vitamin, an operation or a drug. Also, what is the effect on the mind, the emotions and even the spirit? For example, antibiotics are very effective against certain bacteria. However, they often have negative consequences for the intestinal flora, and, at times, for the liver and other organs. Since they negatively affect these important organs, they also negatively affect the whole system in almost all cases. Alternatives to antibiotics, such as colloidal silver, bee propolis, Echinacea, vitamin A or others, are often far superior for this reason.

**Systems principles explain seeming paradoxes in development, including:**

- *Minerals whose levels are elevated on a hair test may be supplemented, while minerals whose levels are low are left alone.*
- *A client is made to feel worse for a while on the road to recovery.* For example, a person with a four lows pattern may be given supplements that cause more fatigue.
- *Supplements that give a sense of well-being are to be avoided in some situations.*
- *A mineral level or ratio that appears at first glance to be alarmingly abnormal may be evidence of excellent progress.*
- *Normal-appearing levels or ratios may indicate serious imbalances.*
- *Seemingly severe organ problems or symptoms, such as a toxic liver or an elevated blood sugar, may not be addressed while other, seemingly minor symptoms such as constipation or insomnia are deemed more important to address first.*
CYBERNETICS

Cybernetics is the study of complex, self-regulating systems. It is also defined as the science of communication and control in complex, self-regulating systems. It is the brilliant work of Dr. Norbert Weiner, who worked at the Massachusetts Institute of Technology, and his colleagues. Dr. Weiner wrote about it in two popular books, Cybernetics, or Control and Communication in the Animal and the Machine (1948) and The Human Use of Human Beings (1950). He and others also wrote innumerable technical papers about it. Cybernetics began as a way to program automatic tracking systems for machine guns on warships during the Second World War. However, it applies to all self-regulating systems including human beings.

The main idea of cybernetics is that complex, self-regulating systems consist of thousands of unstable parts that can only function together thanks to complex feedback loops. These are ways the parts communicate with each other. In fact, at times, the parts are less important than the relationships and feedback loops between the parts. Thus the science of cybernetics focuses less on ‘parts’ and more on the complex relationships and the communication links between the parts. For example, a ratio between two mineral levels is such a relationship. From cybernetics have come several important words and concepts used in development science and in other fields as well:

1. **Homeostasis** is the process of maintaining internal system equilibrium or balance in the face of constantly changing conditions. In our bodies, the changing conditions might include the ambient temperature, one’s energy level, the presence of pathogens, and even one’s mood, for example. The body must keep itself balanced, heated properly, digesting food and doing much more in the face of a constantly shifting internal and external environment.

   The way a complex, self-regulating system does this is with fairly stable homeostatic states or states of balance. *Fast* and *slow oxidation* are such states of our bodies, along with *four lows pattern*. The major hair mineral ratios also represent somewhat stable homeostatic states. Some of these homeostatic states are more healthful than others. **The goal of development is to move the body from a lower energy homeostatic state to a higher energy and healthier homeostatic state.**

2. **Feedback loops** are the special communication links that maintain states of homeostasis. They can be of two major types:

   **Negative feedback loops** stabilize the body by causing a return toward an ideal or balanced state. They tend to return the body to the way things were before a particular part of the system was disturbed or changed. For example, if one does not sleep enough on a given night, the body will signal this with fatigue in order to cause one to sleep more the next night. This tends to return the body to a rested state of balance. Fatigue acts as a feedback mechanism, in other words, that helps us return to stability, balance and health.

   **Positive feedback loops** cause a movement further away from balance. They are also called *vicious cycles* and, at times, *self-fulfilling prophesies*. They always lead to death of the body if they persist for too long. A positive feedback loop causes an element in a complex system that is disturbed to become even more so. **Positive loops destabilize the body, while negative loops stabilize and balance.** Common examples of positive feedback loops include:
• **Lifestyle** – Lack of rest worsens fatigue, which can lead to sleep difficulties from being overtired. This leads to poorer sleep. The cycle may continue until illness occurs.
• **Diet** – Eating sweets, even too much fruit, worsens blood sugar imbalances that increase the cravings for sweets. This, in turn, leads to greater consumption of sugars until hypoglycemia, diabetes and other serious illnesses occur.
• **Mineral balance** – Low tissue calcium in a child increases the stress level, which, in turn, can further increase the oxidation rate. This tends to worsen the calcium deficiency. This, in turn, increases the stress further, which causes an even faster oxidation rate.
• **Overtired children** – Fatigue causes a faster oxidation rate in most babies. This uses up a lot of energy, worsening the fatigue, which in turn increase the oxidation rate further. Soon the child is irritable and may cry or scream for no apparent reason.
• **Emotional illness** – A simple event may cause anxiety that, in turn, adds stress to the body. This, in turn, increases anxiety, which further worsens the person’s stress level. If this continues for more than a few seconds or a minute, at most, a panic attack may occur.
• **Addictions** – All addictions are vicious cycles, which is why they are so dangerous. For example, cocaine, or even caffeine or sugar, may cause a ‘high’, but they also stress the body and deplete nutrients. For this reason, when the substance wears off, the ‘high’ is replaced by a ‘low’ that results in an even greater craving for the item than before one used it.
• **Spiritual** – Feeling like a victim disempowers a person, which makes one feel even more like a victim. This further disempowers one in a vicious cycle that can last a lifetime.

**All serious diseases are vicious cycles.** Anaphylactic shock is an obvious example. The throat may swell and close up, which causes panic and impaired respiration. This, in turn, worsens the shock reaction until death occurs unless the process is stopped somehow. Cancer, diabetes, heart disease and others are also deadly because they involve positive feedback loops.

**Implications of cybernetics:**

• **The goal of development, in a broad sense, is to assist the body to break out of positive feedback loops and to restore stabilizing negative feedback loops.**
• **The life of the body can be viewed as a series of homeostatic states our bodies pass through as they respond and adapt to stress.**
• **Toxic metals and nutrient deficiencies often contribute to vicious cycles in the body.**
• **As one ages or sickens, homeostasis is harder to maintain and more vicious cycles occur.**
• **Modern societies also depend on negative feedback loops to keep society in balance.** Among the important ones are free speech, free markets and open competition in the business world.

**HOLOGRAPHY**

The holographic principle is that the whole is found within each of the parts, or each part of a system contains a blueprint of the whole system. This is a subtle, but very important principle of development. I will give a simple example:

**The sodium/potassium ratio.** This simple ratio indicates the balance between:

• **Pro-inflammatory and anti-inflammatory adrenal hormones (aldosterone and cortisol).**
• Estrogen and progesterone.
• Zinc and copper.
• Yang and yin forces.
• Alarm and exhaustion stages of stress.
• Anabolism and catabolism.
• The Ayurvedic qualities of pitta-vatta and kapha.

In other words, a part of the body system – in this case, the hair sodium/potassium ratio – is a microcosm of the whole and contains the whole, though in an incomplete form. This idea applies to many aspects of development such as the mineral levels, other ratios, the oxidation type and rate, and other mineral patterns.

FRACTALS

A fractal is a numbered pattern that is repeated over and over to form a complex, self-regulating system. Fractal science is a type of design science in which simple numbered patterns are repeated over and over to permit very complex functioning. For example, human beings have two arms, two legs, two eyes, two kidneys and two ears. This is a simplistic example of a fractal using the number two.

In a fractal, the whole pattern is repeated in the parts and the parts express the blueprint of the whole. Holography is a subset or derivative of fractal geometry in which the whole is represented in the parts, but the parts do not contain the entire whole. In a fractal, by contrast, the parts do contain the whole system to a greater degree or even completely. Fractals are very important in development science for the following reasons:

• In development, there are patterns of ones that repeat, twos that repeat, and so on.
• Fractals are the reason why a single, simplistic ratio such as the sodium/potassium ratio or the calcium/potassium ratio gives us so much information all at once. This cannot be understood by any other means.
• Fractals also help us understand the mineral balance in the body because fractal science is used by nature to build the plant and the animal bodies. This is clear from the fractal nature of some flowers and tree trunks, for example, that display mathematically-proportioned patterns that, in turn, produce all of nature’s beauty and functionality.
• Fractals are needed to understand Dr. Eck’s supplement recommendations. He learned that certain supplements mysteriously balance the body, while others do not. While he did not know theoretically why this is so, fractal chemistry can help explain it.
  For example, mercury, cadmium and zinc exist in a fractal arrangement that is represented on the periodic table of the elements as one of the columns on the table. There are many such arrangements in physics, biology, chemistry and even psychology.
• Dr. Eck was aware of what he called couples, triplets and quadruplets among the minerals, for example. This, however is just a small part of the way fractal geometry is used in the body and its biochemistry. The principle goes far beyond and applies to all natural creations.

HEALTH IS DEPENDENT ON ENZYME STRENGTH
The health of the body is the health of its enzyme systems. This concept is from modern molecular biology and biochemistry. It sounds simple enough, and it is at one level. At another level, it is the most complex of all the principles.

Each of the body’s enzymes depends upon the presence of specific components, including many minerals, vitamins and other substances. Some of these are parts of the enzyme. Others are needed as catalysts or facilitators. This means they are not components of the enzyme itself, but they must be present for the enzyme to work properly. Others may function as inhibitory factors that are also needed in the right amount for the enzyme to function properly.

In addition, every enzyme requires certain environmental conditions such as the correct temperature, pH and others in order for it to function properly. Dozens of vitamins, minerals and other chemicals may be required for a single enzyme. Bringing all these parts and conditions together is quite a feat, yet our bodies manufacture and activate millions upon millions of enzymes every second. If the process were to slow or stop for even a minute, death would quickly follow. Development focuses on restoring these enzyme systems. Aging and illness occur when even one aspect of a crucial enzyme is missing or defective in some way.

Measuring enzyme strength. One can roughly assess the level of enzyme activity using the oxidation rate. However, this is only general. Of the body’s trillions of enzyme systems, only a few have been studied in detail. A general assessment is too non-specific to be usable. Also, a malfunction in even one key enzyme system can cause serious illness or even death. The best idea is to just get to work on the slow and arduous task of restoring all the enzyme systems. This discussion, by the way, has little to do with taking enzymes or those found in foods. This discussion is purely about the enzymes made by our bodies every moment of every day.

PREFERRED MINERALS

Most enzymes in our bodies can function with several minerals in a given enzyme binding site. However, one, or rarely two minerals, are always the preferred minerals in the binding site that permit the enzyme to function optimally. Healing with development involves replacing the less preferred minerals with the more preferred minerals to restore enzyme strength. This principle is at the heart of development science. Here is its essence:

- Enzymes require specific minerals to function optimally.
- If the ideal or preferred minerals are not available from the diet, many enzymes can function to some degree using other minerals. I call these less preferred minerals.
- This is an adaptive mechanism to keep one alive in the face of nutritional deficiencies.
- When a less preferred mineral is used in an enzyme system, the enzyme functions at a lower rate of efficiency and effectiveness. This causes health problems of every kind.
- The goal of development and every other truly deep healing system may be viewed as replacing thousands of less preferred minerals in the body’s enzyme systems with the ideal or more preferred minerals. This is the only way on a physical or biochemical level to restore the body’s enzyme systems to full functioning capacity, and thus restore health and vitality to the most optimal levels.

An analogy. Imagine a fan belt on your automobile breaks while you are driving through a desert, miles from civilization. You might try wrapping a leather belt or a rope around the pulleys of the engine in order to continue driving. The proper fan belt is like the preferred
mineral in the body. The leather belt or rope is like a less-preferred mineral. It won’t work nearly as well, but it might allow you to keep going at a slow speed, and it might save your life. Development is like taking the car to the repair shop and having the mechanic replace all the less-preferred parts with the factory original parts. Soon the car starts to run much better!

**Why it works.** The reason minerals can substitute one for another is they “look” similar at the sub-atomic level. Therefore, certain toxic metals can “fit” into the metallo-enzyme binding sites rather well. Exactly how this happens is explained in the well-known periodic table of the elements. Dr. Eck respected the work of the late Henry Schroeder, MD, who wrote:

> “Look at the table vertically. Each element down from the top row is like the one above it, only heavier (and somewhat larger). Its outer electron ring is exactly like that of the one above…. Therefore, it has the same chemical and physical properties, only a bit different because of size. Its reactions are the same.” (*The Trace Elements And Man*, p. 3).

> “When tissues have an affinity for a certain element or are structured by it, they have an affinity for all other elements of the group (in the periodic table of the elements).”  (Ibid. p 6.)

> “The correct key fits the keyhole and unlocks. (A similar key) will fit the keyhole but it won’t unlock. A different make of key will not even fit the keyhole.”  (Ibid., p. 7)

Here are some common examples of mineral replacement:

- **Zinc is needed in the pancreas to help produce a high quality insulin.** If iron replaces zinc, the amount and quality of the insulin will decrease.
- **Magnesium is needed in over 500 enzymes.** If it can be replaced, the replacement mineral causes the enzyme to function at 10% or less of normal capacity. This causes fatigue, heart problems and many other symptoms.
- **Lead can replace calcium in the bones if calcium is not available.** This prevents a total breakdown of the bone. However, it produces a less intact bone structure that causes osteoporosis later in life.
- **Zinc is needed in the arteries to give them flexibility.** If it becomes replaced with cadmium, the arteries become hard and inflamed.

**Implications of the concept of preferred minerals:**

- **Toxic metals do not just deposit idly in the body.** Most are incorporated into specific enzymes, tissues and organ structures. Removing them somewhat forcefully and randomly with chelators can cause problems for this reason.
- **The body has a definite order and time sequence to replace less preferred minerals.** Removing toxic metals and replacing vital minerals is not a matter of dumping out the bad ones and pouring in the good ones. Done haphazardly, the process tends to stall.
- **Specific toxic metals replace specific trace elements.** This is the rationale for the use of specific targeted antagonists for toxic metals.
- **Aging is due, in part, to having too few preferred minerals in one’s enzyme binding sites.**
- **Birth defects are often due to the replacement of preferred minerals with less preferred minerals.** In this sense, our DNA is more like a template than it is a total prescription for enzyme and protein synthesis.
• **Healing reactions** are often the result of a more preferred mineral replacing a less preferred one. To use our automobile analogy, at times the engine is accustomed to using a poorer-quality substitute part. When this is replaced with the factory part, the engine must be tuned again or calibrated to run correctly. Until this occurs, it runs roughly or poorly. This is not a bad analogy for the cause of many healing reactions.

• **Good vitality** is another word for having preferred minerals in your trillions of enzyme binding sites.

**HOMEOPATHY**

Homeopathy is the use of potentized remedies for healing made from plants, animals, minerals, viruses and, in fact, almost anything. It was discovered by Samuel Hahnemann, MD, in the mid-1800s in Europe, where it remains more popular than in the United States. The AMA managed to outlaw homeopathy in America in the early 20th century. The queen of England uses a homeopathic physician. Principles from homeopathy that are part of development science include *pleomorphism, the principle of layers of adaptation* and *aggravations or healing reactions*. The next few chapters discuss these ideas.

**TRADITIONAL NATUROPATHY**

Traditional naturopathy is the use of natural elements from the earth, air, water, food, herbs and the sun for healing. Many principles from this excellent healing tradition used in development include:

• *An emphasis on a healthful diet, lifestyle, clean water for drinking and nutritional supplements to strengthen and balance the body.*

• *The use of herbs.* This large topic is discussed in more detail in Chapter 4.

• *The importance of toxicity in disease, and how to remove toxins safely from the body.*

• *The use of hydrotherapy such as enemas, baths and colonic irrigation.*

• *The use of physical therapies such as sauna therapy, massage and bodywork.*

In America, the AMA managed to outlaw most naturopathy in the early 20th century. Today, unfortunately, most naturopathy, especially that taught in the licensed naturopathic colleges, focuses far too much on symptomatic correction. Also, too many naturopaths want to prescribe drugs and natural hormones, which are also toxic drugs. This is a total departure from their glorious tradition of avoiding all toxic substances.

**EASTERN OR ORIENTAL SCIENCES AND DEVELOPMENT – THE BALANCE OF YIN AND YANG**

All physical life and health depend on making the correct balance between opposing and complementary forces that are traditionally called *yin and yang*. Dr Eck once told me that the science that was closest to development is acupuncture. At the time, I did not understand why he believed this. However, I have since come to appreciate just how important the idea of balance is in development. Examples of balancing yang and yin in the body chemistry include balancing:
• Fast (more yang) and slow (more yin) oxidation.
• Sodium (more yang) and potassium (more yin).
• Zinc (more yang) and copper (more yin).
• Calcium (more yang) and magnesium (more yin).
• High Na/K (more yang) and low Na/K (more yin).
• Sauna therapy and coffee enemas (more yang) and distilled water (more yin).

Today, most of the bodies are yin. Thus, more yang energy is needed by most people.

**Macrobiotics.** This very ancient science assigns a place between the extremes of yin and yang for all types of foods, and one balances the diet this way for optimum health. Macrobiotic ideas were not part of Dr. Eck’s original work. I have added it, however, because it works beautifully. However, as with Chinese medical concepts, only certain aspects of macrobiotics are part of development science. Other aspects of all these ancient sciences appear less helpful today, so they are not part of development science. The topic of yin and yang is discussed more in Chapter 5.

**CHINESE FIVE-ELEMENT THEORY AND ACUPUNCTURE**

The Chinese five-element theory is related to development as well. In development, however, about seven elements are important, and they are not integrated in the same way as in Chinese medicine. However, the concept of basic elements applies very much in development theory. Below, I have listed the element at the left with a chemical element next to it and the Chinese equivalent, roughly, on the right:

<table>
<thead>
<tr>
<th>Development Element</th>
<th>Chemical Element</th>
<th>Chinese Element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food and diet</td>
<td>carbon</td>
<td>Wood</td>
</tr>
<tr>
<td>Lifestyle</td>
<td>oxygen</td>
<td>Air</td>
</tr>
<tr>
<td>Sauna therapy</td>
<td>phosphorus</td>
<td>Fire</td>
</tr>
<tr>
<td>Distilled or spring water</td>
<td>oxygen/hydrogen</td>
<td>Water</td>
</tr>
<tr>
<td>Mineral supplements</td>
<td>many minerals</td>
<td>Metal</td>
</tr>
<tr>
<td>The Roy Masters exercise</td>
<td>zinc and selenium</td>
<td>Earth or grounding</td>
</tr>
<tr>
<td>The God connection</td>
<td></td>
<td>Heaven</td>
</tr>
</tbody>
</table>

**ACUPUNCTURE PATTERNS CORRELATE EXACTLY**

Many acupuncture patterns are identical to the hair analysis patterns. An article at [www.drlwilson.com](http://www.drlwilson.com) describes them. Here are a few examples:

*Yang rising = three highs/four highs pattern*
*Damp heat = copper toxicity*
*Yin deficiency/blood deficiency = bowl pattern*

**THE THREE DOSHAS OF AYURVEDIC MEDICINE**
Ayurveda is an ancient East Indian healing science built around balancing three types of imbalances or ‘blemishes’ called doshas. The correlation with the metabolic types in development is striking for anyone who has studied both systems. Very briefly, the three doshas are:

- **Vatta.** This means air, ether or perhaps mind and emotions. This is the source of the other two imbalances. Western science is just beginning to appreciate the power of the mind and emotions on health.
- **Pitta.** This means fiery energy, will and a more yang approach to life. This correlates perfectly with fast oxidation in development science. However, pitta and the others are qualities of bodies, not metabolic types. Metabolic typing is a Western idea that is far simpler to understand.
- **Kapha.** This means earth or watery energy. It corresponds more to slow oxidation in development. However, once again, kapha is a quality, not a metabolic type.

THE THREE QUALITIES (GUNAS IN sanskrit) OF AYURVEDIC MEDICINE

Ayurveda teaches that nature is comprised of three basic qualities or substances called gunas in Sanskrit:

- **Sattva or balance** is associated with balanced and flexible oxidation.
- **Rajas or hot or burning** is more yang and more associated with an alarm stage of stress and fast oxidation.
- **Tamas or passive** is more yin and most associated with an exhaustion stage of stress and slow oxidation.

Ayurveda also discusses toxins or *ama* in Sanskrit. Unfortunately, I have repeatedly found that some Ayurvedic herbs contain too many toxic metals to be healthful today for long-term use, even those of the best quality. The same is true of many Chinese herbs. Please beware of this and do not use these herbs on a continuous basis. Even products such as Sunrider and other herbal food systems are too toxic for continuous use.

OLDER SCIENCES LESS EFFECTIVE TODAY

Some will disagree with this perspective, but in my 30 years of experience, the older Eastern and Western medical sciences are not as effective today as they once were. This is precisely due to the changes in our food supply, drinking water, air quality, ionizing radiation from atom bomb tests and other factors such as electromagnetic stress. For example, even the best quality organic food today has far lower levels of vitamins and minerals than most food grown 100 years ago. While some practitioners are excellent, in general the older sciences are missing too many elements needed for today’s toxic bodies. For this reason, development science takes some ideas from many of the older sciences, and integrates and updates them to deal with the health disasters and special needs of the 21st century.
9.
OTHER BASIC PRINCIPLES OF DEVELOPMENT SCIENCE

Don, age 35, was a local dentist and a brittle, insulin-dependent diabetic for over 10 years. He took 10-13 units of regular insulin before each meal, and an additional 17 units of NPH insulin at bedtime. He flew 500 miles every few months to visit a prominent diabetes specialist at Scripps Hospital in California. Yet he was feeling worse, with more fatigue, sweet cravings, irritability and mood swings. His prescribed “diabetic diet” was high in fruit and whole grain bread with snacks of fruit between meals. His first hair test revealed:

- **Calcium was 195 mg%**. This is a calcium shell pattern associated with psychological withdrawal, lowered energy production and usually an acidic pH and reduced cell permeability. All of these interfere with blood sugar regulation.

- **Potassium was very low at 2 mg%**. This is associated with adrenal exhaustion and often impaired blood sugar due to imbalanced cortisone secretion. A hair potassium level of 4 mg% or less also indicated he was in sympathetic dominance. This is a tendency to overuse the fight-or-flight nervous system, which also slows healing in many ways.

- **The calcium/potassium ratio was 92.5:1**. This usually indicates diminished thyroid activity, another link in the hypoglycemic-diabetic saga.

- **Zinc, manganese, chromium, selenium and phosphorus levels were also low.**

- **Lead, mercury, cadmium and aluminum** were elevated. The copper and nickel levels were borderline high.

I advised Don to reduce dietary carbohydrates and eat protein every few hours and with each meal. I suggested only a basic development supplement regimen because he told me he was not good at remembering to take pills. He did not want to do coffee enemas, and I was not recommending sauna therapy at that time. Within a few days, however, Don reported reduced sugar cravings, more energy, less hunger in the evenings and fewer mood swings. His wife called me and said he was much easier to live with.

Don came for a retest hair analysis after several months. He was eliminating more lead, mercury, copper and nickel. Cadmium and aluminum decreased somewhat. This indicates that less of these were being eliminated during the first three months on the development program. Calcium decreased from 195 to 114, indicating a much faster oxidation rate. It means Don’s ability to utilize energy was much improved.

Don’s program remained similar, and he had another hair analysis seven months later. The calcium/magnesium ratio finally came into the normal range. Also, zinc improved significantly from 11 mg% to 14 mg%. Phosphorus improved from 11 mg% to 13 mg%. This
might have been due to more protein in the diet, although more tissue zinc is important for protein synthesis and may have been the reason for the improved phosphorus level. A better phosphorus reading often indicates improved vitality, a key to healing all illness. Don’s toxic metal levels remained high, and cadmium was even higher at 0.06 mg%, over six times the ideal level. Cadmium and iron toxicity are common in diabetes. The following imbalances also remained the same: a slow oxidation rate, sympathetic dominance pattern and an elevated sodium/potassium ratio indicating acute stress.

After about a year on a development program, Don felt much better and was very happy with the program. However, he began to slack off his program. Even though his wife packed up his vitamins for him each day, he started forgetting to take them. He told me he was tired of following the regimen. Soon Don started to feel worse, and he stopped checking in every few months. The sad part is that if he had continued just another year or two, Don might not have required the strict diet and nutritional supplements as much, as his body would have been significantly restored.

This chapter introduces another set of important principles that are part of development science. They include vitality or adaptive energy, Western medical sciences, biochemical individuality, metabolic typing, retracing, wellness, orthomolecular nutrition, predictive medicine and restorative or functional medicine.

VITALITY, LIFE FORCE OR ADAPTIVE ENERGY

Vitality, life force or adaptive energy is the most basic measure of health. This is why Dr. Eck called development “the science of human energy”. Adaptive energy was defined by Hans Selye, MD as the energy an organism uses to adapt or respond to its environment. It is much more than just the energy a person uses to move around or even to digest his food. It is more fundamental than that.

Post-modern medical care pretty much ignores the entire concept, much to their detriment. If they paid attention to it, they would have to abandon most of their drugs and procedures because they would find that these deplete the vital force significantly in a lot of cases. A phrase in medical care that most closely describe good vitality is “high resistance to disease”. A phrase that describes poor vitality is “run down”, though this is admittedly crude.

Other cultures gave it names such as chi, qi, prana, orgone energy, vital force and others. However, their definitions are often vague. For example, even with acupuncture techniques, it is hard to measure exactly. Hair mineral analysis can measure it, but only to a degree. At least the hair test is precise and mathematical, and easily duplicated. It can be measured in the brightness of the auric field around a person’s body, but this is only possible with sensitive electronic measuring instruments, and even then it is not precise. The brightness is a measure of the high-frequency etheric or life energy in a body.

Each person is born with a certain amount of this vital force or vitality. As one ages, the amount always declines. However, one can maintain and even increase it by certain well-known means. Methods to help maintain vitality include:

- Eating high quality food that nourishes the body.
- Drinking pure, uncontaminated distilled or spring water only. The correct water may even enhance the vital force or etheric energy.
• Following healthy lifestyle habits such as adequate rest and sleep, engaging in light and regular exercise such as slow walking, and breathing deeply and fully.
• A healthful occupation, fun hobbies, quality personal relationships, happy thoughts and emotional control help maintain a positive attitude and intent to live a long life.
• Development science recommends all these, plus targeted nutrient supplements and detoxification procedures to further help maintain one’s vitality by nourishing and balancing the body in many ways.

Methods that can actually enhance one’s vitality or life force include:

• The Roy Masters observation technique, and not most others. This is the main reason this exercise is recommended in development. It can actually regenerate the body if done correctly over a period of years.
• Eating certain foods and herbs that have high etheric energy can enhance vitality. These include quality meats, eggs, cooked vegetables and some whole grains, but not wheat anymore, and not most fruits, beans, seeds and nuts, which have less etheric energy.
• Cooking food lightly and properly enhances its vital energy. This principle is used in many Oriental sciences such as macrobiotics.
• Close contact with a person who has a higher vitality level also helps. This is one reason some people benefit from intimate relationships, and even why some people visit gurus, although most are not as enlightened as they say they are.
• Some locations radiate more etheric energy than others. For example, higher altitudes and drier climates tend to be a little better.
• Certain rock formations give off more of an etheric energy, as do certain crystals and gemstones.

Implications of the vitality concept are:

• Every ailment or symptom begins with fatigue or lowered vitality. This helps explain why some people catch cold faster than others, for example, even if they have similar lifestyles. We say they are “run down”, which can describe their level of vitality.
• All adaptation to stress uses up adaptive energy. This means that adapting to cold, heat, noise, infection, lack of rest, improper food or other stress of any kind is not helpful for one’s health because these use up adaptive energy. This is why I advise people to sleep a lot, stay warm at all times and avoid vigorous exercise. Some temporary stress due to exercise or activity is good for building the bones and muscles, but this should be its only function. A certain amount of certain other stressors are also beneficial because they are analogous to exercise. That is, they develop other parts of the human body or mind. These are discussed in Chapter 11 on stress.
• Any activity that depletes energy or vitality is not helpful. Even too much thinking is not helpful for health, although some reasoned thinking is essential.
• Building vitality is central in development. This is done with diet, lifestyle modification, supplements and detoxification, along with the mental and emotional training offered by the Roy Masters meditation exercise.
Measuring vitality. This is not easy. The following are principles regarding this topic:

- *Vitality and Age.* Age is always an important factor in determining vitality. For example, all young children are generally more vital than even a healthy person who is 85 years old. This applies even if the child is “sick” and the 85-year-old is “well”. Of course, there are a few exceptions, as one may die in childhood.

- *Vitality is not the same as being “energetic” or “high energy”.* Many people race around all day and even part of the night. However, based on their hair mineral tests and symptoms, most of them do not have a high vitality level. Some live on stimulants, for example, such as coffee, sugar, chocolate and others. Stimulants may also include stress, anger, fear, sexual drive, loud music, medications and other stimulant substances, habits or activities.

- *Vitality roughly corresponds to the stage of stress.* The alarm stage of stress, the earliest stage, has the highest adaptive energy or vitality. The exhaustion stage has lower vitality, in general. This idea may need to be modified, however, by other mineral ratios and levels.

- *Vitality may also be indicated by a more balanced oxidation rate.* Drs. Watson and Eck found that the greatest cellular energy production occurs with a balanced oxidation rate. This can be tricky, however, as many cancer patients have a fairly balanced oxidation rate, at least on their initial hair tests. So other factors can obviously influence the oxidation rate and one must not just consider this one factor to evaluate vitality.

Hair analysis criteria for vitality. Vitality criteria on a hair mineral analysis include:

- *The lower the phosphorus level, below about 13 mg%, the lower the vitality.*
- *Those with a normal or elevated sodium/potassium ratio are generally more vital than those with a low sodium/potassium ratio, provided the ratio is not above about 15:1.*
- *Fast oxidizers are generally more vital than slow oxidizers.* Also, fast-mixed oxidizers tend to be more vital than most slow-mixed oxidizers. However, a very low sodium/potassium ratio in a fast or fast-mixed oxidizer is not a good sign of vitality.
- *High toxic metal levels, especially in slow oxidizers, often indicate a lower level of vitality.*

More specific ways to assess high, medium and low vitality with hair analysis include:

1. High vitality indicators. The more of these that are present the better:

- *A mild or fairly balanced oxidation rate, either fast, slow or mixed.*
- *A sodium/potassium ratio between about 2.5 and 15.*
- *A calcium/magnesium ratio between 4 and 10.*
- *A phosphorus level between 15 and 20 mg%.*
- *Low toxic metal levels.*
- *Good trace element levels.*
- *A calcium level between 35 and 90 mg%.*
- *A potassium level between 4 and about 50 mg%.*
- *A zinc level between 13 and 22 mg%.*
- *An aluminum level less than 0.2 mg%.*
- *No four lows pattern present.*
2. Medium vitality indicators:

- Somewhat elevated level of one or two toxic metals.
- A mild oxidation rate, either slow, fast or mixed.
- A sodium/potassium ratio between 1.5 and 15:1.
- A calcium/magnesium ratio between about 3 and 11.
- A phosphorus level between 12 and 20 mg%.
- Somewhat reduced levels of zinc, chromium, selenium or mild elevation of iron or manganese.
- No four lows pattern present.

3. Lower vitality indicators:

- A high level of one toxic metal or somewhat elevated levels of several toxic metals.
- A more extreme oxidation rate, especially slow.
- A sodium/potassium ratio less than 1.5 or above about 15.
- A calcium/magnesium ratio less than 3 or greater than 11.
- A phosphorus level less than 12 mg%.
- Reduced trace elements such as zinc, or elevated copper, manganese, iron, chromium or selenium, except if one is using a selenium-based shampoo.
- The presence of a four lows pattern.

Chapter 25 discusses vitality in more depth.

WESTERN PHYSIOLOGY, BIOCHEMISTRY, MICROBIOLOGY, HISTOLOGY AND OTHER STANDARD MEDICAL SCIENCES

Development uses Western medical sciences in an unusual way by relating their concepts and facts to:

- Specific stages of stress and metabolic types.
- Specific nutrient deficiencies or toxic metal excesses that alter particular enzyme systems.
- Specific mineral levels, ratios and patterns on a hair mineral analysis.

BIOCHEMICAL INDIVIDUALITY

Each person has somewhat individualized nutritional needs. People’s nutritional needs vary depending upon heredity, age, lifestyle, temperament, occupation, stress levels, and illnesses. They also depend on the metabolic type, mineral ratios, the presence of toxic metals and other subtle factors such as the level of mental development. The idea that everyone has the same nutritional needs is simply incorrect.

Implications of biochemical individuality:

- The RDAs (recommended daily allowances), MDRs (minimum daily requirements) or similar standards are of lesser importance for optimal health.
• Testing for nutritional needs and tailoring nutrition programs must be done for best results.
• Even with hair testing, at times healing programs must be further altered to fit a person’s individual needs. Experienced practitioners understand this well.
• Government efforts to “standardize medical care” will likely continue to fail badly. A committee in the capitol cannot simply arrive at the best way to treat everyone.

ORTHOMOLECULAR MEDICINE

Isolated nutrients can be used to heal many health conditions, when given in the right amounts. This idea was originally put forth by the late Dr. Linus Pauling, PhD, winner of two Nobel prizes. Development is a type of orthomolecular approach. However, it differs from most others in several important respects:

• The goal of development is not to relieve symptoms, although this occurs quickly and easily in almost all cases. Instead, it focuses on whole system responses to stress, improving overall vitality and restoring homeostasis to the entire organism.
• With most orthomolecular approaches, the patient must often remain on a vitamin regimen indefinitely. Otherwise, symptoms tend to return because underlying imbalances have not been addressed. With development, once the stress response is corrected, one need not remain on doses of vitamins forever.
• The high doses of common vitamins and minerals used by most orthomolecular physicians are rarely needed with development. Dr. Eck knew that higher, unnatural doses of anything tend to be more toxic, though they are still much safer than most drugs.

METABOLIC TYPING

Metabolic typing is a method of easing the difficulty of working with complex human bodies by classifying them in some simple way. As used in development, metabolic typing is a physics principle. In other words, it is concerned with qualities of bodies such as heat and cold, expanded and contracted, more tense or more relaxed. These are not strictly medical ideas, yet they apply to the human frame. In this sense, fast and slow oxidation are, in fact, basic states of matter, of which our bodies are made. These are discussed in detail in Chapters 12 and 13.

For example, matter can be more on the hot side or more on the cold side. Matter can be more contracted or yang, or more expanded or yin. Matter can be more reddish or yang or more pale or yin. These qualities are the basis for fast and slow oxidation types, as well as for yang and yin in the ancient Chinese healing arts. Other systems of metabolic typing, such as that found in Ayurveda, or that of Hippocrates and others, are often variants on the same theme.

Although it can be very helpful, cautions with metabolic typing include:

• Metabolic typing systems are never perfect, as they are always generalizations.
• One must not draw conclusions with little understanding. For example, all slow oxidizers are not the same. One must still learn each person’s symptoms, health conditions and so forth.
• One must not label people and create demeaning stereotypes. People are not “fast oxidizers”, technically. They are souls whose bodies happen to be in a fast oxidizer state.
One should not confuse different systems of metabolic typing. For example, this book is based on typing people using hair mineral analysis. Other systems of typing use blood tests, urine tests or other methods. These are not the same, and will yield different results.

Older typing systems, such as Chinese pulse diagnosis, may not work quite as well today due to very different physical health conditions of many people today. Several doctors have objected to the metabolic typing system in this book. They tell me I have bastardized yin and yang, and that I am not an expert in Chinese medicine or Ayurveda. I understand their perspective, but I also know that development works excellently.

RETRACING

Retracing is a fascinating process that occurs only with deep healing methods. One literally ‘returns to the scene of the crime’ and re-experiences an old infection, physical trauma or perhaps another ailment. One may also re-experience an emotional or mental event, memory or even an emotional trauma. The goal is to rework the illness or trauma, hopefully in such a way that it is cleared on every level of one’s being.

While not always pleasant, the process is the only method for fully reversing many symptoms and conditions to remove their every trace from the body and mind.

Other names for retracing. Chiropractic uses the word retracing. Homeopathy calls them aggravations. Psychology, particularly psychoanalysis, uses the word catharsis. Other sciences use words such as the reversal process, healing reactions, flare-ups or purification reactions. Chapter 45 is devoted entirely to this important concept.

THE WELLNESS MODEL OF HEALTH

Wellness is a lifestyle approach to avoid illness and reach one’s highest potential. It is related to high vitality. It is the idea that one can achieve a higher level of health beyond just avoidance of major illnesses. It is a key concept in development science.

Unfortunately, measuring wellness is not easy. Medical methods such as checking one’s blood pressure, height, weight, age, and degrees of artery blockages are factors in determining wellness, but are inconclusive, as are hair analysis assessments. As a result, wellness is a fabulous theoretical idea, but not that useful in clinical practice. Health authorities are now beginning to speak of wellness. They often mean a better diet and lifestyle to help prevent disease. This is an excellent first step, but high vitality or wellness is more than this.

PREDICTIVE AND PREVENTIVE MEDICINE

Real prevention and prediction are engineering concepts that can be of great benefit for medical care as well. One can easily predict in about how many miles a person will need new tires on an automobile based on the depth of the tire treads. In a somewhat similar fashion, one can often easily predict and therefore prevent health disasters using hair mineral analysis and development science.

By correlating over 200,000 hair mineral tests with the client’s symptoms and diagnoses, Dr. Eck identified at least 50 trends or research associations between mineral patterns, and physical and mental health conditions. A trend may appear on the hair test years before symptoms manifest. This is the best form of disease prevention I am aware of.
Post-modern medicine talks about prevention, but their methods such as vaccines, water fluoridation, many x-rays and “preventive drug use” are costly, unsafe and often far from ideal.

RESTORATIVE OR FUNCTIONAL MEDICINE

One can seek to restore normal functioning of the body, rather than just suppress symptoms. These are popular words in the holistic healing field. Development is a functional and restorative approach to healing. Most doctors, however, do not take the concept far enough. For example, many doctors believe that if one’s testosterone level is low, the functional medicine approach is to replace the hormone to normalize its serum level. While this can help symptoms, development goes much further by rebuilding the enzyme systems in the testis to produce more testosterone, rather than use hormone replacements.
Mary consulted me for feelings of fatigue. Our conversation revealed that she was unhappy with her job, felt stuck in a poor quality relationship, and did not like where she was living. When asked why she didn’t do something about the situation, she shrugged her shoulders. Mary had a healthful diet and got enough rest. However, her mineral analysis revealed glucose intolerance and very sluggish adrenal glandular activity. This combination can certainly cause fatigue and impair both mental and physical functioning.

After several months on a development program, Mary returned for a follow up visit. She reported that she found a new job and a new apartment, and had a new boyfriend. This is not uncommon with development. Many people feel stuck in their job, location or relationship simply due to low energy and difficulty in thinking clearly. A development program can help a person to function much better mentally and to have the adaptive energy to move on in their lives, even when that involves taking risks and leaving one’s comfort zone. This process may be called personality integration, maturity or self-actualization.

CHAPTER ORGANIZATION

This chapter briefly discusses more advanced topics that are integral to development science. They include:

- Personality integration.
- The mineral balancing system (specific relationships between all the minerals).
- Biological transmutation of the elements.
- Pleomorphism.
- Spiritual development.
- The chakra system as it relates to development.

PERSONALITY INTEGRATION

This may be defined as the ability to use all of one’s mental faculties in a fully coordinated and integrated manner. Development can help with this in many ways by removing blockages to normal brain functioning, improving the energy level and much more. Personality integration includes such intangibles as the willingness and ability to take risks, face challenges, and have the energy and courage to live up to one’s highest potential. Some may call this self-actualization or self-empowerment. This is an aspect of life that receives little attention,
as it goes beyond the usual definition of mental and emotional health. However, it is what people want, just as they really want “natural health” or wellness on a physical level. A key to personality integration is enhancing one’s energy level greatly. Reasons for this are:

- **Self-esteem is aided by high energy.**
- **Adaptive energy is needed to take risks and make changes in one’s life.**
- **People with higher energy levels think more positively and often feel more capable of carrying out their plans.**
- **Business courses teach that "people buy vitality". This means that higher energy levels have an attractive quality that others sense and admire.**
- **Having abundant adaptive energy helps with all decision-making.**
- **Energy or vitality is often required to stand up for what you believe, especially in the face of pressure to do otherwise.**
- **Building and maintaining quality relationships can take a lot of adaptive energy.**
- **Adaptive energy in abundance helps one to feel feelings deeply, to release old traumas, and to help get in touch with real needs and desires.**

A few simple cases can help illustrate the type of changes that people report on development programs.

**Case #1. The Emotional Catharsis.** Barbara went through a painful divorce two years ago. When asked about it, she assured me she had worked through her trauma with several therapists. However, she still did not feel well. Her hair mineral test showed a very low energy level with a slow oxidizer pattern, a calcium shell and a low sodium/potassium ratio. She began a slow oxidizer diet and an appropriate supplement program to rebalance her body chemistry and improve her energy. About a month into the program, Barbara experienced an emotional catharsis. She would cry at times for hours on end and could not stop rehashing the events of the divorce. After several weeks, the episodes ended as suddenly as they had begun.

When the catharsis began, Barbara initially became angry with me. She blamed something in the healing program for making her so depressed and weepy. I explained that far from making her depressed, the program had increased her available energy and perhaps her ability to process the past to the point where unresolved conflicts were brought to the surface and automatically resolved and released. She began to realize that, in some way, the development program had allowed her to fully experience the pain associated with her divorce and she was now finally free and happy once again. It was as though the program provided a type of emotional support that she needed in order to completely process and release her divorce.

**Case #2. The Wife-To-Be.** A prominent psychotherapist called one day. He asked me to set up a development program for his fiancé, who lived in another state. She sent me a hair sample. The test results revealed a low energy pattern and a few common imbalances. The young woman did not have any health complaints.

I mailed her the dietary instructions and several nutritional supplements, and did not expect to hear back from her anytime soon. However, several weeks later she called, somewhat embarrassed. She explained that the healing program had "lifted a cloud from her mind" and she was beginning to view the world differently. Among other things, she said she could not go
through with her marriage to the therapist. In this case, a simple change of diet and lifestyle, along with several targeted nutritional supplements, had somehow shifted her entire view of herself and what she wanted in her life.

**Case #3. The outburst.** A kind, mild-mannered, 30-year-old man consulted me with no specific health complaints. He said he just wanted to be "checked out" with a hair mineral analysis. I noticed, however, that he was quite agitated. His nervousness was so pronounced it was difficult to be in his presence. His hair analysis revealed a common slow oxidizer pattern and a low energy pattern.

After several weeks on a development program, the man went through an interesting personality change. He explained to me that he had been sharing his home with a roommate for a year who did not treat him or his property with respect. On one occasion, this friend had put his fist through a wall, for example. However, since they were friends, he had not spoken up about the problem. One evening, however, the client "went berserk", expressed his anger and told the roommate to leave at once. He shocked himself in the way he was able to express his need so clearly and forcefully and resolve the problem so easily. I noticed the young man was now much calmer.

Note that in each of the instances above, improving the balance of the body chemistry enabled each one to have a better level of awareness and an improved ability to process his or her life experiences. This also somehow enabled each of them to move ahead in a positive direction. This is the process of personality integration or self-actualization.

**THE BODY’S MINERAL SYSTEM**

Each mineral in our bodies affects the levels of all the other minerals in extremely specific and sometimes surprising ways. They are maintained in a delicate balance, regardless of the stresses on the body. The scientist who categorized these relationships in the soil was the late William Albrecht, PhD, who worked at the University of Missouri in the early twentieth century. He designed the “mineral wheel” that is on the cover of this book, illustrating the complex interactions of the minerals. His papers, some of which are quite technical, are collected in *The Albrecht Papers*, published by Acres USA.

Other scientists also noticed these interesting relationships between minerals. In 1998, Dr. Robert Becker and Gary Seldom authored *The Body Electric: Electromagnetism and the Foundations of Life*. They noted that copper is needed to fix calcium in the bones. Carl Pfeiffer, MD, PhD also noted some of the interactions that occur between minerals in the body.

Development science incorporates these complex interactions in the supplement recommendations. Dr. Eck, for example, found that if one wants to raise calcium, giving calcium will not help and will often lower the hair calcium level. However, giving copper causes the hair calcium to rise easily, without even supplementing calcium. To raise sodium one gives manganese, and to lower sodium one gives zinc. To raise magnesium, one can often give calcium, while giving magnesium will not work. To raise potassium, zinc will often work well, but potassium usually will not work.

These are just a few examples of this complex, but very essential aspect of development science. Dr. Eck made use of this subtle concept in designing his formulas and his corrective programs. This is the reason they are often simple, yet very effective for correcting the oxidation
rate and other mineral imbalances. This is also why \textit{symptomatic} nutritional programs, and \textit{replacement therapy} to restore nutrient minerals, are much less effective, in our experience. The mineral system of the body is extremely complex and utilizes physics principles that are far beyond the scope of this book.

\textbf{BIOLOGICAL TRANSMUTATION OF THE ELEMENTS}

This theory states that \textit{living organisms are capable of changing one element into another at body temperature and at normal atmospheric pressure}. It is a very controversial idea. Mainstream scientists largely avoid the topic, as its implications threaten the very basis of physical and biological chemistry. However, its truth has been proven over and over again. A major author and proponent of the theory is Dr. Louis Kervan, a brilliant French scientist. He wrote, among other works, \textit{Biological Transmutations} (1966, 1972 and 1998). Dr. Kervan offers numerous simple experiments to prove the theory that anyone can duplicate.

For example, a chicken will lay eggs that contain more calcium than the amount of calcium in the chicken’s diet. This has long been a mystery, since chickens do not tend to feed on high calcium foods. Biological transmutation provides a simple and elegant alternative explanation. Dr. Kervan worked out the chemical reactions that would need to take place and offers proof of how the transmutation works.

Chapters of Dr. Kervan’s book sound remarkably like Dr. Eck’s discoveries made through the use of hair mineral testing. For example, Dr. Kervan devotes an entire chapter of his book to the sodium/potassium ratio and how the body transmutes sodium into potassium. He notes that the ratio seems to depend upon aldosterone and cortisol. This bears great resemblance to some of Dr. Eck’s work as well.

Dr. Kervan also devotes a chapter to the calcium/potassium ratio. He found evidence suggesting that the activity of the thyroid hormones regulates this ratio. This is extremely similar to Dr. Eck’s conclusion that the calcium/potassium ratio is related to thyroid activity. Dr. Kervan also discusses why it is foolish and even dangerous to supplement certain minerals that may appear low in blood or hair. He explains the problem is they will be transmuted, and could cause a more severe imbalance. This is similar to Dr. Eck’s clinical observations concerning replacement therapy.

Hair analysis may indeed be giving us insight into much more esoteric mechanisms the body uses to maintain homeostasis. Many anomalies and odd uses of nutrients that Dr. Eck and others discovered by trial and error may be explained by this esoteric and advanced molecular biology concept.

\textbf{PLEOMORPHISM}

\textit{Animal and human cells can change form and function, depending on the terrain or medium in which they live}. This is an older medical concept dating back several hundred years, and also a controversial one. It is currently out of fashion, however. The word \textit{pleomorphism} means many phases, many forms or many states of matter. The concept is that physical matter, especially living organisms, can take a variety of forms and change back and forth from one to another depending upon the terrain or the environment in which they find themselves. For example, bacteria might change into fungal organisms in a different environment.
The terrain includes nutrient levels, the oxygen level, the acidity, and the amount of toxic metals and other toxins that are present. These, of course, change in the human body depending on one’s state of health, oxidation type, stage of stress, mineral ratios and other factors. The concept is used in dark field microscopy and in some European homeopathy texts. This theory actually predates the germ theory. While Louis Pasteur is credited with the germ theory, his nemesis, Dr. Antoine Beauchamp, championed the pleomorphic view of body cells.

Pleomorphism emphasizes the terrain, while the germ theory places much less emphasis on the environment of the cells and focuses on categorizing and killing thousands of bacteria, viruses, fungi and other forms of pathogenic microorganisms that may inhabit a human body. The two men disagreed on whose theory was best. According to written records, on his deathbed Pasteur admitted he was wrong and that Beauchamp was correct. Post-modern medicine, however, is entirely built on the germ theory and mainly ignores the terrain or overall health of the host organism. In fact, they often poke fun at “health nuts” and at most detoxification regimens designed to enhance the cellular milieu of the body.

Well-known proponents of pleomorphism include an impressive list of European, American and Canadian scientists such as Guenther Enderlein, Royal Rife and Gaston Naessens. Dr. Naessens calls it the somatid theory. He wrote:

"I have been able to establish a life cycle of forms in the blood that add up to no less than a brand new understanding of the basis of life. What we are talking about is an entirely new biology, one out of which has fortunately sprung practical applications of benefit to sick people, even before all of its many theoretical aspects have been sorted out."

According to the pleomorphic theory, all cells are capable of moving through 15 or 16 stages or forms. Only the first three or so are normal. The rest are pathological, ending with bacterial, fungal and perhaps viral forms. Dr. Eck was not aware of the connection between his research and pleomorphism, to my knowledge. However, it is possible that he identified some of the basic biochemical characteristics that cause the pleomorphic forms or changes in body cells. This is why I include the concept in this book. Below are listed the basic hair analysis patterns that I believe are associated with each of the main pleomorphic states. This needs to be researched more, however:

1. Fast oxidation, Na/K between 3-8, and Ca/Mg between 5-10.
2. Fast oxidation, Na/K less than 3 or more than 8 or so, and Ca/Mg between 5-10.
3. Slow oxidation, Na/K more than 3 and Ca/Mg between 5-10.
4. Slow oxidation, Na/K between 1-3, and Ca/Mg between 5-10.
5. Slow oxidation, Na/K between 1-3, and Ca/Mg between 2.5-5 or greater than 10.
6. Slow oxidation, Na/K between 1-3, and Ca/Mg between 1.5-2.5 or greater than 10.
7. Slow oxidation, Na/K between 1-3, and Ca/Mg less than about 1.5 or greater than 10.
8. Slow oxidation, Na/K between 0.5-1, and Ca/Mg between 5-10.
9. Slow oxidation, Na/K between 0.5-1, and Ca/Mg between 2.5-5 or greater than 10.
10. Slow oxidation, Na/K between 0.5-1, and Ca/Mg between 1.5-2.5 or greater than 10.
11. Slow oxidation, Na/K between 0.5-1, and Ca/Mg less than 1.5 or greater than 10.
12. Slow oxidation, Na/K less than 0.5, and Ca/Mg between 5-10.
13. Slow oxidation, Na/K less than 0.5, Ca/Mg between 2.5-5 or greater than about 10.
14. Slow oxidation, Na/K less than 0.5, and Ca/Mg between 1.5-2.5 or greater than 10.
15. Slow oxidation, Na/K less than 0.5, and Ca/Mg less than 1.5.
I will also list these as pure patterns. This is for research purposes in the future, and can basically be ignored unless one is particularly interested in this subject. The patterns and ratios below are those that would show up if one can eliminate all or most of the toxic metals and toxic chemicals from the body. They all are four lows macromineral patterns, but this is not the same as the four lows patterns written about elsewhere in this textbook. The pure patterns are as follows:

1. Four lows with fast oxidation, Na/K between 2.5-5, and Ca/Mg between 5-9.
2. Four lows with fast oxidation, Na/K less than 2.5 or more than about 5 & Ca/Mg between 5-9.
3. Four lows with slow oxidation, Na/K more than 2 and Ca/Mg between 5-9.
4. Four lows with slow oxidation, Na/K between 1-2, and Ca/Mg between 5-9.
5. Four lows with slow oxidation, Na/K between 1-2, and Ca/Mg between 2.5-5.
6. Four lows with slow oxidation, Na/K between 1-2, and Ca/Mg between 1.5-2.5.
7. Four lows with slow oxidation, Na/K between 1-2, and Ca/Mg less than about 1.5.
8. Four lows with slow oxidation, Na/K between 0.5-1, and Ca/Mg between 5-9.
9. Four lows with slow oxidation, Na/K between 0.5-1, and Ca/Mg between 2.5-5.
10. Four lows with slow oxidation, Na/K between 0.5-1, and Ca/Mg between 1.5-2.5.
11. Four lows with slow oxidation, Na/K between 0.5-1, and Ca/Mg less than 1.5.
12. Four lows with slow oxidation, Na/K less than 0.5, and Ca/Mg between 5-9.
13. Four lows with slow oxidation, Na/K less than 0.5, Ca/Mg between 2.5-5.
14. Four lows with slow oxidation, Na/K less than 0.5, and Ca/Mg between 1.5-2.5.
15. Four lows with slow oxidation, Na/K less than 0.5, and Ca/Mg less than 1.5.

This is quite advanced research. The implications are enormous, including the following:

- **If the terrain is all important, then diet, lifestyle, rest, sleep, thoughts and emotions should be the focus of our health care system, not drugs, surgery, fluoridation and other toxic methods.**
- **If terrain is important, detoxification of the body is critical, as development asserts.**
- **If terrain is critical, then keeping the body pure in all ways should be the goal.** Morals, character development and careful education of the young are therefore of the greatest importance. The move today away from values such as total honesty and integrity in favor of political correctness and moral relativism is just plain stupid for the well-being of the society.

**MENTAL AND SPIRITUAL DEVELOPMENT**

Development, as used in this book, refers to the growth or unfoldment of the subtle human bodies, sometimes called the etheric, mental, causal and other bodies. According to some, this is the ultimate goal of human existence. This type of development of a human being may be denied by many who only believe in the physical life. Others believe in mental and spiritual development, but do not think that simple items such as a diet, nutritional supplements or a healthful lifestyle with plenty of rest are needed or too helpful for this type of development. This topic is discussed in more detail in Chapters 6 and 40.

**THE CHAKRA SYSTEM AND DEVELOPMENT**

Development science helps develop the seven major chakras or energetic centers
of the body. This is quite wonderful, although the benefits usually cannot be seen or felt directly. Specific ways in which development helps this energetic system of the body are:

- Enhancing vitality is necessary for the process.
- Replenishing vital nutrients and removing toxic metals are most necessary and helpful.
- An emphasis on yang foods is most helpful.
- Use of animal glandulars (more yang) and avoiding yin supplements and herbs are helpful.
- The near infrared sauna, and, in fact, any sauna can help the chakras somewhat.
- The Roy Masters exercise, when done regularly, is extremely helpful.

Below are a few brief notes on each of the seven lower chakras as they relate to health and development:

**The first chakra = grounding.** The energy in this part of the body helps in keeping one’s feet on the ground and in feeling safe as you go through life. Everyone today needs help in this area. City dwellers, in particular, are often out of touch with the earth due to living in high rise apartments surrounded by electromagnetic pollution, poor air quality, noise, toxic chemicals in the building materials and elsewhere, and not enough vegetation for optimum wellness.

The glands most associated with this chakra are mainly the adrenals. Nutrients that appear most important for the development of this chakra include zinc, selenium, chromium, manganese and others that have to do with vegetative functions such as blood sugar regulation.

Development of this chakra is very critical for women today. They used to be more grounded thanks to rural lifestyles. Today, starting at an early age, girls are encouraged to excel in school and to enter the business world. This takes them away from a grounded and centered lifestyle. As they grow up, women often focus on their appearance, which is totally superficial and ungrounding. Sitting in front of computers for hours, and wearing high heels and sexy clothing continues to detract from the grounded nature that women love and need. They become insecure and overachieving, which damages their health tremendously. Some women turn to homemaking, and this is helpful to a degree.

Men today are often far more grounded than their women. Their greater sexual desires tend to be quite grounding. In addition, their upbringing actually tends to cause them to be more grounded than in previous decades and centuries. They are trained today to sit quietly in offices, repair machinery and do other “dirty” jobs that tend to be quite grounded in many cases. This is not traditionally the way societies trained their men, as in earlier times they needed to be fierce warriors to defend the tribe.

The effects of modern society in these ways has been to cause a type of role reversal that is good for the men, but not for the women. The women suffer more “burnout” and sympathetic dominance, while the men are having somewhat fewer problems in these areas. This is particularly important for child-bearing, which requires healthy women.

Development helps the first chakra the most of all. Sugar-eating is very yin and ungrounding, and that must stop. Instead, the emphasis must be on more rest, a more yang or grounding diet with quality drinking water, and several nutritional supplements. The near infrared sauna therapy is particularly helpful for it as well. Coffee enemas and the Roy Masters exercise also focus energy on this area of the body.

The first chakra is the most important today. In most people, it is poorly developed, often spins backwards, and does not provide the firm connection to the earth that is so important for
proper development of the upper chakras. If this chakra is improved, all the others improve. This is an interesting and exciting reason why sauna therapy, especially with the light sauna, and coffee enemas as well, are helpful in a spiritual sense. This is a new way of understanding certain physical therapies, and not one that is discussed in many books that I have read.

*The second chakra = development.* This chakra is the beginning of spiritual development for human beings. It has to do with one-on-one relationships, usually of a sexual nature. The glands most associated with this energy center are the testes and ovaries. Nutrients that appear particularly critical for the development of this chakra include zinc, copper, manganese and other transition metals. These are metals in the middle of the periodic table of the elements. The name transition metals is appropriate, as these actually help transition a person from one state of matter to the next.

This chakra tends to be more important for those with a fast oxidation rate and a low sodium/potassium ratio. These people are in a difficult transition, which this chakra can represent and assist with. The fact that transition elements help people make the transition from fast to slow oxidation may help the reader appreciate that development science is about vital transitions that Dr. Selye called *stages of stress.* In fact, they are stages of development of a human being. Development programs help people move easily from fast into slow oxidation if that is the direction they need to be going.

The second chakra is most critical today, especially for fast oxidizers, as it is a transition to the third chakra. This means that it controls and enables a person to think clearly. When the second chakra is deranged, as it is in most men, in particular, their thinking is not clear. Men’s problem in this area of the body is their higher sex hormone levels. Sadly, many women like it this way, as it gives them a certain edge or power over the men. As a result, these mothers and fathers do not encourage their male children to stop thinking about sex and start thinking more deeply. Such lower chakra thinking, however, just harms us all because without clear thinking the boys harm the girls and the cycle of misery that is called “love” just continues on planet earth. Fortunate are the young boys whose mothers and fathers teach them that sex is fine, but it is of very minor importance, relatively speaking. One’s energy is best spent learning the truth about life, and not on convincing the opposite sex to engage with you in some way.

*The third Chakra = beliefs.* This chakra is the most common one to be deranged in modern humanity. It has to do with judgments, power, control over others and other types of information that one “feels in the gut”. Most important, it has to do with the principles that one lives by. Organs such as the stomach, intestines, liver and pancreas are located in this area and have to do with this chakra. However, the sex glands are also very associated with this chakra as well. Particular nutrients involved with this chakra are those needed for the organs above. These include chromium, manganese, zinc, iron for the liver and phosphorus in protein foods.

This chakra needs balancing in almost everyone today. It is much worse, particularly in Americans, than it was say 50 years ago. The most important reason for this that I can think of was the removal of prayer and teaching religion from the schools. This was not healthy from this perspective, although it had other benefits, most likely. The third chakra, more than any other, is like a compass. It helps one to know right from wrong. Today, the principles taught in the middle schools and high schools include such insane ideas as diversity in race, sex, sexual orientation and color. I say insane because these are superficial. What is missing are the deeper principles of spiritual development that used to be taught instead. America was founded on the
idea that skin color, race, creed and religion simply do not matter and to pay no attention to them. This is much closer to the truth. The new emphasis on diversity is simply socialism in disguised form and a way to “level the playing field” that denies individual rights, another basic concept that America was founded upon that is a far more spiritually-oriented concept.

When one learns the wrong principles about life, the third chakra is deranged, often for life. It spins in chaotic ways and loses power. As a result, the person becomes weak-willed and easily influenced and swayed by politicians and others who have “charisma”. This is very damaging for society and for each person. Correcting the third chakra by reading books such as the bible, learning about Austrian economics, and listening to conservative talk radio, for example, is extremely helpful, even if seems odd at first, which it will.

The fourth Chakra = give and take in relationships. This center is a more advanced energy center having to do with partnerships and friendships, but not sexual ones and usually not just those of a close intimate type such as in a family. It needs balancing in most everyone. It is located at the level of the heart, lungs and bronchial tubes. Difficulty with this chakra can cause symptoms in these organs and tissues.

Nutrients concerned with this chakra include vitamin C, copper, zinc and many, many others because social interaction, in fact, is a higher human faculty that requires excellent nutrition. One reason for social decay in a society such as America is the decline in the overall quality of the people’s nutrition. As a result, people simply do not relate as well to each other. Prisoners often improve dramatically with better nutrition, and would do even better with a sophisticated program such as development for the same reason. Most criminals are anti-social and “getting back at society” in some way. It is so sad that the criminal justice profession does not embrace nutrition more.

This center has more to do with partnerships, real friends and other levels of give-and-take in society that occurs in business and social organizations, for example. Development may assist greatly with the development of this chakra by helping a person to be strong and clear enough to reach out to others in social relationships in a balanced and sane manner.

The fifth, sixth and seventh chakras = spirituality. These are the upper, more spiritually-oriented chakras that have to do with the nervous system, in general, and the brain, in particular. The fifth has to do with creative expression in the world. The sixth has to do with a broadening of mental understanding or wisdom. The seventh has to do with connecting with higher levels of awareness or “God”, development of the subtle bodies, and what may be called expansion of consciousness.

The gland most associated with the fifth energy center is the thyroid gland. Many women, for example, have learned to “hold their tongue”, so it is no surprise that many women also have thyroid troubles, in part for this reason. Other reasons for their thyroid problems are copper imbalance, mercury toxicity, neck tension and iodine antagonists in the environment. Nutrients important for the fifth chakra include zinc, iodine, and selenium. Men, in particular, need these nutrients badly today. Otherwise they tend to remain caught in the lower chakras and do not develop the qualities we associate with male character development such as honesty, integrity, intuitiveness and the ability to hold one’s beliefs even when challenged by authorities and peers. These are exactly the qualities needed today in politics, for example. Instead, too many politicians are weaklings, influenced by money, very corrupt and worse.

The sixth and seventh chakras are controlled by the pituitary and pineal glands to a large
extent. The sixth is located between the eyes, roughly, and extends out in front and out in back of the head. The seventh, called the crown chakra, begins in the pineal gland located roughly in the middle of the brain. It extends in only one direction, as with the first chakra. The crown chakra extends upward and usually a little backward and emerges from the head around the area of the crown of the head, which is slightly toward the back of the head.

These chakras are rarely open or active in anyone under the age of 30, and most people never develop them well. Development can greatly assist their development by helping a person set up a strong foundation upon which to build a spiritually-oriented future. Also helpful are supplementing zinc and selenium, in particular, along with a balanced mental exercise such as the meditation process taught by Roy Masters. The development of the higher centers also depends on removing at least some toxic metals. This is accomplished better with development than with any other method I am aware of.

Other aspects of development science that assist with these chakras are the use of a near infrared sauna, in particular, although any sauna may help with toxin removal. The near infrared lamps seem to have specific frequencies that also help remove certain emotional blocks to higher energy center development.

**Hair analysis may provide insights regarding the condition of the first two chakras.** Medical intuitives and others who can see the chakras have commented to me the following:

**The first chakra.** *Sympathetic dominant women*, in particular, are in need of grounding. This has to do with developing the first chakra, primarily. Activities that may help include gardening, meditating—but only with the Roy Masters exercise, wearing flat or low heeled shoes and dressing more traditionally so as not to attract the wrong kind of attention. Other helpful hints are to limit computer and cell phone use. If one must use computers and cell phones, limit the time, sit as far away as possible from computers and ground yourself, if possible. Also, limit shopping and unnecessary travel. These activities tend to be very ungrounding.

**The second chakra.** *Fast oxidizing men, especially those with a low sodium/potassium ratio*, often need attention in this chakra. It is usually spinning backwards due to sexual activity and other reasons. They need direction to know that life is not just about physical activity and sex. Life is also about slowing down, getting to know your sexual partner in areas other than the physical relationship, and moving on to higher aspirations and goals.

This is often most deranged in fast oxidizers as well. However, everyone needs work in this area. This is why the correct study of authors who have the deeper principles correct is almost essential, and sadly lacking in the colleges, for example. Meanwhile, reading the work of Karl Marx, Lenin, Mao Tse Tung and Hitler is sure to derange the third chakra in most gullible people. Sadly, this is what is taught today on many college campuses. This situation will change, I believe, soon because the ideas of the “great dictators” are totally incorrect and eventually the young students will rebel when they realize their professors are wrong.
Marie, age 28, suffered from severe panic attacks, premenstrual syndrome, a stubborn case of eczema, severe anxiety, very extreme insomnia, fat and sweet cravings, allergies, dry skin, cold in winter, a low body temperature, acne, recurrent kidney and respiratory infections, irritable bowel syndrome, menstrual cramps and thoracic outlet syndrome due to an extra rib. She was fearful and prone to depression. She also experienced episodes where her body would just shake uncontrollably. She ended up in the emergency room every few months due to panic episodes that left her exhausted and even more frightened.

Her first hair mineral analysis revealed a slightly slow oxidation rate and a sodium/potassium ratio of 1.22. This indicates hidden copper toxicity, quite severe chronic stress and often chronic infections, tissue catabolism, extreme adrenal weakness and intense feelings of frustration, resentment and hostility. Arsenic was slightly high. Aluminum was elevated, which usually indicates the presence of hidden iron and manganese as well.

Marie ate decently and tried to care for herself well. However, she ate a lot of wheat, fruit, jellies, crackers and not enough cooked vegetables. With an improved diet and very few supplements, since she was sensitive to them, her sleep improved within a month from 2 or 3 hours nightly to 8 or 9 hours. This ended most of her panic attacks and episodes of shaking, and at least gave her some hope. She also began to use a sauna and do coffee enemas.

Within only a few months, her energy improved dramatically and she reported feeling happy for the first time in years. Within a year, a chronic respiratory infection flared up and then went away. Her racing thoughts also stopped for the most part. She discovered that eating garlic, which is high in selenium, makes her feel better. She still needs 10 or 11 hours of sleep to feel her best, but she functions excellently most of the time if she gets plenty of rest and sleep. She remains extremely sensitive, so much so that she said a simple massage made her depressed for hours. She is much too hard on herself, she says, and this may be reflected on hair mineral retests because she often dips into a four lows pattern. This is associated with individuals who are somewhat compulsive and very rough on themselves.

Development focuses on understanding and modifying the stress response. While all healing methods reduce stress in different ways, development is centered upon the somewhat complex principles of both engineering stress theory and Dr. Selye’s stress theory of disease. Knowing this will help practitioners to understand, for example, why many healing methods are not suggested in this book, while a few come highly recommended. This chapter discusses many important concepts related to the stress response.
DEFINITIONS

The words below are critical to be able to describe and appreciate development:

**NOURISHMENT.** This is any factor or event that living organisms need, either continuously or at times, in order to survive and thrive. Obvious ones are food, water, air and perhaps warmth. However, they also include many less obvious items and events such as rest, friendship or love.

**STIMULI.** As used in this book, stimuli are events or substances that may seem essential, but really are not needed. Physical stimuli include cold, loud noises, excessive heat, wounds, food items that mainly irritate the body, and drugs of many kinds. Mental and emotional ones include anything that provokes fear, anger, guilt or other negative emotions or thoughts. Spiritual stimuli are usually called temptations and include bad habits, stealing, lying, cheating and so on. Stimuli of any kind cause the process that is called stress or the stress response. This phenomenon involves the sympathetic nervous system, the glands, and every aspect of the body, as it responds or attempts to adapt to stimuli.

**STRESSORS.** As used in this book, stressors are the same as stimuli. In other words, a stressor is anything or any event that causes stress and the stress response. Nourishment, by this definition, does not cause the stress response to any significant degree. That is the true difference between nourishment and stimuli. Even nourishment, such as eating a healthful meal, causes a slight stress response, but relatively little compared to stimuli or stressors.

**ADAPTATION.** This is the process organisms go through as they change and compensate in response to stimuli or stressors of all kinds. Organisms adapt to stress, in other words, by changing themselves to accommodate it as best they can, while maintaining their physical and biochemical integrity as much as possible.

**ADAPTATIONS.** These are the changes our bodies make in thousands of parameters such as blood sugar, blood pressure, and mineral levels and ratios, as they adapt or change themselves in response to their ever-changing environment. These changes and behaviors may be adaptive, which means helpful or valuable for the survival of the organism. They may also be maladaptive, which means the changes that are made are not helpful or not valuable for the survival of the animal or person.

Life presents us with a constant barrage of stimuli and some nourishment. We must learn to distinguish between the two and to choose the nourishment and reject the stimuli. When ill, this is even more important. This includes a nourishing diet and lifestyle, for example. Nutritional supplements also either nourish or stimulate to some degree. The hair mineral analysis can help distinguish which are needed at a given time. Mental and emotional nourishment, rather than stimuli, are also important for all of us.

All symptoms are adaptations. Development views all illnesses, even serious ones such as diabetes and cancer, as adaptations. This is quite different from post-modern medicine that tends to view most symptoms as harmful and just to be eliminated. For example, depression can be adaptive if it forces a person to slow down and rest more. It is maladaptive if it causes a person to abandon all his friends or commit suicide. However, in both cases, it is more than just a symptom or disease, as medicine views it. In this manner, the language of the stress theory of disease allows us to have a much deeper understanding of the body and its ailments. Other Implications of these definitions include:
Everyone confronts constant needs for nourishment and must also avoid stressors and stimuli. No one escapes this process for more than a few minutes, in fact.

Nourishment always tends to reduce stress. Stimuli tend to increase stress.

Learning which items, events and behaviors are nourishment and which are stimuli is a key to survival, health and long life.

The time factor can be confusing in this effort. For example, that which seems pleasant now may later cause stress. A shot of whiskey can feel great, but later damages the liver and kills brain cells. Conversely, that which is painful or unpleasant now may be nourishing in the future. Eating a nutritious meal can make one want to just sleep. However, the next day one may feel much better.

Even location can confuse us. A stressful item or event in one place may actually be nourishing or even life-saving when one goes elsewhere. Packing a bulky winter coat for a trip to Alaska may seem stressful at home, but is life-saving when one arrives in Alaska.

False or conflicting perceptions often confuse one’s judgment regarding nourishment and stimulation. A friend may tell you to wear high heels because you “look great”. The friend does not realize they cause pain in your feet and your back. Confusion may thus arise as to whether high heels are really nourishing for you or not.

If there is no response to a stimuli, there is no stress response. For example, loud noise is only stressful if you must listen to it. If you wear earplugs and cannot hear the noise, it will not provoke a stress response, although the noise is present in the environment. This applies to all stimuli, both internal and external to an organism.

TYPES OF STRESS-PRODUCING STIMULI

Stimuli can be of many kinds. There is some overlap in the categories below:

- Primarily physical. These might include heat, cold, breaking an arm or leg, toxins of all kinds, infections, nutrient deficiencies and others.
- Primarily emotional. These include feelings of fear, anger, hatred or other emotions.
- Primarily mental. These include fixations, imbalanced thinking, errors of judgment, cloudy or foggy thinking, hallucinations, delusions and other mental phenomena.
- Internal or external. Internal stimuli come from within the body and include fatigue, effects of an infection or the presence of a toxic metal. External stressors might include financial or family stress, social problems, excessive heat or cold, accidents and others.
- Acute or chronic. Acute might be a loud explosion or a bright light suddenly shined in the eyes. Chronic means longer-term such as living in polluted air or eating junk food for years.
- Conscious or hidden. Conscious includes anything you are aware of such as freezing cold temperatures, or a fear of cancer that you know about. Hidden stressors include radiation exposure you are unaware of, subconscious attitudes and thoughts, or the effects of childhood traumas you have forgotten or suppressed.
- Systemic or local. Some stressors affect the entire body and mind, such as fatigue and some nutritional deficiencies or toxic metals. Others are local, meaning they mainly affect just a part of the body. Some only affect the muscles, such as lifting weights. Noise affects mainly the nervous system. Others might affect the spirit nature of mankind, such as watching too many disasters or negative messages on television.
• **Very targeted for an individual or of a general nature.** Some stressors are very individualized, such as having to be around a cat if you are allergic to cats. Other people can be in the same situation without a problem. However, other types of stressors, such as being caught in a flood or a fire, affect everyone.

• **Spiritual stressors.** These are stressors that essentially tempt one to say, think or do something that is not in one’s best interest. They may include temptations to use illegal drugs, steal from a department store, tell lies to get ahead, compromise your values and principles to make money or get a job, and so forth. In each case, one is tempted to depart from principles of honesty, integrity and wholesomeness. Many succumb to such stressors, and resisting can also be stressful. However, resisting temptation sets up a type of corrective stress or positive stress that builds character, wisdom and inner strength.

**Implications of understanding all the types of stressors or stimuli:**

• *One’s total exposure to stress is a combination of all these types of stressors.*

• *It is important not to omit any of them when considering a person’s total stress load.*

• *It is usually far easier to control internal stressors than it is to control the world outside.*

• *Stressors one is unaware of are often the most harmful, as they act without your even attempting to counter them.*

**STRESS AND ADAPTIVE ENERGY**

Adapting and responding to any stimuli or stressor uses up adaptive energy of the body. Therefore, the less the body must adapt, the more energy it will have. This principle is discussed elsewhere in connection with the principle of vitality. I mention it here because it is also an essential stress principle. For example, a balanced and flexible oxidation rate requires the least amount of adapting to stimuli derived from the oxidation states, and therefore it is the highest energy metabolic state. Very slow oxidation involves far more adaptation, so the energy level of the person is lower. Restoring health and adaptive energy involves reducing the amount of adaptation the body must engage in. This, in turn, means reducing and eliminating as many stimuli as possible.

**Stress and death.** Too much stress, especially if it causes intense physical or emotional pain, causes most people to want to die. This is a major cause of death that is not considered in medical thinking often enough. This is also the reason this chapter is very important and not just a theoretical concept.

**THE STRESS WAVE**

The body’s response to stress is in the form of a wave. This is a critical concept, though it may seem esoteric. It begins with a resting situation. There follows a phase of excitation, followed by a phase of relaxation, and then a return to the resting phase. This is somewhat like an ocean wave with an up phase, followed by a down phase, and then a return to a baseline level. It can be seen clearly, for example, on an electrocardiogram, which is the way the heart responds to stress. The stress wave can be momentary, daily, monthly in the case of the menstrual cycle,
seasonal or it can span a lifetime. However, the idea is the same regardless of the time frame. The following story may be helpful to illustrate the principle of the wave:

**The “up” phase of the wave.** While walking to work, a pedestrian must cross a busy street. Having looked both ways, he strolls out into the street. Halfway across, a car approaches suddenly at high speed. In an instant, the body secretes more adrenaline, noradrenaline and other stress hormones, and the stress response begins. Blood rushes to the brain and to the muscles to prepare to fight or run. The pulse and blood pressure increase to pump even more blood to the brain and muscles. Glucose and insulin also pour into the bloodstream to prepare the pedestrian to run away. The pupils dilate and the hearing and sight become sharper. In short, the entire body goes on high alert or “code red”. This is like the upward movement of the wave.

**A catabolic and destructive state.** At the same time that blood rushes to the muscles and brain, it flows away from all the glands and organs that are not essential for defense. These include the stomach, intestines, pancreas, liver, thymus, kidneys and others. As a result, for example, the orderly digestion of the pedestrian’s breakfast comes to an abrupt halt. Elimination may occur in an uncontrolled way or it stops altogether. The body’s ability to fight infection also diminishes, since healing an infection is not at all important at this time. In this fashion, the stress response stops or inhibits many vital body functions.

This is like taking most factory workers away from their jobs so they can fight a war. It is occasionally fine, providing it is a real emergency and only extends for a short time. However, if it continues, the nation begins to starve for workers and the production of goods slows down. In fact, all militaristic nations such as North Korea and the former Soviet Union suffer and are often destroyed for this reason.

**The “down” or recovery phase.** Let us assume the pedestrian runs out of the way of the car and reaches the side of the road. He finds he must sit or lean against a railing for a few minutes to catch his breath and calm down. The body slowly clears the blood of the excess hormones, sugar, cholesterol and many other chemicals, and the blood circulation and respiration slowly return to normal levels. This is the recovery phase of the stress response, and corresponds to the trough of an ocean wave. After a few minutes, the pedestrian resumes his walk to work.

**The cause of disease.** Life can be viewed as a process of responding to millions of these stress waves all day long, year after year. The waves are needed to cope with emergencies or threats of emergencies. Sooner or later, however, the system gets knocked out of kilter and the body becomes mired or stuck in a permanent stress response. Fast oxidation is the first of these permanent stress responses and is a more or less continuous fight-or-flight response.

After a few years of fast oxidation, in most cases the body cannot maintain this permanent state of alertness or alarm. It then sinks into an even worse condition called slow oxidation. Here the stress response system is so deranged and out of kilter that even when a threat develops, the body cannot mount a full stress response. Since this is like a nation without proper defenses, disease is common and death often occurs. Slow oxidation is like wearing out the military so that when a real threat arises it cannot respond properly.

**Sub-oxidation or four lows.** An even more deranged stress response may also occur. A body in a four lows mineral pattern is trying to respond like a fast oxidizer but it is ineffectual, meaning the body does not respond properly at all. Instead, it just wears itself down more, like a car stuck in a ditch spinning the wheels. This is where most people succumb to death. In summary, the stress wave:

- Begins with a resting level that corresponds to a calm ocean.
• Goes into a state of heightened metabolic activity or an alarm reaction when a stimulus triggers a stress response. This corresponds to the peak of the wave.
• When the emergency is over, and assuming one survives, a recovery phase follows. This corresponds to the trough of the wave.
• After a recovery phase, the system returns to the baseline state, like a calm ocean.
• Since the waves keep coming day after day, the stress response mechanism becomes damaged in most people at a very young age. This is the basic cause of the oxidation types and of most human illness, from a stress perspective.
• We cannot entirely stop the waves from crashing into us, but it is rather easy to reduce the waves in most cases. Also, much can be done to strengthen the body in order to enhance its ability to respond properly and vigorously to the stress waves.

STRESS ASSESSMENT USING HAIR MINERAL ANALYSIS

A hair mineral analysis, when interpreted properly, allows one to do a rather thorough stress analysis on the human body quickly and inexpensively. Repeat hair mineral analyses during a development program can provide even more information. The large subject of hair analysis interpretation is discussed in Chapters 20-24. This short section just focuses on some of the principles, which include:

• Any and all imbalances on a hair test most likely represent stress on the body. These would include mineral deficiencies or excesses, biounavailability indicators, the presence of toxic metals, and any imbalanced ratios or other patterns that are present.
• The more imbalances that are on a test, the more stress is likely present. For instance, a slow oxidation pattern, by itself, indicates less stress than slow oxidation with a low sodium/potassium ratio and a potassium level of 2 mg%.
• The more severe the imbalances, as a general rule, the more stress is present.
• A hair mineral analysis can often help determine what kind of stress is present. For example, it may indicate stress caused by a lifestyle factor or an attitude. It might also reveal stress caused by pushing oneself hard. It may indicate stress due to excessive toxic metals or nutrient deficiencies. It may show stress due to overeating on carbohydrates or perhaps stress due to a vegetarian or low-protein diet. It might indicate stress due to particular mineral imbalances such as fast oxidation, four highs or a four lows pattern, each of which are different in their qualities and their effects.
• The meaning of a level, ratio or pattern may be different depending on whether it is an initial hair test or a retest.
• Some hair mineral patterns indicate the effectiveness of the body’s fight-or-flight mechanism. The order of effectiveness of the stress response is roughly as follows:

1. Fast oxidation with a normal sodium/potassium ratio. This is the most effective.
2. Fast oxidation with a low sodium/potassium ratio. It is less effective, but still potent.
3. A four highs pattern. This is much less effective, but still somewhat powerful.
4. Secondary hyperthyroidism or Grave’s disease. This interesting condition may represent a very ineffective or partial stress response that is dangerous for health.
5. A four lows pattern. This is least effective and most dangerous way to respond to stress in the long term.
• **The imbalances revealed on a single hair mineral test only indicate the top layer of stress patterns.** Deeper layers that will be uncovered on retests will reveal other stress patterns, usually from the past, as they are uncovered and retraced or unwound as a result of following a development program.

• **The later the stage of stress, according to the stress theory of disease, the more chronic and deeper or layered is a person’s stress.** For example, in comparison with a fast oxidation pattern, a slow oxidation pattern usually indicates more chronic stress and many more layers that are underneath it. A four lows pattern on an initial hair test generally indicates even more chronic and deeper patterns of stress.

**THE IDEAL STRESS RESPONSE**

The ideal stress response is no response at all! This does not mean that one just sits around if, for example, a car is hurtling toward oneself. However, it means that the body would respond without too much fanfare or exaggerated response. Books describe Eastern yogis, for example, that manage to stay calm when the temperature is very cold, or if they eat a toxic morsel of food. Their bodies do not overreact and they handle situations with calmness and clarity.

On a hair analysis, this would mean that one maintains a fairly balanced oxidation rate. To do this one must be able to absorb or "digest" every experience without reacting excessively to it. To do this perfectly is impossible in a physical world. It could only occur if one is not attached at all to any physical or emotional state or condition. Since one is located in a particular place in space, this is a type of attachment and if someone pushes you out of your place, you will react. However, on an emotional level, detachment or non-attachment is much more possible. In the New Testament of the bible, Jesus referred to this as being “in the world, but not of it”. This is a key to long life, health and happiness precisely because you will react less to events and people around you.

**Strengthening the body also helps one to be less attached physically and emotionally.** A healthy physical body handles all stimuli or stressors better. This is one rationale for eating well, resting sufficiently and taking other steps to improve physical health. This will not stop one from reacting, but often the reactions will be more mild, easier to control and perhaps easier to avoid. Improving physical health can help one cope with everything from invading bacteria or viruses to negative thoughts, fearful emotions and physical, social or financial hardship. *An important principle of nutritional therapy is that reducing internal biochemical stress on the body so it becomes healthier will enable one to better handle far more external stress.* This brings us to a general discussion of how to work with stress in one’s life.

**WORKING WITH STRESS**

Options for handling stress from people or events include:

• **Eliminate it.** This is usually done by fighting it or running away. One might destroy the source of stress, such as killing germs or defeating an enemy of another sort. Running away may include divorcing a person or quitting a stressful job.
• Reduce its potency or effect. This can be done in many ways, depending on the source of the stress. One might need to wear more clothing to reduce the effect of the cold of the winter, for example. One might wear earplugs to protect against noise, or work to resolve hidden traumas to reduce one’s emotional triggers and other problems that traumas can cause.

• Learn new coping skills. This can be something of a physical nature, such as taking karate lessons to physically defend yourself. It might be learning a new coping skill on an emotional or mental level. For example, one might adopt new attitudes or beliefs that empower you or help render a source of stress much less irritating or harmful.

• Detach mentally and emotionally. This is a particular type of coping skill. In a very general sense, it might be described as “dying to the world”. It is an ancient approach discussed in the bible and elsewhere. One must realize that life is not primarily about physical existence in this world. One must learn that many of the wants and needs of the physical brain and body are false, and simply the result of false conditioning. This helps one let them go and can reduce stress immensely. This does not mean becoming a martyr or a hermit. It merely means releasing old attachments to people, places and things so that changes in these affect one much less.

• Learn about identity exchange, vampirism and soul retrieval. These are more advanced stress topics that are very important. An article at www.drlwilson.com discusses these topics.

POSITIVE ASPECTS OF STRESS

Most therapies, including development, add some temporary stress. This is needed to cause a correction. In fact, any type of change, even speeding up a very slow oxidation rate, adds some stress to the body. Just following a diet or even just using a sauna adds a little stress. This occurs because almost any intervention tends to interrupt or break the patterns a person is accustomed to. The very act of breaking an old pattern is stressful to a degree. For success with development, a person must be willing to go through a little stress that occurs when changing one’s diet or lifestyle, and due to changes in body chemistry.

Developmental stressors. An intriguing positive aspect of stress is that it can act as a force to move people ahead in their physical, mental, emotional and spiritual development. This may be called the evolutionary impact of stress. Essentially, applying the right kind of stressor at the right time causes a reaction or effort by the body or mind to overcome the stressor. The effort brings into play more life force energy, which, in turn, causes an evolutionary or developmental change. A simple example is body-building. If one wishes to have stronger arm muscles, then one works or stresses those muscles. This actually causes a little more life force or vitality to be applied in the nerves leading to the arms and in the muscles themselves. This results in the development of larger arm muscles.

A more subtle example is teaching discipline or emotional control to a child. One must force the child to obey a few rules, such as finishing a project or cleaning up the bedroom. This stressor forces the child to apply more life force energy or vitality to the task at hand. The added stress sends more adaptive energy through the nervous system and this actually develops a part of the brain to a greater degree. MRIs and other brain scans have actually shown that people who use their minds more will develop certain areas of the brain to a greater degree.

This is a wonderful type of positive stress principle. It explains why people who had a difficult childhood, for example, often excel if they can overcome the negativity of their early
life situation. It is also the reason why coddling children or adults, as is done in welfare states and socialist nations, is not a wise idea. Of course, this is not an argument for starving people or working them to death. However, it is an argument for allowing people to make their own way as much as possible, and for encouraging hard work for the maximum human development.

THE AUTONOMIC NERVOUS SYSTEM

**Definition.** The autonomic nervous system is a set of nerve centers in the brain and elsewhere that controls the body’s response to stress, among other functions. Its purpose is to protect the individual from the ravages of the internal and external environment.

**Shifting the gears.** One function of the autonomic nervous system is to switch the body, in a second or less, between 1) a state of rest, relaxation and regeneration, also called the *parasympathetic state*, and 2) a fighting response called the *sympathetic state*. In almost everyone, the autonomic nervous system is overworked and quite out of balance. Reasons for autonomic nervous system imbalances include:

- **Stress from any source, especially of long duration.** This forces the body into a sympathetic or fight-or-flight mode of operation too much of the time.
- **Improper nutrition.** The nervous system requires dozens of nutrients that are low in the food supply. Improper eating habits only make the problem worse.
- **Fatigue.** This is an extra stress factor that also activates the sympathetic nervous system.
- **Chronic infections anywhere in the body.** These often spew toxins into the bloodstream that act as intense irritants to the nervous system.
- **Unconscious emotions and traumas.** These can often trigger fight-or-flight reactions.
- **Consciously holding on to traumas.** Adults tend to recall traumas that retrigger their sympathetic nervous system. This is extremely common. People regularly relive their car accidents, floods, fires, robberies, rapes and other scary events instead of learning how to let them go. Proper counseling and the Roy Masters meditation-observation exercise, with other methods including nutritional correction, can be helpful for this problem.
- **Toxic metals and toxic chemicals.** These can irritate, stimulate, disrupt and otherwise alter the stress response. The exact action depends on which metals or chemicals are involved, and where they are lodged in the body. Toxic metals can also increase emotional responses. For example, iron is associated with rage, and copper toxicity is associated with emotionality. The toxic metals also interfere with proper digestion and absorption of nutrients.
- **Poor decisions.** These create tremendous extra stress for many people. Examples range from using drugs or alcohol to spending too much money. The Roy Masters exercise is excellent for this group of people, along with an improved lifestyle and emotional control.
- **Inability to cope with stress.** This refers to the ability to “roll with the punches”. An important reason for this is poor health, though at times one must learn new coping skills.
- **Incorrect ideas, attitudes or beliefs.** Attitudes such as paranoia, victim thinking or aggressiveness tend to enhance stress responses. In contrast, a belief that God is good and is in charge of our world can help tremendously to reduce some types of stress.
- **Lack of emotional control.** This also sends many people into a fight-or-flight reaction.
- **A cringing posture and general body tension.** An unusual stress factor is a cringing posture. This common posturing tightens the muscles of the upper back and neck, and often tightens the pelvis as well. A quick look at an anatomy book reveals that these are precisely the...
spinal nerve areas that activate the sympathetic nervous system. In other words, by tightening the muscles in these areas, one can slightly compress the nerves and stimulate the sympathetic ganglia located here. Poor posture eventually leads to a chronic tension on these nerves and more permanent derangement of the autonomic nervous system. This may help explain some of the benefits of chiropractic, Rolfing, deep massage, yoga, tai ch’i, deep breathing and other methods that correct the posture and release muscle tension in the body.

ASSESSING THE AUTONOMIC SYSTEM USING HAIR MINERAL ANALYSIS

Hair analysis patterns related to various states of the autonomic nervous system include:

- **High sodium/potassium ratio** = a more acute stress and inflammation indicator.
- **Low sodium/potassium ratio** = a more chronic stress indicator. It may also indicate weakness of both branches of the autonomic nervous system, especially with slow oxidation or if the phosphorus level is less than 11 mg%. Symptoms include fatigue and often negative emotional states.
- **True fast oxidation (with a normal Na/k ratio)** = stuck in a sympathetic state. Mild fast oxidation is normal in babies and young children. Many, however, are in “overdrive”, which causes irritability, ADHD, infections and other problems.
- **Fast oxidation with a low sodium/potassium ratio in a young child** = a more chronic stress pattern, but still a relatively early pattern of stress in the stress theory of disease.
- **Slow oxidation** = stuck in an unhealthy parasympathetic state due to “burnout” of the sympathetic nervous system in almost all cases. This is the situation of most adults and many older children, as well.
- **Sympathetic dominance** (potassium below 5 mg%) = a person acts as though he is still in fast oxidation, even though the body has moved into slow oxidation. This places a lot of stress on the body and usually leads to serious illness if it continues. Many with this pattern take on too much work, or worry excessively. Toxic metals may contribute to the tendency to feel like one is being chased by a tiger all the time. Such people may be tense, “uptight”, stress-seekers or anxious. They enjoy or are used to powering through their fatigue, their problems and their entire lives, at times. This is done by activating the sympathetic or fight-or-flight system to give them the energy to keep on going when they are exhausted. A person in this condition may also talk, think, eat or work at a rapid pace, faster than the optimum.
- **Three highs or four highs** = a secondary acute stress response or “second wind”.
- **Toxic metals** = this causes irritation of the nervous system.
- **A calcium/magnesium ratio between about 9.5 and 13.5** = eating too many carbohydrates may cause this type of blood sugar stress.
- **Spiritual defensiveness** (calcium/magnesium ratio above 13.5) = lifestyle stress. Something in the lifestyle or perhaps an attitude is causing stress and needs to change.
- **Three lows, also called the overwhelming stress pattern** = the stress level is not sustainable and a person is close to moving into a four lows pattern.
- **Four lows pattern** = an end stage stress pattern characterized by low levels of all the macrominerals, and usually great fatigue. Malnutrition may play a role in some rare cases, especially when the pattern occurs in young children or babies.
RESTORING THE AUTONOMIC NERVOUS SYSTEM

Restoring the autonomic nervous system is a gigantic task that may involve many or even all of the factors below.

• **Rest.** This is the most important of all. There is no substitute for at least 9-10 hours of sleep every single night. Most people also need a morning or afternoon nap as well. This allows the nervous system the time to rest and rebuild. The hours before midnight are much better for sleeping, so one should go to bed early, by 9 PM at the latest, whenever possible.

• **Activity.** Exercise is a powerful sympathetic stimulant. Avoid excessive activity of any kind. Reduce even gentle exercise to no more than a half to one hour several times a week. Also avoid becoming exhausted while exercising or while doing anything else.

• **Diet.** Animal protein is particularly helpful for the brain and nervous system, as it contains fats and proteins essential for the nerves. These include the omega-3 and omega-6 fatty acids and many others. Excellent foods for the nervous system are eggs, meats, nuts, root vegetables and a little oily fish such as sardines and salmon.

• **Nutritional supplements.** Supplements must be appropriate for one’s oxidation type and rate, and for the other mineral ratios as well. In addition, calming symptomatic nutrients include calcium, magnesium, selenium, manganese, zinc and chromium. Other calming nutrients include GABA, L-taurine and a product called ICMN from Endomet Laboratories in Phoenix, Arizona that contains inositol, choline, methionine and niacinamide. Mild herbs that help the nervous system include valerian, chamomile, passionflower, skullcap and hops.

• **Reduce all harmful stress.** Stress activates the sympathetic nervous system and can arise from within the body or from outside. Both are equally harmful to the nervous system. Reducing stress includes correcting a cringing posture and relaxing the entire spine with chiropractic, osteopathic work and other methods.

• **Correct thinking and beliefs.** Improper thinking or out-of-control emotions are major sources of stress for millions of people worldwide. Chapter 2 discusses correct thinking in more detail. The Roy Masters meditation exercise and other modalities such as counseling, biofeedback, attending worship services and support groups may also help. Other hints are to surround yourself with uplifting books, CDs, films and other spiritually-oriented materials. Also, pick your friends and relationships carefully. Work, school and all your activities either contribute to your contentment or detract from it. A wonderful and simple spiritual practice to release resentment is to practice forgiveness and gratitude each day. Catch yourself whenever you do not forgive everyone in the world for all that you believe they have done to you or failed to do for you. This also helps undo the very damaging idea of feeling like a victim.

• **Cultivate contentment.** Contentment is different from feeling happy or excited. Happiness, as most people know it, is often short-lived. It is often an attempt to overcome feelings of unhappiness. Contentment or joy, in contrast, is a state in which you are at peace with yourself and the world, even if the world around you is not to your liking. It is possible to choose joy and contentment, rather than anger and hatred for those who disagree with you.

• **Avoid comparing yourself with others.** Comparisons often lead to fear and anger. The world is never fair from our limited perspectives. However, much is hidden from our view. If you knew more about others’ lives, you might be less hasty to compare yourself with them.
• **Breathe deeply, slowly and consciously.** Breathing is an ancient method of controlling the autonomic nervous system. Breathing is one of the few bodily functions that is under the control of both the conscious and the autonomic nervous systems. By controlling breathing, one can indirectly control the autonomic nervous system. This is one reason breathing exercises are so important in yoga and other ancient healing systems. Regular, slow, deep breathing, by itself, turns off the sympathetic nervous system. Most people will need to practice this every day to obtain lasting results.

• **Detoxification.** This is extremely important to restore the autonomic nervous system. Toxic metals and toxic chemicals irritate and stimulate the nervous system in everyone today. Sauna therapy, coffee enemas, colonic irrigation and development programs will slowly eliminate this cause of nervous system toxicity.

• **Other natural therapies.** Chiropractic, bodywork, hand and foot reflexology, the chi machine, perhaps using a backswing or inversion table, and other methods such as cranial osteopathy can help relax the nervous system and may be essential for some people.

• **Therapies such as soul retrieval are interesting as concerns reducing certain types of stress.**

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**Chart of the Sympathetic and Parasympathetic Nervous Systems**

<table>
<thead>
<tr>
<th></th>
<th>Sympathetic System</th>
<th>Parasympathetic System</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Function</strong></td>
<td>To defend the body against attack</td>
<td>Healing, regeneration and nourishing the body</td>
</tr>
<tr>
<td><strong>Overall Effect</strong></td>
<td>Catabolic (breaks down the body)</td>
<td>Anabolic (builds up the body)</td>
</tr>
<tr>
<td><strong>Organs and Glands It Activates</strong></td>
<td>The brain, muscles, thyroid gland and the adrenal glands</td>
<td>The liver, kidneys, enzyme pancreas, spleen, stomach, small intestines and colon</td>
</tr>
<tr>
<td><strong>Hormones and Substances It Increases</strong></td>
<td>Adrenalin, noradrenalin, cortisol, cortisone, insulin and thyroid hormones</td>
<td>Parathyroid hormone, pancreatic enzymes, bile and other digestive enzymes</td>
</tr>
<tr>
<td><strong>Body Functions It Activates</strong></td>
<td>Raises blood pressure and blood sugar, and increases heat production</td>
<td>Activates digestion, elimination and the immune system</td>
</tr>
<tr>
<td><strong>Psychological Qualities</strong></td>
<td>Fear, guilt, anger, willfulness, and aggressiveness</td>
<td>Calmness, contentment and relaxation</td>
</tr>
<tr>
<td><strong>Factors That Activate This System</strong></td>
<td>Stress, fears, anger, worry, excess thinking, vigorous or too much exercise, sugar, caffeine, other stimulants of all types</td>
<td>Rest, sleep, meditation, relaxation therapies, feelings loved, feelings of gratitude, peace and contentment</td>
</tr>
</tbody>
</table>
Mary Ann, age 58, had been to many holistic doctors over the past 10 years. Her symptoms included chronic Lyme disease, uterine cancer 8 years ago (treated with surgery and radiation), constipation, impaired memory, brain fog, osteoporosis, post-nasal drip and chest congestion. Her first hair mineral analysis revealed a very sluggish oxidation rate with a calcium shell pattern. This is associated with a delicate or sensitive constitution in most cases and often with the development of cancer due to a calcium imbalance. Her calcium level was 205 mg% (ideal is about 40 mg%), indicating biounavailable calcium buildup in her tissues and probably her brain as well. This can cause memory problems and brain fog. She also had slightly elevated levels of mercury, arsenic and aluminum, and hidden copper toxicity.

On her healing program, Mary Ann began to feel stronger with more energy within a few weeks. She used a sauna daily for half an hour. Her second hair analysis revealed high lead of 0.190 mg% (ideal is about 0.08 mg%). Her aluminum level rose to 0.94 mg%. High aluminum always tends to indicate hidden iron and manganese toxicity as well. Mary Ann’s calcium shell improved, with the calcium level falling from 205 to 169 mg%. She reported less brain fog and better elimination, but she was still often cranky and could not seem to organize things well.

Mary Ann’s next hair test a year later was unusual, with a four highs pattern. Also, iron shot up to 6.5 mg% (ideal is about 1.9 mg%). Manganese was slightly elevated at 0.05 mg% and chromium was 0.592 mg%. Her next test, a year later, was even more dramatic with a manganese level of 0.214 mg% and a slightly higher mercury and aluminum level. She reported feeling better and better, though there were plenty of ups and downs as these metals kept being eliminated one by one.

Mary Ann’s most recent mineral analysis, about two years later, indicates a much more balanced oxidation rate, with normal iron and manganese levels. Mary Ann reports feeling quite well, with no symptoms of Lyme disease and no recurrence of cancer.

The concept of the oxidation types is one of the most important ideas in development science. It offers a way to:

- Enhance adaptive energy and balance body chemistry.
- Understand and balance the autonomic nervous system.
- Understand many thyroid and adrenal imbalances, and often improve them easily.
- Understand and correct hundreds of common physical symptoms and conditions.
- Understand and correct many mental and emotional symptoms and disorders.
- Even gain insights about current social and political trends in the nation and in the world.
WHAT ARE THE OXIDATION TYPES?

The oxidation types represent many things, including:

- Yang (fast oxidation) and yin (slow oxidation) expressions of the life force.
- Homeostatic states of the body and mind. This means they are fairly stable states of the whole human system that allow the body to cope successfully with its environment.
- The stages of stress in Dr. Selye’s stress theory of disease.
- In Ayurvedic philosophy, pitta (fast oxidation) and kapha (slow oxidation).
- Stages of breakdown of the body from optimum health to near death.

THE BASIC SEQUENCE OF THE STRESS RESPONSE AND THE DEVELOPMENT OF THE OXIDATION TYPES

1. THE OXIDATION RATE AT BIRTH. Babies are all fast oxidizers. They have many signs of fast oxidation such as a fast pulse, a fast breathing rate, a slightly high body temperature, a moist, sweaty appearance of the skin, and vigorous outward-directed mental and emotional expression.

   After birth, the oxidation rate increases dramatically, in most cases. The causes for this are a combination of birth trauma, bright lights, loud noises, and strange home smells to which babies are extremely sensitive. Other causes are giving babies and infants toxic vaccines and drugs. Finally, stress is high on some babies due to poor quality food and from angry, fearful or perhaps just insensitive or ignorant parents, siblings and others in the baby’s environment. Many babies have their arms slightly dislocated, for example, by parents swinging them to and fro. For all these reasons, most babies become stuck in very fast oxidation from the time they are born until they begin to move into slow oxidation roughly at age 3 to 10.

   Biochemically, the origin and sequence of the stress response in a newborn is as follows:

2. TISSUE SODIUM RISES.

   - Stress of any kind increases aldosterone secretion. This causes increased sodium retention at the level of the kidneys.
   - This causes the serum sodium level, and soon after, the tissue sodium level to rise. The hair sodium may increase from 25 mg% to as high as 100 or even 1000 mg%. The rise in sodium also causes the sodium/potassium ratio to increase, at times very high.

3. POTASSIUM RISES TO STAY IN RATIO WITH THE SODIUM LEVEL.

   - A new stress. The elevated sodium/potassium ratio is a new stressor. Maintaining this ratio in a range from about 2 to about 7 is an important homeostatic mechanism in the body.
   - Potassium retention. In response to the unbalanced sodium/potassium ratio, the kidneys cause more potassium to be retained in the blood, and later in the tissues as well. The exact mechanism of potassium retention requires further research.
   - Potassium rises. Potassium retention causes mainly the tissue potassium to rise. Now both the sodium and the potassium levels in the tissues such as the hair are elevated. This tends to rebalance and helps preserve a normal or near-normal sodium/potassium ratio.
4. CALCIUM AND MAGNESIUM LEVELS BEGIN TO DECREASE, FORMING THE CLASSIC PICTURE OF FAST OXIDATION.

- *Sodium and potassium can dissolve most chemical compounds.* This occurs because they are potent solvents. The reason is they are monovalent elements, meaning they have one free electron in most instances. These elements can dissolve almost any water-soluble chemical.
- *Dissolving alkaline reserve minerals.* Higher levels of sodium and potassium in the blood, in particular, but also in the tissues, begin to dissolve some compounds of calcium, magnesium, zinc, copper and other divalent (two free electrons) elements. These minerals are also called alkaline reserve minerals because they have an alkaline effect on the body.
- *More dissolved or ionized minerals.* Dissolving these compounds means they are broken down, leaving more of minerals such as calcium and magnesium floating free or ionized.
- *Kidney excretion and loss of alkaline reserve minerals.* The increased amount of free, ionized or dissolved minerals signals the kidneys to excrete more of them. This is a normal mechanism to control the amount of them and the ratio of ionized to non-ionized minerals in the blood and tissues. The end result is a continuous loss of calcium, magnesium, copper, zinc and other vital trace elements from the body.
- *Role of the thyroid.* The thyroid gland may play a secondary role in causing the excretion of some calcium. More thyroid activity is known to cause a decrease in serum calcium.
- *Classic fast oxidation.* On a hair analysis, the pattern of high sodium and potassium with low calcium and magnesium is the classic picture of fast oxidation. This is the pattern in almost all newborns and most young children. At times, it also persists into adulthood, but this is not common and is becoming more and more rare today due mainly to nutritional depletion.

5. NUTRITIONAL DEFICIENCIES START TO DEVELOP.

- *The alarm response may go on for weeks, months or even a few years.*
- *Lost minerals must be replaced in the diet.* Minerals that are excreted by the kidneys must be replaced in the diet. This, unfortunately, is difficult or impossible today, thanks to the use of hybrid crops and other factors that have reduced the mineral content of our food supply. Even mother’s milk is often not adequate to replace these minerals fully.
- *As a result, nutritional deficiencies begin to occur.* By 2-3 months of age or even sooner, some children develop a degree of nutrient deficiency for this reason. This, along with stress and the use of medical drugs, is the main cause of most neonatal and childhood diseases.
- *Car engine analogy.* Fast oxidation is like running a car engine fast for days without having the time to properly replace all worn parts. Eventually, the entire engine starts to fail.
- *Army analogy.* Fast oxidation is like drafting a large part of the working population into the army and forcing them to be on high alert for months or even years without resting. Eventually, the stress wears them out. Also, the nation lacks for factory and other workers. Finally, this “military posture” cannot be maintained.
• **Toxic metal buildup.** As nutrient deficiencies occur, toxic metals replace some of the missing vital minerals in key enzyme binding sites. This is similar to replacing skilled workers who are drafted into the army with inferior replacements. They do not perform as well.

• **The end of a healthy alarm reaction.** Eventually, the body cannot maintain the alarm state or fast oxidation. Thus begins the slide into slow oxidation.

**6. THE DEVELOPMENT OF MIXED AND SLOW OXIDATION.**

• **Sodium decreases.** As the fight-or-flight response weakens, the sodium level decreases first. This is due to lower levels of aldosterone secretion and perhaps also due to other factors having to do with the kidneys.

• **A low sodium/potassium ratio.** The result is a sodium/potassium ratio less than about 2.

• **Burned out fast oxidation.** Fast oxidation with a low sodium/potassium ratio is called **tired or burned out fast oxidation.** Dr. Eck felt it was also perhaps a **resistance stage of stress.**

• **Possible mixed oxidation.** One may go into a temporary state of mixed oxidation for a short while as the sodium level declines.

• **Potassium decreases, too.** The body cannot live for long with a very imbalanced sodium/potassium ratio. As a result, in most cases, the tissue potassium level soon follows sodium and declines as well.

• **The end of fast oxidation.** Lowering the sodium and potassium levels effectively ends the first or alarm stage of stress, or fast oxidation. This occurs by age 3 to 10 in most people.

**7. THE RISE OF THE TISSUE CALCIUM AND MAGNESIUM LEVELS AS SLOW OXIDATION DEVELOPS.**

• **Continuing adrenal exhaustion.** As stress and nutrient shortages continue to mount, the adrenal and thyroid gland continue to “burn out” or decrease their activity level. As they do, the hair tissue sodium, and later the potassium, decrease below their ideal levels.

• **Dissolved or ionic calcium and magnesium decline.** Sodium and potassium regulate the amount of ionized or soluble calcium, magnesium and other minerals in the blood. As the sodium and potassium levels decline, so does the amount of dissolved or ionic minerals in the serum and eventually the tissues.

• **The opposite of fast oxidation.** This is the opposite of what occurs in fast oxidation, in which there was too much ionized or soluble calcium and magnesium in the blood serum.

• **A reduced level of bioavailable calcium and magnesium.** The low level of soluble calcium and magnesium effectively results in a deficiency of **bioavailable** calcium and magnesium. In this case, the word bioavailable means that while calcium and magnesium are present, not enough is in an ionized form to meet the body’s needs. Ideally, about 40-60% of our calcium must be in an ionized form in the blood to be utilized properly.

• **Symptoms of calcium deficiency in the midst of plenty.** Bioavailable calcium is the cause of the peculiar phenomenon in which slow oxidizers often have symptoms of calcium and magnesium deficiencies, although a hair test indicate plenty of these two minerals are in the tissues. This is an endless source of confusion until one understands the cause.
8. DISEASES OF AGING START EARLY IN SLOW OXIDATION.

- **Damage control.** Calcium coming out of an ionized state in the blood often forms hard compounds with phosphorus, oxygen and other minerals. These can be extremely damaging to the heart, the arteries and the veins. As a result, the body quickly moves them out of the blood serum and into the soft tissues, where they do less damage.
- **Calcium precipitation.** Dr. Eck was not clear about how the process works, but it is clear that calcium begins to precipitate into the soft tissues all over the body. Among the worst places are the brain, the joints, the artery walls themselves, the kidneys and other organs.
- **Faucet analogy.** This is chemically akin to hard water deposits on the faucets and pipes of homes fed by hard water. This is water that is high in non-ionized calcium and magnesium.
- **Calcium rises in the hair.** Calcium precipitation into the soft tissues is revealed on hair mineral analyses as an increase in the levels of calcium and magnesium in the hair.
- **Classic slow oxidation.** A hair analysis with lower sodium and potassium levels and higher calcium and magnesium levels is the classic picture of slow oxidation.
- **Calcification is death to the body.** The slow process of calcification of the tissues is lethal for the body. It cannot survive this way. Calcification is the primary disease of old age. It is given many names such as arteriosclerosis, otosclerosis (ears), “hardening” of the brain, the organs, the veins and arteries, and so on.

9. THE DEVELOPMENT OF OSTEOPOROSIS.

- **Replenishing serum calcium and magnesium.** As calcium and magnesium are lost from the blood into the soft tissues, the body tries to replenish them. Some is ingested in the food. Supplements of calcium and other minerals may also be helpful.
- **Food and supplements, however, are never enough.** In the state of slow oxidation, imbalances in the pH and ionization potential of the blood are such that even the best food and food supplements cannot maintain an adequate level of ionized minerals in the blood for long. Supplements and an excellent diet, however, are much better than doing nothing at all. To really correct the problem, though, one must correct the oxidation rate and stage of stress.
- **Bones are the body’s mineral storage site.** Bones are not only the structural support for the body. They are also the calcium and perhaps other mineral reserve sites. In other words, the body can store minerals here safely. Then, any time more calcium is required, the body will tap the reserves to replenish the blood and other sites with calcium and other minerals.
- **Breaking down the bones with more osteoclastic activity.** In slow oxidation, the body taps the bone reserves to obtain more minerals for the blood. Low levels of ionized calcium and magnesium in the serum stimulate activity of the osteoclasts. These are cells that dissolve some calcium and other minerals from the bones and make them available to the blood.
- **Osteopenia and osteoporosis.** In slow oxidation, the process of tapping the bones for minerals continues for years and always leads to osteopenia and perhaps osteoporosis.
- **Dexascans not that accurate.** Assessing bone loss is tricky because x-ray scans are not that accurate. Fluoride and lead in the bones, for example, can make the bones seem more dense than they really are. Selenium in the bones makes them look less dense than they really are.

10. THE VICIOUS CYCLE OF TOXIN BUILDUP. A vicious cycle occurs in all slow oxidizers:
• Low adaptive energy or vitality reduces the ability to remove all toxins from the body.
• This results in a buildup of toxic metals, chemical toxins, and biological toxins such as infections of all kinds. This further interferes with the body’s adaptive energy level.
• This further increases the toxic load until death intervenes in most cases. Death may be due to a heart attack, cancer or other symptom, but the underlying reason is toxin accumulation.

11. COLLAPSE INTO FOUR LOWS, AN END STAGE STRESS PATTERN.
• Most die in four lows. While the sequence of the oxidation types is of critical importance, so is the endpoint stress response. For most people, life ends not in fast or slow oxidation, but in a four lows pattern. Dr. Eck discovered the pattern, which he defined as a calcium level less than 40 mg%, magnesium less than 6 mg%, sodium less than 25 mg% and potassium less than 10mg%. Dr. Eck also discovered how to reverse it in many cases.
• One can collapse into four lows in many ways. One can go directly from fast oxidation into four lows, though this is rare. I call this a fast oxidizer collapse. The first four numbers on an ARL or TEI chart taken together look like an ascending line. From here the person collapses into four lows. Another possibility is one can go into four lows from slow oxidation. I call this sliding down into four lows. One can also go into four lows from a four highs pattern, what I call a belly flop. A final possibility is some combination of the above.

Fast oxidizer collapse  Sliding down from  Belly flop from  Ups and downs before
into four lows    slow to four lows    four highs to four lows    crashing to four lows

FACTORS THAT INFLUENCE THE OXIDATION TYPES AND RATE

The following are generalizations only, as so many combinations of factors are possible:

• Improper nutrition and eating habits. This is often the most important single factor that moves people from a balanced oxidation rate to the extremes of fast and slow oxidation.
• Aging. As one grows older, vitality decreases and this moves people into slower oxidation.
• Stress. Stress depletes nutrients and affects the glands. Acute stress tends to enhance the oxidation rate, while chronic stress tends to wear out the body and cause slow oxidation.
• Lifestyle. Adequate rest helps keep a person in fast oxidation. Mild activity is also good. Too much or vigorous exercise wears out the body and moves people into slower oxidation.
• Individual effects. The same habit or behavior might affect different people in various ways, depending on their health and temperament. For example, mild alcohol use may temporarily increase the oxidation rate by providing readily available “fuel” for the body. In others, it definitely depresses the oxidation rate.
• Stimulants. Caffeine, loud music, stimulant drugs and extreme exercise temporarily keep a person’s oxidation rate faster, but eventually wear out the adrenals and cause slow oxidation.
• **Hereditary and congenital weaknesses.** These are variable. Some push the body into slow oxidation at a young age such as Down’s syndrome. Others cause a faster oxidation rate.

• **Infections.** These usually stimulate the body for a while, but later wear it out.

• **Prescription, over-the-counter and recreational drug use.** These cause stress on the liver or other organs and often move it faster through the oxidation types. Specific drugs stimulate or depress metabolism in complex ways.

• **Toxic exposures.** At first, most toxic metals tend to speed up the oxidation rate. Later, they cause damage to the body, causing it to remain stuck in slow oxidation or four lows.

• **Attitudes that tend to move people into a fast oxidation rate.** These include joy, happiness, a forward-looking attitude and a genuinely more positive attitude about life. Others are having more self-love, more self-appreciation and greater ego strength. Attitudes that can cause an extremely fast oxidation rate are excessive anger, anxiety, aggressiveness, overt controlling temperament, sexual aggressiveness, living totally in the future, paranoia at times, egoism, hatred, thoughts of murdering or harming others and other fight-or-flight-related emotions.

• **Attitudes that tend to move a person into healthy slow oxidation** include a desire to slow down and become more self-aware and present, thinking of others over oneself, a healthy introversion, interest in spiritual topics and a genuine desire for peace and quiet inside the body and out. Others are being methodical, thorough, even-tempered, considerate and polite. Traits that can cause a very slow oxidation rate include grieving, thinking and living in the past, and believing that oneself or others are victims. Others are low self-esteem, depression, negative thinking, feeling sorry for oneself and engaging in confused, distracted or unfocused thinking. Others are feeling defeated, overwhelmed, blocked, stifled, despairing or suicidal.

• **Attitudes and beliefs that can move a person into a four lows pattern.** These include negative thinking, giving up inside, cynicism, extreme resentment, worry, compulsiveness, ruminating or obsessing over things endlessly, perfectionism, stoicism, martyr attitudes, and being very hard on oneself and perhaps on others.

• **Hormonal differences between men and women.** Men tend to be faster oxidizers in part due to their higher levels of cortisol and testosterone. Estrogen in women generally has a slowing effect on the oxidation rate, according to research by Dr. Eck.

• **Other.** Accidents, injuries, surgeries (due to many drugs used), structural imbalances and subtle electrical and other imbalances can all affect the oxidation rate. Even a chiropractic misalignment or clogged colon can stress the body enough in a few cases to alter the oxidation rate significantly.

**GENERAL SYMPTOMS AND TENDENCIES ASSOCIATED WITH FAST AND SLOW OXIDATION INCLUDE:**

• **Height and body shape.** Genetic and nutritional factors affect one’s height and growth rate. However, fast oxidation tends to inhibit growth in height to a degree due to a higher cortisol and cortisone level. Therefore, children who remain in fast oxidation longer, especially into adulthood, tend to be of shorter stature and often have a stockier build. This is sometimes called an “adrenal metabolic type”. Those who go into slow oxidation earlier may be taller and of a more slender and delicate build.

• **Body shape with weight gain.** Classically, fast oxidation causes a more ‘Cushinoid’ body shape, so named after an illness called Cushing’s disease. The person is not as tall, and is
broad in the middle. The arms and legs tend to be thinner as well.

When fast oxidizers gain weight, they develop the *apple-shaped* body. There may be a Cushing’s syndrome “buffalo hump” in the back in very extreme cases. The apple shape is due to high cortisol, which in turn causes high insulin, which deposits fat in the belly area. Fast oxidizing women tend to have higher estrogen levels and tend to be more curvy, fleshy or voluptuous looking. These women also tend to have a larger bust and skinny extremities.

The classic *slow oxidizer* has a *pear-shaped* body, especially later in life. This is due to sluggish adrenal and thyroid gland activity, which is more associated with fat deposition on the hips and legs. The upper body is often thinner and smaller.

The *sympathetic dominant* variant of slow oxidation often has a more angular body. That is, there is little fat deposition. Women with this pattern are often progesterone-dominant, giving rise to a slender, less curvy body shape.

Women tend to have more estrogen, which causes fat deposition in the hips and breast areas. Women with low estrogen tend to be more angular, tall and slender. Combinations of these situations occur as a person passes through various stages of stress at various ages.

**Caution:** I found that body shape is an unreliable way to assign a metabolic type to anyone, or to recommend a nutrition program. You are often viewing a person as they were some years ago, in terms of body chemistry. I found that often a hair mineral analysis did not correlate with my guesswork based on body shape or questionnaires, and that hair analysis was much more accurate from a clinical standpoint.

- **Frequency of bowel movements.** Fast oxidizers tend to have more than one bowel movement per day. Very fast oxidation causes a tendency for diarrhea. In contrast, one or fewer movements per day is commonly associated with slow oxidation. Very slow oxidation and sympathetic dominance are often associated with constipation due to sluggish peristalsis, intestinal dysbiosis, depression and other causes.

- **Cellular excitability.** William Koch, MD, a brilliant physician of the early 20th century, wrote “Calcium is important with magnesium in lessening the cell irritability, while sodium and potassium increase it.” - *The Survival Factor in Neoplastic and Viral Diseases*, p. 241. Fast oxidizers have lower calcium and magnesium and higher sodium and potassium levels. As a result, their cells tend to be more sensitive and irritable. Slow oxidation is the opposite.

- **Skin and hair.** Increased metabolic activity in fast oxidation is associated with increased activity of the sweat and the oil or sebaceous glands of the skin. This causes a tendency for more oily skin and hair. Slow oxidizers are the opposite, which makes them more prone to dryer skin and hair. Exceptions can occur due to fatty acid imbalances, poor hydration and occasionally other reasons. Most teens, for example, have oily skin due to hormone changes and sometimes due to diet high in poor quality fatty foods such as chocolate and French fries.

- **Water content of the tissues.** A higher water content of the skin of fast oxidizers, due in part to a higher tissue sodium level, tends to cause their skin to have a more watery appearance and poorer muscle definition. Slow oxidizers may have better muscle definition and a dryer appearance to their skin due to lower tissue sodium that may cause less water retention.

- **Complexion.** Fast oxidizers often have a more ruddy complexion. This may be due to higher blood pressure, better circulation, a greater tendency for inflammation and perhaps better liver function. This is true even though the sympathetic nervous system tends to move blood inward, away from the periphery of the body. Slow oxidizers tend to be more pale due to poorer skin circulation. Slow oxidizers may also look more yellowish due to sluggish liver and bowel activity, and greater toxicity.
• **Blood circulation.** Fast oxidation is more associated with good circulation. The hands and feet are usually warm, even in cold weather. Slow oxidation is more associated with poorer circulation, a tendency for colder hands and feet, and a lower body temperature, in part due to impaired thyroid and adrenal activity. *Sympathetic dominant* slow oxidizers are those who are caught in a fast oxidizer mentality when the body has moved into a slow oxidation pattern. They tend to use the sympathetic nervous system to excess. Their hands and feet are often cold because they draw most of their blood to the center of their bodies in an attempt to ward off an impending attack. This is part of an exaggerated fighting or running response.

• **Food cravings.** Food cravings can express the body’s desire to balance the body. Usually, however, food cravings are a very inaccurate way to assess the oxidation rate. *Fast oxidizers* who are in touch with their real needs desire fats and oils such as dairy products, red and fatty meats, cream and butter. These foods tend to slow the oxidation rate. For example, babies do well on milk. While mother’s milk contains some sugars, it also contains almost 50% fat. Feeding children low-fat milk is almost always a mistake, in part for this reason. Babies need breast milk and little else except perhaps some pure water.

  Adult fast oxidizers require much more fats and oils. These are higher calorie foods that tend to slow the oxidation rate. Fast oxidizers often enjoy steak and potatoes with sour cream, for example. If fast oxidizers do not eat enough fats or oils, they often will crave starches, sugars or perhaps alcohol to provide more calories and stave off hypoglycemia.

  *Slow oxidizers* tend to have chronic low blood sugar and need more protein, in particular. Most in slow oxidation crave sweets and starches due to a chronic low blood sugar level. In addition, simple and complex carbohydrates often feed yeast organisms in their intestines, and this can cause cravings for these foods via an addictive and allergic phenomenon. These cravings become much worse, as a rule, if they do not eat protein foods several times daily.

  They may also crave salt in some cases. Sea salt actually helps them a lot, as their bodies do not retain sodium and potassium well. This is due to impaired adrenal gland activity and lower aldosterone secretion, which are part of slow oxidation. Slow oxidizers should not like fatty foods, although some crave milk, a comfort food for many people. They really do not have the ability to digest fats very well at all. They usually have more difficulty with higher fat foods, as liver activity is more sluggish and gall bladder activity is also sluggish. They often remark that higher fat foods such as steak tend to “sit in the stomach”.

• **Blood Pressure.** Fast oxidation is associated with increased vascular (sympathetic) tone and sodium retention due to elevated aldosterone levels. These frequently result in a blood pressure above 120/80. Fast oxidizers are also more prone to *labile* or changing high blood pressure. This is because greater sympathetic nervous system activity can cause momentary constriction of the arteries when a person is tired or emotionally upset.

  Healthy slow oxidizers tend to have blood pressures less than 120/80. This is due to weaker vascular tone and low sodium levels due to adrenal and thyroid weakness. These cause a somewhat reduced blood volume and blood pressure. Very slow oxidizers often have very low blood pressures, which can cause vertigo when they stand up quickly. Later in life, slow oxidizers and unhealthy fast oxidizers both become prone to hardening and clogging of the arteries. This can lead to high blood pressure in both metabolic types.

• **Sweating.** Enhanced metabolic activity in fast oxidizers increases the generation of heat in body tissues. This is associated with increased sweating. Slow oxidizers generally sweat much less, and many hardly sweat at all due to a lower overall body temperature.
• **Mood.** In fast oxidation, all metabolic processes speed up, including mental functioning. This can result in a tendency for fast thinking, sharper thinking and a generally more positive outlook. Extreme fast oxidation causes nervousness, irritability, anxiety, and even paranoia and aggressiveness. In slow oxidation, toxicity, nervous depletion, and mineral deficiencies cause a tendency for mental sluggishness, lethargy, apathy, and in many cases, depression. Very slow oxidation is also associated with despair, brain fog and confusion.

• **Types of infections.** Fast oxidizers tend to be more prone to viral and bacterial infections. Examples are the common childhood diseases such as mumps and measles. Slow oxidizers often get more fungal infections, which are “cold”. Fungi feed on dead and dying tissue, and this is a good description of a slow oxidizer. Exceptions occur, however. Slow oxidizers certainly get viral infections and some babies develop thrush or cotton mouth. While this is a fungal infection, it is due to a high pH in certain body cavities combined with a poorly developed immune response, and perhaps the use of antibiotics. Most babies, however, are not generally prone to fungal infections.

• **Energy level.** Cellular energy production is best when the oxidation rate is balanced, or close to balanced. This means neither too fast nor too slow. A fast oxidation rate, within certain limits, is definitely associated with a higher energy level than a slow oxidation rate. However, very fast oxidizers are “over-revving their engines”. They may appear energetic and even frenetic, but their real energy efficiency is lower. It is not a controlled, healthy energy, either. Mild slow oxidizers usually have excellent energy levels if they do not have a lot of toxic metals or other problems. As the oxidation rate declines, one feels more fatigue. Very slow oxidation, particularly with a low sodium/potassium ratio, is associated with exhaustion, depression of all body functions, and even suicidal thoughts as a result of very low cellular energy production.

• **Animal protein preference.** Fast oxidizers tend to prefer red meats to other meats, as they contain a higher percentage of fat. They also have a higher dynamic action, a term that is not used often today, but is a true concept. It has to do with the action of the protein on the body. Fast oxidizers may also prefer the high-purine proteins found in abundance in foods such as sardines, anchovies, tuna fish and organ meats. Purines are high-energy phosphorus compounds that contain more nucleoproteins.

   Slow oxidizers tend to prefer chicken, fish, eggs or vegetarian sources of protein. These tend to contain less fat and fewer purines, and have a lower dynamic action. For these reasons, they are generally easier for them to digest.

• **Cell permeability.** Dr. Koch wrote, “sodium and potassium thus tend to increase the cell’s exchanges and the entrance of water soluble toxins. Calcium, magnesium and strontium tend to reverse this situation.” - *The Survival Factor in Neoplastic and Viral Diseases*, p. 241.

   In other words, fast oxidizers, with their high sodium and potassium and low tissue calcium and magnesium, have greater cell permeability. Slow oxidizers have less permeable cell membranes due to higher tissue calcium and magnesium levels, and perhaps due to other factors such as fatty acid deficiencies or others. This accounts for many unusual phenomena having to do with blood sugar, thyroid hormone disorders and others.

• **Histamine levels.** Carl Pfeiffer, MD, PhD, noted that some people had higher serum histamine levels than others. Dr. Pfeiffer did not know about metabolic typing, but Dr. Eck stated that fast oxidizers tend to have higher histamine levels, perhaps due to their more permeable cell membranes, than do slow oxidizers.
• **Cellular pH.** Slow oxidizers are more acidic at the cell level than most fast oxidizers due to:
  o *Much less bioavailable calcium.* Calcium is absolutely required to neutralize lactic acid and other acidic end products of cell metabolism.
  o *More infections,* especially more fungal infections in slow oxidizers. These excrete extremely acidic products in most cases.
  o *More toxic metals.* Most toxic metals are very acidic in their reactions in the body.
  o *Lower levels of alkaline reserve minerals* in the body. Slow oxidizers are generally more mineral deficient due to poor digestion and absorption, and simply due to their poorer health. They have literally burned out these minerals.
  o *More bowel toxicity.* The presence of intestinal infections and low digestive enzymes cause more putrefaction of proteins and fermentation of sugars in slow oxidizers. These create plenty of acidic toxic chemicals in the bowel of most people today.
  o *Greatly impaired cell permeability.* Slow oxidizers generally have more biounavailable calcium, which reduces cell permeability. Low omega-3 fatty acids and other nutritional deficiencies in most slow oxidizers may also contribute to this problem.

**Caution:** Avoid using the pH of the urine, saliva or blood to measure cellular pH. There is very little relationship between them. In fact, they are generally very poor indicators of cellular pH. Dr. Eck avoided the trap of recommending foods, or other healing methods based on their effect on pH. For example, distilled water can be a way to alkalinize the body, although the water is slightly acidic, because it removes many acidic toxic metals. Fruit can acidify the body, although it is alkaline in reaction, because it often slows the oxidation rate and may cause fungal problems. This makes a person more acidic. Therefore, avoid the acid-alkaline method of recommending foods. Also avoid all alkaline water, for the reasons explained in Chapter 2.

**Mixed oxidation.** These individuals may exhibit qualities of both fast and slow oxidizers. Much depends on the particular mineral ratios in each case. However, mixed oxidation is always temporary, so the qualities and symptoms will often shift quickly.

**OTHER TOPICS RELATED TO THE OXIDATION TYPES – EARLY IDENTITIES AND THE OXIDATION TYPE**

A person’s identity is formed at a young age by impressions from outside, but also from the body chemistry itself. If a person is a very fast oxidizer as a child, for example, he may grow up more suspicious of others, more aggressive and/or less concerned with others. This is what happens to many people, especially boys. On the other hand, if one grows up in very slow oxidation, one may think that fatigue, some depression and despair are “normal” and part of one’s personality, when they are really just effects of a very sluggish oxidation rate.

These early life impressions can affect the friends one makes, the partners one chooses, and the occupations, hobbies, sports and every other aspect of one’s life. Understanding this concept could be very helpful for parents, teachers and even political leaders who wish to produce citizens who are balanced, meaning not too aggressive and angry, but not depressed or feeling like victims, either.
IDENTITY DISCOMFORT AS AN OXIDATION RATE IMPROVES

Some people literally build their entire lives around early impressions that include the body’s oxidation rate. When a person follows a development program, the changes that take place in the oxidation rate can cause discomfort and confusion. It can even cause a person to abandon the program. Below is an example from clinical practice. This is followed by some of the reasons the problem occurs and how to handle it.

**Slow to faster oxidation.** Jan, age 40, joked that her friends called her “the depression case”. She had been this way as long as she could remember. However, she functioned okay, she thought. Her hair analysis showed a very slow oxidation rate, which is often associated with depression. She began a development program and did extremely well. For example, after a year or so, her dentist told her she had regrown 2 millimeters of jawbone in her mouth that had receded. He was really telling her she had reversed some osteoporosis of the maxillary bones. This was astonishing to the dentist (and to me as well, since, at that time, I was less experienced with development).

Soon afterwards, however, Jan came to me and said she was quitting the program. She admitted feeling stronger and happier, but felt anxious and somehow uncomfortable. I knew why. She was no longer as depressed and it did not “fit” her identity. She was in a homosexual relationship and I heard that it was not working well. Jan was very upset about this. Also, she just didn’t relate to people the same way. Before, she had hated men, for example, and now she found herself strangely interested in men for the first time. Regardless, she stopped her development program. A few years later, however, Jan asked to go back on her program. She was ready, she said, to come out of slow oxidation now and resume her healing with me. Most likely, she had become used to her new personality based on a less sluggish oxidation rate and was ready to progress to the next level.

**Why identity problems occur as the oxidation rate normalizes.** Reasons in both fast and slow oxidizers include:

- **Too relaxed and too aware of others.** When fast oxidation is reduced on a development program, a person may feel more relaxed. He may have less ambition or drive, less nervous energy and perhaps less sexual desire as well. It can feel as if the world is closing in around oneself. This is disturbing to fast oxidizers whose entire identity may be wrapped up in a sense of power, speed and control over situations. It is probably worse for men in our society, as these traits are more highly valued in men.

- **In high gear.** As a slow oxidation rate speeds up on a development program, it can be equally uncomfortable. It can feel as though someone just gave you a high-powered sports car to drive, but no driving lessons. Slow oxidizers, in many cases, have learned to get by on much less energy. When the energy level increases, especially if it happens quickly, many wonder if they can handle it, wonder what to do with it, or whether they are becoming “hyper”. New interests and desires will arise, old friends will seem like slugs and there is often more sexual desire. Often they begin to look and feel sexier as well, which is a problem for some women, in particular, who may not know how to handle the new attention they receive, much of it perhaps negative.
• **Too smart.** While fast oxidizers on the program may start to feel groggy and relaxed, some slow oxidizers will begin to feel “too smart”. This might not seem important, but many people in society thrive on the “ignorance is bliss’ mentality. In other words, they prefer not to use their brain any more than necessary to get by, in part because it doesn’t work well. When it starts to function properly, some people don’t like it or don’t know what to do with it. It is the opposite of the fast oxidizer, who must learn to give up some of his 20 hobbies like flying airplanes, racing ocean-going boats and rafting the rivers because the levels of nervous energy and drive are less.

• **Increased awareness.** Most unhealthy fast oxidizers and many slow oxidizers have a reduced level of awareness. Their energy is focused mainly inside of themselves, rather than on their surroundings. They must do this just to survive. As they break out of these toxic patterns, their new awarenesses can seem harsh, cruel and shocking. Most are not prepared for it and are not sure what to do about it. In fact, some withdrew into slow oxidation and a calcium shell just to get away from this heightened awareness.

• **Loss.** A longstanding oxidation rate, whether too fast or too slow, is part of a person’s “comfort zone”. When the rate changes, there can be a feeling of uneasiness and even loss. For example, a fast oxidizer may lose his edge - his nervous excitement to which he is accustomed. He may suddenly not feel like continuing his reckless and thoughtless habits. A slow oxidizer may lose his *calcium shell of protection from the world*. In either case, loss can be painful, even if it is a good thing.

• **Anxiety.** All of these changes can cause anxiety. At times, it is severe enough to cause a person to sabotage the program in some way, such as cheating on the diet, skipping supplement doses, gorging on sugar and caffeine, or perhaps staying up too late. If a practitioner and client realize what is happening, it can be dealt with. It might even mean slowing down the program by taking fewer supplement doses, for example, or taking a break from the program until the person adjusts to the reality of a healthier body chemistry.

**YOUNG CHILDREN’S ISSUES AS THE OXIDATION RATE CHANGES**

Most often, the changes in children’s health, attitudes and behavior as a result of a development program are amazing and wonderful. At times, however, the following may occur:

**Slow oxidizing, and even fast oxidizing children, may become more energetic for a while as they become healthier.** This may occur because they are becoming more happy and joyous, or because they now have the energy to “act out” or respond correctly to stressors. Some may just be experimenting with their newly found energy. This is all good, though it can look like hyperactivity. It is never a reason to drug the child. Most of the time, a child’s behavior can be controlled by giving the child more Paramin, or calcium and magnesium, and even by substituting more full-fat cheese, meat and eggs for carbohydrate foods.

**Fast oxidizing children may slow down and not want to play baseball or run around as much.** This is also excellent, but can be unnerving for parents. It is not a problem. If it is extreme, the nutrition program may need adjusting. However, many children are so toxic and depleted, they might withdraw for a while to heal. This is especially true in the rare case of a child with a four lows pattern.

**Family dynamics may change.** Changes due to a development program may cause other, unexpected shifts in the family. Parents may need to seek help with changes if they do not know what to do about them.
THE BLESSING OF SLOW OXIDATION SYMPTOMS

Health challenges that occur in slow oxidation such as adrenal exhaustion, hypothyroidism, depression, copper toxicity and even dreaded diseases like cancer and heart attacks can have positive benefits. Among others, they can cause a person to slow down physically, and to think more about life and what one truly wants and needs. This tends to promote mental maturity, clarity of thinking and emotional stability. This can be a blessing in disguise that helps a person to move beyond a superficial life.

Through my own illness of this sort, I have learned the truth that we are here to mature mentally and emotionally. This is not the same as achieving the “full potential” that most psychologists talk about. It is not primarily about a wonderful career, many friends and a comfortable lifestyle. It is about something far deeper. It has been written about mainly in books such as the *The Lives Of The Masters Of The Far East* by Baird Spaulding.

EVOLUTION, SPIRITUAL DEVELOPMENT AND THE OXIDATION TYPES

As a person develops mentally and emotionally, he or she will often move from fast oxidation into slow oxidation. This occurs for several reasons:

- *Less focus on the physical aspects of living.*
- *More rest and sleep.*
- *Reduced adrenal and thyroid gland activity and lower stress and sex hormone levels.*
- *Often becoming quieter and calmer, as part of becoming more introverted.*
- *Perhaps fewer dietary stimulants and a calmer lifestyle with activities such as meditation.*

**Enhancing mental development in the children.** It may be wise to feed and raise children so they move into a mild slow oxidation condition at a young age. This would be preferable to the stress and mental damage of a very fast oxidation rate, as most young children experience today. This could help greatly to regenerate the human race in a single generation. Simple steps that would be most helpful are:

- *A development program.* Almost all children would benefit from this to remove toxic metals and balance the chemistry. A year or more would be needed for most children.
- *Reducing stress and pressure on children.* This would require changes in school and at home, but they would be well worth it.
- *Much more rest.* Children all need 10 hours or more of sleep each night.
- *The diet must have plenty of the omega-3 oils and quality steamed vegetables.* Less red meat may also help keep the oxidation a little slower, provided other quality proteins such as eggs and raw, certified milk, cheese and yogurt are substituted for it.
- *Relaxing and calming activities are also helpful to keep the oxidation rate somewhat slower.*

The chart on the next page illustrates how the oxidation rate relates to maturity.

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<th>FAST OXIDATION = FUN</th>
<th>SLOW OXIDATION = SLOWING DOWN</th>
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<td>Fast oxidizers are happier, more superficial,</td>
<td>Slow oxidizers are often sadder, inward</td>
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extroverted, faster moving, upward moving, elated, and usually live more in the ego mind. Some adults are “vampires”, living off the energy of others.

moving, introverted, and generally much slower moving. Many feel like victims and thinking is cloudy. It is often a more spiritual place, with more self-reflection and less of an ego focus.

**Extreme fast oxidation (Ca/K less than 0.5:1).** This is an extremely stressful condition of most babies and young children that scars many of them for life, causing intense fear and even paranoia. This means a person is suspicious and may react quickly to any perceived threat. Adults with this condition tend to be hyperkinetic, hyperthyroid and often anxious, irritable, on edge, and ready to fight at the slightest provocation. This is not a healthful or spiritual situation.

**Extreme slow oxidation (Ca/K greater than 100:1).** Even more introverted and often depressed. The person is often physically ill and ‘ill in spirit’, which means lonely, unhappy and just wanting to give up. Most have a calcium shell to some degree, indicating a protective stance, psychological withdrawal and defending the Inner Self. It is a holding pattern to prevent complete collapse. However, some use this pattern to help them grow and mature inside. Thus it is often a healthful place to start the spiritual journey toward real maturity.

**Fast oxidation with a sodium/potassium ratio less than 2.5:1.** This is called tired or temporary fast oxidation. The person is in transition to slow oxidation in most instances. Ego-related issues may be stumbling blocks. This can be a difficult transition for many people.

**Slow oxidation with a sodium/potassium ratio less than 2.5:1.** This is an even more introverted, tired and perhaps depressed situation, and perhaps getting worse. This is not an ideal situation for development as it can lead to destructive behaviors such as eating sugar, drinking alcohol, risk-taking behavior to feel ‘alive’, thrill-seeking and others.

**Fast oxidation with a sodium/potassium ratio less than 1:1.** This is an advanced transition from fast to slow oxidation or may indicate severe resistance to change. The person may have been traumatized in some way that makes the transition to a more spiritual life much more difficult.

**Slow oxidation with a sodium/potassium ratio less than 1:1.** Very tired, unhappy and usually depressed. Perhaps an old trauma is causing the person to essentially ‘hide out’ from life. This is a painful place, but it can motivate a person to move in a spiritual direction, nevertheless.

**A bowl pattern in fast oxidation.** An incorrect diet or pushing oneself in the wrong direction can cause this pattern. This can indicate movement toward a step up pattern which is a death pattern.

**A bowl pattern in slow oxidation.** This is more common than a bowl in fast oxidation. It usually represents extreme resistance to change or a simple dilemma on the road to change into full-fledged slow oxidation.

**SOCIETAL AND POLITICAL IMPLICATIONS OF THE OXIDATION TYPES**
Society is an organism, just like our bodies. Each nation has an immune or defense system, a fuel or energy processing system, and every other system that our bodies have. All must function reasonably well or the society begins to decay. As more citizens of America and Europe, in particular, sink into adrenal exhaustion, toxic metal poisoning and nutritional depletion, the societal organism sinks a little as well. This may be called “nutritional determinism”. Some believe that societies rise and fall based on new technologies, new religions and for other reasons. I believe that as more and more people are unable to think clearly or function well, it is causing profound changes in the nature of Western societies. These include:

- **Unhappy relationships.** People who are ill often blame others around them for their problems. This causes many difficulties in relationships.
- **Atheism.** When one feels tired all the time and doctors can’t find the reason, it is easy to doubt that God cares or even exists.
- **Moral relativism.** When one feels ill or depressed much of the time, momentary pleasures take on much greater importance. They may be the only thing left that makes one feel ‘happy’ or ‘alive’. Moral codes, instead of being guides for living healthfully, seem like irrelevant obstacles that block ‘happiness’, though this is never really true. Few realize that moral relativism translates into cheating and corruption at all levels, particularly among the leaders of the government. This is extremely destructive for the society.
- **Drug use, both legal and illegal.** Without medical answers, millions “self-medicate” for their aches and pains, anxieties and depression. Mind-altering substances allow one to feel good for a few hours, even if they destroy the nervous system in the long run.
- **Utopianism and totalitarianism.** Many blame their health and wellness problems on ‘the system’, however they perceive it. This gives rise to the mantra that “change” is the answer. Most people have little knowledge of history, so they cannot see that most of what has come as change is just a throwback to far worse, old-fashioned and corrupt ways of doing things.
- **Socialism.** Happy, healthy, energetic people do not need or want government telling them how to live and what to do and not do. Tired, depressed, failure-oriented people think they need and may even want government welfare, entitlements, “special benefits” and more.
- **Scapegoating.** Individuals, as well as governments, that do not function well tend to look for someone to blame. Common scapegoats are the rich, religious people and others. This further divides society and can lead to wars with other nations.
- **Chaos, violence and war.** Poor quality decisions, especially at high levels of government, cause the final destruction of society. Misinformed and cloudy-minded people keep electing the same poor quality leaders. This will eventually doom any nation. This happened to the Roman empire and could happen here as well. In Rome, perhaps an important factor was the advent of lead water pipes in the city of Rome that insidiously poisoned the ruling class, lowered their IQs and perhaps induced them to violence.

Today, our culture is plagued by a combination of fatigue due to air and water pollution, combined with pollution due to fluoride and other chemicals added to the water and food supply. In addition, the levels of toxic metals are higher than ever before in recorded history, and not just lead. This is made worse by the use of hundreds of over-the-counter remedies, along with toxic medical procedures. This is not the same as ancient Rome, but a modern scourge, nevertheless.
SPECIFICS OF BALANCED, FLEXIBLE, FAST, SLOW, SUB-OXIDATION AND MIXED OXIDATION

Jaclynn, age 3, was a Down’s syndrome baby. Her mother had taken her to many doctors. She was growing very slowly, had mitral valve problems, a poor appetite except for salty foods, and allergies to milk, corn and other foods. Jaclynn was also a very obstinate child. Her first hair analysis revealed fast oxidation with a sodium/potassium ratio of 0.41 (normal is 2.5). This indicates very chronic stress, usually intense frustration, resentment and hostility, and often chronic infections and excessive tissue breakdown or catabolism. Her trace element levels were all very low, including a hair zinc level of 3 mg% (normal is 16-20). This is as low as I have ever seen, and is almost always associated with delayed development and birth defects. Zinc is essential for protein synthesis, growth and development of the nervous system. The only toxic metal revealed on the first analysis was high aluminum at 1.5 mg%. Babies with Down’s syndrome and other genetic imbalances often have initial hair mineral analyses of this type.

I suggested changing Jaclynn’s diet from peanut butter, soy milk and a lot of fruit, to more cooked vegetables, more meat to provide zinc, and no soy products whatsoever. She also took supplements of zinc, copper, calcium and magnesium to begin to correct her very imbalanced chemistry. Babies and children usually do not need to take many supplements, as their digestive systems are extremely sensitive and they do worse if they are given too many. Jaclynn’s response was slow. Her nutritional deficiencies and toxic metal load were enormous. However, she started to grow a little faster, became stronger and would no longer dislocate her hip when she moved.

Her second hair analysis four months later was very similar to the first one. The sodium/potassium ratio was even worse and the zinc remained the same, in spite of the diet and supplements. The explanation is that removing toxic metals such as aluminum often causes a worsening of the sodium/potassium ratio temporarily. As for zinc, this child was so depleted that the body apparently did not have extra zinc available to be lost into the hair. Therefore, the hair level remained low, even though important changes were taking place inside.

Seven months later, the next mineral analysis revealed the same zinc level of 3 mg%, plus a four lows pattern. This looked even worse. However, on retests, four lows sometimes occurs and it is just a retracing of an older collapse or burnout condition. Meanwhile, while Jaclynn’s physical height remained below average, her food allergies diminished and her cognitive abilities began to leap far ahead of other Down’s syndrome children.

On the most recent hair test three years after starting her program, the zinc level finally moved up to 6 mg%. This is still a very low number, but 100% improved from earlier. Jaclynn is still small for her age, but her cognitive and speaking abilities are developing at a very
unusual pace. According to her mother, her test results are “off the chart” compared to other Down’s syndrome children. Also, her physical features are changing and she no longer looks as much like a Down’s syndrome child. Zinc is essential for growth and development on many levels. I surmise that Jaclynn is using the limited zinc she has for brain development, but there is still not enough for normal body growth. I believe this will correct itself as she keeps replenishing zinc with a proper diet and the correct nutritional supplements.

The oxidation type and rate are unique and very special aspects of development science. They orient the practitioner and client immediately regarding the homeostatic state of the body and provide a tremendous amount of other information as well.

Ratios, a key to assessing the oxidation type and rate. This chapter concerns several important mineral ratios. Here is a basic math review of ratios:

- A ratio indicates a relationship or balance point between two quantities. Another word for this is fractions. Five over two is the same as the ratio between five and two.
- A ratio is a pure number with no units. Ratios can be expressed as simply a number, or they may be written as a number, followed by a colon, followed by the number 1. For example, on a hair analysis, if calcium is 40 mg% and potassium is 10 mg%, the ratio of calcium to potassium is 40 divided by 10 or 4:1. In this book, ratios are expressed just as a single number, such as 4 in the example above.

The car analogies. To explain the oxidation rates, I will use the analogy of a car engine because many people are more familiar with cars than with the body. Fast oxidation is like:

- The car engine is badly tuned so it idles too fast and the engine cannot slow down.
- The gas-air mixture is too rich, so the engine runs roughly and too fast all the time.
- The gas pedal is stuck in the down position so the car can’t slow down.
- The engine is not “emotionally adjusted” and keeps thinking it is “under attack” all the time.
- In temporary fast oxidizers, which is the case with adults and older children who are in fast oxidation, the situation is even more severe. The vehicle is badly damaged deep inside, yet it is still stuck in “fast idle” with the engine racing. It is like a ticking time bomb.

Slow oxidation car analogy. Slow oxidation is more like:

- The engine is not getting enough gas, so it will not go very fast.
- The gas-air mixture is too lean so the engine coughs and chokes without enough fuel.
- The person is driving with his parking brake engaged.
- The engine is simply all clogged up and is not capable of much speed.

THE IDEAL OXIDATION RATES:
BALANCED OXIDATION – NOT TOO FAST OR TOO SLOW

- This tends to put the least strain on the body.
- It allows the body to produce energy in the most efficient manner.
- It may indicate a flexible oxidation rate, as described in the paragraph below.
• It may indicate mental and emotional balance, which are helpful for health, but also essential for what is called development in this textbook.

Exceptions. In some situations, an oxidation rate can appear balanced on a hair test when, in reality, the person is not healthy at all. These situations include:

• Four lows pattern. This is similar to the car engine being very stuck in one gear.
• The delicate souls in four highs. A few people keep their oxidation rate balanced using their minds or emotions. They often have a four highs pattern on the hair analysis, but not necessarily. These delicate ones are difficult to work with, at times. For example, they may not like a healing program that does not permit their caffeine and other stimulants. Also, if they “lose their balance” and fall into very slow oxidation, for example, they are prone to “crashing”, meaning they feel tired and depressed. They might also speed up too much at times, and feel anxious for this reason.
• Other. Toxic metals, emotional states, medical drugs or something else can skew the hair mineral readings, especially on tests near the beginning of a program. This often makes the oxidation rate appear balanced when it is merely compensated to look this way. A weakness of hair mineral analysis is that it cannot always reveal hidden imbalances. For this reason, one still needs to ask about clients’ symptoms, diets and lifestyles for a complete understanding of the test.

FLEXIBLE OXIDATION – ABLE TO SPEED UP OR SLOW DOWN

An ideal oxidation rate is flexible. This means the body can increase it or decrease it as needed. In our analogy, the auto engine should be able to run very fast or very slow, as needed. Assessing flexible oxidation is not possible with current mineral testing technology. A hair analysis only provides an average reading over a three-month period of time. Therefore, we cannot read the oxidation rate from moment to moment or even day to day, as the test is now performed. The best one can do is to check the test for a fairly balanced oxidation rate, as this gives a clue that the person may be able to both speed up and slow down. In contrast, an extremely fast or extremely slow oxidation rate usually means the person is more stuck in either fast, slow, mixed, four lows or some other pattern.

FAST OXIDATION

Definition. Fast oxidation is a homeostatic state of body chemistry characterized by excessive adrenal and thyroid glandular effect at the cellular level. It is not quite the same as high levels of adrenal and thyroid hormones. The oxidation states have more to do with glandular effect, and not primarily hormone levels.

In the stress theory of disease, it is an early stage of stress, also called an alarm stage or alarm reaction. It is a more sympathetic or fight-or-flight state of body chemistry. This is not the same as sympathetic dominance, a condition that occurs mainly in slow oxidizers and is primarily related to lifestyle and a mental tendency to push oneself hard.

Mathematically, Dr. Eck defined fast oxidation on a hair test as a calcium/potassium ratio or Ca/K less than 4:1 and a sodium/magnesium ratio or Na/Mg greater than 4.17:1.
Degrees of fast oxidation. One may further define fast oxidation as mild, moderate or extreme. The lower the calcium/potassium ratio or the higher the sodium/magnesium ratio, the more extreme the fast oxidation. Since two ratios are used to determine the oxidation rate in this work, the difference between them is a simple way to define how extreme the oxidation rate is. The following cutoff points are somewhat rough and arbitrary and are our, not Dr. Eck’s:

- **Mild**: A calcium/potassium ratio between 1.6 and 4.
- **Moderate**: A calcium/potassium ratio between 0.4 and 1.5.
- **Extreme**: A calcium/potassium ratio less than 0.4.

READING FAST OXIDATION ON A HAIR ANALYSIS

Most of the time, fast oxidation is easy to read on a hair mineral chart from Analytical Resarch Labs. However, in a few situations this is not true. The two ways to identify fast oxidation are:

- **Visually**. On the graph from Analytical Research Labs and perhaps a few other laboratories, one can often recognize it at a glance because the first two numbers are low and the second two are elevated. This is the familiar appearance of fast oxidation. Exceptions are when the first four numbers are all high or all low. Then it is difficult or impossible to recognize the fast oxidizer pattern visually.
- **Calculate the ratios**. Calculate the calcium/potassium and sodium/magnesium ratios. Then use the criteria mentioned above to determine fast or slow oxidation. The ratios may be shown on the graph page of the report, or you may calculate the ratios by hand.

Factors that can skew the macromineral readings, making the determination of the oxidation rate more difficult in a few cases:

- **Washing hair at the laboratory**. This makes it difficult, if not impossible, to identify the oxidation type accurately. For this reason, do not use a laboratory that washes the hair for oxidation rate assessment.
- **Water softeners**. Rarely, bathing and drinking water softened with salt or potassium will raise the sodium or potassium levels, depending on the chemical used.
- **Toxic metals**. This might also affect the readings. The toxic metals may or may not be showing on the hair mineral test.
- **On retests only, the release of biounavailable or “metastatic” calcium can skew the calcium and magnesium levels upward**. This topic is discussed more in the section on retests and in Chapters 14 and 24.

TWO VARIETIES OF FAST OXIDATION

Dr. Eck identified several variants of fast oxidation:

1. **True fast oxidizers** are mainly young children and babies. All the others are generally temporary fast or slow under stress. Dr. Eck defined true fast oxidation as a test with a:
• Sodium/potassium ratio greater or equal to 2.5:1.
• Calcium and magnesium levels most often less than 40 mg% and 6 mg%, respectively.
• Zinc usually less than 17 mg%.
• Sodium, potassium or both are above their ideal values of 25 mg% and 10 mg%, respectively. Another way to say this is that three lows or four lows pattern is not present.

Symptoms. True fast oxidizers usually have more symptoms of fast oxidation, as described in Chapter 12. These include irritability, anxiety, nervousness and others.

2. Temporary fast oxidizers or slow oxidizers under stress. These are fast oxidizers that have other imbalances on the hair chart that indicate their condition is not a true fast oxidizer state, but rather a temporary one due to the presence of toxic metals or some other physical, emotional or spiritual stress condition. A hair mineral test will usually reveal a:

• Sodium/potassium ratio less than about 2.5. This is the main indicator.
• Calcium level perhaps greater than about 40 mg%.
• Magnesium level perhaps greater than about 6 mg%.
• Three lows or four lows pattern may be present.
• Zinc level perhaps greater than about 16 mg%. True fast oxidizers usually have lower zinc levels.

Rarely, a person has none of these indicators, so that the hair analysis would appear to indicate a true fast oxidizer. In fact, however, the person is a temporary fast oxidizer. Signs of this include 1) the person’s age is greater than about 10, and/or 2) the person has significant health problems, usually including some slow oxidizer symptoms.

Symptoms of temporary fast oxidizers. Symptoms of both fast and slow oxidation may be present because this is a stalled transition state between fast and slow oxidation. For example, one may be anxious at times, yet depressed and tired at other times. Another combinations is high blood pressure (a fast oxidizer tendency) and hypothyroidism (a slow oxidizer tendency).

SLOW OXIDATION

Slow oxidation is a homeostatic state of the body characterized by reduced thyroid and adrenal glandular effects. In the stress theory of disease, it is a resistance or exhaustion stage of stress. It is a relatively parasympathetic state of the body compared to fast oxidation. However, it is not a healthy parasympathetic state. Instead, extreme weakness of the sympathetic branch of the autonomic nervous system causes the body to compensate. The body moves into a parasympathetic state mainly as a defense measure to prevent further damage to the body.

Understanding resistance stage of stress. Dr. Selye proposed a resistance stage of stress between the alarm and exhaustion stages of stress in animals. Dr. Eck did not speak about it at great length. The following chart shows possible ways to identify it using hair mineral analysis:

<table>
<thead>
<tr>
<th>Alarm Stage</th>
<th>Resistance Stage</th>
<th>Exhaustion Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
Using the Na/K ratio

<table>
<thead>
<tr>
<th>Na/K greater than 5</th>
<th>Na/K between 2 and 5</th>
<th>Na/K less than 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast oxidation with an Na/K ratio greater than 2.5</td>
<td>Fast oxidation with an Na/K ratio less than 2.5, four highs, four lows, step up, step down and sympathetic dominance patterns. These are all fast-to-slow oxidation transition patterns</td>
<td>Very slow oxidation or a four lows pattern</td>
</tr>
</tbody>
</table>

Using various hair analysis patterns

<table>
<thead>
<tr>
<th>Na/K greater than 5</th>
<th>Na/K between 2 and 5</th>
<th>Na/K less than 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast oxidation with an Na/K ratio greater than 2.5</td>
<td>Fast oxidation with an Na/K ratio less than 2.5, four highs, four lows, step up, step down and sympathetic dominance patterns. These are all fast-to-slow oxidation transition patterns</td>
<td>Very slow oxidation or a four lows pattern</td>
</tr>
</tbody>
</table>

**The shift into slow oxidation.** One can move into slow oxidation as early as the age of one. More often, it occurs between 3 and 10 years of age. The shift is occurring sooner today than even 29 or so years ago when I first began reviewing hair charts. This is probably due to a combination of:

- More babies are being born with significant mineral imbalances due to poor health of their mothers.
- More vaccines, drugs and other toxic medical interventions used on young babies.
- More electromagnetic and electronic stress from cell phone and other wireless devices.
- More family stress. This is due to many factors including “burned out” parents and siblings, and perhaps even the breakdown of family values in the United States and Europe.
- Perhaps more spiritually-inclined children being born who have more trouble coping.

**Definition of slow oxidation according to Dr. Paul Eck.** Mathematically, Dr. Eck defined slow oxidation as a calcium/potassium ratio of 4 or greater, and a sodium/magnesium ratio of 4.17 or less. Slow oxidizers can be further classified as mild, moderate or extreme. Below is a rough mathematical way to assess the degree of slow oxidation:

- **Mild:** A calcium/potassium ratio less than 30 and greater than 4.
- **Moderate:** A calcium/potassium ratio between 30 and 100.
- **Extreme:** A calcium/potassium ratio greater than 100.

For example, if the calcium/potassium ratio is 52, the oxidation rate is moderately slow. However, if the calcium/potassium ratio is 220, it indicates extreme slow oxidation.

**HOW TO READ SLOW OXIDATION ON A HAIR MINERAL ANALYSIS**

- **Visually.** On a calibrated chart from Analytical Research Labs, a slow oxidation rate is present when the calcium and magnesium bar graphs appear taller than the sodium and potassium bar graphs. Exceptions include four highs and four lows patterns. With four highs, all the bars of the macromineral bar graphs may be off the chart so one cannot read the oxidation rate visually. In four lows, the numbers may be so low the ARL bar graphs may be unclear. Mixed oxidation is the other possibility and is discussed below.
- **Calculate the ratios.** Calculate the calcium/potassium and sodium/magnesium ratios and then use the criteria above to figure out the metabolic type and rate. The ratios may be calculated for you somewhere on the graph page.
MIXED OXIDATION

Mixed oxidation is a term Dr. Eck used to describe the situation when one of the two ratios used to assess the oxidation rate indicates fast oxidation and the other indicates slow oxidation. It is purely temporary and resolves to fast or slow oxidation usually in a few months on a properly-designed development program. The cause of mixed oxidation is usually not easy to figure out and not important.

**Definition.** Mathematically, mixed oxidation is defined either as a:

- Calcium/potassium ratio greater than 4:1 AND sodium/magnesium ratio greater than 4.17:1
- Calcium/potassium ratio less than 4:1 AND sodium/magnesium ratio less than 4.17:1.

**Mixed oxidizer symptoms.** Symptoms of both fast and slow oxidation may occur together, depending on the actual ratios and other imbalances on the analysis.

FAST AND SLOW MIXED OXIDATION

Mixed oxidation is further classified as fast mixed or slow mixed oxidation. This has to do with whether the ratios indicate one is closer to fast oxidation or closer to slow oxidation. This is important to know, especially for designing supplement and dietary programs.

**Determining fast and slow mixed oxidation.** The mathematical calculation is basically to determine which ratio is more extreme. For example, in fast mixed oxidation, the ratio indicating overactive glandular effect is more extreme (further away from its ideal level) than the ratio indicating underactive glandular effect. In slow mixed oxidation, the ratio indicating underactive glandular effect is more extreme (further away from its ideal level) than the ratio indicating overactive glandular effect. Here are two ways to do this:

1. A simple mathematical method is to subtract the calcium/potassium ratio from the sodium/magnesium ratio. If the number is positive, it is a fast mixed oxidizer. If it is a negative number, it is a slow mixed oxidizer. This is not perfect, but very close and very simple. For example, let us say the calcium/potassium ratio is 6 and the sodium/magnesium ratio is 8. Eight minus six yields 2, a positive number. This indicates a fast mixed oxidation state.

2. Note whether the Na/Mg or the Ca/K ratio is further from the ideal value. Whichever is further from the ideal is the one to pay attention to. Then note if that ratio is showing slow or fast oxidation. If fast, then it is a fast mixed oxidizer.

For example, if the Ca/K ratio is 8 and the Na/Mg ratio 16, the ratio that is further from the ideal is the Na/Mg ratio. When the Na/Mg ratio is elevated, it indicates fast oxidation. Since this ratio is the more extreme, these ratios indicate fast mixed oxidation.

**Symptom-based mixed oxidizer programs.** In about 80% of cases, the methods above are the best way to guide the design of the diet and nutritional supplement programs. However, in a few cases, symptoms may be a better guide, especially when the mixed pattern is close to balanced – meaning not skewed much toward fast or slow mixed oxidation.
For example, if the sodium/magnesium ratio is 10 and calcium/potassium ratio is 10.5, the person is almost perfectly in the middle between a fast mixed and a slow mixed oxidizer. In this case, deciding how to set up a program is not as easy. In these cases, symptoms can be another way to determine whether to recommend a fast oxidizer or a slow oxidizer nutritional program. This is one of the rare times that symptom pictures are used in development.

If, for example, a person complains mainly of fatigue, depression or constipation, it is likely that underneath the person is a slow oxidizer, regardless of the exact mineral ratios. If, on the other hand, a person complains mainly of anxiety, nervousness, high blood pressure with excellent energy, it is likely that underneath the person is a fast oxidizer, and requires a fast oxidizer supplement program and diet, at least until a retest can be done in a few months. This method is not foolproof, but it may work best in some situations.

**Other methods of assessing the oxidation rate.** Other methods of determining the oxidation rate are used by a small number of physicians. These include blood tests, questionnaires and others. Everything in this book pertains to Dr. Paul Eck’s method of assessment only.

**SUB-OXIDATION OR FOUR LOWS PATTERN**

Four lows or sub-oxidation, *on an initial hair analysis only*, is often an end-stage stress or death pattern. This very important pattern is described in detail in Chapter 22.

**DEATH AS A MEDICAL DISEASE**

Medical science does not address this subject in much detail. However, since development is a predictive and preventive science, first and foremost, it is very helpful for practitioners to be aware of patterns on hair analyses that are associated with severe illness and death. For example, it allows a practitioner to say with some authority that a client must, if he wishes to get better, follow the program faithfully in these cases, and even then it may be too late or other factors may intervene and prevent the best outcome.

**Causes for death of the body.** The underlying causes for death of the body are the opposite of the causes of health and vitality in the body. They include:

- *Toxin accumulation.* These may be toxic metals, toxic chemicals or biological toxins such as bacteria, viruses, fungi, parasites and others. The growth of tumors and cysts in the body may also be viewed as a type of toxin accumulation that can block arteries or press on nerves, for example, causing death.

  Toxic thoughts or toxic emotions may also be important. They include negativity, cynicism, resentment, hostility and victim thinking. These do not cause death directly, but may cause a person to eat poorly, drink alcohol, make poor quality decisions, have an accident or waste energy in emotional outbursts or mental upset. Many neuroses eventually lead to death because a person becomes caught up in unrelenting emotions or thoughts and cannot escape. This causes depression and a desire to die in many older people.

- *Depletion of nutrients or malnutrition.* This is a very common cause of death in older people who have weak digestion, often impaired teeth and have trouble feeding themselves as well.
• Infection. I list this separately, although it was mentioned under toxins. Infection is specifically a weakening of the immune response or defense systems of the body.

• Imbalances involving yin and yang. This may seem esoteric, but has to do with imbalances in the oxidation rate and major mineral ratios. Balance is a key to health. When the body is out of balance, many ailments arise. This is somewhat of a whole system or cybernetic principle.

• Rigidity. To continue living, the body and mind must be flexible enough to respond to stress. If the body or mind become too rigid, they are much less able to adapt.

• Low energy production. Energy production at the cellular level is a primary cellular activity. Low energy production impairs every other body system since all of them depend on biochemical energy. Low energy is thus an underlying cause for death, no matter what the immediate symptoms or diseases are that a person has.

• Vicious cycles. As explained in Chapter 8, negative feedback loops are a key to maintaining balance and health. Positive feedback loops, also called vicious cycles, may lead to death.

• Entropy, disconnecting or disassociating the parts of the body and/or mind. This may sound unusual, but simply means that the body’s communication systems break down. As a result, nerve and hormonal signals do not get through, or they become distorted. As a result, the integrity of the whole system begins to break down.

• Discouragement and/or despair. Many older people, and some young people as well, can become very discouraged for any number of reasons. As a result, they are happy to die to relieve their misery.

DEATH PATTERNS ON A HAIR MINERAL ANALYSIS

Identifying patterns associated with the end of life is important for practitioners and for clients or patients – mainly to begin immediately to alter the pattern if life is to be preserved. All of the following patterns can be changed and ended with a properly designed development program. Note that more than one death pattern can be present on one hair test, such as a four lows pattern combined with a low sodium/potassium ratio. See the index of this book for more in-depth explanations of each of the patterns below:

1. Sodium/potassium ratio less than about 0.4. This is an important hidden trauma pattern associated with chronic severe stress. It is an electrical-discharging pattern that cannot go on too long. It is also a give-up pattern and a severe reversal pattern. For much more on this basic pattern, see page 257 and other references to this ratio in the book index.

2. Double low ratio pattern, also called double inversion pattern or double give-up pattern (Na/K < 2.4 and Ca/Mg < about 3). This is usually a slow death pattern, meaning the person is not in immediate danger. However, there is usually a strong death wish that can manifest at some time in the future.

3. Step Up pattern. This is a variant of double low ratio pattern in which the person is in fast oxidation and the first four numbers form a pattern of steps moving up to the right. The steeper the steps go upwards, the worse the pattern. This pattern is associated with a faster or more immanent death, often from a heart attack, stroke or other catastrophic event. This pattern is not seen much because usually the person dies before a hair analysis can be done.

4. Four lows pattern. This is a very chronic death pattern in which the person has, to some degree, entered the so-called tunnel of death spoken of by those who have been through a near-death experience. The lower the numbers, the more severe the pattern.
14.
PRINCIPLES OF MINERALS AND DISCUSSION OF THE MACROMINERALS

Barbara, age 72, helps with office work, although she is technically retired and has arthritis and generalized weakness. She is hard-working, thoughtful, caring, kind and smart. She began a development program, but really does not like it. She takes her supplements regularly, but thinks the diet is too restrictive. The water for drinking, she says, is too difficult for her to bring home from the supermarket. I mentioned that in many cities it can be delivered, however. Also, saunas are just not her style, although she feels well when she does them, and even has a beautiful one in her house that her husband uses. She has a background in nursing, so she understands how important a clean colon can be, but does not like the idea of regular coffee enemas. As a result, she still has her arthritis and fatigue. Some days she has trouble even getting out of bed. She says she tries, but does not do enough of the program, especially at her age, to really undo the toxic metals and nutrient deficiencies that often give rise to common symptoms such as arthritis.

This case is included because development is not for everyone. It is best for those who are committed, self-disciplined and willing to follow a rather strict diet in order to slowly rebuild the intestinal tract and the entire body. The saunas, coffee enemas and meditation practice are not essential. However, for older people and those with chronic health conditions, they are superb and well worth the extra time and effort.

Definitions. R. Buckminster Fuller loved to say that everything on earth is just a combination of the 103 chemical elements – or the minerals. Arranged in various ways, they make up our bodies, our food and water, the trees and animals, the air we breathe and all physical items on our planet. Important words concerning minerals include:

- **Atomic forms of minerals.** These are single minerals, though they may come in clusters such as O2.
- **Molecules.** These are two or more atoms of one element or of several elements.
- **Compounds.** These are molecules made of two or more minerals.
- **Ionic forms of minerals.** These are unbound and usually dissolved in a liquid such as water.
- **Colloidal minerals.** These are similar to ionic, but with a specific particle size, and the particles are usually suspended in liquid and electrically charged so they stay suspended.
- **Metals.** These are a particular group of minerals. All conduct electricity well and have other common properties. They include copper, iron, zinc, manganese, molybdenum, lithium, cobalt, magnesium, selenium, uranium, lead, mercury, cadmium, aluminum and others.
• **Alloys.** These are mixtures of metals that are melted and then mixed together, often in a special order and in special proportions. Steel, stainless steel and many other are alloys.

• **Amalgams.** These are like alloys, except they are mixed together at room temperature, usually. Dental amalgams contain mercury, copper, cadmium, and silver, for example.

• **Synergists.** These are minerals that help each other to function better in some way.

• **Antagonists.** These are minerals that function in ways that compete or oppose each other. They may compete for absorption or they may replace each other in enzyme binding sites.

• **Co-factors.** These are minerals that are required at the same time in an enzyme.

• **Catalysts, facilitators or enzyme activators.** These are minerals or other chemicals that are needed to make a chemical reaction happen, even though the mineral or substance is not directly part of the reaction.

• **Inhibitors.** These are minerals or other substances that slow down or stop a chemical reaction or an enzyme from functioning. Fluorides and bromides, for example, are potent inhibitors.

• **Isotopes.** These are variants of all the minerals with names like carbon-12, carbon-13 and carbon-14. All the isotopes or variants of a mineral have the same number of protons in the nucleus, but a different number of neutrons. The more neutrons, the heavier the element.

• **Chelates or chelated minerals.** These are minerals that are attached to or bound to amino acids or other substances. Many minerals are absorbed and utilized better in this form.

• **Mineral chelators.** These are substances that bind very tightly to various minerals and, for this reason, are used to remove minerals from the body.

• **Mineral transporters.** These are substances that carry minerals throughout the body.

**Minerals in our food.** Minerals are perhaps the most important groups of nutrients human beings require. Unlike some vitamins, for example, minerals cannot be made inside the body and must come from the diet or drinking water. Minerals regulate most body functions by participating in all chemical compounds in our bodies. They also form the structure of the body.

**PRINCIPLES OF MINERALS**

• **Eck’s law of minerals: Every mineral has an effect on every other mineral.** It is scientifically impossible to change the level of even one mineral in the body without simultaneously changing the levels of ALL other minerals. This is basic systems theory.

• **There is a mineral system in the human being.** This is an extension of the principle above. It means that minerals are maintained in specific balances with each other in our bodies.

• **The major minerals must be maintained in a certain balance in our bodies or disease results.** In practice, this means that we are rarely facing just a zinc deficiency or a copper toxicity. All the minerals must be maintained in the proper balance for optimum health.

• **Balance is expressed mathematically as ratios between minerals.** For example, a sodium/potassium ratio expresses the relationship or balance between sodium and potassium.

• **Most of humanity around the world is quite mineral deficient.** The impact of this is incalculable in terms of human health and disease. One of the tasks of development is to remineralize the body. This usually takes several years, though symptomatic change may occur much sooner. Dr. Eck was one of the very few scientists and clinicians who understood the importance of mineral nutrition, how deficient the population is, how to gently restore the balance, and how long correction requires. He was fond of saying that
“medical doctors know it can take 9-12 months to replenish just one mineral such as iron. Imagine how long it takes to replenish a dozen or more trace elements.”

- *The bioavailability of a mineral is critical.* Dr. Eck was a pioneer in the area of mineral bioavailability. It means that minerals must be in particular forms or combinations to be utilized. Otherwise, they cannot be utilized correctly, even if they are present in abundance.

- *Symptoms of a mineral deficiency are often identical to the symptoms of a mineral excess or bioavailability.* Dr. Eck observed this over and over again. For example, too much copper or too little copper can cause symptoms of a vitamin C deficiency. Too much copper oxidizes and destroys vitamin C. Too little copper inhibits the activity of ascorbic acid oxidase, a copper-dependent enzyme needed to activate vitamin C in the body.

- *The interactions between the minerals are a central theme in development science.* These interactions are used to balance the minerals on a hair mineral analysis. This is very different from administering foods or supplements to simply replace low minerals. The latter is called replacement therapy. It is far less effective, in our experience.

- *Measuring minerals in the body is not a simple task.* The reason for this is that each mineral is present in every tissue and organ in different amounts. A reading in the blood does not tell one much about the cells, for example. A liver biopsy may not tell one much about the amount in one’s brain, and so on. As a result, any method of assessing mineral levels offers only limited information about them. This is why general systems theory and cybernetics concepts, and ideas such as the oxidation types, are required to help figure out what is occurring in the body as a whole, and how to correct it at the deepest levels.

- *Minerals can substitute, displace and even “defend” each other.* Chapter 21 discusses these interesting properties of minerals.

- *Finally, all the above means we must keep a humble attitude when dealing with the complexity of minerals.* Simple concepts can never explain all their properties.

### PROBLEMS WITH MINERALS TODAY

Most everyone today is deficient in essential minerals such as calcium, magnesium, zinc, selenium and manganese. In most areas of the world, the soils are low in minerals because they have been farmed too much and incorrectly. The problem is the human and animal waste matter is not returned to the soil, and is instead flushed into the oceans where it is a pollutant. The refining of table salt makes the mineral deficiencies much worse. Eating refined grains such as white flour and white rice also make the mineral deficiency problem much worse in most parts of the world today.

Improper eating habits such as eating too many foods at once, overeating, eating on the run in a car, for example, or eating at one’s desk instead of sitting down quietly, also reduces mineral absorption even more. The use of thousands of food chemicals and additives often irritates the intestines and reduces mineral absorption even more. In addition to all this, other problems related to mineral nutrition are:

- *Parasitic infections.* These further impair mineral absorption and utilization. The problem is worst in underdeveloped nations, but occurs in America, Europe and Asia as well. Eat cooked food only in most nations today, even in American restaurants, for safety reasons.

- *Congenital deficiencies.* All babies today are born low in important trace minerals. This occurs because their mothers, in particular, are usually horribly mineral deficient.
• Impaired digestion. Stress, intestinal infections such as candida albicans, improper eating habits and improper food preparation, among other reasons, impairs digestion in most people. This is why everyone is given a digestive aid in development science.

• Drinking water somewhat helpful. This can be a decent source of minerals, but is generally not too good because there are too many competing substances that impair mineral absorption. However, this is one reason to avoid drinking distilled or reverse osmosis water except for short periods of time. In development, distilled water is used for detoxification only for the first three to nine months when one begins a program. It can also be helpful for short periods of time during some detoxification or healing reactions.

• Sea salt a good source. A high quality sea salt such as Real Salt or Celtic Salt, can add a significant amount of minerals to a person’s diet. Most everyone should use quality sea salt in the diet. However, never add salt to water, as some doctors are now recommending.

• Kelp and vegetable juice are helpful. The other general mineral supplements used in development science are kelp, and carrot and green juice up to 10-12 ounces daily, and perhaps Veg-easy or dried vegetables in a capsule or powder form. These all help supply more minerals to the body in highly absorbable forms. Do not use much of other sea vegetables such as nori. All sea vegetables contain significant levels of toxic metals. Kelp, however, is acceptable because it contains more substances that help remove toxic metals.

• Digestive aids are also helpful for many people, especially older adults. I recommend a powerful digestive aid called GB-3 for almost everyone because it helps mineral absorption.

• Herbs, and most other trace element and electrolyte drinks and solutions. These are often not helpful, and are often toxic. Many do not contain enough of the trace minerals most people need such as zinc. Many also contain some toxic metals.

INDIVIDUAL MINERALS -
THE MACROMINERALS

The major blood and tissue macrominerals are calcium, magnesium, sodium and potassium. Some people also include phosphorus, sulfur, chlorine and a few others in this category.

CALCIUM (Ca)

Calcium is called the structural element because almost all of it is in the bones. However, calcium is also vital in small quantities for nerve tissue and a little is in the blood. Calcium is one of the most plentiful elements on the earth and in the body. Calcium is also a critical mineral for life on earth, as it is required for the formation of calcium carbonate and other essential mineral compounds that are used in the oceans by plant life.

Excellent quality bioavailable calcium is lacking in the diets of most people. The main food sources are raw and organic dairy products, carrots and carrot juice and a few other vegetable sources such as nuts and seeds. However, when cows milk is pasteurized and homogenized, calcium availability declines greatly. As a result, most people are not benefiting enough from the calcium in the milk, cheese and yogurt they are consuming.

Strict vegetarians (vegans) can have even more difficulty obtaining enough calcium, although greens and products such as carrot juice are excellent sources if one eats or drinks enough of them. One must drink about 10-12 ounces of carrot juice daily. Seeds and nuts such
as almonds and almond butter are also good sources of calcium. However, one must eat at least a few spoonfuls of almond butter daily to obtain enough calcium. Most people do not digest seeds and nuts well enough in the whole food form, so nut butters are better sources of calcium.

**FUNCTIONS OF CALCIUM.** These include:

- **Structural strength of the bones.**
- **Muscle and nerve contraction and relaxation.**
- **Cell permeability regulation.** In excess, it reduces cell permeability.
- **Thyroid and parathyroid activity.** Calcium inhibits thyroid-stimulating hormone (TSH). Hormones from these glands, in turn, help regulate calcium balance.
- **Hormone secretion, including female hormones and insulin secretion to a degree.**
- **Cell division.** For example, cancer will often improve as calcium metabolism is balanced.
- **Autonomic balance.** Calcium inhibits the sympathetic nervous system, which is one reason for giving calcium supplements to most people today.
- **Phosphorus metabolism and energy production in the Krebs or carboxylic acid cycle.**
- **Detoxification.** Calcium antagonizes lead and cadmium.
- **Blood clotting.**
- **Fat digestion.**
- **pH balance.** Bioavailable calcium is extremely alkaline-forming and is used to neutralize lactic acid and help maintain the pH balance of the blood and the tissues.

**Psychological qualities** associated with calcium are stability, hardness, rigidity and perhaps physicality. Calcium is also an important sedative mineral. When deficient or biounavailable, as it often is today, one becomes weak, spacey and too flexible in one’s thinking and reasoning. However, since it builds up pathologically, the person also becomes defensive, “hard” and rigid in the personality.

*A psychological buffer element.* Calcium decreases one’s sensitivity to stressors of all kinds. For example, ADHD children often have low calcium in the hair tissue. This contributes to their hypersensitivity and nervousness. They may be very sensitive to other children, or to noise or other types of stressors. They are lacking in this important buffering element.

*A calcium shell.* This occurs when a hair tissue calcium level is above 170-180 mg%. It is common, especially in adult women, and is associated with psychological withdrawal, depression and emotional suppression in most cases. It can cause a degree of sexual numbness, as well. It also lowers one’s awareness level, like living behind a concrete wall of calcium.

*The calcium personality type,* which is different from the calcium shell, tends to be earthy, plodding, steady and blunt. They often move slowly and awkwardly, and are unpolished in their language and mannerisms. They develop slowly and have a great potential for love and spirituality. These individuals are often farmers and other manual laborers.

**CALCIUM DEFICIENCY SYMPTOMS.** These include osteoporosis, rickets, non-union of fractures, tooth decay, irritability and insomnia. Others are poor posture, misshapen teeth and other bone abnormalities such as bowed legs. Others include muscle cramps, irritability, hyperkinesis, hyperacidity, bruising, high blood pressure, fight-or-flight reactions, fast oxidation, lead and cadmium toxicity and cancer. Other symptoms could occur secondary to these because calcium is involved in many body functions. Phosphoric acid in soda pop worsens calcium deficiency.
CALCIUM TOXICITY SYMPTOMS. These may include fatigue, depression, defensiveness, muscle weakness, pain, arteriosclerosis, arthritis, kidney stones and perhaps gallstones. Others are bone spurs, rigidity, slow metabolism, constipation, social withdrawal and spondylitis (rigidity and inflammation of the spine).

Biounavailable Calcium. In many instances, calcium is biounavailable. This means it is present, but cannot be used properly for some reason. This condition causes symptoms of deficiency and excess at the same time. Biounavailable calcium is present to some degree, as a rule, whenever the hair calcium level is over about 80 mg% or about 800 parts per million. This occurs most in slow oxidizers. Symptoms are typically anxiety and fatigue at the same time. Many also have some degree of osteoporosis, arthritis, muscle tightness or cramps, and perhaps calcium deposits in various organs or tissues, especially if a person is older than about 35.

PHYSIOLOGICAL EXPLANATION OF THE ABOVE. The following is from the Textbook of Endocrine Physiology, 2004, by James E. Griffin and Sergio R. Ojeda, p. 358. “In humans, maintenance of extracellular calcium ion concentration within narrow limits is essential for a number of vital functions including mineralization, blood coagulation and membrane function. Ionic calcium also plays an important role in the permeability and excitability of plasma membranes.

“When the extracellular fluid concentration of calcium ions falls below normal, the nervous system becomes progressively more excitable because of increased permeability of the neuronal membrane to sodium. Nerve fibers become hyper excitable, spontaneously depolarized and initiate nerve impulses to peripheral skeletal muscles, thus eliciting tetanic contraction. This effect is the basis for the muscle spasms and marked hyperreflexia seen in hypocalcemic tetany. The traditional positive Chvostek sign – a twitching of the facial muscles in response to tapping over the facial nerve at the angle of the mandible – is one manifestation of hypocalcemic tetany. In severe hypocalcemia, increased central nervous system irritability may lead to seizures.

“An increase in serum ionized calcium depresses central and peripheral neural excitability, resulting in mental sluggishness and hyporeflexia.”

“Acute acidosis decreases binding and increases ionized calcium, whereas acute alkalosis (author’s note - in serum, in slow oxidation) increases binding with a consequent decrease in ionized calcium.”

CALCIUM IN THE LIFE CYCLE. Children need a lot of good quality calcium for their bones and for their developing nervous systems. This is just one reason why a child’s diet is so critical for his physical and intellectual development. Unfortunately, pasteurized and homogenized milk is not nearly as helpful as certified, raw milk or fresh mother’s milk in terms of calcium bioavailability.

Full-fat milk best. Babies and children almost always need full-fat milk. Some parents believe that children will become fat if they drink whole milk. In fact, the opposite is true, assuming the rest of the diet is healthful. Skim and low fat milk are not healthful for most children as they are too high in sugar and too low in fat. I am told that farmers use low-fat milk products to fatten hogs. Even worse than commercial low-fat milk for children is to substitute soda pop, tea, water or soy milk for the more nutritious breast milk or an organic, certified raw cow, goat or sheep milk.

Breastfeeding and substitutes. Ideally, children should be breastfed for at least two or three years. If possible, continue breastfeeding until the child will not accept any more, or at
about age three. This will give a child the best start in life. If breast feeding for three years is not possible, or the child will not accept breast milk, then a formula made with whole goat milk, or a meat-based or organic, raw cow’s milk formula is usually next best. The next best would be a formula made with almond or rice milk. Soy is not the most desirable beverage for babies, children or anyone else because of problems ranging from genetic modification to phytates and enzyme inhibitors. See below for information about natural milk formula for babies. Babies and mothers should be relaxed when feeding. Children will often vomit if they are uncomfortable when feeding.

**Wet nurses.** Breast milk does not have to come from the biological mother. Most any wet nurse would do. In earlier times, this was the habit and still is the case among primitive tribes who understand more about this subject than do most highly educated Westerners.

**Dairy cows are hybrids.** Unfortunately, most cows are bred for the highest milk production, not for a balanced, nutritious milk. The milk is somewhat high in female hormones, and often contains antibiotic residues. This is not healthful for babies or anyone else, either. For these reason, look for organic and preferably raw, certified animal milks if breast milk is not available. Always prepare baby formula at home and do not use ready-made formula, if possible. *Nourishing Traditions* by Sally Fallon contains several formula recipes.

**Fruit juices and soda pop deadly for children.** Juices and soda pop usually contain fruit acids or phosphoric acid that bind calcium, magnesium and zinc and remove these essential minerals from the body. Also, sugars found in these products interfere with calcium metabolism. The fact that a juice is enriched with calcium is not that helpful, as it is often not well absorbed.

**How to drink milks.** Milk is really a food, not a beverage. It should be sipped slowly, as babies do, and swished in the mouth before swallowing it. Gulping down large glasses of milk, as many people do, is not the best way to enjoy good quality milk.

**DIETARY SOURCES OF CALCIUM.** Excellent calcium-rich foods include raw, certified milk, cheese and yogurt. Others are carrot juice, sardines, caviar, cod roe, smelt and egg yolks. Soups made with bones of lamb, chicken, or veal joints are also excellent sources. Comfrey, Swiss chard and other green plants are also excellent. The next best sources are brewer’s yeast, kelp and other sea vegetables. Other sources are almonds, sesame seeds, beans and filberts. Dark green vegetables such as kale, collard greens, mustard greens and turnip greens are also good.

Corn tortillas or corn chips prepared in the traditional way with lime are other decent sources of calcium. Corn bread or corn eaten as a vegetable are not good sources unless they have added lime. Pasteurized, homogenized milk, cheeses and yogurts are not as good sources due to the processing of the milk. Also, many people have sensitivity to dairy products today that make them unsuitable for some adults.

**Strict vegetarians need calcium.** Although calcium is found in greens, nuts and seeds, the calcium from these sources is generally less available than in raw dairy products. Vegetarian diets are also often lower in calcium synergists such as vitamins A and D.

**CALCIUM SUPPLEMENTS.** The best calcium supplements are food-based such as carrot juice or kelp. Kelp combines calcium with other minerals needed for calcium utilization. It also contains alginates that help bind the toxic metals found in all sea products. Some people, especially fast oxidizers, may become anxious eating kelp, however, due to its iodine content that may stimulate the thyroid gland. Other excellent calcium supplements include calcium
lactate, citrate, true chelates and gluconate. Bone meal used to be popular and is a superb supplement if it is not contaminated with lead. Microcrystalline hydroxyapatite crystals (MCHC) is another excellent form of calcium. Other good forms that are used less often are calcium orotate and aspartate.

Calcium carbonate (dolomite), phosphate, dicalcium phosphate and tricalcium phosphate are not as well absorbed. Calcium carbonate is common chalk. It is extremely alkaline and found in Tums, other anti-acids and coral calcium. Adequate stomach acid is important for digestion and carbonate supplements will deplete stomach acid to a degree. This can interfere with proper digestion. In dicalcium and tricalcium phosphates, the phosphorus binds tightly to the calcium, reducing its absorption to a large degree. Tiny amounts of these products are sometimes used as fillers in vitamin tablets, which is fine.

Coral calcium supplements are popular, but may contain toxic metals. In his book, Barefoot on Coral Calcium, An Elixir of Life, author Robert Barefoot mentions that coral calcium contains significant amounts of iron, aluminum and strontium. Aluminum and strontium are poisons. Most people also have toxic levels of iron stored in their livers. Dr. Barefoot dismisses this problem. His book is poorly referenced and contains no scientific studies of coral calcium. I suggest avoiding coral calcium. Many mineral supplements can make one feel good for a while due to a high toxic metal content. Be very careful with them. Serious imbalances can take years to develop and can be difficult to correct. Many calcium preparations in drug stores also contain lots of sugar. Some are even sold like candy. These products will be less effective because sugar upsets calcium metabolism. Usually, the calcium is in the form of calcium carbonate, a poorly absorbed form. I suggest avoiding calcium carbonate and sugared calcium supplements.

**Most people need some calcium.** The only exception is if the hair calcium level is excellent and the patient is a male. Otherwise, Dr. Eck gave everyone a significant amount of supplemental calcium and magnesium. Reasons for this are:

- Most people do not obtain enough bioavailable calcium in their diets.
- Calcium and magnesium help relax the sympathetic nervous system. This is very helpful for almost everyone.
- Many people, especially slow oxidizers, have biounavailable calcium to some degree.
- All women, and perhaps some men, benefit from extra calcium to help prevent and correct osteoporosis.
- Calcium is protective against several toxic metals that are common in the environment.
- Calcium and magnesium supplements help many people relax and sleep better.

**CALCIUM AND HAIR MINERAL ANALYSIS.** According to Dr. Eck’s research, an ideal calcium level in a hair sample that is not washed at the laboratory is about 40 mg% or about 400 parts per million. A good range is about 35 to about 65 mg%. When calcium is in this range, a person’s overall health is usually better than if it is lower or higher. Fast oxidizers tend to have low levels, as low as 10 mg% or even lower. This is associated with calcium deficiency and a fight-or-flight response. Slow oxidizers have higher levels, in general, up to 1000 mg% or 10,000 parts per million or even higher. This is associated with calcification of the tissues and severely biounavailable calcium. While these are by far the most common situations, occasionally others also arise:

- *In four lows pattern the hair calcium is low, but the person may be a slow oxidizer.*
• Some fast oxidizers have a somewhat elevated hair calcium level. Usually they are temporary fast oxidizers. This just means the person will shift into slow oxidation in most cases within a few months of beginning a development program.

• Mixed oxidizers can also have unbalanced calcium levels.

**Reasons for a low hair tissue calcium in babies and other fast oxidizers:**

• Excessive adrenal activity in fast oxidizers causes sodium retention by the kidneys due to the action of aldosterone. This raises the tissue sodium level, which causes calcium to become more soluble in the blood. This, in turn, causes a loss of calcium loss through the kidneys. It is an adaptive mechanism, in theory, because calcium relaxes the nervous system. A lower blood and tissue level tends to cause a state of heightened alertness to prepare an animal or human being to fight or run. While advantageous during a threat to one’s life, most babies remain in this pattern for years, causing behavior problems and depletion of many minerals.

• A dietary calcium deficiency. Babies usually obtain enough calcium from breast milk. Once the baby is weaned, however, the diet today often contains poor quality sources of calcium such as pasteurized and homogenized milk, cheese and yogurt. This is a serious problem today. To repeat, those who live in a fight-or-flight pattern much of the time are continuously losing calcium in their urine. Knowing all of this at a glance from a properly performed hair mineral analysis gives one a lot of information about a client almost instantly. In addition, the measurement is mathematically precise. This is also helpful to avoid guesswork that is so common in medical care.

**Hair calcium in slow oxidation.** As the body tires out, it goes into the exhaustion stage of stress. Here an entirely different calcium imbalance occurs. Calcium cannot be kept in a soluble enough form in the blood, due in part to reduced levels of tissue sodium and potassium, which are elements that solubilize or dissolve calcium. Calcium then begins to precipitate out of the blood and becomes deposited in a biounavailable form in the soft tissues. It may deposit in the hair, skin, arteries, joints, ligaments and to some degree organs such as the brain, liver, kidneys and others. Dr. Selye described this interesting phenomenon in his book, *Calciphylaxis.*

Calcium is usually depositing pathologically whenever a hair calcium level on an initial hair test is greater than about 80 mg%, although I do not recall Dr. Eck giving an exact hair calcium reading that indicates the beginning of this condition. Its severity depends on how long the pattern has been present and how high the hair calcium is. On retests during a development program, other factors can raise the hair calcium such as the release and elimination of biounavailable calcium from the body tissues.

*The calcium shell pattern.* As the hair calcium level rises higher than about 170 mg% or so, Dr. Eck called it a calcium shell pattern. This is a more severe state of calcium biounavailability. It also has important psychological implications, which are discussed in detail in Chapter 42. These include a diminished awareness level, as though one is living behind a high wall. Associated with this is a degree of psychological withdrawal, emotional suppression or repression and often feelings of fatigue and depression.

**Biounavailable calcium is one of the most important imbalances today.** Calcium deficiency is important. However, even more important for adults is biounavailable calcium. It is the number one killer of adults because it contributes to:
• “Hardening” of the tissues, especially the arteries, which eventually causes heart failure.

• Acidification of the tissues, though often with a falsely alkaline saliva or urine pH. This, in turn, leads to cancer in many cases and is the reason people are excited about any therapy that can alkalinize the tissues. However, avoid most simplistic methods to alkalinize the body, particularly alkaline water machines. These are discussed in Chapter 2.

• Destruction of the joints and the bones as well.

• Dementias and other nervous system problems due to calcification of the arteries leading to and within the brain. Also, calcium often deposits in the brain tissue itself.

• Others include venous problems and sclerosis of the organs. All this may be part of aging.

**What about chelation therapy for calcium deposits?**  EDTA and other chelating agents can remove significant amounts of calcium from the body. They are used by some doctors to clean plaque from the arteries. However, chelation is not part of development. Its problems are it always removes some essential minerals, the agents may be somewhat toxic to the kidneys, it does not respect the body’s natural order of healing and metal removal, and most important, it does not seem to be needed. Development seems able to remove most toxic metals at much deeper levels, at times faster, and in a safer fashion.

**PTH and high hair calcium.** Dr. Jeffrey Bland, PhD, states that a high hair calcium is due to hyperparathyroidism and excessive secretion of parathyroid hormone or PTH. This is an interesting theory. However, I would not agree with this in most cases for the following reasons:

- **Calcium is very elevated in so many hair analyses that it would mean that parathyroid disease is epidemic, which it is not.** Dr. Bland is correct if he only means extremely high calcium levels, but I believe he generalizes to most high tissue calcium.

- **Calcium is low in the bones of most slow oxidizers.** This should not be the case if PTH is high in all these individuals.

- **PTH raises calcium in the blood, but not in the hair.** This is not mentioned by Dr. Bland, but is an important fact.

**CALCIUM SYNERGISTS.** Magnesium balances calcium in many ways, some of which appear to be very subtle. One of its important roles is to help keep calcium in solution. This is a critical role, as calcium tends to form hard compounds with phosphorus and other minerals. Hardness is wonderful when needed, but in the wrong places it clogs the arteries, irritates the tissues and restricts blood flow to the kidneys and to other organs. This is why magnesium intake is so critical today, especially if one is supplementing calcium, as many people are doing. On hair analyses, magnesium usually moves in the same direction as calcium, especially when a person is healthy, and even in many disease states. If it does not, it usually indicates health problems. The hair calcium to magnesium ratio is kept within a tight range in healthy people, between about 4:1 and 9.5:1.

**Phosphorus** is synergistic with calcium in the bones and in many other compounds. **Silicon** is another calcium synergist. It may be transmuted into calcium, according to Dr. Louis Kervan, author of *Biological Transmutations*.

**Adequate hydrochloric acid in the stomach** and **adequate protein in the diet** are also required for calcium utilization. The body generally chelates calcium in the stomach. This means that the body links calcium to proteins or amino acids in the stomach so that it is absorbed
better. This process requires sufficient hydrochloric acid, as well as the presence of amino acids from protein foods.

Sodium and potassium enable calcium to remain in solution in the blood, according to Dr. Eck’s research. Too much, however, leads to calcium loss from the blood through the urine. Sodium and potassium are also critical for calcium metabolism in many enzymes. In fact, a recent study found that potassium is required for bone strength or density. (Jehle, S., et al., Partial neutralization of the acidogenic Western diet with potassium citrate increases bone mass in women with osteopenia, *J Am SocNephrol*. 2006;17:3212.)

Copper is required to fix calcium in the bones and helps raise the tissue calcium level. Iodine is required for thyroid activity. Deficiency can cause a hypothyroid condition and resultant calcium imbalance. Low thyroid activity is associated with biounavailable calcium and calcium deposition in the soft tissues.

Boron is also synergistic with calcium in subtle ways. Boron supplementation is known to help maintain the bones in some people. Its mechanism may be to improve adrenal gland activity, which makes copper and calcium more bioavailable.

Vitamin A is synergistic with calcium for cell membrane activity and perhaps for nervous system activity, as well.

Vitamins D assists the absorption of calcium from the intestinal tract and may assist the deposition of calcium into the bones. Adequate adrenal hormone levels are essential for proper calcium metabolism. Infrared light and full-spectrum light are also extremely beneficial for calcium metabolism. In part this is due to their effect on vitamin D levels. However, they may have more subtle benefits as well.

CALCIUM ANTAGONISTS. Dietary sugars, including fruit sugars, upset the calcium/phosphorus ratio in the blood more than most other factors. This was the research of Melvin Page, DDS, author of *Degeneration, Regeneration*. Sugars also tend to stress the adrenal glands and upset other hormone balances. These, in turn, may upset calcium metabolism as well. Caffeine stimulates the adrenals and eventually weakens them badly. Phosphoric acid or fruit acids bind to calcium from the diet and form insoluble compounds that are difficult to absorb. In this way, phosphoric acid causes calcium deficiencies. Soda pop containing sugars, caffeine and phosphoric acid is a deadly combination for this reason. Unfortunately, it is not true that all fruit acids are immediately changed to harmless compounds in the body.

Strontium. This is a toxic metal that competes to some degree with calcium for absorption. Some holistic doctors give strontium supplements, but Dr. Eck did not use them or need them. A better answer is to correct the calcium balance, which can be done with development. Calcium may be antagonistic in some instances with magnesium, sodium, potassium, phosphorus and other minerals that compete with it for absorption.

Lead can often easily replace calcium in certain enzyme binding sites throughout the body, and in certain parts of the bones. Hidden lead toxicity, for example, is an important cause of weak bones, osteoporosis and other bone problems, including some unexplained fractures and unexplained anemias. Bone density may appear normal. Toxic metal assays using blood, urine or hair may not reveal excessive lead when it is deeply buried inside the bones. Lead toxicity is still a major cause of illness in the world, although lead is used less in industry today.

Cadmium also replaces calcium in some enzyme binding sites and perhaps in the bones. Cadmium also antagonizes calcium in other ways. Among other effects, cadmium hardens and weakens the arteries and causes inflammation. The body then coats the arteries on the inside
with calcium and fatty plaques to protect them from rupturing. This is a pathological use of calcium, however, that causes cardiovascular disease and often death. **Fluorides** may assist calcium to a small degree in the bones. However, too much, as is found in most American drinking water supplies, competes with calcium for absorption and utilization, and tends to weaken the bones. It causes more hip fractures, for example, in those who drink fluoridated water and perhaps causes problems for those who use fluoridated toothpaste as well.

**Phytates** are phosphorus compounds found in uncooked grains, soy products, improperly prepared bean dishes and occasionally other foods. They bind calcium and prevent its absorption. **Excessive oxalic acid** found in spinach, cranberries, rhubarb and tea can interfere with calcium utilization if these foods are eaten in large enough quantities. In small quantities they are fine, however. **Low stomach acid and low protein diets** impair calcium utilization. Calcium must be bound to amino acids in the stomach and intestines to be properly utilized. 

**An alkaline pH in the stomach for any reason** impairs calcium utilization. This is one of many reasons I do not recommend the very popular alkaline water machines. **Anti-acids and acid-blocking drugs** interfere with calcium absorption for the same reason.

**MAGNESIUM (Mg)**

Magnesium is another **structural** element, but has mainly to do with enzyme structures, not physical ones. Magnesium is involved in **every body function**, where it is required for thousands of critical enzymes everywhere in the body. It is also one of very few minerals that cannot be replaced by a less preferred mineral in many of these enzyme systems.

Magnesium is low in almost everyone today due primarily to low dietary intake. Refined grains, fruits, soda pop, coffee, teas and cows milk dairy products contain very little magnesium. These are also the most widely eaten foods, except for meats and eggs. Vegetables, nuts, seeds and whole grains are good sources, but most people do not eat enough of these.

Stress and too much exercise also use up magnesium quickly. Very few sports drinks replenish it in great enough quantity, for instance. In addition, most people cannot use the magnesium they have in their bodies due to its biounavailability. This is discussed below.

**MAGNESIUM DEFICIENCY SYMPTOMS.** These include anger, belligerence, irritability, fatigue and pain due to muscle tension, as seen in conditions such as fibromyalgia. However, magnesium activates and assists with so many enzymes that symptoms can include almost anything.

*The Myers magnesium cocktail.* The late John Myer, MD developed the now famous “Myers cocktail”. It consists of intravenous magnesium mixed with other minerals and vitamins. He wrote that this simple cocktail helps with a number of ailments, thanks to widespread deficiencies of magnesium and other vitamins and minerals. It can help with symptoms of asthma, migraines, fatigue, acute muscle spasms, upper respiratory infections, chronic sinusitis, seasonal allergies, rhinitis, cardiovascular disease and others. However, Myers cocktails and other IV minerals are not recommended in development because they are a “shotgun” approach, not nearly as safe, and not effective for delicately balancing body chemistry. Their value is in replenishing minerals and vitamins quickly, often in a few days. Once this is done, then one is better served, in our view, with a delicate and precise program of oral nutrients according to the principles in this textbook.
Intravenous (IV) or intramuscular (IM) magnesium are also widely used in hospitals for obstetric emergencies such as eclampsia and pre-eclampsia, heart attacks and many other emergencies, for which it is excellent. It is less effective, in my experience, for long-term use, as its effect tends to wear off after a few days to a few weeks. This tells us the magnesium shots or IVs fill a need, but they do not, on their own, restore the mineral balance. Magnesium oil has similar symptomatic effects, but is dangerous for longer-term use and should be avoided for all but short-term use.

**Magnesium and Hair Analysis.** An ideal hair magnesium level is about 6 mg% or 60 parts per million. This does not mean, however, that a magnesium deficiency is not present. In fact, most people need more magnesium, regardless of the hair level. Fast oxidizers often need the most, and their hair levels are usually low. Slow oxidizers tend to have higher hair levels, but it is often somewhat biounavailable. Dr. Eck supplemented most people with magnesium and gave more, at times, if the magnesium level was very high or very low.

**Biounavailable magnesium on the hair analysis.** When magnesium is above about 9 mg% it is at least partially biounavailable. This is a problem for millions of people. Symptoms of this imbalance may include fibromyalgia and other types of pain, irritability, insomnia, muscle weakness, depression, muscle cramps, especially after exercising, and possibly others.

**Magnesium Synergists.** These are similar to those for calcium. They include vitamins A, D, E, K and perhaps a few others. Vitamin D, for example, appears to assist magnesium metabolism, not just calcium absorption. **Vitamin B6** or pyridoxine has a close relationship with magnesium. By taking B6, one can enhance magnesium effects and vice versa. Magnesium is thought to help vitamin B6 to be incorporated into some enzymes. **Vitamin B1** or thiamin is a synergist with magnesium in glucose metabolism. **Vitamin C** is a synergist in connective tissue synthesis. **Tetraiodothyronine** or T4 increases cellular magnesium levels. In fact, many nutrients are synergistic with magnesium because magnesium is involved in almost all body functions.

**Magnesium Antagonists.** Magnesium antagonists tend to be somewhat similar to those for calcium. Important ones include calcium, sodium, potassium, phosphates, fluoride, all toxic metals and others. **Alcohol** severely depletes magnesium. This is due, at least in part, to the fact that metabolizing alcohol uses up many magnesium-dependent enzymes. This requires them to be reconstituted, using up a lot of magnesium. Alcohol is also a diuretic that can remove magnesium from the body through the kidneys.

**Diarrhea.** Magnesium is rich in the stool as it passes through the digestive tract. If diarrhea occurs, significant amounts of water and magnesium are lost from the body. This can help deplete magnesium. Several days of diarrhea are not a severe problem. However, if one has chronic intermittent diarrhea, as can occur with irritable bowel syndrome or colitis, magnesium loss can be significant.

**Soda pop and sugar in the diet** lower magnesium levels. These contain phosphorus compounds that bind firmly to magnesium, along with calcium and zinc, and tend to remove these minerals from the body. Soda pop is the worst. Some of the ‘high’ that one gets from drinking soda pop is actually magnesium depletion that causes a form of anxiety and irritability. Even the high phosphorus content of meat, eggs, cheese and other animal proteins lowers magnesium to some degree, but not that much because these foods contain some magnesium.
Exercise. Exercise uses up some magnesium. This contributes to leg cramps, shin splints and other symptoms that come with exercise. It can explain the ‘high’ of exercise to some degree as well. Ionizing radiation can lower the body’s magnesium level significantly. It is not usually noticeable unless exposure is chronic and intense. Taking extra magnesium before radiation treatments may help protect one from some of the damage due to radiation therapy.

SODIUM (Na)

Sodium is the solubility and volatility mineral. It is found mainly outside the cells or extracellularly. Although sodium does not participate in a single enzyme in the body, it is the body’s great solvent, meaning it dissolves many chemicals. It is also a major regulator of the fluid balance, pH and other fluid-related aspects of the body. These are its major functions.

The great solvent. Sodium is a monovalent element, meaning it has one free electron. It dissolves many compounds made of calcium, magnesium, copper, iron, zinc and other minerals.

The great alkalizer. Sodium is a very alkaline-forming element. It is used to help maintain an alkaline medium for nutrient exchange in the blood and the interstitial fluid.

Sodium and the adrenals. Sodium is regulated primarily by the adrenal glands. High sodium is associated with excessive adrenal activity. Low hair tissue sodium is associated with adrenal weakness, fatigue and burnout.

Sodium, the electrical conductor. Sodium is one of finest conductors of electricity. The body is an electrochemical factory. Sodium represents one pole of the human “battery”. Sodium is outside of the cells while the other pole of the battery is potassium inside the cells. This can become complex. However, it can be summarized by stating that when the hair sodium/potassium ratio is normal or a little high, the electrical potential across the cell membranes are higher. When the ratio is low, an electrical discharge is occurring and the potential tends to be lower. This is why the hair sodium/potassium ratio is called the vitality ratio and so many illnesses are associated with a low sodium/potassium ratio. It can also help one understand why inflammation and an acute stress response are associated with an elevated sodium/potassium ratio.

Sodium, the great regulator. Sodium also regulates the pH to some degree, blood and other fluid viscosity, CO2 transport, and the solubility of proteins and organic acids in the body. It influences stomach acid levels, blood pressure and even blood sugar through its effect on the adrenal glands. Its effects on cell membranes include the regulation of membrane permeability to a degree, sodium pump action, neuromuscular irritability and the speed and quality of nerve impulse conduction. Sodium also indirectly regulates parts of the brain, including the pituitary gland. It also directly and indirectly regulates thyroid, pancreas and other glandular activity.

Sodium and sweating. The body conserves sodium superbly. For example, if one sweats regularly, as occurs with sauna therapy, the sodium content of the sweat begins to decrease as the body acclimates to sweating. This is a survival mechanism that works well for those, for example, who do physical work and sweat often.

Sodium and high blood pressure. One of the problems in some cases of high blood pressure is too much sodium in the blood. This causes excessive water retention and higher blood volume that, in turn, increases the blood pressure. However, there are many other causes of high blood pressure discussed in Chapter 30. Common refined table salt is a poisonous junk food that should be avoided completely. A quality sea salt, such as Real Salt, often does not raise blood pressure and is helpful to remineralize the body. Reducing high blood pressure often
requires much more than salt restriction in order to reduce toxic metal accumulation in the arteries and especially in the kidneys.

**Sodium and stomach acid.** Sodium imbalance is related to stomach acid disturbances. Sodium chloride is required in the manufacture of hydrochloric acid in the parietal cells of the stomach lining. Dr. Paul Eck observed that when the sodium level is low in the hair tissue, hydrochloric acid is often low in the person’s stomach. This helps explain widespread stomach acid deficiencies in the population, which can cause digestive problems. True fast oxidizers may have an opposite situation, with high tissue sodium levels, and too much stomach acid.

**GERD and too much stomach acid in slow oxidizers.** Gastric reflux disease, or GERD, is often not a problem of too much sodium or too much stomach acid. Eating wheat, or sometimes other grains such as rye, seems to be more of a problem. Eliminating these foods often helps with GERD. There can also be a *hiatal hernia.* This can often be resolved by stopping wheat or other grains, and reducing the hernia with one’s fingers. Chapter 26 gives the basic procedure to reduce a hiatal hernia. Also avoid straining at the stool to prevent or correct a hiatal hernia.

**Sodium as an addictive mineral.** Sodium can cause a type of ‘high’ or elevated mood. This is related to aldosterone secretion and adrenal glandular activity. This can cause cravings for salt in some people and is one reason that salty food is served in restaurants and elsewhere.

**SODIUM AND HAIR ANALYSIS.** An ideal adult hair sodium level, according to Dr. Eck, is about 25 mg% or 250 parts per million. It tends to be higher in babies and small children. Women tend to have a lower value than men, in general, due to overall weaker adrenal glandular activity. The level can vary from 1 mg% to over 1200 mg%.

**The adrenals and kidneys regulate the hair sodium level.** The adrenal hormone aldosterone regulates the tissue sodium level in large part, along with the rennin-angiotensin mechanism of the kidneys. Other factors such as the kidney energy in Chinese terminology also regulates the sodium level, perhaps through the adrenal glands in some way. A low hair sodium level is associated with weak adrenal activity, slow oxidation and an exhaustion stage of stress. It indicates sodium loss through the kidneys and is usually affected little or not at all by eating salt, for example. Eating sea salt, however, will often make these individuals feel somewhat better as it replaces some of the sodium lost in the urine.

**Elevated hair sodium.** An elevated hair sodium level is a feature of fast oxidation and an alarm stage of stress. The cause is usually higher aldosterone secretion by the adrenal glands. This may be due to acute stress or to emotions such as anger or fright. Cadmium and other toxic metals in the kidneys, along with kidney infections, can also raise the hair tissue sodium level. The hair level of sodium can also increase due to *kidney stress* during the elimination of a toxic metal such as boron, or the elimination of a toxic chemical.

**SODIUM SYNERGISTS AND ANTAGONISTS.** Sodium is involved with every other mineral in the body. It can be both synergistic and antagonistic with most of them at one time or another. **Zinc** tends to lower sodium, while **copper** tends to raise sodium in relationship to potassium. **Potassium** always moves higher and lower with sodium in healthy people. However, sodium and potassium also antagonize each other electrically, for example, as explained above.

**Calcium and magnesium** are synergists in many biochemical reactions involving energy production and other body functions. However, in terms of the oxidation rate, they are sodium
antagonists. They are divalent elements while sodium is a monovalent element. When they decrease, sodium tends to increase in the hair tissue, and vice versa. **Phosphorus and other trace elements** are also closely related to sodium in many ways. They are synergists at some times and antagonists at others. Phosphorus is a synergist in pH regulation, for example.

**Bicarbonate** is also a synergist in carbon dioxide transport in the body because it forms NaHCO3 (sodium bicarbonate) if adequate sodium is available. When sodium is low, carbon dioxide can build up in the tissues to a degree. This occurs in most slow oxidizers. One of Dr. George Watson’s original ways to test the oxidation rate involved measuring the serum CO2 level. **The toxic metals** are the only minerals that are almost exclusively sodium antagonists. Toxic metals have no place in the body, whereas sodium is one of its most essential minerals.

**POTASSIUM (K)**

Potassium is the other major monovalent element in the body, along with sodium. It is tied so closely with sodium that they form a pair. Potassium is mainly inside the cells, however, while sodium concentrates more in the blood, and interstitial fluid. Potassium has a single electrical charge. This makes it a good electrical conductor and tends to make it very water-soluble. It performs many essential functions ranging from regulating the heart to balancing the electrical potential of the body. Here are the main ones:

- **A potent solvent.** The monovalent elements are the body’s solvents. Though less important than sodium, potassium also functions to dissolve many chemical compounds in the blood.
- **Association with cortisol levels.** Sodium is more associated with adrenalin and aldosterone, which are faster acting hormones. Potassium is more associated with cortisol and cortisone. These are slower-acting or later-stage stress hormones. The correlation on hair mineral tests is only a general one, however, as many factors can influence the hair levels.
- **Thyroid gland regulation.** Potassium sensitizes the cells to thyroid hormone, according to Dr. Eck’s research. In addition, when sodium and potassium rise, tissue calcium tends to decrease. This causes the cells to become more permeable to thyroid hormone, in particular, and to other hormones such as insulin, as well.
- **Cancer fighter.** Max Gerson, MD pioneered a high potassium diet for cancer and other degenerative diseases. His rationale was that potassium leaking out of the cells causes depolarization of the cells and disease. His answer was to replenish potassium in the diet. Today, however, that diet, usually composed of many glasses of carrot and apple juice, appears to be less effective because the cancer problem is not so much about potassium as it is about toxic metals and toxic chemicals in the body that must be removed to restore health. Dr. Gerson knew about toxic metals, also, but the situation is much worse today. Chapter 35 offers many more details about cancer.
- **Fluid balance and osmotic regulation.** Potassium does this along with sodium, calcium, magnesium and phosphorus.
- **Nerve conduction, especially in the heart.** Those who eat improperly with not enough vegetables, in particular, may feel weak or even experience palpitations, skipped beats, arrhythmias and rarely heart attacks from potassium depletion. This can be much worse, for example, if they do not replenish their minerals and they use saunas or hot tubs that induce intense sweating. This is why I recommend kelp and sea salt if one uses a sauna.
• Regulation of blood viscosity, serum and cellular acidity, and CO2 transport in the red blood cells.
• Regulation of cell membrane potential, cell permeability, sodium pump action, muscle contraction and relaxation, and nerve impulse conduction. These are all in conjunction with sodium and other macrominerals in most cases.

POTASSIUM AND HAIR ANALYSIS. An ideal hair potassium level is about 10 mg% or 100 parts per million. Please note that hair potassium and sodium levels are extremely erratic and inaccurate if the hair has been washed at the laboratory.

Adrenal hormone levels are reflected in the hair potassium level. Low hair potassium tends to correspond to reduced adrenal and thyroid glandular activity. Elevated hair potassium tends to correspond to increased adrenal glandular activity and, at times, high cortisol in particular. However, the presence of toxic metals and other factors such as toxic metals in the kidneys, for example, can also either elevate or depress the hair potassium level.

Sympathetic dominance. A hair potassium level of 4 mg% or less is a pattern called sympathetic dominance. A secondary indicator is a high Na/K ratio. This pattern is explained in detail in Chapters 22 and 43. It indicates a person who “pushes” himself, either physically with excessive activities, or mentally with worry or fear. As a result, the person remains in a fight-or-flight mode of living too much, even when the body is very tired. One therapist phrased it as “acting as though you are being chased by a tiger all of the time”. Sympathetic dominance is mainly a lifestyle pattern. This means it is often more of a habit pattern, rather than a strictly physical illness or condition. However, the presence of excess copper, and excesses of toxic metals, along with possible zinc deficiency, can reinforce and hold one in the pattern.

Potassium affected by water softeners. In a few cases, showering and perhaps drinking water softened with potassium may elevate hair potassium levels considerably. To avoid this distortion, before sampling the hair, wash and rinse the hair thoroughly with distilled or reverse osmosis water two times if you regularly bath in tap or well water softened with potassium.

POTASSIUM SYNERGISTS. Potassium works closely with sodium, calcium and magnesium to regulate metabolism. Other synergists include most vitamins. These assist kidney activity and may therefore help regulate the potassium level in the blood and the tissues. Most of the important trace minerals are also synergists because they all regulate potassium levels to a degree. Dr. Paul Eck emphasized that zinc appears to raise potassium in the mineral system of the body. Phosphorus, along with zinc, are synergists in protein synthesis.

POTASSIUM ANTAGONISTS. Calcium and magnesium tend to rise in the hair as potassium falls. Sodium is pumped out of the cells and potassium must be pumped in to maintain the electrical balance of the cells. This antagonism with sodium is particularly important. Copper, in the mineral balancing system, lowers potassium to some degree. In fact, a low hair potassium level is an indicator for hidden copper toxicity. Vitamin D can raise the calcium level, which tends to lower potassium, as can too much vitamin A, in some people. All the toxic metals, once again, are antagonistic to all of the vital minerals in the body.

PHOSPHORUS (P)

Phosphorus may be called the excitatory mineral because of its role in the high energy
fuel system of the body. It is the only non-radioactive element that is not stable when in an atomic or singular form. Some readers may recall a high school science experiment demonstrating this fact. The teacher gently lifts a piece of pure phosphorus out of a jar filled with water. In less than a minute, it bursts into flame spontaneously. As a result of its instability in atomic form, all phosphorus in the body exists as phosphates (PO4).

**SOURCES OF PHOSPHORUS.** Phosphorus is found in all protein foods. Cows milk is very high in phosphorus. Raw grains are high in phytates, which are phosphorus compounds. Soda pop often contains phosphoric acid to cut the sweetness. This can be absorbed to some degree. However, it is very acidic and can erode the teeth, for example.

**FUNCTIONS OF PHOSPHORUS.** About 85% is in the bone structure, where it interacts with calcium to form the hard part of the bones. The rest has several major functions, including:

- **Energy production.** This is probably its most important role. ATP or adenosine triphosphate is the high-energy molecule that is used as the “refined fuel” for every purpose in the body. It is somewhat like refined gasoline in today’s society.
- **Growth and development.** Phosphates are extremely important for growth of the body. For example, mother’s milk is rather low in phosphorus compared to cows milk. Cows, of course, grow much faster and larger than human beings. This is one of the problems with drinking cows milk. Milk from smaller animals such as goats and sheep tends to be more like human milk in their phosphorus content.
- **The nervous system.** The nervous system is extremely dependent on phosphorus compounds. These assist the production of the myelin sheath. Also, the brain uses so much energy that high-energy phosphorus compounds are critical for thinking and higher development of the human being. This is one of the reasons vegetarians may be prone to fatigue, anxiety and depression more than meat eaters. Meat is far higher in bioavailable phosphorus compounds.
  
  Also, some vegetarian foods, especially raw grains, are high in another type of phosphorus compounds called phytates that bind vital minerals and remove them from the body. This is a problem with eating raw grains in such products as granola and unleavened bread. Certain ancient methods of food preparation, such as adding yeast to bread dough and adding lime to corn, were developed to reduce the high phytate content of grain foods. For this reason, some people deplete vital minerals when they try to eat differently, substituting raw or just soaked grains for baked bread, for example.

- **Cell membrane function.** Phospholipids are another type of phosphorus compounds that are absolutely essential for health. For example, omega-3 and other fatty acids are incorporated into phosphorus compounds to form cell membrane structures needed for the transfer of nutrients into the cells and to move waste products out of the cells.

- **All protein synthesis.** Phosphorus is involved in DNA and RNA synthesis. This, in turn, is needed to make all body proteins, enzymes, hormones and millions of other chemicals.

- **Bone formation, buffering the pH of the blood and maintaining the osmotic balance of the body fluids.** All of these involve phosphorus compounds. While they are all critical functions, they may be less important from an evolutionary standpoint than the ones above.
PHOSPHORUS AND HAIR ANALYSIS. Dr. Eck found that hair phosphorus mainly has to do with protein synthesis. In fact, it is a critical hair analysis indicator. Without sufficient protein synthesis, healing is definitely impaired. Thus, correcting the phosphorus level on a hair analysis is of primary importance.

An important vitality indicator. I also use phosphorus as a vitality indicator, although Dr. Eck did not. An ideal value of hair phosphorus is between about 15 and 18 mg% or 150-180 parts per million. The hair must not be washed at the laboratory for accurate readings. Pubic hair often gives much higher and more variable phosphorus readings. For this reason, head hair is far preferable. While most laboratories allow practitioners to submit pubic hair samples, I do not allow clients to use them, unless there are no alternatives.

High hair phosphorus. A phosphorus level greater than about 18 or 19 mg% indicates a milder form of protein breakdown or catabolism. However, it is usually not significant and corrects itself with development programs within a few months in most cases.

Low hair phosphorus. A level less than about 15 mg% indicates some degree of tissue catabolism or impaired protein synthesis. A level below 11 mg% indicates serious protein synthesis problems and, I believe, significantly lowered vitality. Causes for this include:

- **Not enough dietary protein, or too much of a lower quality protein such as tofu or beans.**
- **Incorrect eating habits.** These include fast-paced lifestyles, eating in the car and eating standing up or when upset.
- **Eating a less well utilized, incomplete, poorly absorbed, overcooked or spoiled protein food.** For example, overcooked meat or eggs are harder to digest. Most protein powders such as soy powders or others may also be poorly utilized in some people.
- **Problems in the digestive tract or elsewhere that interfere with the absorption or utilization of amino acids.** A common one is a chronic candida albicans infection, for example. Others might be leaky gut syndrome, an inflamed intestinal tract or an irritated bowel due to a parasitic infection.
- **Deficiencies of many minerals required for DNA and RNA synthesis such as zinc and magnesium, among others.**
- **The presence of toxic metals or high levels of biounavailable copper or other minerals that impair protein synthesis.** For example, an excess of biounavailable copper or other toxic metals can inflict oxidant and other types of damage on proteins in the body.

Phosphorus and zinc. A low hair phosphorus level frequently indicates a need for zinc or excess copper in the body, regardless of the hair zinc or copper levels. This was another of Dr. Eck’s brilliant insights about the body and about hair mineral analysis. Zinc is required for several important enzymes involved in protein synthesis such as RNA transferase. Without adequate available zinc, protein synthesis is severely impaired.

Zinc spots. Zinc is required for protein synthesis. If zinc becomes deficient, the body prioritizes its zinc reserves and can reduce the synthesis less essential proteins such as the skin, hair and nails. This is one cause for baldness, skin diseases and “zinc spots”, small whitish spots on the fingernails and toenails. One can even calculate when stress or another condition reduced the available zinc by the location of the spots relative to the distal end of the fingernails. The nails grow about one-fourth of an inch per month. Impaired protein synthesis due to low zinc or high copper is also why some women develop stretch marks, baldness at times, spider veins, varicose veins, digestive problems and many, many other telltale signs of low zinc. These
indicate stress and copper imbalance, at the very least, and may indicate other problems with protein synthesis.

**A possible celebration pattern.** A sudden increase in hair phosphorus on a retest when a person has followed a development program is often positive, even if the level rises to 25 or 30. It may reflect a breaking down old, diseased tissue. The level usually returns to a more normal level on the next retest.

**PHOSPHORUS SYNERGISTS.** These include most of the trace minerals and hundreds of other nutrients that are involved in energy production, cell membrane formation, protein synthesis, the nervous system and fluid balance. **Calcium** is absorbed with phosphorus and is a synergist in bone formation. **Magnesium** is a synergist in energy production and protein synthesis. **Vitamin D** assists phosphorus absorption, along with calcium absorption and utilization. **B-complex vitamins** require phosphorus for their activity, in many cases.

**PHOSPHORUS ANTAGONISTS.** These are many and include cortisol and steroid-containing drugs such as nasal sprays, pain remedies, cortisone shots and other steroid-containing products. In part, the devastating effects of these common remedies may be their detrimental effect on phosphorus metabolism in the body. This can help explain common side effects such as bone loss, thinning of the skin, exhaustion, adrenal damage and others.

**Sodium** and **potassium** are both synergistic and antagonistic with phosphorus. They are needed to absorb phosphates in the intestines. However, they also lower calcium and phosphorus in the blood. For example, children have more sodium and potassium in the hair and other tissues than adults. For this reason, children often have lower levels of phosphates in their blood and tissues than adults. However, their hair phosphorus level should be about the same as adults at about 15-18 mg%.

**SULFUR (S)**

Sulfur is a **fiery** mineral. It is found in gunpowder, for example. It burns very fast and hot. Historically, it is also associated with a fiery personality. Sulfur is one of the more abundant element in the human body. It is found in most proteins in the sulfur-containing amino acids, along with phosphorus and nitrogen. These three elements form a triad of important elements needed as building blocks or structural components of all animal tissues. Sulfur, however, is not one of the important regulators of the body, so it is less important in development. Some laboratories measure its level in the hair. The level is always quite high in comparison with other minerals.
15.
THE TRACE MINERALS –
THE TWINS, ZINC AND COPPER

Terence, age 73, still has osteoarthritis, muscle cramps, sweet cravings, irritability before meals, arteriosclerosis, high cholesterol and triglycerides, allergies, glaucoma, macular degeneration, intestinal gas, easy bruising and some prostate enlargement. When he first consulted me, his breakfast was a mixture of pumpkin seeds, cranberries, walnuts and one-fourth of a cup of flaxseeds. For lunch, he was eating blueberries, cherries or an apple. Dinner was fish or a tofu burger with a vegetable, red wine and cheese-flavored almonds for dessert.

This diet is better than most, but low in cooked vegetables and lacking in animal quality proteins. It also includes foods I find are harmful such as a too much fish, dried fruit and lots of tofu. These are fine once in a while, but not as staples. Also, red wine is high in iron and most men already have too much iron. In addition, alcohol can totally stop mental or spiritual development by poisoning certain brain centers. Terence’s first hair analysis revealed a very slow oxidation rate with a calcium level of 220 mg%, or a calcium shell. Copper was elevated at 5.6 mg% and phosphorus was poor at 10 mg%. Mercury was also high at 0.05 mg%, perhaps from eating fish. Aluminum was extremely elevated at 1.38 mg% (ideal is about 0.1 mg%).

A vegetarian hair analysis. Slow oxidation, elevated copper, low phosphorus and perhaps low zinc Dr. Eck called a ‘vegetarian’ hair test because this pattern is so common among vegetarians who are tired, consume too much copper and not enough zinc and, as a result, have impaired protein synthesis. Terence started to feel better almost immediately upon changing his diet and stopping a large number of supplements recommended by the Life Extension Foundation and other groups. All were good quality, but we find most are not needed and, in fact, slow or stop deeper healing because they were not exactly what he needed at the time. He also built a sauna and uses it regularly. This has helped him immensely. Terence’s second hair analysis showed a much faster oxidation rate, half the copper level and less mercury. Phosphorus remained at 10 mg%, however.

After two years, Terence slipped off the program and went back to his old eating and food supplement habits. A retest he did three years after the first one showed patterns similar to the first test, indicating most likely a worsening of his health. The point of this case is that even though Terence was willing to follow directions, he came to doubt the somewhat unusual nature of development science and decided to follow “standard” holistic nutritional recommendations, instead, including a largely vegetarian regimen and piles of nutritional supplements. Having tried many other nutritional systems, I keep coming back to development because it is much safer and more effective than the others. However, it is somewhat unusual and not in the mainstream of nutritional science or holistic medicine at this time.
THE TRACE MINERALS

The trace minerals are a group of about 20 elements needed in human and animal bodies in very small quantities. They are often toxic in higher amounts. As a group, they function almost exclusively as components or co-factors for millions of enzymes, many of which have yet to be identified. This differs from the macrominerals, which are needed more for pH, fluid and osmotic regulation. This section of the book on trace minerals is divided into three chapters:

- Chapter 15 (this one) discusses what I have called the twins – zinc and copper.
- Chapter 16 discusses the friends or amigos - manganese, iron, chromium and selenium. Aluminum is one of the amigos also, but is a toxic metal that is discussed in Chapter 18.
- Chapter 17 discusses other trace elements – iodine, lithium, boron and molybdenum.

Additional trace minerals include silicon, germanium, rubidium, vanadium, tin, zirconium and several others. However, these are less important at this time for development science, so they have been omitted to save space.

THE TWINS - ZINC AND COPPER

Zinc and copper are called the twins because they have a very close and interesting relationship to each other in the body. They are synergists in that they are both involved in:

- The stress response and regulating the levels of the macrominerals.
- Sexual and reproductive activity.
- The emotions and brain activity. In particular, both are involved in what I have called Level Two and Level Three brain disorders. These are explained in Chapters 38 and 39.
- Maintenance of connective tissue and the immune response.
- Both are transition elements in the periodic table. This has special significance as well.

On the other hand, they are also important antagonistic elements in the following ways:

- The stress response. Zinc tends to raise potassium and lower sodium on a hair mineral analysis. Copper tends to raise sodium and lower potassium.
- Brain activity. Zinc can act as a calming neurotransmitter and is one of the ‘sedative’ minerals, with calcium and magnesium. In contrast, copper is an excitatory mineral that stimulates the production of the biogenic amines. These are stimulatory neurotransmitters such as epinephrine or adrenalin, norepinephrine or noradrenaline, and dopamine.
- Emotions. Zinc appears to activate the frontal lobes or neocortex of the brain, also called the ‘new brain’. Copper inhibits the activity of zinc, and thus appears to enhance the activity of the diencephalon. This part of our brain is also called the old brain, the ‘animal brain’ or the ‘emotional’ brain.
- Sex and reproduction. Zinc is more associated with the male reproductive tract, while copper is more associated with women’s sexual and reproductive activity.
- Immune response. Zinc is involved with fighting infections. While copper is important for this also, excessive copper is definitely associated with a tendency for more infections.
- Zinc is a powerful anti-oxidant nutrient, while copper can be an oxidant nutrient.
EVERYONE HAS ZINC AND COPPER IMBALANCE TODAY

This was an insight of Dr. Eck’s. The reasons for widespread imbalances include:

- **Most parents-to-be are deficient in zinc and have excess copper.** This is easily passed on to their children in utero. The children’s imbalance is **congenital**, or present at birth, but not **genetic** or inherited. This difference is crucial and not understood well today.
- **Stress.** This depletes zinc and copper. Lowering these minerals helps raise the sodium and potassium levels, preparing the body for the fight-or-flight reaction.
- **Chronic, ongoing stress depletes the adrenals and causes even more copper accumulation.**
- **Low zinc in the soil, and in hybrid crops today, causes low zinc in the food supply.**
- **Food refining tends to remove more zinc than copper, such as the refining of flour and sugar.**
- **Impaired digestion.** This is due to many factors such as chronic intestinal infections with candida albicans, unhealthful eating habits and other reasons.
- **More vegetarian-oriented diets.** These further reduce zinc intake and increase copper intake.
- **Some people eat a lot of high-copper foods such as dark chocolate, avocados, nuts and tea.**
- **Copper in birth control devices.** Copper exposure from a copper-7 IUD, and the effects of birth control pills, patches and the hormone-containing IUD, can drastically increase copper and reduce zinc levels in the bodies of some women.

COPPER

A friend’s 76-year-old mother was under the care of a well-known holistic cardiologist for severe heart valve disease. Medical drugs were not helping, so she was trying a natural approach with various vitamins and minerals. However, her heart valve was getting worse by the day and she had been scheduled for a valve replacement operation in two weeks.

I asked my friend to send me a hair sample from his mother immediately. The result showed fast oxidation with a low sodium/potassium ratio. This is a common cardiovascular disease pattern and responds to copper alone in many instances. Her hair copper level was well within the normal range, but hair copper levels are often unreliable indicators for the need for copper. Her cardiologist had told her to take B-complex vitamins, vitamin C, coenzyme Q-10 and potassium. Not only was she not taking copper, but all of these excellent supplements can lower tissue copper. Her cardiologist was making her mineral balance and her health condition decidedly worse with these supplements, in my view.

By telephone, I suggested immediately stopping all her supplements, and instead, taking 3 mg of chelated copper 3 times daily, with nothing else. She did this and within a week she was so much stronger that surgery was postponed. By then, I had sent her a more complete development program, which also included a digestive enzyme, calcium and magnesium, and a metabolic pack for a fast oxidizers with a low sodium/potassium ratio. She continued to become stronger on this regimen and never required heart valve replacement surgery. She visited me several years later and appeared to be in excellent health. This case illustrates:

- The simplicity of development therapy in some cases.
- The dramatic effects of a simple chelated copper supplement, when taken in the right amount.
• A serious problem with nutritional therapy when done without using a properly performed and correctly interpreted hair analysis. My friend’s mother had had many other medical as well as holistic types of testing done in her travels from doctor to doctor.
• While subtle, the case also shows the importance of not washing the hair at the laboratory. When washed, the macromineral readings are skewed in many cases and much less accurate.

**FUNCTIONS OF COPPER.** Copper is a soft, reddish, malleable metal that is an excellent conductor of electricity. Among its many functions in the body are:

• **The bones and connective tissue.** Copper is required to fix calcium in the bones and to build and repair all connective tissue. This includes the tendons, ligaments, skin, hair, nails, arteries, veins and other soft tissues. Imbalances contribute to most skeletal, cardiovascular, muscular and other common conditions such as bone loss, scoliosis, kyphosis, fibromyalgia, and most conditions of the skin, hair and nails.

• **Energy production in the cells.** Copper, along with bioavailable iron, is needed in the final steps of the Krebs energy cycle called the electron transport system. This is where most cellular energy is produced in each cell.

• **The immune response.** Copper favors aerobic or oxygen-based respiration in the cells. Yeasts, fungal organisms and bacteria favor an anaerobic or glucose-based metabolism. When copper is deficient or biologically unavailable, infections often develop or worsen in the body, particularly fungal ones. Farmers make use of this principle and spray copper sulfate on many food crops to kill various fungi and other bugs. Copper is also used to disinfect swimming pools, hot tubs and municipal water supplies. People who have stubborn infections, especially yeast or candida infections, usually have a copper imbalance. Correct this and the yeast vanishes, often quickly.

• **The glandular system, particularly the thyroid and adrenal glands.** The thyroid gland is extremely sensitive to copper. It may build up in the thyroid gland, contributing to most types of thyroid difficulties.

• **Reproductive system.** Copper is intimately related to estrogen metabolism, and is required for women's fertility and to maintain pregnancy. Copper and estrogen tend to move up and down together in the body. Imbalance can contribute to every conceivable female organ difficulty such as premenstrual syndrome, ovarian cysts, uterine fibroid tumors, infertility, miscarriages, female organ cancers, sexual dysfunctions and others.

• **Nervous system.** Copper stimulates the production of the neurotransmitters epinephrine, norepinephrine and dopamine. It is also required for monoamine oxidase, an enzyme related to serotonin production. As a result, copper is involved with several aspects of the central nervous system. Copper imbalances are strongly associated with most psychological, emotional and often neurological conditions. These include memory loss, especially in young people, depression, anxiety, bipolar disorder, schizophrenia and many others.

• **Melanin production.** Copper is required for tyrosinase, an enzyme that converts tyrosine into melanin, the pigment that gives our skin and hair their color. Albinos, for example, may have a copper imbalance, as do those with other pigmentation problems such as vitiligo, a condition in which patches of skin lose their color. Dr. Eck felt that graying of hair may also have to do with copper imbalance. Hair loss is often related to copper imbalance as well.
• **Growth and development.** A severe copper deficiency seen in Menke’s kinky hair syndrome shows how important copper is for growth and development. This rare condition of impaired copper absorption is fatal within the first year of life unless copper supplements are given.

**SOURCES OF COPPER.** These include:

• **Congenital copper imbalance.** Most children today are born with copper imbalances, primarily due to imbalances in their mothers.

• **Zinc deficiency from any cause.** This tends to cause a copper overload. Copper replaces zinc in some enzymes in the body. Causes for zinc deficiency include stress from any cause, low soil zinc, the use of hybrid crops that are lower in zinc, food refining and processing, impaired digestion, babies are born low in zinc, spraying vegetables with EDTA or other chelating agents to preserve the color, and possibly others.

• **Vegetarian diets.** Vegetarian foods are lower in zinc, as a rule, and may be higher in copper.

• **Eating high-copper foods.** These include dark chocolate, some teas, nuts, avocados, yeast, all soy products, dried fruits, mushrooms, shellfish and organ meats.

• **Stress and impaired adrenal gland activity.** Dr. Eck felt that adrenal insufficiency is an important cause for copper imbalance because adrenal weakness affects copper transport proteins such as ceruloplasmin and perhaps metallothionein.

• **Medical causes.** Copper in intra-uterine birth control devices can raise the tissue copper level. Hormone therapy, particularly the birth control pill, the patch or the birth control IUD with hormones can raise tissue copper significantly in some women. Steroid hormones such as prednisone and others can also raise tissue copper levels and deplete zinc. Other medical drugs may impair the liver’s ability to remove copper.

• **Vitamin pills.** Many multivitamins contain too much copper. Prenatal vitamins are often the worst, with 2 to 4 mg of copper in each tablet.

• **Other.** Sources such as drinking water that passes through copper pipes, copper jewelry worn on the skin, copper added to tap water, fungicide residues on food, copper in swimming pools, dental materials and occupational exposures are often less important, but not always.

**Prenatal vitamin problems – two cases.** *Mrs. Robinson had given birth to a healthy boy six months ago. Her doctor told her to continue her prenatal vitamin that had 3 mg of copper per tablet. She called because both she and her baby were experiencing hair loss. Even without a hair analysis, I guessed the prenatal vitamin was to blame. Stopping it caused the hair loss problem to abate rapidly.*

**Prenatal vitamin problems #2. A young woman consulted me for post-partum depression. She casually mentioned she was continuing to take her prenatal vitamin that contained several milligrams of copper. I suggested stopping the prenatal vitamin at once.

Two weeks later, she returned for a follow up visit. Her depression had gone away as soon as she had stopped the prenatal vitamin. However, another problem also went away. Apparently the prenatal vitamin with copper had made her so anxious she could not handle her baby when he cried. She had been beating the baby to get him to stop crying. Fortunately, since stopping the prenatal vitamin the doctor gave her, all was now better. Her hair test revealed copper toxicity, which was no doubt aggravated by the prenatal vitamin tablet.*
COPPER IMBALANCE - THREE TYPES. One reason copper is complex to learn about is that it can be out of balance in several ways in the human body. These include:

- **A simple deficiency.** This is the case in fast oxidizers. Always supplement copper in fast oxidizers. Fast oxidizers with a low sodium/potassium ratio need even more copper.
- **A simple overload or excess.** Copper excess is present in most slow oxidizers. Perhaps this has to do with impaired adrenal activity, faulty elimination of it and/or a zinc deficiency.
- **Biological unavailability due to improper valence or perhaps other factors.** Copper, like iron and most metals, can have several valences. The unusable form may well be an oxide. Copper may also become biounavailable for other reasons, such as deficiency of a transport factor such as ceruloplasmin or perhaps metallothionein. Dr. Eck believed this is the main reason copper becomes biounavailable as the adrenal glands weaken. Adrenal activity, he learned, is needed for ceruloplasmin synthesis in the liver.

SYMPTOMS OF COPPER IMBALANCE

DEFICIENCY SYMPTOMS. These have to do with damage to connective tissue and with fast oxidation. They include aneurysms, heart valve problems, venous problems, artery wall weakness, low or high blood pressure, rashes, brittle nails, hair loss, stretch marks, scarring, and cancer, for example. Fast oxidizer symptoms may include anxiety, irritability, nervousness, muscle cramps and muscle tightness. Others include aggressive behavior, autism, ADD, ADHD and others.

ELEVATED COPPER. A simple excess of copper will produce different symptoms depending upon where the copper is lodged in the body. It tends to accumulate first in the liver, then the brain and female reproductive organs, and perhaps the testis as well. After that, it can accumulate in the joints and elsewhere. Excess copper is usually in a biounavailable form, where it acts as an inflammatory agent and causes severe oxidant damage in some cases as well. Symptoms may include inflammation, pain, menstrual problems in young women, testicular pain, cancers, allergies, brain fog, emotional and mental illnesses, thyroid and liver disorders and many others.

BIOUNAVAILABLE COPPER SYMPTOMS. Biounavailable copper tends to produce a combination of symptoms of deficiency mixed with symptoms of overload.

NERVOUS SYSTEM SYMPTOMS. Dr. Eck called copper the ‘emotional’ or ‘love mineral’ because it has such a profound impact upon the central nervous system. The psychiatric implications of copper imbalance are tremendous. Most psychological and psychiatric conditions improve when copper is brought into a better balance in the body.

The overall effect of excess and biounavailable copper appears to be to increase most emotional activity in a human being, while zinc tends to balance the emotions. Dr. Eck read that copper stimulates the diencephalon, also called the ‘old’ or ‘animal brain’. This can enhance a tendency for most emotional conditions, from depression and anxieties to autism, ADD, ADHD, brain fog, insomnia, epilepsy, fears, phobias, loss of concentration, aggression, violence, obsessive-compulsive behavior, bipolar tendencies, Tourette’s syndrome and some schizophrenias. Other conditions discussed in the mental health section of this text are also related to copper imbalance. These are so common and respond so well to development science it is a wonder more doctors are not aware of the importance of copper in mental illness.
**Copper and world violence.** Violence around the world is more common in nations with the worst zinc and copper imbalance. For example, in the Middle East, the primary staple food is wheat. Today’s wheat is higher in copper and also pro-inflammatory due to its glutamine content and other factors. Inflammation tends to use up zinc in the body, since zinc, along with calcium and magnesium, are sedative or anti-inflammatory minerals. Today’s wheat is also low in zinc due to hybridization, low soil zinc and refining of whole grains to make white flour. America and parts of Europe and Asia also use wheat. However, people here eat more meat and fish, foods that are rich in zinc.

**The Walsh studies of prisoners and copper.** Chapter 38 discusses studies of criminals that indicate that many have copper imbalances. Young women also commit more violence just before the menstrual period, a time of the month when the tissue copper level rises.

**Copper personality types.** Dr. Eck identified personality qualities associated with each of the major minerals. There appear to exist several high copper personality types. These are discussed in Chapter 43. Positive copper personality traits include a humble, warm, caring, sensitive nature, often with an artistic and creative orientation. Such individuals may excel as writers, musicians, artists, engineers, psychologists and intuitives of various kinds. Often high-copper people are also young looking and can be child-like in their mannerisms. Many traditionally feminine traits are associated with copper such as softness, gentleness and intuitiveness.

When the personality is not fully integrated or the copper becomes too high, negative traits appear that may include spaciness, racing thoughts, living in a dream world, gullibility and naiveté. Others are childishness, excessive emotions, sentimentality, a tendency to depression, fearfulness, hidden anger and resentments, phobias, psychosis and violence.

The copper personality type tends to accumulate copper easily. The mineral may function as a psychological defense mechanism. It causes one to detach slightly from reality. This provides relief from stress for these usually very sensitive individuals. It can work well for a while, providing the copper does not become too high. Very high copper can cause panic attacks, nervous breakdowns or psychotic breaks with reality. As a result, artists, inventors and other high-copper types often "live on the edge", in part due to their high copper level. Schizophrenias related to elevated copper often respond excellently to development programs.

**REPRODUCTIVE SYSTEM SYMPTOMS.** Women are copper dominant, while men are zinc dominant. This means copper is more important for women, while zinc is somewhat more important for men. Adult women suffer much more from copper imbalance than men.

*Premenstrual syndrome or PMS.** Symptoms often mimic the symptoms of copper imbalance. This occurs because estrogen levels and copper levels correlate well, and both increase before the menstrual period. This can be why taking copper antagonists a week before the period such as zinc and vitamin B6 often reduces PMS symptoms. At times, the cause of PMS is more complex. Bioavailable copper may cause a different set of PMS symptoms than a simple high copper. Chapter 31 discusses PMS in more detail.

Other copper-related female symptoms include amenorrhea, dysmenorrhea, fibroid tumors, ovarian cysts, pelvic inflammatory disease, fibrocystic breast disease, endometriosis, polycystic ovaries and others.

*Miscarriages, infertility and low libido.** Copper is required to become pregnant and to maintain a pregnancy. Studies indicate that women with low estrogen and often low copper have more miscarriages. Correcting the copper balance can help female fertility and avoid miscarriages.
Sexual desire. Copper imbalance may reduce libido in both men and women due to:

- **Low energy levels.** This can be due to a slower oxidation rate that leads to less interest in sex.
- **Tissue numbness or insensitivity.** This may be associated with an excessively high copper level, which is related to the deposition of calcium in the body tissues. This may reduce sexual excitement, that, in turn, can cause less interest in sex.
- **Depression and negativity.** These can be side effects of low energy or high copper and may contribute to a reduced sex drive.
- **Estrogen imbalance may interfere with testosterone levels.** This can affect the sex drive in both men and women.
- **Pain on intercourse or vaginal dryness.** These may also be related to copper imbalance.

**Excessive sexual desire and sexual dysfunctions in women.** Another curious effect of copper excess in women can be excessive sexual interest. This has to do with excessive estrogen levels and liver toxicity in some women that probably increases testosterone levels.

**Birth control pills and copper IUDs (intra-uterine devices for birth control).** These two birth control methods definitely affect copper metabolism in the body. While some women can handle them, others experience depression, anxiety, personality changes and more serious side effects from them. Problems may take years to develop. This aspect of women’s sexual revolution has probably caused more disasters in women’s health than any other. Cancers and heart disease have increased drastically, in part due to these devices and drugs. Even if a woman stops the birth control pill after a number of years, her risk of cancer remains higher for the rest of her life.

**Estrogen dominance.** Higher-copper women are often diagnosed as estrogen dominant. Medicaly, this means they have more estrogen in their bodies, proportionately, than they have progesterone. However, from my perspective, they are usually just copper toxic. This does, indeed, increase estrogen in some cases. In others, the problem is impaired detoxification of estrogen by the liver due to toxicity of the liver with copper and other toxins.

Estrogen dominance usually resolves easily using development, without a need for hormone therapies. Hormones are supposed to be made in the body. Administering them orally or any other way tends to worsen the balance of the body chemistry. In this sense, both synthetic and natural or bio-identical hormones are drugs, no matter what anyone says to the contrary.

**Copper and body shape.** Higher copper women and men tend to have more fatty and often watery body tissues due to more estrogens and perhaps a higher tissue sodium level that causes some water retention. Men and women with low or biounavailable copper tend to be lower in estrogens and have a more linear body shape and often less watery tissues as well. However, copper is certainly not the only factor affecting hormones and body shapes. Some pesticides, for example, mimic the effects of estrogen and can affect the hormone balance.

**Male sexual imbalances.** Men should be zinc dominant. This means their copper levels should be somewhat lower than in women’s bodies, though this is not reflected on their hair tests because copper does not primarily accumulate in the hair tissue. Among men, symptoms of copper toxicity include prostate enlargement, prostate infections and perhaps some prostate cancer. Others include ED or erectile dysfunction, testicular pain and testicular cancer in some cases. As copper is released from the testicles on a development program, men may experience temporary, sharp pain in the testicles for a few hours to a day or two.
**Secondary sex characteristics and copper.** Secondary sex characteristics are those aspects of sexuality that are more mental and emotional than they are physical. For example, attitudes, likes and dislikes of men and women, and other qualities we associate with men versus women are influenced by hormonal factors and at times, by copper. Dr. Eck noticed, for example, that homosexuality was more common among men with very high hair tissue copper levels.

**CONNECTIVE TISSUE SYMPTOMS.** Copper is required for collagen formation and for keratin, the material used to make hair, skin and nails. Copper, along with sulfur, is important for the disulfide bonds that give connective tissue its qualities of elasticity and strength. As a result, copper deficiency or biounavailability are associated with all collagen and connective tissue conditions including loose ligaments, tendonitis, bursitis and many others. Other serious ones include aneurysms and heart valvular disease.

Other disorders include venous stasis, varicose veins, stretch marks, capillary fragility, easy bruising, bleeding problems, and virtually any condition involving the hair, skin and nails. These include alopecia or hair loss, dandruff or other fungal infections of the scalp, dermatitis, eczema, scarring such as keloid scarring, vitiligo or loss of skin color, and others.

**High copper and vitamin C deficiency.** Vitamin C and copper are antagonists. Therefore, excessive copper can cause all the symptoms of low vitamin C. These include connective tissue disorders such as bleeding gums and others such as impaired healing and a tendency for infections.

**Bone, joint, and skeletal problems.** Other common conditions that are often related to copper include osteoporosis and arthritis. These often respond well to balancing the copper and zinc in the body. Others include scoliosis (lateral bending of the spine), kyphosis (hunch back) and most other back problems such as slipped discs and degenerative disc disease.

**APPETITE AND EATING DISORDERS.** Copper-toxic individuals may be drawn to sweets or salty foods due to adrenal insufficiency. Ingesting sea salt is often beneficial for these people. Avoid common table salt, however, as it is very deficient in trace elements. Sweets, including fruit juices, provide a temporary lift for many copper-toxic individuals. However, they worsen the underlying copper imbalance for a number of reasons. Sugars are deficient in zinc and tend to make zinc deficiency worse. Sweets also stimulate the adrenal glands, which eventually depletes them even more. Sugar has many other negative effects on metabolism as well.

**Anorexia.** Excessive copper and/or low zinc can interfere with normal appetite, in part by interfering with the senses of taste and smell to some degree. Teens are at greater risk for copper imbalances because they are often under a lot of stress, which depletes zinc even faster. Also, their diets are often of poor quality and too low in zinc-rich meats, for example. Instead, they eat a lot of carbohydrates such as pizza that actually interfere with zinc uptake in the intestines. This combination can be lethal for some teenage girls, in particular.

**Vegetarianism.** Vegetarian proteins are higher in copper and lower in zinc, so they tend to worsen copper toxicity. Fast oxidizers fare poorly on these diets, even though fast oxidizers require more copper. Fast oxidizers also need much more fats and oils, which tend to be low in these diets.

**Obligatory vegetarians.** Dr. Eck coined this term to describe people whose energy and digestion have declined so much they cannot digest meats well anymore. As a result, they gravitate toward vegetarian diets, thinking they are better for them. This occurs often today, especially among women and some teenagers who tend to be very slow oxidizers. Meat feels ‘heavy’ in their stomachs, especially if it is rich in fat such as steak or lamb.
Is vegetarianism more spiritual? Many people, including the author many years ago, felt they were becoming more “spiritual” by following a vegan diet. However, it was really destroying my health by causing copper toxicity and other nutrient deficiencies. This can make one feel calmer and somewhat spaced out. This, however, is not real mental development, I have since learned.

In fact, Dr. Eck found that as the copper balance improves and the liver and other organs regenerate, most people develop a craving for meat, as it is a rich source of many nutrients including zinc, copper, alpha-lipoic acid, B-complex vitamins, carnitine, taurine and others. Grass-fed meats and wild game are also usually excellent sources of zinc, omega-3 fatty acids and other nutrients.

Eating meat can cause uncomfortable symptoms. Dr. Eck found that when a vegetarian eats red meat, or even a lot of chicken or turkey, for example, it may cause a copper elimination. This can result in fatigue, a headache, acne, gas, bloating, an upset stomach, heaviness in the gut, and other symptoms. If the person does not understand why this occurs, he or she may feel this is proof that meat is not healthful, when it is not true.

The symptoms may occur because the body is not used to the food. It can also occur because eating meat increases the activity of the adrenal and thyroid glands, which in turn enhances the oxidation rate. This allows the body to eliminate some copper. The body must move the copper into the blood stream, where it causes the temporary symptoms until it is eliminated completely through the bile, urine or other routes. Solutions for this problem are:

- **Eat small portions of meat and don’t worry about the symptoms, which will eventually subside.**
- **Enhance the eliminative organs with enemas, saunas or other means to improve copper elimination.**
- **Use a powerful digestive aid to assist digestion such as GB-3 from Endomet Labs.**
- **Rest after all meals.** Resting after a meal is always an excellent habit.

COPPER AND CANCER. A hair copper level that persists on several tests above about 10 mg% is often related to a tendency for infections and possibly cancer. Another indicator of hidden copper and a tendency for immune imbalance is a sodium/potassium ratio less than about 2:1. Copper imbalance may impair the immune response in many possible ways:

- **Tumor angiogenesis.** This is the ability of a cancer to grow new blood vessels so it can spread. Recall that copper excess or biounavailability damages connective tissue such as blood vessels. This might increase the chances that a cancer will spread more easily.
- **Vitamin C.** Copper lowers vitamin C, a substance known to protect against some cancers. This may lead to oxidant damage due to copper-induced vitamin C deficiency.
- **High estrogen levels.** Copper excess is associated with high levels of estrogens, which are potent carcinogens.
- **Impaired liver function.** Copper accumulates in the liver and can damage it.
- **Zinc deficiency.** High copper is associated with zinc deficiency. Zinc is vital for the immune response.
- **Impaired cell respiration.** Copper in the proper amount is needed for aerobic or oxygen-based cell respiration. As copper becomes less bioavailable, cells cannot use oxygen as well and may revert to a sugar-based respiration characteristic of cancer.
- **Low thyroid conditions.** Copper imbalance often affects the thyroid gland. Hypothyroid conditions are common in cancer patients.
CHILDREN’S HEALTH AND COPPER. Children are all born with high levels of copper. This may persist for several years. It gives babies and young children a spacey quality in which they live somewhat in their own little universe. As children grow, the copper level should decline. However, many children have so little zinc, as well as other mineral imbalances, that high or biounavailable copper persists into adulthood.

Why children have copper imbalances. Copper imbalance problems for a child often begin when still in the womb. High-copper mothers pass on excessive copper, along with low levels of zinc and other trace minerals, to the fetus through the placenta. This problem is called congenital copper imbalance. It is to be distinguished from a genetic or inherited error of the DNA. It is simply an imbalance present at birth that was passed from mother to child. The inherited copper storage disease, Wilson’s disease, is discussed later in this section.

Once the child is born, causes for high copper include too much copper in the breast milk, possibly, which may even cause a baby to reject the breast milk. Infections, medical interventions such as vaccines, and stress may also further deplete zinc. This has the effect of causing the symptoms of high copper as well.

Symptoms of copper imbalance in babies and children. Copper has a powerful impact on children. Imbalances may cause diaper rashes, eczema, ear infections, delayed development syndromes, learning disorders, colic, ADD, ADHD, autistic tendencies, sleep problems and childhood cancers. Other conditions might also be related to copper imbalance that are discussed above in regards to adult symptoms of copper imbalance.

Prevention and correction. Congenital copper imbalance can often be prevented easily if a mother-to-be corrects her biochemical balance and oxidation rate before becoming pregnant. This is always best. If the problem in the mother is left unattended, serious birth defects can arise from copper and zinc imbalances. Zinc is known to help prevent neural tube defects, as well as others.

Most copper imbalance can also be corrected after a baby is born if the child is born normal in most regards. If there is a birth defect due to this cause that cannot be totally corrected, development can be superb to help minimize the damage and assist with rehabilitation.

Symptoms of a copper imbalance in a mother-to-be. Many times there are no symptoms at all. The mother may also look very well. This is unfortunate, but usually true. In my experience, only a properly performed and properly interpreted hair mineral analysis can assess the copper/zinc balance adequately. This can help explain why one of every 100 or even more children in America today is either born with or will develop a severe developmental, learning or behavioral disorder. It also helps explain the soaring rate of childhood cancers in America and elsewhere. Obviously, post-modern medicine is not caring adequately for pregnant women.

CARDIOVASCULAR SYMPTOMS. This has been discussed with connective tissue disorders above. In addition, high or biounavailable copper is associated with mitral valve prolapse, heart arrhythmias, palpitations and heart failure. It may also be involved with some cardiomyopathies, although others, such as Keshan’s disease, have more to do with selenium.

ANEMIA, HISTAPENIA AND PYROLURIA ASSOCIATED WITH COPPER. Iron deficiency anemia. Copper is required for the conversion of iron from Fe+2 to Fe+3 and back again. This is an essential aspect of hemoglobin formation. When the copper level is excessive and biounavailable, it often causes a mild microchromic, microcytic anemia. This is most often misdiagnosed as an iron deficiency anemia when the real cause is a copper
imbalance. It does not respond too well to iron, although taking enough iron will lower copper
somewhat because iron and copper are antagonists in many ways.

Beware that iron toxicity can be even worse than copper toxicity, so anyone with an iron
deficiency type of anemia should be checked with a hair analysis for copper imbalance before
taking iron. Recall that the hair copper level is NOT the way to evaluate copper. This is
explained below. In our experience, few people need more iron except perhaps vegetarians, and
some menstruating women who eat poorly or those who lose a lot of blood each month.

**Hemolytic anemia.** *Wilson’s disease,* a rare inherited disorder of copper storage, is
associated with a hemolytic anemia. According to *Harrison’s Textbook of Internal Medicine,* this
may be due to oxidant damage of the red blood cells due to copper or even a vitamin C deficiency.

**Histapenia.** Carl Pfeiffer, MD, PhD stated that copper destroys histamine. He identified a
type of schizophrenia in which serum copper is elevated and histamines are low. Slow oxidizers
may also have low histamines due to impaired cell permeability.

**Pyroluria.** This refers to the presence in the urine of “mauve factor” or kryptopyrroles. Dr.
Eck stated this has to do with copper imbalance, usually high copper. Patients with pyroluria often
display many symptoms of copper toxicity. These include migraine and other headaches, emotional
sensitivity, fatigue, nervous exhaustion, fears, depression, anxieties, insomnia, anorexia and others.

In addition, these patients respond excellently to supplementary zinc and vitamin B6. These
are well-known copper antagonists. Dr. Pfeiffer wrote that in cases of pyroluria, an oral dose of 50
mg of vitamin B6 “reduces excretion of zinc while increasing copper excretion”. (*Mental And
Elemental Nutrients,* p. 407)

**ADDICTION AND COPPER.** Addictions may involve copper in the following ways:

- *Addictions help some people avoid copper toxicity symptoms.* Copper imbalance frequently
causes fatigue, depression, anxiety, spaciness, brain fog and other annoying or scary symptoms.
A major reason people are attracted to some addictive substances or behaviors may be to
stimulate the adrenals, in part to keep their copper in balance and prevent these symptoms. Any
stimulant will tend to harmfully keep the adrenals pumping, from intense exercise, caffeine and
sugar to loud music, spicy foods, excessive sex or cocaine.

- *The ‘copper high’.* A friend, Alice, is a brilliant nutritional consultant. She tells me that she
enjoys having a high hair copper level. When she tries to lower it with zinc, or worse, with
molybdenum, she feels nervous, anxious and, in fact, depressed. Copper may give one a ‘high’
by causing a slight detachment from reality. Thus some people will be attracted to copper-
enhancing foods or activities for this reason. These might include eating chocolate,
vegetarianism, raw food diets and perhaps other high-copper foods such as avocados.

- *Copper, cadmium and addictions.* Dr. Eck stated that cadmium found in marijuana and tobacco
cigarettes, and even in coffee, drives copper out of the blood and back into storage. These drugs
may be addictive, in part, because by driving copper out of the blood, copper symptoms
temporarily diminish. They will come back, however, when the drug wears off.

**DETECTING COPPER IMBALANCE**

Copper accumulates in the liver, brain, kidneys and other internal organs where it is not
easy to measure without painful and invasive biopsies. Blood, urine, feces and hair testing are
also used to detect copper imbalances. No direct test for copper tends to be totally reliable. The
liver biopsy is considered diagnostic for Wilson’s disease. Carl Pfeiffer, MD, PhD used serum copper tests. Other doctors measure serum ceruloplasmin. However, these tests can be normal or low even when copper is excessive in the tissues.

Simple urine tests are not reliable because the body does not usually eliminate much copper in the urine. Urine challenge tests using penicillamine, (D-(-)-3-mercaptovaline), a somewhat toxic copper chelator, are better, but can still miss many copper problems.

**HAIR MINERAL ANALYSIS TO DETECT COPPER.** When performed and interpreted as described in this text, the hair mineral test is excellent to detect several copper imbalances. These include copper excess, copper deficiency and biounavailability, which is a combination of excess and deficiency.

Using the hair mineral analysis to assess copper is complex, at times. *The hair copper level is not a reliable indicator, according to Dr. Eck’s research. Instead, one must look elsewhere on the test for subtle indicators.* First let us discuss the meaning of a high, normal and low hair copper level. Then let us discuss the interpretation of “hidden” or more subtle copper indicators on a hair analysis.

**The hair copper level.** An ideal hair copper level in an adult is probably about 2 mg% or 20 parts per million. However, the hair copper level often varies in a seemingly random fashion. This is why it is a poor indicator of copper metabolism.

*High hair copper.* On an initial hair analysis, a copper level greater than about 2.5 mg% indicates excessive and biounavailable copper in both fast and slow oxidizers. However, this is not true on retests. Very often, on retest hair analyses, copper may rise in the hair as it is being eliminated due to a development or other health program.

*Low hair copper.* In slow oxidizers, a hair copper less than 2.5 mg% is not significant. Most of the time, excess tissue copper is present. Often, a low copper in a slow oxidizer indicates biounavailable and excessive hidden copper. Therefore, *be careful not to give copper to all those who have a low hair copper level.* This is a common mistake. *See below to determine who needs a copper supplement.*

All fast oxidizers are in need of copper, regardless of the copper reading. A low reading in a fast oxidizer is a true deficiency state. A high reading is a biounavailable copper, and supplementation is still needed.

*Showing copper.* When the hair copper is elevated, especially in a slow oxidizer, Dr. Eck and I call it “showing your copper”. I am not sure why some people show their copper toxicity more than others. It may have to do with emotional openness or perhaps has to do with the bioavailability of the copper.

**COPPER IMBALANCE INDICATORS.** As stated above, the hair copper level is not a good indicator for many copper imbalances. Through years of research, Dr. Eck found that the following are excellent indicators for the major copper imbalances:

*High tissue copper:*
- Copper level greater than about 2.5 mg%.
- Calcium level greater than about 70 mg%.
- Potassium level less than about 4 mg%.
- Zinc level less than about 13 mg%.
- Mercury level greater than 0.02 mg%.
• Calcium/potassium ratio greater than 10:1.
• Sodium/potassium ratio less than about 2:1.
• Phosphorus less than about 12 mg%. This is a newer indicator with less research behind it.
• Four low macrominerals.
• Perhaps a zinc level greater than about 20 mg%.

The list above indicates that most people have a copper imbalance involving too much tissue copper. The reason Dr. Eck knew this was that as people progressed on a development program, copper would eventually start coming out and copper-related symptoms such as headaches or rashes would then disappear.

**Biounavailable copper:**
• Copper level less than 1 mg% or greater than about 3 mg% in a slow oxidizer.
• Copper level greater than 2.5 mg% in a fast oxidizer.
• A sodium/potassium ratio less than about 2.5:1 in either a fast, slow or mixed oxidizer.

**A need for copper supplementation:**
• All cases of a sodium/potassium ratio less than about 2.5 mg%.
• All fast oxidizers.
• Perhaps in those with a low calcium/magnesium ratio, but only in a fast oxidizer or a four lows pattern.
• Combinations. Fast oxidizers with a low sodium/potassium ratio require more copper than if only one of the above patterns is present. Even more copper may be needed for a step up pattern, which has all three of the above situations combined on one chart.

**THE BLESSING OF COPPER TOXICITY.** Copper toxicity, though it causes many unpleasant symptoms, can be a blessing in disguise. It may force one to slow down, relax more, and review one’s lifestyle, diet, attitudes, occupations and other aspects of life, in order to make changes that promote a more healthful life. Those with a copper personality type may use copper to detach or “space out” to some degree because they either do not know how to handle the world or they are in a situation such as a job or relationship that is not working well for them. It can be a blessing to really see this and make necessary changes.

Many of those with a copper imbalance are sensitive people who must live their lives in a peaceful and directed manner, and not just “follow the crowd”. A copper imbalance is a wakeup call for these people that something is out of balance in their lives. In these ways, the scourge of copper imbalance can be one of the most positive events in a person’s life. The only popular book on the subject that I know of is *Why Am I Always So Tired?* by Ann Louise Gittleman (1999).

**Copper synergists.** These include calcium and magnesium, which often move in the same direction as copper on hair mineral analyses. Others are dietary factors that help balance fast oxidation including vitamins A, D, B12, choline, inositol, fat in the diet and a low-carbohydrate diet. For connective tissue and a few other functions, zinc and vitamin C are synergists as well. Iron is needed with copper for energy production in the electron transport system. Many other nutrients are also required with copper in other body functions.
COPPER ANTAGONISTS. These include most B-complex vitamins, vitamins C and E, protein in the diet, molybdenum, manganese, chromium, selenium, zinc, iron and perhaps other trace elements. Sulfur-containing foods, herbs and amino acids are also often used as copper antagonists such as L-taurine, methionine, cysteine and others.

WILSON’S DISEASE, AN INHERITED COPPER DISORDER. This very rare disorder (about 1 in 200,000) is often confused with acquired copper overload. I have never actually seen a client with Wilson’s disease. I wonder if it is a real entity, or if it is just a severe case of acquired copper imbalance.

The two might not be easy to tell apart because acquired copper toxicity can cause similar symptoms as Wilson’s disease including low ceruloplasmin, chronic hepatitis, anemia, kidney damage and brain damage. These symptoms of Wilson’s disease, however, can teach us a lot about the long-term effects of copper overload on the body. Mental symptoms similar to Parkinsonism and some resembling multiple sclerosis may also occur. These can provide important clues as to the causes of these common diseases of our time.

A sign of Wilson’s disease that is easy to check for is the Keyser-Fleischer ring. This is a golden-brown or sometimes gray-green pigment ring around the edge of the cornea or the inner part of the eye. This is present in about 50% of cases. Wilson’s disease has nothing to do with a newer syndrome called Wilson’s syndrome. This is a failure to adequately convert tetraiodothyronine or T4 to triiodothyronine or T3.

BALANCING COPPER. As more practitioners discover the extent and importance of copper imbalance, they are using various means to correct it. Dr. Eck spent years analyzing mineral analyses and working with clients to come up with his protocols for copper imbalance. He designed protocols that address this problem very successfully, without side effects, at low cost, and quite permanently in most cases. He also observed other methods of treatment. Here are a few comments on all these methods of balancing copper:

Development science. This works superbly for copper imbalance. In keeping with the principles, however, one must always focus on balancing the entire body chemistry, rather than focus mainly on copper. When this is done, copper imbalances usually go away on their own, permanently, without adverse effects and without upsetting other parameters of health.

Chelation therapy. Practitioners may use synthetic agents that bind copper and remove it forcefully. These include DMSA, DMPS, perhaps EDTA or D-penicillamine (Cupramine or Depen). Among the natural chelating products are those containing chlorella, cilantro, zeolite, yellow dock, bugleweed and others. Dr. Eck never used or recommended these methods. In fact, he found that EDTA and other drugs worsened the sodium/potassium ratio on clients’ hair tests, which tends to indicate a decreased vitality level. Problems with all chelators include:

• Removing zinc and other vital trace elements. This is the most serious problem, and tends to make the client worse in subtle ways. It occurs even if one supplements the trace minerals.
• Chelation alone does not address the underlying causes of copper imbalance. This can slow progress and cause a recurrence of the copper toxicity.
• Single-agent methods such as chelation often upset the overall balance of the body in subtle ways, such as unbalancing the oxidation rate.
• Toxicity of the chelating agent, in some cases.
• Removing copper before the body is ready to release it, especially in sensitive people. This is not as common, but does occur.

**Antagonist therapy.** Another way to reduce a high copper level is with copper antagonists such as zinc, manganese, B-complex vitamins, vitamin C or molybdenum. This approach is helpful and safer than chelation, but still limited and may not work too well. Problems with this method are that it often does not address deeper causes for the problem such as slow oxidation, adrenal exhaustion or liver toxicity. It also often unbalances the body in subtle ways. For example, giving high doses of chelating drugs or any supplements is extremely yin in Chinese medical terminology. This can affect the oxidation rate and many other aspects of body chemistry.

**Dietary methods.** One can also limit the amount of copper in one’s diet. This approach is somewhat helpful. One must stop eating most nuts, seeds, whole grains, chocolate and avocados. Even more important is to add enough nutritious meats, eggs and other protein foods, along with plenty of cooked vegetables to supply zinc and the many other nutrients that everyone needs today.

**Mistakes that practitioners make regarding copper supplementation.** These include:

- *Giving copper based just on a low test reading.* This is often harmful. Only give copper supplements to fast oxidizers or when the hair sodium/potassium ratio is low.
- *Not supplementing copper when it is really needed, as in the cases discussed above.* As a reminder, the hair, serum or other copper tests are not reliable indicators in most cases.

**COPPER DETOXIFICATION SYMPTOMS.** As copper is removed from the tissues, one may experiences minor symptoms. These occur because high levels of copper, as they are being eliminated through the bile and urine, may temporarily upset the balance of minerals in the blood or in the tissues. The symptoms often include headaches, skin rashes, racing thoughts, strange odors, digestive upset, mood swings and energy fluctuations. Women may experience menstrual changes and occasionally ovarian pain. In men, testicular pain is possible.

To minimize symptoms, drink, more distilled water, take extra coffee enemas, rub the feet more, use a near infrared sauna more often and be sure to rest and eat lightly of the correct foods such as cooked vegetables, rather than a lot of grains, for example. One may also stop a development program, except for the GB-3, for a day or two until symptoms subside. Extra vitamin B6, zinc, bile acids and perhaps milk thistle and dandelion root may also mitigate elimination symptoms. Rarely, I will use molybdenum to lower a high copper, but it is usually not needed and is slightly toxic, so it is best used very sparingly.

**ZINC – A CRITICAL MINERAL TODAY**

Zinc is a very alkaline-forming, rather soft, white-colored metal. It is perhaps the most amazing single mineral in the human body. Dr. Eck called it the gentle strength mineral. I suggest also calling it the balancing mineral because of its unique actions in the body.
FUNCTIONS OF ZINC. Zinc has many roles, including:

- *Protein synthesis.* Zinc is required for RNA transferase and other enzymes involved in the synthesis of all proteins, enzymes, hormones and other tissues.
- *Carbohydrate metabolism.* Zinc is required for insulin production and secretion, and to extend the action of insulin.
- *Male and female sexual and reproductive activity.* Zinc is especially helpful for male sexual activity. Both the male and female sexual secretions are rich in zinc. The prostate gland is a reservoir for zinc.
- *Vision.* Zinc concentrates in the retina and other structures of the eyes, where it acts as an anti-oxidant and has other functions as well.
- *Cardiovascular system.* Zinc is essential to maintain the flexibility of the arterial walls and thus to maintain normal blood pressure. Cadmium can replace zinc in the arteries, leading to hardening of the arteries.
- *Acid-base balance.* Zinc is an important alkaline mineral in the body.
- *Oxygen and carbon dioxide balance.* Zinc is needed for carbonic anhydrase, an enzyme that helps remove CO2 from the body.
- *Digestive system.* Zinc is required to produce all digestive enzymes.
- *Nervous system.* Zinc is intimately involved in the central nervous system as a calming neurotransmitter and has other subtle roles as well. Some are described below.
- *Appetite, taste and smell.* Zinc is needed for the sense of taste and smell, and helps regulate the appetite as well. Low zinc is associated with anorexia and other eating disorders.
- *Endocrine system.* Zinc is needed for the synthesis of most hormones in the body.
- *Blood disorders.* Low zinc can lead to anemias due to lead or copper toxicity.
- *Musculo-skeletal system.* Zinc is required for bone and muscle proteins and strength.
- *Connective tissues.* Zinc is required for the skin, hair, nails and other soft tissues.
- *Immune response and wound healing.* These are other functions that involve zinc.
- *Inflammation.* Zinc is the primary anti-inflammatory mineral. Deficiency is associated with many painful and inflammatory symptoms.
- *Detoxification.* Adequate zinc helps prevent cadmium and mercury toxicity. Zinc appears to help the elimination of copper, mercury and other toxic metals in many ways.

SOURCES OF ZINC. The best sources of zinc are red meats, chicken, turkey, eggs and seafood. Vegetarian sources are not as good, such as pumpkin and sunflower seeds, and to a lesser extent brewer’s yeast and a few cheeses. Far less important sources of zinc include skin ointments such as zinc oxide, Caladril and perhaps other skin creams. Zinc is used in these products for its soothing and healing effect on the skin. *Head & Shoulders* shampoo is also high in zinc. It is not the best form of zinc, but some is absorbed from the product. Zinc is used in this product to overcome dandruff, a fungal infection of the scalp that causes itchiness and flaking of the skin.

Reasons for an almost universal zinc deficiency today include:

- *Soils low in zinc.* The zinc has been farmed out in many areas of the world. This is a serious worldwide problem that is aggravated by modern farming methods that do not return all the human and animal manures to the land.
• **Hybrid crops.** Newer crop varieties do well on zinc-depleted soils, but contain much less zinc. Wheat, for example, is now much lower in zinc. This makes it a much more inflammatory food item today, for which reason I do not recommend eating any at all.

• **Food processing.** Milling whole grains often removes most of the zinc in the food. Spraying frozen vegetables with EDTA to retain color also removes more zinc.

• **Diets high in sugars and carbohydrates.** Zinc is essential for insulin and carbohydrate metabolism. Eating a high-carbohydrate diet stresses this system and depletes zinc faster.

• **Stress.** Zinc is lost often within minutes as part of the fight-or-flight response.

• **Less meat in the diet.** One of the few good sources of zinc is meats. In general, people are eating less meats. This may have other benefits, such as reducing iron intake, but it also reduces zinc intake and can cause disease for this reason. Low zinc may be one reason vegetarians do not live as long as meat eaters, in general.

**SYMPTOMS OF ZINC IMBALANCE.** The symptoms and conditions associated with zinc deficiency are practically identical to the symptoms of copper toxicity. They may include:

• White spots on the fingernails, although there are a few other causes of this symptom.

• Stretch marks, varicose veins and most cases of dermatitis, eczema, acne, psoriasis, dandruff, hair loss and many other skin disorders.

• Most conditions related to the male and the female reproductive systems. These include menstrual problems, prostate difficulties, erectile dysfunction and most others.

• Most birth defects directly or indirectly involve a zinc deficiency.

• Delayed development, short stature, undescended testicles, and many other problems related to growth and development.

• Brain-related disorders such as autism, ADD, ADHD, dyslexia and many others.

• Most vision disorders such as macular degeneration, near and farsightedness, retinitis, keratitis, blepharitis and other infections. Glaucoma, cataracts and other eye problems may also involve zinc deficiency. Eye doctors are among the few medical practitioners who use zinc and other nutrients to prevent and treat vision-related problems.

• Nervous system disorders. Zinc may be considered a calming neurotransmitter in its own right. Deficiencies, in particular, often result in hyperkinesis, anxiety, irritability, nervousness, emotional instability, mood swings, bipolar disorder, violence and most other mental and emotional symptoms. Other neurological conditions such as epilepsy or seizures, schizophrenia and other severe emotional disturbances often involve zinc deficiencies.

• Immune response disorders. This includes infections and cancers.

**ZINC AND HIGHER THOUGHT.** Zinc is critical for higher level mental functioning. This is its most amazing property. It does this by helping to activate the higher nerve centers of the neocortex or new brain. The neocortex is the crowning achievement of mankind. This is why zinc is such a special mineral. Exactly how zinc interacts with the brain matter is mysterious and not fully understood. However, zinc seems to be able to activate advanced mental activity and more advanced attitudes such as compassion, love and others.

When zinc becomes deficient, all types of criminal and anti-social behaviors increase drastically. As a result, zinc supplements and diets with meats such as lamb have a special importance in development science and are part of every program. Vegetarian nations such as China and India may have less cancer and heart disease than America, Australia, New Zealand
and the nations of Europe. However the vegetarian nations do not show the same degree of mental and/or spiritual development, in part due to lower zinc levels in their diets.

**DETECTING ZINC IMBALANCE.** Urine, blood and feces assessment are not considered reliable ways to check zinc status. Some doctors measure the zinc level in white or red blood cells. However, these cells are in contact with the blood, so they may reflect blood levels more than they reflect tissue levels of zinc. However, even if they reflect tissue levels, they are not a tissue that is an important zinc target organ such as the eyes, prostate or the brain.

**Zinc assessment in development science.** To cope with the problem of measuring zinc, development uses a different approach as follows:

- *Dr. Eck believed that everyone today requires supplementary zinc.* Reasons for this have been mentioned above having to do with the soil, our food supply, modern diets and stress.
- *Instead of worrying about the total body load of zinc, one need only know how much zinc each person needs at a particular time.*
- *He found that the hair zinc level is often not a reliable indicator of how much zinc is needed.*
- *Instead, he found the sodium/potassium ratio is generally the best basis for recommending supplementary zinc.* When the ratio is less than 2.5:1 the amount of zinc given is about 25-50 mg, with a little more given for a lower ratio. Copper must be given along with it because copper is generally biounavailable in this situation.
- *When the sodium/potassium ratio is greater than 2.5:1, more zinc is needed.* The amount varies from 50 mg if the ratio is up to about 6:1, up to about 130 mg daily if the ratio is over 12:1. This should not be continued for more than a few months, however. A retest hair analysis will show if one should continue these high levels of zinc supplementation.

**Care with zinc supplementation.** Too much zinc lowers copper, reduces the sodium/potassium ratio and can even lower the hair zinc level, according to Dr. Eck’s research. It can cause some depression, prostate problems and others. This has to do with the complicated mineral balancing system of the body. Avoid random zinc supplementation for this reason.

**HAIR ANALYSIS AND ZINC ASSESSMENT.** An ideal hair zinc level is about 16-20 mg% or 160-200 parts per million. The level in fast oxidizers is usually lower than in slow oxidizers, perhaps due to the essential antagonism between sodium and zinc in the body.

**Low hair zinc.** On an initial hair test, a zinc level below about 13 mg% indicates either a serious zinc deficiency, or at times, zinc will be low because it is acting as a defender to keep the sodium level or the sodium/potassium ratio higher. On a retest hair analysis, zinc may decrease when toxic metals are removed. The zinc may replace the toxic metal in enzyme binding sites throughout the body, and does not deposit in the hair for a few weeks or months. This is always a temporary decline in the zinc level and not a concern. On a retest, zinc may also decline because it was displaced upward on the first test by the presence of lead, cadmium or other toxic metals. Defenders and displacement are discussed in Chapter 21.

**High hair zinc.** An elevated hair zinc does not indicate an elevated total body zinc. A high zinc often indicates the presence of toxic metals, such as copper. The zinc somehow reduces their negative effects. The copper or other toxin need not show up on the test itself. As the copper or other toxic metal levels decrease, the hair zinc level decreases toward its ideal level.
**Zinc overload.** This is rare, and usually due to taking more than 100 mg of supplemental zinc for several months without taking copper. In these cases, however, the hair zinc level may not be elevated. Zinc overload could occur rarely in occupations such as mining and manufacturing such as galvanizing, in which a zinc/cadmium coating is applied to metals.

**Use of Head & Shoulders shampoo.** The hair zinc level can become very high in people who use Head & Shoulders shampoo regularly. It declines quickly, however, upon changing one’s shampoo or at least reducing the frequency of its use. In these cases, I have never seen clinical signs or symptoms of zinc overload. Most likely, the form of zinc used in the product is not well absorbed and just affects the scalp and hair, not the entire body.

**ZINC SYNERGISTS.** Zinc is involved in so many enzyme systems that most of the other vital minerals are synergists with zinc in one or more enzyme systems. Particular synergists include:

- **Selenium, chromium** and magnesium in many enzyme systems.
- **Insulin** and testosterone.
- **Calcium, magnesium** and zinc function together as ‘the sedative elements’. They calm the sympathetic nervous system.
- In some situations, zinc raises sodium and potassium levels by supporting adrenal glandular activity and perhaps for other reasons.
- Most B-complex vitamins and others. In particular, zinc and pyridoxine or vitamin B6 have a close relationship due to their roles in essential enzymes in the brain and elsewhere.
- In fast oxidizers, zinc causes calcium and copper to rise by reducing the stress response.
- **Copper** is also synergistic with zinc in many enzyme systems as well.

**ZINC ANTAGONISTS.** Copper is sometimes antagonistic with zinc. Zinc may also lower estrogen for this reason. It also lowers aldosterone as part of its anti-inflammatory response. Zinc can lower sodium on a hair tissue mineral analysis, especially if given in high doses. Most toxic metals are able to replace or displace zinc in various enzyme binding sites. One reason for this is that zinc is involved in so many enzymes systems.

Zinc often lowers the hair calcium in slow oxidizers. This occurs because zinc helps to restore adrenal activity in slow oxidizers. It also occurs because zinc lowers copper, which is often directly related to the level of calcium. Too much zinc in slow oxidizers, however, may raise hair calcium by lowering sodium excessively. Zinc competes with most trace minerals for intestinal absorption. This means that the same transporters that adsorb zinc through the intestines are used by the body to adsorb the other trace minerals. Therefore, taking extra zinc may inhibit the adsorption of the others.

**A balancing mineral.** Zinc appears to be able to help raise a low level of calcium, magnesium, sodium and potassium. It also appears to help reduce elevated levels of these same minerals. Few other elements have this special balancing property, sometimes called an adaptogen. This word means the substance helps the body regulate itself in the face of different kinds of stress. Zinc is definitely such a substance.
Carol, age 55, suffered from tinnitus or ringing in the ears. This is known to be associated with a chronic ear infection, perhaps manganese or arsenic toxicity, or arteriosclerosis affecting the ear structures. She also had memory loss and was angry, which is often associated with iron toxicity. Her first hair analysis revealed a four highs pattern and an aluminum of 0.6 mg%. Otherwise, few imbalances were present. High aluminum is an indicator that a person has high levels of the ‘three amigos’ - aluminum, iron and manganese.

Carol started a development program and began to feel better as well. Four months later, a retest mineral analysis revealed a slow oxidation pattern without four highs. In addition, her manganese, iron and aluminum levels were all very high. A rise in these minerals on a retest indicates an elimination in progress. Often, though not always, aluminum, iron and manganese rise and fall in the hair together. This is why they are called the ‘friends’ or ‘amigos’. Their function, apparently, is to support the sodium level and the adrenals, probably by irritating them in some way or irritating the nervous system. On the next hair test, these levels declined once again. As this occurred, Carol felt even better.

This chapter discusses some of the most critical trace elements for our health today. Most people are somewhat deficient in all of them except iron, which is present in excess in most people. Most people also have excessive amounts of biounavailable manganese and often chromium and selenium. This chapter is titled “The Amigos or Friends” because usually iron, manganese and perhaps chromium and selenium appear together in a biounavailable form, particularly in slow oxidizers. The principle of the amigos is if any one is present in excess on a hair analysis, most likely all of them are present in excess in the body, in a biounavailable form.

IRON

Iron may be called the hardness or rigidity mineral. Like the metal itself, iron tends to be associated with hardness and strength, but a rigid and brittle strength. It is a highly acid-forming mineral and one of the most plentiful minerals on earth with many critical roles in the body. Today, acquired iron overload is a major hidden health condition. It accumulates pathologically in most Americans and Europeans, contributing to health problems mainly related to infection and inflammation. These ailments include arthritis, cancer, cardiovascular disease, diabetes, and many others. When it accumulates, it is often in a biounavailable iron oxide form.
**FUNCTIONS OF IRON.** Iron is critical for every cell. Its many functions include:

- **Oxygen transport.** Iron is the central atom in hemoglobin, which carries oxygen in the blood.
- **Muscle function.** Myoglobin, the main muscle protein, requires iron.
- **Energy production.** Iron is required in the cytochrome enzyme system in the electron transport section of the Krebs energy cycle. Copper is also involved in this enzyme system.
- **Purine metabolism.** Iron is required for xanthine oxidase and purine catabolism. This is the breakdown of certain proteins and amino acids in the body.
- **Detoxification and protection from free radicals.** Iron is also needed for the superoxide, peroxidase, glutathione, and catalase enzyme systems. Glutathione peroxidase is a primary enzyme in the liver detoxification pathways. The catalase, superoxide, and peroxidase systems have to do with removing free radicals from the body to prevent oxidant damage.
- **The brain.** Iron is used in animals and probably humans for the sense of direction. Tiny magnetic particles of iron or manganese guide animals and perhaps humans, acting like compasses that respond to the magnetic poles of the earth. This may be a reason for jet lag when traveling through time zones and even when traveling north to south.
- **Sexuality and emotions.** Iron is a lower ‘male’ element and associated with anger and rage.
- **Hormones.** In animals, at least, iron is also involved in the synthesis of the catecholamines such as epinephrine, norepinephrine, and dopamine.

**SOURCES OF IRON.** Meats, poultry, and foods from the sea are the best source of readily absorbable iron. Red meats contain iron in the form of myoglobin, an iron-containing protein that gives the meat the reddish color. Vegetarian sources of iron are less absorbable and include green vegetables, blackstrap molasses, brewer’s yeast, bone meal, soybeans, sunflower and pumpkin seeds.

**Poorly absorbed iron.** Most white, refined, and bleached flour is enriched with a poorly absorbed form of iron. This can be an important source of iron in poor nations, and for those who consume baked goods, soups thickened with flour and other flour products. Most other trace minerals have been removed from this flour, so the added iron makes it quite unbalanced nutritionally. This is a reason to avoid all white flour products.

Iron contamination of wells and ground water occurs often in certain areas. One should filter out the iron if it is high in the water supply. Iron cookware can supply a little poorly-absorbed iron if it is used regularly.

**Occupational exposure.** Those in the building trades and especially metalworking trades such as welders, steelmakers, sheet metal workers, auto repairmen and others may absorb iron dust through the skin and by inhalation. Iron is also used in fertilizer manufacture, wood preservatives, weed killers, pesticides, inks, dyes and other assorted chemical processes.

**Anger and iron buildup.** Interestingly, holding onto anger may cause the body to retain much more iron. Iron settles in the amygdala, a part of the brain associated with rage and anger.

**Adrenal exhaustion,** of itself, may cause the retention of a biounavailable form of iron, perhaps as a way to boost the hair sodium level by stimulating the adrenal glands. This may be an oxide or other toxic form of iron. It might also irritate the pituitary gland or other areas of the brain that can activate the sympathetic nervous system.
LOW IRON SYMPTOMS. Common symptoms include fatigue, weakness, shortness of breath, a pale complexion and a microchromic, microcytic anemia. However, these symptoms may be due to a copper imbalance and copper-related anemia, which is far more common today.

CAUSES FOR IRON DEFICIENCY. Among the most important ones are:

- **Diets low in meat and eggs.** Children, in particular, need more iron because they are growing fast and building muscle and blood. In less-developed nations, meat-deficient diets combined with parasitic diseases that cause subtle internal bleeding can result in severe iron problems in children and adults.
- **Heavy menstrual periods.** Young woman can develop iron deficiency if the periods are heavy and if the women do not eat enough iron-rich meat or eggs.
- **Vegetarian diets.** These are lower in iron, and the iron is less absorbable, in general.
- **Over-the-counter and prescription pain killers.** Tylenol, Aleve, Excedrin, Anacin, aspirin, ibuprofen and many others irritate the stomach and intestines and cause hidden bleeding into the intestines. Often it is not discovered until a person is severely anemic.
- **Blood loss from other causes such as a bleeding ulcer, an accident or other possible causes.**

IRON TOXICITY. **Genetically determined iron toxicity.** The classic iron storage diseases, hemosiderosis and hemochromatosis, are well known in medicine. Hemosiderosis refers to iron deposition in body tissues. Hemochromatosis is a later stage of it associated with tissue injury. Medically, the cause is usually unknown.

**Acquired iron overload.** The body conserves iron very well. This is helpful at times, but is now contributing to iron overload in many people. Symptoms are vague, routine blood tests are often normal, and liver biopsies are somewhat invasive and even dangerous.

Symptoms of iron toxicity. Iron can replace zinc, manganese and perhaps even magnesium in many enzyme systems of the body. Common symptoms and conditions that may occur are:

- **Inflammation.** Biologically available iron is protective against oxidant damage. However, toxic or biounavailable iron is highly pro-inflammatory. One may develop arthritis, cardiovascular disease, other aches and pains, liver disease, eye diseases such as macular degeneration, glaucoma and others, high blood pressure and other common conditions.
- **Diabetes, hypoglycemia and prostate disease.** If iron replaces zinc in the pancreas, it may cause diabetes. If it builds up in the prostate, it can cause symptoms here.
- **Cancers.** Toxic forms of iron, perhaps oxides, can interfere with energy production and detoxification, and lead to cancers.
- **Emotional problems.** Iron accumulates in the amygdala, a part of the brain associated with feelings of rage. Dr. Eck read that in Europe, bar room brawls occurred after customers had consumed large quantities of beer brewed in iron vats. Informal questioning of clients indicates that those with elevated hair iron levels often report feeling angry or enrageld. Arrogance is another symptom associated with excessive iron in the brain.
- **Infections.** Iron feeds certain bacteria and can enhance a tendency for bacterial infections.
- **Other.** Symptoms are often vague and confusing, and can mimic many conditions.
DETECTION OF IRON OVERLOAD. Serum iron, ferritin, and total iron binding capacity or TIBC may not detect iron overload, particularly in its early stages. However, serum ferritin is sometimes helpful, and a level greater than about 60 is suspicious. A liver biopsy is diagnostic, but is rarely recommended due to its cost and danger. *Hair analysis is very helpful, but the hair iron level is not a good indicator.* See below for hair mineral evaluation of iron.

IRON AND HAIR MINERAL ANALYSIS. An ideal iron level on a hair mineral analysis is about 1.8 - 2 mg%. A higher hair level is associated with iron toxicity. A lower level, however, is not significant. This is because iron does not tend to accumulate in the hair. A reliable and newly recognized indicator for iron toxicity is excess aluminum or manganese. **Iron toxicity appears to be indicated on a hair mineral analysis whenever the iron, manganese or aluminum are elevated above their ideal levels of about 2 mg% for iron, 0.04 mg% for manganese and about 0.1 mg% for aluminum.**

This is a recent addition to Dr. Eck’s work. In the last few years, and with the help of the use of near infrared saunas, I noticed that whenever aluminum or manganese are elevated, clients following a well-designed development program eventually begin to eliminate iron from their tissues, causing the hair iron level to rise as it is removed. The level then settles down to normal once the elimination process is over.

**Iron buildup is a homeostatic mechanism to help support adrenal activity.** The body appears to accumulate some biounavailable iron because it irritates the tissues and raises the sodium and perhaps the potassium levels to some degree, supporting weak adrenal glands.

**Most people are iron-toxic.** Using the criteria above of high manganese, iron or aluminum, *most people have some iron toxicity today.* This should not be too surprising, given the common use of iron-enriched flour in thousands of food items, the iron found in meat, eggs, and some vegetables, along with the difficulty in removing iron from the body.

**Acquired iron overload with iron deficiency.** In most cases, a diet containing meat, eggs, and green vegetables supplies plenty of available iron. Very rarely, a person has both an acquired iron overload, and yet requires iron supplementation. These are usually vegetarians, those who abuse anti-inflammatory drugs, and a few women with very heavy menstrual periods.

IRON REMOVAL. Removing excess iron is not easy. Medical methods are blood-letting or the use of iron chelating drugs such as deferoxamine. Neither method works too well for the following reasons:

- They both remove other vital nutrients along with iron.
- They both remove bioavailable iron along with biounavailable or the toxic form of iron.
- They may not remove enough of the toxic or oxide form of iron.
- They can both unbalance the body chemistry, at times severely.
- Neither method addresses the causes of iron overload, so the problem tends to recur and requires repeated treatments for life.
- Deferoxamine or Depen is toxic and can damage the kidneys. As a result, it is rarely used.

In contrast, a properly designed development programs can lower elevated tissue iron easily and safely, in my experience. This is quite amazing for experienced doctors to see. The body removes it naturally as the chemistry becomes more balanced. It is revealed, often without any warning, on a retest hair analysis as an elevated iron level when the iron is released from
storage sites. Symptomatic improvement generally occurs at the same time, with a reduction of inflammatory symptoms such as aches and pains, or improvement in one’s diabetes and cancer. NOTE: Near infrared saunas and coffee enemas may be needed to accomplish iron removal.

IRON SYNERGISTS. Many elements act as synergists in various enzyme systems. Copper assists in energy production and heme synthesis. Molybdenum assists in xanthine oxidase, selenium in glutathione peroxidase and cobalt in vitamin B12 and heme synthesis. Vitamin C increases iron absorption. This is one reason I don’t recommend prolonged use of high-dose vitamin C. B-complex vitamins assist in energy production.

IRON ANTAGONISTS. Many elements compete with iron for absorption, including cobalt, zinc, cadmium, copper, nickel and manganese. Lead directly interferes with hemoglobin synthesis, as can an imbalance of copper. Other toxic metals can compete with iron as well, in some cases.

MANGANESE

Manganese is another amazing mineral. Dr. Eck called manganese the maternal element because a deficiency of it in some animals causes reduced maternal behavior. However, I have not heard this reported in human beings, where manganese imbalance is quite common. The functions of manganese include:

- Energy production. Each cell requires manganese in the mitochondria to produce energy.
- Musculo-skeletal system. The health of the skeleton and soft tissues such as the skin, hair, ligaments, tendons and muscles requires manganese.
- Mucopolysaccharide production. These are jelly-like compounds that buffer many substances that flow between the cells. They also keep fluid in the spaces between the cells.
- Cell membranes. Manganese is required in animals for the cell membranes of the heart, pancreas, liver and kidneys.
- Detoxification. Manganese is part of the superoxide dismutase enzyme system in each cell that helps rid the body of harmful free radicals to stop oxidant damage.
- Sensory organs. It plays a role in vision and hearing.
- Liver function. It has to do with cholesterol metabolism and blood clotting.
- Carbohydrate tolerance. Manganese is deficient in those with hypoglycemia and diabetes.
- Neurotransmitter synthesis.
- Endocrine system. Manganese is important for thyroid hormone production (T4).

SOURCES OF MANGANESE. Manganese occurs in several valences, and +2 and +3 are the most common. The biologically active form is +3. It is poorly absorbed in the +2 form and toxic in the +6 form. Bioavailable manganese is found in many foods. Among the highest are tea, kelp, nuts, grains, bran, wheat germ, corn and parsley. Many other foods have some as well, though the overall levels are low, as they are today with all the vital trace minerals. This commonly causes a deficiency of manganese in most people today.

Environmental sources are less bioavailable and usually toxic. Drinking water contaminated with manganese is common in some areas of America due to industrial pollution or water flowing over certain rock formations. Manganese excess does not have to be reported by
municipalities, according to United States EPA rules. As a result, most people who are drinking
it are not aware of the contamination. It is revealed often on hair mineral tests, however.

**Gasoline and manganese.** Since the early 1970s, manganese compounds have replaced
lead as a gasoline octane booster. Manganese is an improvement over lead, but both are harmful.
Occupational exposure includes those in the welding and metalworking industries, manganese
miners and a few other industries. Manganese is used industrially in paint pigments, varnishes,
fertilizers, battery manufacture and in the production of all steel.

**SYMPTOMS OF MANGANESE DEFICIENCY AND TOXICITY.** Deficiency
symptoms are usually vague and may include fatigue, depression, hypothyroidism, glucose
intolerance, tendon and ligament disorders, and other poorly defined symptoms. Deficiency is
widespread in America and Europe due to refined food diets and impaired digestion and
absorption of minerals. This may contribute to widespread fatigue, obesity and diabetes.

**Toxicity symptoms.** Most people have too much biounavailable manganese in their
bodies. It is one of the 'three amigos', meaning it is found in a biounavailable form along with
iron and often aluminum. All of them appear to help bolster the sodium level and increase
adrenal activity, probably by irritating the adrenals or the nervous system.

The symptoms of mild manganese overload include irritability, anxiety, and some degree
of emotional detachment. Often there can be a somewhat skeptical attitude and not enough joy
in one's life. This attitude is very prevalent in modern societies, as is manganese toxicity, in our
experience. It is seen the clearest in many people raised on the East coast of the United States. It
gives them a certain hesitancy and distance from others. This is helpful to a degree, but
ultimately not so. Those with less manganese tend to be more relaxed and less 'uptight'.

**Severe toxicity.** Welders, machinists and others in the metalworking trades can absorb a
lot of manganese through inhalation or contact. It can cause severe symptoms including
diabetes, cancer and even criminality and psychopathic or sociopathic behavior. Manganese was
very high in the hair of a number of psychopathic murderers. Manganese miners can develop a
condition called manganese madness. It shares certain features with Parkinson's disease such as
an impaired gait, tremors and often a fixed or silly facial expression. It may also be related to
mad cow disease, or bovine spongiform encephalitis or BSE. Most cases of BSE were traced to a
pesticide sprayed on the spines of cows in England that impaired manganese utilization.

**MANGANESE AND HAIR ANALYSIS.** The ideal manganese level on a hair analysis
when the sample is not washed at the laboratory is about 0.04 mg% or 0.4 parts per million.
However, hair manganese readings are often deceptive because most people need more
bioavailable manganese, and most people have too much biounavailable manganese, regardless
of the manganese reading. This always appears to be the case in very slow oxidizers and in slow
oxidizers with a low sodium/potassium ratio.

**Assessing manganese.** A low hair manganese level means very little, in my experience.
A high hair manganese is indicative of severe manganese overload in some cases. In others, it is
due to bathing in high-manganese water. On retests, a higher manganese level may indicate an
elimination of some biounavailable manganese via the hair and skin. To assess the degree of
bioavailable manganese overload, I have found it is best to look to the levels of aluminum and
iron. This was discovered since Dr. Eck's passing. An aluminum level greater than about 0.1 or
iron greater than about 2 mg% are the indicators for biounavailable manganese overload. The
higher either of these are, the more excess manganese is often present.
Supplementing manganese when the hair level is high. I have also found that when manganese is elevated in the hair, supplementing the person with bioavailable manganese will not raise the hair level further, and usually will help it to decrease to normal.

MANGANESE SYNERGISTS. Zinc and chromium are involved with manganese in glucose metabolism in the body. Iron is involved with manganese in superoxide dismutase and other superoxide enzymes. Many other nutrients are synergistic with manganese such as copper in connective tissue, B-complex vitamins in energy production and others.

MANGANESE ANTAGONISTS. Iron, zinc, copper, calcium, magnesium, cobalt, vanadium and perhaps other trace elements all compete with manganese for absorption. This is why high-dose manganese therapy is dangerous if continued for more than a few weeks, at the most. Development never recommends high-dose manganese supplementation, but others use it occasionally for muscle and ligament problems.

CHROMIUM

Chromium may be called the blood sugar mineral. Its functions include:

- **Glucose regulation.** Chromium may assist insulin to move sugar through the cell membranes.
- **Protein synthesis.** Chromium may also be involved in RNA and DNA replication.
- **Cholesterol synthesis.** Chromium supplements often lower an elevated cholesterol.

SOURCES OF CHROMIUM. Excellent food sources include egg yolks, peanuts, grapes, organic dairy products, wheat, wheat germ, brewer's yeast, molasses, kelp, seafood, liver and black pepper. I do not recommend any wheat, seafood, liver or peanuts. These are less healthful products for various reasons.

Many metalworkers are exposed to toxic forms of chromium such as chromates, dichromates and hexavalent chromium used in steel-making, welding and electroplating or making "chrome" car bumpers. Some powerful detergents contain chromium compounds, as do gasoline fumes, paints, dyes and a few other products. Some chromium is highly toxic. Trivalent chromium is essential for our health and is sold as a chelate, hexaniacinate and picolinate. A form called GTF chromium derived from brewer's yeast is probably the best absorbed supplemental form.

CHROMIUM DEFICIENCY IS UNIVERSAL. Chromium levels in most foods are low. The amounts in refined foods, such as white flour, are extremely low. Widespread chromium deficiency may be one reason for the epidemic of diabetes, obesity, high cholesterol and hypoglycemia today. Most people must supplement chromium, just as they must supplement zinc, selenium and magnesium because all are low in most diets today. Chromium levels decline with age. This may be due to a low intake from the diet and perhaps a reduced ability to absorb chromium with aging. Taking a digestive enzyme can help prevent the reduction in chromium and other trace elements that comes with age.

Babies low in chromium today. Most babies are born with lower levels of chromium than in the past due to deficiencies in their mothers. This can cause young children to crave sweets, for example, or develop diabetes at an early age, even though they are fed well.
HAIR ANALYSIS AND CHROMIUM. Hair appears to be fairly reliable to assess overall chromium levels. An ideal hair chromium level is probably about 0.12-0.14 mg% or higher.

Chromium assessment. A low hair chromium is very common and probably reflects a chromium deficiency. A high hair level on an initial hair test is rare and may be due to an occupational exposure, bathing water contamination or rarely to the use of old or poor quality chrome-plated scissors that cause a little chromium to flake off and mix with the hair sample. On retests, a high chromium level is often a release of stored biounavailable and toxic chromium. Many times, aluminum, iron, manganese or selenium will also elevate at this time. These minerals are called the amigos or friends, because they often shift together on hair mineral analyses. When the elimination is over, the hair chromium level will return to normal or, more often, becomes low on later hair analyses.

CHROMIUM SYNERGISTS. Magnesium, zinc, manganese and possibly vanadium are synergetic in the enzymatic reactions involved in glucose metabolism. Adequate stomach acid and digestive enzymes are helpful for chromium absorption from food or supplements. All the B-complex vitamins assist chromium in glucose metabolism to some degree. Among hormones, insulin is perhaps the most critical synergist. Many other nutrients are needed along with chromium in energy production and cholesterol metabolism.

CHROMIUM ANTAGONISTS. Zinc, manganese, vanadium, iron and other trace minerals compete with chromium for absorption. This is one of the problems with white bread, for example, that is loaded with too much iron and has had its chromium stripped away. Sugars, fruit, fruit juices and starches in the diet, stress and resultant cortisol and insulin secretion can further deplete chromium.

SELENIUM

Selenium is highly alkaline-forming and an amazing mineral. It is important today for many reasons, including its important mental and spiritual effects upon human beings. It may be called the spiritual mineral because it helps develop centers in the brain that lead to mental development. Its functions include:

- Detoxification. Selenium complexes with toxic metals and assists their removal, especially mercury, cadmium, arsenic and perhaps nickel. It is also required for the cytochrome P450 detoxification system in the liver.
- Respiration. It is involved in red blood cell oxygen transport.
- The digestive system. It is needed for pancreatic homeostasis.
- The reproductive system. Selenium may prevent birth defects due to cadmium and zinc deficiencies. It is also helpful for sperm motility, maturation, fertility and viability.
- Thyroid activity. Selenium is required for the formation of tetraiodothyronine or T4 in the thyroid gland. It is also required for the conversion of T4 to T3 in the tissues. T3 or triiodothyronine is the much more active form of the hormone.
- The skeletal system. Selenium may help maintain the bones and teeth free of decay.
- Glutathione synthesis. Glutathione is required for liver detoxification. Selenium is required for its production in the enzyme glutathione peroxidase, along with iron.
• **An antioxidant.** Selenium is involved in removing singlet oxygen atoms called free radicals that damage body tissues.

• **Cardiovascular health and energy production.** Selenium is required to produce coenzyme Q-10. Low tissue selenium may be why older people, in particular, are often low in this important compound that is important for many tissues, and often boosts the energy level.

• **Connective tissue.** It helps maintain the hair, skin, keratin and other connective tissues.

• **The immune response.** It is considered preventive for cancer and maybe for other disorders.

• **Metabolic.** It is involved in lipid and sulfydryl metabolism. It is also an alkalinizing mineral because it is required for lactic acid dehydrogenase, the enzyme that removes lactic acid.

• **Prostaglandin synthesis.** Selenium is required for the conversion of prostaglandin G to prostaglandin E and F. The prostglandins are anti-inflammatory substances that may play important roles in reducing inflammation throughout the body.

• **Protein synthesis.** Like zinc and chromium, selenium is involved in human transfer RNA as the compound Se-uridine. Thus, it plays a role in the synthesis of all proteins in the body.

• **Mental health.** Selenium, along with silicon, give a silky, smooth quality to the personality. Foods high in selenium, such as corn silk, also have a silky quality. Those who are deficient in selenium and silicon tend to be irritable, crabby, and often unpleasant to be around.

**MENTAL DEVELOPMENT AND SELENIUM.** As human beings develop spiritually and mentally, selenium and silicon replace iron in certain brain areas. These ‘lighter’ minerals appear to assist higher reasoning and more refined emotional expression. Selenium is associated with what may be called the ‘higher’ emotions such as compassion, peacefulness and joy.

**SOURCES OF SELENIUM.** Bioavailable selenium is found in few foods today. Corn has an absorbable form, especially blue corn chips and blue corn tortillas made in the traditional way. These are highly recommended, since everyone needs selenium. Be sure to ingest a source of omega-3 fatty acids if one eats a lot of corn chips because the vegetable oil in the chips is too high in omega-6 fatty acids. Other sources include yellow organic corn chips and tortillas, garlic, goat and cow milk and a few other foods such as Brazil nuts. However, nuts are very yin in Chinese terminology so they are not recommended as a staple food, as is blue corn, for example. Astralagus is an accumulator of selenium. This excellent herb is often used for infections and other immune symptoms. Depending on the soil levels of selenium, astralagus can accumulate up to 15 mg/gram of selenium.

**Supplements.** The best way to ingest selenium is through foods. However, due to low levels in foods, supplements are needed. The best appear to be food-based ones. The next best are probably yeast-based selenium or selenomethionine.

**SELENIUM DEFICIENCY SYMPTOMS.** Common symptoms include cancers, depression, irritability, anger, sluggish liver detoxification and hypothyroidism. Symptoms are often vague because they may involve sluggish detoxification of all the toxic metals and impaired glandular activity. Interestingly, low selenium also seems to impair brain development in the human being. Societies that eat more selenium in products such as wheat and corn, such as Americans and Europeans, often have better developed nervous systems. Most Mexicans, unfortunately, eat mainly the inferior white corn.

**TOXICITY OF SELENIUM.** Selenium can be toxic if consumed in large quantities in a toxic form. This is very rare in humans, however, unless one is exposed to selenium salts due to
industrial pollution, or in one's occupation or drinking water supply.

Selsun Blue shampoo has a lot of selenium in it. This will cause elevated hair selenium levels. It can cause minor selenium toxicity. If the hair selenium is elevated, ask the client about shampoo. If Selsun Blue is used, have the client reduce it to once a week or less, and the elevated hair reading usually goes away promptly, indicating that toxicity was probably not severe.

**HAIR ANALYSIS AND SELENIUM.** Selenium accumulates in the hair tissue and can be assessed with hair analysis. The ideal level is about 0.1 mg% or 1 part per million. Low hair selenium is very common because selenium is deficient in most people. Selenium is also used up rapidly in the process of detoxification. In addition, on development program, selenium and other trace minerals are sometimes retained elsewhere in the body if they replace or complex with toxic metals, or are being used in some other way. This can cause the hair level to decline, even when it is being supplemented. When this occurs, the level usually rises again on the next hair mineral analysis.

**High hair selenium.** This is often due to the use of Selsun Blue shampoo, as described above. On retests, it may also be due to an elimination of toxic and biounavailable selenium during a development program.

**SELENIUM ONE OF THE ‘AMIGOS.** Selenium and chromium are lesser members of the 'friends' or 'amigos'. These are elements that form toxic compounds, probably oxides, that may stimulate adrenal gland activity by irritating the glands or by some other toxic mechanism. Apparently, the toxic form of selenium cannot be easily converted to a bioavailable form, so the body will eliminate it through the hair during the healing process as part of a development program. If this occurs, the selenium level on a retest hair analysis will rise above the ideal in most cases. On the next test, the level will usually decrease again into the normal range, indicating that the elimination process through the hair and skin is over.

**SELENIUM SYNERGISTS.** Vitamins C, E and others work with selenium as critical parts of the anti-oxidant system of the body. Iron is needed with selenium for the synthesis of glutathione peroxidase. Iodine, manganese, copper and perhaps other elements are needed with selenium for thyroid hormone synthesis. Manganese, zinc and other trace elements are required along with selenium for proper functioning of the liver detoxification systems and for mental and emotional balance in the nervous system.

**SELENIUM ANTAGONISTS.** All of the toxic metals such as mercury, cadmium, gold, silver, titanium, arsenic, aluminum and others are antagonistic to selenium for absorption and in their metabolic roles in the body. Interestingly, sulfates increase the excretion of selenium. This may be because sulfates assist with detoxification and may work with selenium in some way to help remove toxic metals.
Victor, age 49, had many symptoms related to obesity. His weight was as high as 350 pounds and he suffered from Barrett’s esophagus, a severe form of gastric reflux disease or GERD. He also had a diagnosis of secondary hyperparathyroidism, kidney stones, esophageal ulcers, chronic stiff neck, stress, irritability before meals and an inability to skip meals. He was also anxious and did not enjoy his job.

Victor’s first hair analysis was somewhat unusual, with a four lows pattern and a low sodium/potassium ratio. It also revealed high levels of lead, mercury, arsenic and aluminum. Victor read and studied about development on the internet and became thoroughly committed to the program. He especially followed the diet without wheat and sugar, and with plenty of steamed vegetables. Within eight months, his weight decreased by 150 pounds. The next time he visited his doctor, the Barrett’s esophagus was completely healed, much to the doctor’s surprise. The hyperparathyroidism also improved, as did most other symptoms. Weight loss is simple and safe for almost everyone on a properly designed development program. If one follows the diet and the targeted supplement program faithfully, most who are significantly overweight can safely lose 100 pounds or more, often within a year or even less.

IODINE

Iodine is a slightly acid-forming mineral that may be referred to as the thyroid mineral. However, every cell of the body utilizes iodine in some form. The main problem involving iodine today is not a simple deficiency, but environmental contamination with iodine antagonists. This is explained below.

SOURCES OF IODINE. All fish, seafood and sea vegetables contain plenty of bioavailable iodine compounds. Other sources are quality eggs, onions and garlic. A less than ideal form of iodine is added to all table salt in most Westernized nations. Other sources of iodine include natural thyroid glandular products, thyroid extracts such as Westhroid and Naturthroid, and mineral supplements containing iodine. Sea salt sold in health food stores is an unrefined salt that may or may not contain added iodine. Most do not need added iodine, as they contain a little iodine naturally.

Environmental sources include some iodine-containing soaps and antiseptics, although most have unfortunately been removed from the market. Radioactive iodine is produced by all nuclear power plants and A-bomb tests, and it is used medically to destroy overactive thyroid glands. This is a barbaric treatment for hyperthyroidism that is never required, in our experience.
THE PROBLEM OF THE IODINE ANTAGONISTS. Fluorides, bromides and chlorine compounds in the food, air and water compete with iodine for absorption and utilization in many enzymes. This is the major reason for iodine deficiency today, even in those who eat iodine-rich foods and use iodized salt. The antagonists are creating severe iodine deficiencies in most Americans and in some Europeans. Let us examine this situation.

- **Fluorides.** These are the worst iodine antagonists. The main source today is fluoridated water supplies. Artificial fluoridation with toxic fluoride compounds for over 50 years has contaminated all the groundwater in America. This means it is in the irrigation water used to grow food. Also, foods prepared with water, which include breads and thousands of other prepared foods, often also have high levels of fluoride in them.

  Ignorant public health and water authorities keep adding more fluoride to the water supplies, even though people now get too much of it. Adding it to toothpaste, mouthwash and dental fluoride treatments are even more toxic and insane. More information about the many serious problems associated with adding toxic fluorides to drinking water and to products such as toothpaste and mouth washes is available at [www.drlwilson.com](http://www.drlwilson.com).

- **Bromine and bromides.** Bromine is another highly toxic element used, by law, to help bread rise. Previously, iodine was used in bread-making. Foolish health authorities believed that people might get too much iodine so they now force bakers to use bromine instead. This is another reason to avoid most baked goods if one values one’s health.

  Often, when iodine is supplemented, one eliminates bromine from the body. This can be measured in the urine or perhaps in the hair. This occurs because iodine replaces the bromine in enzyme binding sites. Health often improves as this occurs.

- **Chlorine and chlorinated compounds such as chloramines.** Another insane practice is the addition of highly toxic chlorine to most water supplies. A much safer alternative is hydrogen peroxide or ozone sanitization of water, which is used in some locations. Chlorine is also used to whiten various food products, at times, such as flour and perhaps some sugars. It is also used widely in industry as a bleaching agent and an anti-bacterial and anti-viral agent used to sterilize or sanitize many products. Thus most people are exposed to large amounts of toxic chlorine compounds every day.

SYMPTOMS OF IODINE DEFICIENCY. These include:

- **Fatigue, frustration, depression, hypothyroidism and hypoglycemia.**
- **Cold hands and feet, slow oxidation and often sympathetic dominance pattern on a hair analysis.**
- **Weight gain and disorders of calcium metabolism due to their thyroid imbalances.**
- **If iodine deficiency occurs during gestation or in early life, it causes cretinism.** Symptoms include a short stature, mental retardation and a general delayed development syndrome. While the full-blown condition is rare, mild forms of it are common, due mainly to iodine antagonists in the environment.
- **Possibly goiter or a swollen thyroid gland.** This is quite common, but hard to diagnose in many people unless one carefully palpates the thyroid gland. It usually clears up easily with iodine supplementation.
- **Irritability, anxiety and infertility in women and perhaps in men.**
• Electrical imbalance in the cells, brittle or falling hair, difficulties with the skin and nails, and at times pneumonias and other respiratory problems.
• Other. Dr. David Brownstein, in his book entitled *Iodine, Why You Need It, Why You Can’t Live Without It* (2008) mentions many other symptoms that have responded to iodine treatment. These include ADD, atherosclerosis, autoimmune problems, breast cancers, Dupuytren’s contracture, excess mucus production, fatigue, fibrocystic breasts, hemorrhoids, headaches, hypertension, infections, infertility, keloid scars, liver diseases, ovarian diseases, parotid duct stones, Peyronie’s disease, prostate disorders, sebaceous cysts, thyroid disorders and vaginal infections. Lower iodine levels are also associated with a generally higher mortality rate.

IODINE TOXICITY. Too much iodine can inhibit thyroid gland activity. However, an overdose from food sources is rare. Japanese people who eat a lot of fish and seaweed often consume high amounts of iodine with no apparent ill effects at all. The most common type of overdose is from radioactive iodine. Causes include nuclear fallout in the air from power plants or A-bombs tests, or from medical uses of RAI. Symptoms include all of those associated with destruction of the thyroid gland, as well as thyroid cancers.

DETECTING IODINE IMBALANCES. As with all the trace minerals, accurate detection of deficiencies is not that easy. Dr. Brownstein recommends an iodine loading test in which the person is given a dose of Iodoral and then urine is collected for 24 hours. The degree of deficiency is measured by how much is absorbed from the loading dose. A more crude test involves painting an iodine solution on the skin and observing how quickly it is absorbed. This test is not considered nearly as accurate.

Most people in America, Europe and inland Africa and Asia need more iodine, especially slow oxidizers. Using kelp, as explained below, there is little danger of taking too much. Therefore, I do not feel the need to test for iodine.

Iodine and hair mineral analysis. Iodine is often not read on hair tests. The reason, I am told, is difficulty in measuring it accurately.

IODINE SYNERGISTS. Selenium is probably the most important synergist. The conversion of iodide into iodine in the thyroid gland involves an oxidation reaction that requires an enzyme called TPO or thyroperoxidase. It also requires hydrogen peroxide. If too much hydrogen peroxide is left in the thyroid, however, it leads to Hashimoto’s disease, a common thyroid problem. Selenium helps control the level of hydrogen peroxide. It is needed to make glutathione peroxidase, whose function, among many others, is to detoxify hydrogen peroxide after it has done its job in the thyroid gland.

Selenium is also required for iodothyronine deiodinase, the enzyme needed to convert the relatively inactive T4 to the much more active form of thyroid hormone - T3. Any deficiency of selenium in the body will impair T3 production and thus cause hypothyroidism symptoms, even if the body is producing plenty of T4. Manganese, magnesium, copper and perhaps other nutrients, assist iodine in connection with thyroid activity. Many other nutrients work with iodine in other enzymes.

SUPPLEMENTING WITH IODINE. In America and Europe, iodine deficiency may be causing an epidemic of obesity, cancer, thyroid problems and others. Solutions are to:
• *Eat some fish or sea vegetables.* However, limit fish intake to only twice weekly, due to mercury contamination, and eat only small fish as these contain less mercury, in general. The best may be sardines or salmon, even in cans, as these contain the most omega-3 fatty acids, which most people need. Kelp is also an excellent iodine source.

• *Avoid iodine antagonists.* This means eating few baked goods and drinking only distilled or spring water. Carbon filters take out some chlorine, but only as long as they are quite clean. They will not remove most fluorides and bromides. Only distilling water or the use of reverse osmosis will remove most fluorides and bromides. Never drink reverse osmosis water, however, because it does not appear to hydrate the body well enough. It will also leach vital minerals from the body. Limit the drinking of distilled water to a few months at the beginning of a development program because it, too, will begin to remove too many vital minerals from the body if it is used for extended periods of time.

• *Take an iodine supplement such as kelp.* Kelp is an excellent supplement because it:
  • Contains many trace elements that our bodies need, in addition to iodine. It thus acts as a very high-quality general mineral supplement.
  • Contains alginates. All products from the sea contain some toxic metals, as does kelp. However, kelp, among all the sea vegetables and other sea products, contains the most substances that bind and remove the toxic metals in the kelp.
  • Very inexpensive and available without a prescription.
  • A natural food. This means it is safer, easily absorbed and easy for the body to regulate how much it will absorb. In contrast, single-mineral products such as Iodoral or Lugol’s solution, if used for more than a month or so, can tend to unbalance the body’s mineral system by antagonizing or competing with the absorption or utilization of other elements.

Some doctors say that one must give iodine in both the iodide form and elemental iodine forms. However, I am not convinced of this, since food sources may not contain both forms and have nourished humanity for millions of years.

**LITHIUM**

Lithium is a very alkaline-forming mineral. It may be called the *relaxing* mineral because it helps some cases of bipolar disorder, both the manic and the depressive phases. The main function of lithium seems to be to protect the brain from oxidant and perhaps other kinds of damage. It appears to be a powerful anti-oxidant substance, especially within the brain.

It is thus an anti-aging nutrient for human brains that may slow the progression of diseases such as Alzheimer's disease, other dementias and Parkinson's disease. Lithium may also help generate new brain cells by enhancing DNA replication in the brain. This may be of help with mental development, in particular. Lithium also increases the production of a major brain protective protein called bcl-2 in both human and animal brain cells.

Lithium also appears able to protect against the effects of ischemic strokes. In one study, researchers blocked a brain artery in rats. Some of the animals were pre-treated with lithium for 16 days, while the other were not so treated. The researchers reported that the lithium-treated rats experienced 56 percent less cell death and many fewer neurologic deficits than the controls.

In fact, low-dose lithium is so neuroprotective that some researchers suggest it should be used along with any drug being used for depression, anxiety, or any other mood-altering reason to protect brain cells against any toxic effects of the drugs. Some speculate that lithium may
have other roles as well. Research indicates it may control symptoms of gout and relieve rashes caused by seborrheic dermatitis or dandruff. It may even help prevent diabetes and anorexia.

**SOURCES OF LITHIUM.** Small amounts of lithium are present in most foods. Modern refined food diets, however, may be quite low in lithium, along with most of the essential trace elements. Safe, low-dose lithium supplements such as lithium orotate are inexpensive and appear to be well-utilized.

**DEFICIENCY AND TOXICITY SYMPTOMS.** A lithium deficiency may contribute to some cases of depression, manic-depressive disorder and perhaps to some cases of aggressiveness. Lithium deficiency may also be a factor in some cases of Alzheimer’s disease and other dementias.

Lithium toxicity is almost always related to high-dose lithium given for bipolar disorder. Symptoms include nausea, vomiting, tremors, confusion, liver problems, delirium, seizures, coma and even death. Patients on high-dose lithium must be tested regularly for elevated liver enzymes, indicating liver irritation or damage. However, toxic symptoms can appear long before liver enzyme levels elevate.

**HAIR ANALYSIS AND LITHIUM.** An ideal hair level of lithium is about 0.001 mg%. Hair lithium levels may not be that helpful or reliable indicators for supplementation. Those on high-dose medical lithium therapy always eventually show an elevated hair lithium. Lithium appears to both raise or lower the sodium level in the mineral balancing system, and perhaps it balances it. Dr. John S. Carman noted that lithium therapy may help regulate serum calcium and magnesium levels. If this is the case, it could be because it regulates the oxidation rate. Lithium is not used regularly in development for several reasons:

- *It does not appear to be needed as much as many other trace elements such as zinc, chromium, selenium, magnesium and others.*
- *It is found in most natural foods to some degree.* If one eats well and takes a digestive aid, supplementation is usually not needed.
- *Continued usage could be toxic, although it is probably safe if the supplement dose is small.*
- *Lithium appears to be less critical at this stage of human evolution, though it is very helpful for particular conditions and symptoms.*

**LITHIUM SYNERGISTS.** Lithium synergists in the brain, particularly in the hypothalamus, are too numerous to list. They include *all the vitamins, particularly B-complex vitamins, vitamin C, E* and others. Synergists also include most of the other trace elements such as *zinc, chromium, manganese, selenium* and *iodine.* Lithium is also synergistic with most *hormones* and *neurotransmitters.*

**LITHIUM ANTAGONISTS.** Antagonists include all *toxic metals, all drugs that affect the brain,* and other substances that oppose lithium utilization in the brain and elsewhere.

**BORON**

Boron is a very alkaline-forming mineral. It may be called the *plant* mineral because it is
very important for the vegetable kingdom. It appears to be less important for most human beings. The functions of boron in human beings are not well understood. However, it appears to affect the adrenal glands, the stomach and perhaps the skeletal system. Boron is helpful for hot flashes in some women, perhaps because of its effect on the adrenal glands or on the hormonal balance of estrogen and progesterone in some way. Boron, along with lithium, may be an anti-aging mineral.

**SOURCES OF BORON.** Food sources include meats, most vegetables, nuts, legumes, fruits, wine, cider, beer and bone extracts. Boron is widely used in industry as a cleansing agent, a water softener and an antiseptic. It is also widely used in fertilizers and for some drugs. It was formerly used as a food preservative, but is somewhat toxic. It is also found in enamel, glass, shellac, plastics and is used to shield control rods in nuclear power plants. For these reasons, boron contamination may occur in some water supplies.

**DEFICIENCY SYMPTOMS.** Deficiency symptoms may include hot flashes, vaginal dryness, low blood sugar and osteoporosis. In plants, boron is a very essential nutrient. Less is known about the need for it in human beings.

**TOXICITY SYMPTOMS.** Toxicity only occurs due to ingestion of borate, boric acid and other toxic forms of boron. Symptoms include fears, irritability, noise sensitivity and back, leg and chest pain. Others include nausea, vomiting, headache, diarrhea, hypothermia, restlessness, skin loss, kidney damage and if very severe, death. Chronic overload can cause a poor appetite, nausea, weight loss, decreased sexual activity in men, low seminal volume and low sperm count.

**HAIR ANALYSIS AND BORON.** Hair analysis is helpful to assess boron levels. An ideal hair level is probably about 0.5 mg%. Boron, however, is not used in development science at this time, except for symptoms of hot flashes, and then only when the use of Thyro-complex from Endomet Labs is not effective.

**BORON SYNERGISTS AND ANTAGONISTS.** Boron synergists include calcium, magnesium, strontium, cobalt, inositol, choline, vitamins A, D, E and B12. Antagonists may include nitrogen and phosphorus.

**MOLYBDENUM**

Molybdenum is an alkaline-forming mineral that is a copper antagonist. It may help eliminate copper through the kidneys, though I am not sure of the route of excretion. Although it is a powerful copper antagonist, Dr. Eck used it very sparingly because it is somewhat toxic. We consider it one of the “amigos”. Also, it does not correct the cause of copper imbalance, but just helps lower copper. For this reason, it can easily cause a low copper level if used for too long or in a careless manner. For both these reasons, it is not used in development science.

**FUNCTIONS OF MOLYBDENUM.** Molybdenum is found in all human cells. Its many functions are still a topic of research. Most likely they include:
• An electron transfer agent. This means it is involved in energy production in the Krebs energy cycle in the cells.
• A cofactor in at least five redox reactions.
• A ligand binding agent.
• The oxidation of aldehydes.
• Sulfate metabolism, specifically the oxidation of sulfites.
• Fat metabolism and purine metabolism (needed for xanthine oxidase).
• Detoxification reactions involving SO₄.
• Iron and copper metabolism (a powerful copper and perhaps iron chelator).

In some animals, molybdenum is also required for thyroid activity, but this has not been proven in humans, to my knowledge. Also in animals, molybdenum is required for reproduction. I do not believe this has been proven in human beings.

SOURCES OF MOLYBDENUM. Excellent sources are lamb, sunflower seeds, lima beans, lentils, peas, buckwheat, oats and barley. Others that are not recommended foods include wheat germ, sorghum, pork (a dangerous food due to parasitic infections), soybeans and beef liver. Some molybdenum is found in many natural foods.

Environmental sources. Molybdenum is used in steel alloys, lubricants and red pigments. Human toxicity from these sources, however, is rare.

DEFICIENCY AND TOXICITY SYMPTOMS. Deficiency may be associated with copper toxicity and dental decay. Otherwise, clear deficiency symptoms are not known.

Molybdenum toxicity is called molybdenosis. Acute poisoning causes severe diarrhea and, in animals, it can cause coma and death. Chronic toxicity causes copper deficiency symptoms in animals including anemia, alopecia, loss of hair color, growth retardation, bone and joint abnormalities, weight loss, anorexia, osteoporosis, diarrhea, testicular degeneration, dermatitis and gout. Interestingly, copper supplements often reduce gout.

MOLYBDENUM AND HAIR ANALYSIS. An ideal hair molybdenum level is probably 0.005 mg% or 0.05 parts per million. This is quite approximate, however. The significance of the hair level of molybdenum is not clear and more research is needed about this unusual mineral.

MOLYBDENUM SYNERGISTS AND ANTAGONISTS. The main synergists are iron, sulfur and phosphate (PO₄) in the xanthine oxidase enzyme system. Other synergists are zinc, manganese, vitamins B-complex and C, and sulfur-containing amino acids in balancing copper in the body. Other synergists are all the nutrients needed for adequate thyroid function such as iodine, selenium, manganese and others.

MOLYBDENUM ANTAGONISTS. A major antagonist is copper. Zinc is both a synergist and antagonist in certain cases. Other trace elements may compete with molybdenum for absorption. Any toxin that interferes with thyroid activity such as fluoride or chlorine may be considered a molybdenum antagonist. Any condition that weakens the thyroid gland, and more so adrenal glands, also tends to oppose molybdenum. The reasoning here is that thyroid and moreso adrenal weakness are the most important causes for an elevated copper level in the
body. Sulfates (SO₄) and phosphates (PO₄) may be other molybdenum antagonists in some situations, though they can be synergists as well.

OTHER TRACE MINERALS

Other trace elements include barium, cobalt, germanium, zirconium, rubidium, strontium, vanadium, tin and others. They are not included in this book for several reasons:

• They are not as important physiologically.
• They are not used in development science.
• Less research exists about them. Perhaps in the future more will be discovered about their use for healing.
• Most are a little toxic and none are recommended for clinical use at this time.

CLINICALLY SIGNIFICANT MINERAL RANGES

Almost all hair testing labs list mathematically-determined mineral ranges on their reports. These are often standard deviations from an average or mean laboratory value. Dr. Eck preferred a different concept of clinically significant ranges. This idea is important, along with the mineral ratios and patterns discussed in Chapters 23 and 43.

The importance of clinically significant ranges is that optimum health seems to require that certain hair mineral levels be kept at or near ideal levels. Other mineral levels may vary more widely, even in a state of good health. For example, phosphorus must be kept in a tight range in head hair samples. Calcium, in contrast, may vary more widely.

The chart below lists these ranges for adults. Variations occur with children, men versus women and even possibly for various races. However, these are less important for development science at this time. Hair must not be washed at the laboratory for accurate readings.

CLINICALLY SIGNIFICANT HAIR MINERAL RANGES FOR ADULTS

<table>
<thead>
<tr>
<th>Mineral</th>
<th>Very Low</th>
<th>Low</th>
<th>Decreased</th>
<th>Normal</th>
<th>Sl. High</th>
<th>High</th>
<th>Very High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>4-7</td>
<td>8-14</td>
<td>15-37</td>
<td>38-80</td>
<td>81-170</td>
<td>170-500</td>
<td>500 +</td>
</tr>
<tr>
<td>Magnesium</td>
<td>1</td>
<td>2</td>
<td>3-4.9</td>
<td>5-12</td>
<td>12.1-24</td>
<td>24-60</td>
<td>60 +</td>
</tr>
<tr>
<td>Sodium</td>
<td>1</td>
<td>2-3</td>
<td>4-19</td>
<td>20-40</td>
<td>41-80</td>
<td>81-250</td>
<td>250 +</td>
</tr>
<tr>
<td>Potassium</td>
<td>1</td>
<td>2-4</td>
<td>5-7</td>
<td>8-15</td>
<td>16-30</td>
<td>31-100</td>
<td>100 +</td>
</tr>
<tr>
<td>Zinc</td>
<td>1-3</td>
<td>4-10</td>
<td>11-15</td>
<td>16-20</td>
<td>21-30</td>
<td>31-60</td>
<td>60 +</td>
</tr>
<tr>
<td>Iron</td>
<td>hidden</td>
<td>hidden</td>
<td>1-2</td>
<td>2.1-5</td>
<td>5.1-10</td>
<td>10 +</td>
<td></td>
</tr>
<tr>
<td>Copper</td>
<td>&lt; 0.6</td>
<td>0.7-0.8</td>
<td>0.9</td>
<td>1-2.6</td>
<td>2.7-5</td>
<td>5.1-20</td>
<td>20 +</td>
</tr>
<tr>
<td>Manganese</td>
<td>hidden</td>
<td>hidden</td>
<td>0.03-0.05</td>
<td>0.51-0.1</td>
<td>0.11-0.5</td>
<td>0.5 +</td>
<td></td>
</tr>
<tr>
<td>Chromium</td>
<td>0.01</td>
<td>0.02-0.04</td>
<td>0.05-0.08</td>
<td>0.09-0.14</td>
<td>0.15 + contamination</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selenium</td>
<td>0.01</td>
<td>0.02-0.04</td>
<td>0.05-0.08</td>
<td>0.08-0.12</td>
<td>0.12 +</td>
<td>or biounavailable</td>
<td></td>
</tr>
<tr>
<td>Phosphorus</td>
<td>6-8</td>
<td>9-11</td>
<td>12-15</td>
<td>16-20</td>
<td>21-30</td>
<td>30-60</td>
<td>60 +</td>
</tr>
</tbody>
</table>
18. TOXIC METALS

Jim, age 55, was a bright, energetic doctor of Ayurvedic medicine. He was also a friend. He consulted me because he was having difficulty focusing his mind. Recently, while driving in the right lane of a freeway, he had accidentally followed another driver off an exit ramp. He knew the road and knew that it was not his exit.

Jim’s hair levels of lead, cadmium, arsenic and aluminum were among the highest I had ever seen. I knew that Jim was a careful eater and had no obvious exposure to metals. The source turned out to be very high-quality Ayurvedic herbs imported from India. He had taken them for many years under the guidance of a well-respected physician in the Western USA.

I advised Jim that he must do something quickly to reduce his toxic metal levels. Jim, however, does not like Western sciences and ignored the advice. His dementia soon worsened until he could no longer function on his own, and he now lives disabled in a nursing home.

Toxic metals have no known positive role in the body. They are everywhere and affect everyone. They have become a major cause for birth defects, ADHD, autism, disability, aging, mental illness, divorce, criminality and all the killer diseases of our day. The study of toxic metals is sadly mostly ignored in post-modern medical care. Most holistic doctors also do not pay enough attention to them, or they would all begin with hair analysis, sauna therapy and coffee enemas in an attempt to reduce the load in everyone.

All of the toxic metals are extremely acid-forming, physically toxic and neurotoxic. This chapter begins with general information that applies to all the toxic metals. The second part of the chapter discusses the sources and symptoms of each of the major toxic metals. Additional information about each toxic metal is in the Mineral Reference Guide in Appendix II.

THE TOXIC METAL HAZARD TODAY

Today, everyone has excessive levels of toxic metals. In fact, humanity today is exposed to the highest levels of them in recorded history, up to several thousand times higher than even several hundred years ago. The main reasons is industrialization. The toxic metals are persistent and cumulative. The late Dr. Henry Schroeder, MD, a world authority on minerals, wrote that “most organic substances are degradable by natural processes. However, no metal is degradable...they are here to stay for a long time”. Toxic metals are a major cause of inflammation, infection, irritation and tissue damage because they can and do:
• Replace nutrient minerals in enzyme binding sites. This, in turn, inhibits, overstimulates or otherwise alters the activity of the affected enzyme. This occurs with trillions of enzymes. An affected enzyme may operate at 5-10% of its normal activity, or it may function at twice the normal rate. Either way, this can contribute to every imaginable health condition.

• Replace other minerals in tissue structures. These tissues, such as the arteries, joints, bones and muscles, are weakened and slowly destroyed by the replacement process.

• Cause irritation, necrosis, inflammation, atrophy and other toxic effects.

• Support development of fungal, bacterial and viral infections that are difficult or impossible to eradicate until the toxic metal is eliminated.

• “Short-circuit” and otherwise damage the brain and nervous system in many ways, leading to most mental and neurological disorders.

MODERN FOODS AND TOXIC METALS

The danger of toxic metals in the environment is greatly aggravated by 1) the low overall mineral content of most of the food supply and 2) contamination of the food supply. The way this works is that an abundance of essential minerals in the diet protects the body against toxic metals. This occurs because minerals are needed for enzyme systems. If the preferred minerals are not available in the food, the body picks up whatever minerals it can from the food, air and water as substitutes. Causes for the low trace mineral content of most foods include:

• Much of the world’s crop-growing areas have been farmed for hundreds of years in ways that deplete the soil of vital minerals. Newer farming practices may be even worse.

• Hybrid crops grown today are designed for today’s mineral deficient soils and contain much less vital minerals than crops grown even 50 years ago.

• Toxic sprays used the world over damage soil microorganisms needed to help plants absorb minerals from the soil. Organic food is a big step in the right direction for this reason.

• Once crops are harvested, food refining and processing almost always reduce the trace mineral content of the food. For example, whole wheat flour, when milled to make white flour, loses 40% of its chromium, 86% of its manganese, 89% of its cobalt, 78% of its zinc and 48% of its molybdenum. Refining cane into sugar causes even greater losses.

In fact, according to Weston Price, DDS, author of Nutrition and Physical Degeneration, primitive man often ate 5 to 11 times the amount of the essential minerals in his diet as modern man. Dr. Price lived over 100 years ago. Today, I would guess modern man is eating half again as much vital minerals in the same food items due to the reasons listed above, many of which are new. The term 'empty calories' aptly describes most of our food today, not just the white flour and white sugar products.

Causes for toxic metal contamination of food, including even organic food, include:

• Irrigation water is often contaminated.

• Sewage sludge, fish meal, seaweed and other contaminated products are commonly used as fertilizers, even at organic farms.

• Food grown near highways or downwind of industrial plants may contain too much lead and contaminants. Even organic home gardens may be contaminated if, for example, old house paint containing lead leaches lead into the soil.
• Food preservation, processing, refining, transportation and packaging usually add contaminants to the food to some degree. For example, copper, aluminum and other toxic substances are found in the water used to produce breads, cooked rice, cakes, pickles and thousands of other prepared foods. Most companies, even health food companies, only filter the water with carbon. Carbon does not remove most toxic metals.

Aluminum is often found in table salt used in food processing. Antimony may be found in cardboard juice, soup and milk containers. Iron, bromides, fluorides and other metal compounds are often added to food during processing.

Impaired digestion adds to our toxic metal woes. Impaired digestion and reduced absorption of essential minerals, discussed in Chapter 26, creates even more mineral deficiencies. The bodies are then even more prone to absorbing toxic metals.

AIRBORNE SOURCES OF TOXIC METALS

In addition to water and food-borne toxic metal poisoning, air pollution is a less important, but sometimes a critical source of toxic metals. Common sources include:

• Aircraft exhaust. Burned high in the atmosphere, aircraft fuel residues often contain some metals and deposit everywhere, affecting everyone on earth.

• Coal-fired power plants. Burning coal can release mercury, lead, cadmium and other toxic metals. Coal-fired plants in America have scrubbers, but all the plants in India, China, Mexico, Malaysia, Singapore and hundreds of other nations may not, and it can affect us all.

• Oil. Iranian and Venezuelan oil are high in vanadium. Some other oil is excessive in toxic sulfur compounds. Tetraethyl lead was added to gasoline for many years. Residues are present on pavement and may settle on buildings, cropland and elsewhere. Today, manganese is added to gasoline. This is quite an improvement over lead, but is not helpful, either. There is no need for these compounds in gasoline today.

• Radioactive minerals. Uranium exposure is largely from airborne sources such as nuclear tests, accidental nuclear releases and radon gas in some sealed buildings.

• Incineration can be clean. Older methods of incineration released toxic metals into the air. Scrubbers and higher temperature incineration take care of this today. However, few controls are used with incinerators in most developing nations.

• Smoking. Cadmium, arsenic, lead and nickel are in pesticides sprayed on most tobacco and marijuana, even “organic”. Cadmium is used in cigarette papers to keep them lit.

OTHER SOURCES OF TOXIC METALS

Prescription and over-the-counter drugs. Many patent drugs contain toxic metals. Cipro (fluquinolones) and Prozac (fluoxetine) are fluoride-containing chemicals. Thiazide diuretics contain mercury. These include Maxzide, Diazide and many others. Antacids such as Ryopan, Gaviscon, Maalox, Mylanta and many others are very high in aluminum.

Thimerosal or sodium ethylmercurithiosalicylate, a mercury-containing preservative, is used in most vaccines, including flu shots. Independent evaluation of a large study that is part of the Centers For Disease Control Vaccine Safety Datalink concluded that “children are 27 times as likely to develop autism after exposure to three thimerosal-containing vaccines than those who
receive thimerosal-free versions”. Although the studies were taxpayer-funded, the results are being intentionally withheld from the public.

Vaccines given to babies and young children can be a major source of toxic metals. The toxic metals are incorporated easily into the brain and other vital organs during early childhood and cause serious nervous system problems in most cases.

**Vitamin and mineral preparations.** Fulvic acid, humic acid and other supplements from “natural mineral deposits” frequently contain some toxic metals. Clay products such as bentonite, zeolite, azomite, montmorillonite and others usually contain high amounts of aluminum and should be used for a limited time only, if at all. Geritol contains too much iron and many prenatal vitamins contain a lot of copper. While these are not technically toxic metals, most people have too much and the amount in the vitamins is excessive for them. Alkaline water machines contaminate the water with platinum, titanium and other extremely toxic metals.

**DIRECT CONTACT SOURCES**

Anti-perspirants and many cosmetics contain aluminum. Dental amalgams contain mercury, copper, cadmium and other metals. Some dental bridges, and especially older crowns, contain very high amounts of nickel, an extremely toxic metal. Prostheses and pins used to hold bones together may contain nickel and other toxic metals. Copper intra-uterine devices, if left in place for years, may release a lot of copper into the body. Soaps, body lotions and other cosmetics often contain toxic compounds. A few hair dyes and even lipsticks contain lead. Household lawn and garden chemicals may contain lead, arsenic and other compounds. Mercury-treated seeds and arsenic-treated wood are other common sources of toxic metals.

**Occupational exposure** is important for millions of industrial and other workers. Among the most toxic occupations are the building trades, particularly plumbers, electricians, painters, welders and others. Auto repair, printing, ironwork, farming and selected other occupations also may expose one to high levels of toxic metals. Workers need to wear gloves and masks, and take other precautions when handling inks, metals and other toxic materials. Unfortunately, most occupational exposure occurs without the knowledge of either the worker or even the employer, in some cases. Happily, the world has improved a lot in this area in the past 50 years. An important reason for this is the development of hair mineral testing for metals.

**CONGENITAL TOXIC METALS**

Congenital means present at birth. Hair mineral analyses of newborns and infants usually reveal high levels of toxic metals in all babies. This is very, very unfortunate. Most have never eaten regular food or even drank tap water. The only explanation is that these infants receive their toxic exposures in utero during gestation. Indeed, hair analyses of the mothers confirm the presence of the metals in the mothers, though often not on the initial hair tests. The mother must remain on a development program long enough to eliminate the metals, at which time they will be revealed on repeat hair mineral analyses as the body releases them.

Congenital toxic metals is one of the most important subjects of our day. This book only touches briefly on it in a few places. However, it is an important cause of childhood cancers, autism, ADD, ADHD and children’s infections. Toxic metals children are born with may also cause delayed development syndromes, higher birth defect rates and high infant mortality rates. This vital topic deserves its own separate book.
DETECTING TOXIC METALS IN THE BODY

The detection of toxic metals is not easy. Indeed, no method of detection that I am aware of will detect anywhere near all of them scattered throughout the body. Fortunately, detection of toxic metals is not that important in development science. Instead, we assume everyone has excessive amounts of all of them. Development programs can slowly remove all the toxic metals, along with several hundred or more toxic chemicals.

**Common detection methods.** Blood, urine and feces tests. Blood tests are mainly helpful for acute exposures because many toxic metals are removed quickly from the blood and stored in the tissues, where they do less damage. Simple urine or feces tests are not too helpful as they depend a lot on the last meal one ate, for example.

**Urine challenge tests with EDTA, DMPS or other chelating agents** are not much better. In this test, the doctor gives a chelating agent that binds to the metal the doctor is looking for. The patient collects his urine for up to 24 hours afterwards, which is analyzed for toxic metals. This will still miss most toxic metals because the metals are lodged deep within organs and tissues and are not reached by the chelating drug. Most chelating agents only circulate in the blood, so they miss most toxic metals hidden in organs and tissues such as the liver and the brain.

Testing with kinesiology, pendulums, electrodermal screening, radionic machines and other methods can help, but are not considered too reliable, as they depend a lot on the skill of the operator, for example. MRI testing for toxic metals is a future technology that is accurate.

DETECTION OF METALS WITH HAIR ANALYSIS

Hair mineral analysis reveals toxic metals that are deposited in the skin and hair tissue during the time the hair grew. In other words, it is a **biopsy** or tissue reading, unlike blood, urine or feces testing for heavy metals. This seems to be an advantage, in many cases. For accurate toxic metal assessment using a hair mineral test, one must combine 1) elevated toxic metal levels and 2) poor eliminator levels. The latter indicate hidden toxic metals. Poor eliminators are explained in more detail on page 274, and in much more depth in an article of the same name at WWW.DRLWILSON.COM. It is one of the most interesting hair analysis patterns.

Using the combination of elevated toxic metal levels and poor eliminator patterns, one can obtain a decent, but not a perfect indication of some of a person’s or an animal’s toxic metal problems. Repeated hair tests during a development program will reveal more toxic metals as they are thrown off by the body into the hair and skin.

In 1979, The United States Environmental Protection Agency reviewed over 400 studies of the use of hair analysis for toxic metal detection. They concluded that “hair is a meaningful and representative tissue for (biological monitoring for) antimony, arsenic, cadmium, chromium, copper, lead, mercury, nickel, vanadium and perhaps selenium and tin.”

**Ideal toxic metal levels.** Earlier editions of this book listed the ideal ranges for the toxic metals that I use. However, these are no longer correct due to newer research and improvements in the complete development programs that allow us to reduce the toxic metal levels further than in the past.

Since the ideal toxic metal levels are changing, for the most current values please visit WWW.DRLWILSON.COM. Scroll down near to the bottom of the home page. On the right side, click on the article entitled **Human Hair Mineral Levels – Ideals, Ranges, Toxicity And Poor Eliminators.**
Warning: Ideal hair mineral values can vary between laboratories. This is because most hair testing labs wash the hair, some washing it more than others, and with different chemicals. This definitely affects the readings, and is confusing for doctors. I currently recommend only Analytical Research Labs for hair testing, as they do not wash the hair at all. However, toxic metals are less affected than the more water-soluble electrolytes (Ca, Mg, Na, K, & P).

TOXIC METALS AND DISEASE STATES

Many diseases are simply metal toxicity. Toxic metals can contribute to any imaginable symptom or illness. Many cases of diabetes, cancer, multiple sclerosis, Parkinson’s disease and many others may be mainly toxic metal poisoning. Let us use diabetes as an example. Iron, manganese or other metals can replace zinc in the pancreas. This will impair the production and secretion of insulin. Others may cause the production of a lower quality insulin that is less effective in regulating blood sugar, causing so-called “insulin resistance”.

Combinations of toxic metals can be even worse. Most people have too much of up to two dozen toxic metals. Symptoms are often due to combinations of metals acting on the body in many ways at once. This can cause many “varieties” of cancers, heart disease, diabetes, pain syndromes, arthritis and other so-called “diseases”.

Toxic metals cause aging. Toxic metals slowly deactivate enzyme systems, weaken body structures and have other degenerative effects. The process quickly becomes a vicious cycle. As more of the toxic metals accumulate, digestion and absorption of the essential minerals worsens. This causes the body to replace them with more toxic metals. Also, as the metals build up, the body’s ability to eliminate them decreases, causing even faster rates of metal buildup. This results in death unless the cycle can be reversed. In a sense, everyone dies of toxicity, even if it is called cancer, heart disease or kidney failure.

Toxic metals and gene expression. Genetic defects may be due to toxic metals. The gene may be okay, but the metal interferes with gene expression. This type of defect is called a polymorphism. An article in the American Journal of Clinical Nutrition (2002, 75:4;616-658) discussed this hidden cause of genetic defects.

For example, zinc is required for RNA transferase, a key enzyme in gene expression. Not surprisingly, zinc deficiency and its replacement by cadmium, perhaps, is associated with neural tube defects and other birth defects and developmental delays.

Removal of toxic metals. Chapters 5, 44 and 45 discuss this extensive topic.

INDIVIDUAL TOXIC METALS - LEAD

Lead may be called the violence and horror toxic metal. It is the most researched toxic metal and has been mined and used for thousands of years. Common sources of lead include:

- Printing, inks, lubricants, paints and dyes.
- Gasoline. Lead was added to gasoline for over 50 years. High levels may still be found on some city streets and city buildings. Lead-containing dust may blow around on windy days.
- Ceramic dishes from other nations may contain leaded glazes that may scratch off or chip off into the food.
- Pesticides. These are sprayed on most agricultural crops. Lead arsenate is a common one.
- Cosmetics and skin care products. These can include lipstick and dark hair dyes.
Symptoms. Lead is associated with over 100 symptoms. Of all the toxic metals, lead has been studied most extensively, perhaps because the dangers of lead poisoning have been known since biblical times. Lead replaces calcium in the body, leading to problems ranging from thyroid and adrenal problems to nervous system disorders and many neuromuscular symptoms. Conditions such as Parkinson’s disease, Alzheimer’s disease, osteoporosis and other types of bone diseases are often related to lead toxicity to some degree.

Anemia. Lead causes an anemia that can be fatal, as well as epileptic seizures, tremors, reproductive disorders, glandular problems, tooth decay and much more. Lead also causes severe mental and emotional symptoms. These include a decline in IQ and other measures of intelligence in children and adults.

Children and lead. Lead is a severe problem for poorly-nourished children because their growing bodies need a lot of calcium. When calcium is deficient or if the environment is high in lead, it easily replaces calcium in the body. Also, lead passes easily through the placenta from mother to child, causing congenital problems including birth defects in children. It is also associated with ADD, ADHD, autism, delayed development and practically every other childhood mental and even physical problem.

Interestingly, high lead rarely shows up on early hair tests. This may be because it replaces calcium in the bones, where it is held in place tightly and not easily released. Later, during development programs, the lead level will often rise on a hair test as the lead is released from the bones or other tissues.

Lead and violence. Lead is intimately connected with violence on earth. Lead is used in bullets, and those who make and use bullets can become toxic with lead. This can cause or worsen a violent tendency in some cases. Lead affects children this way the most and is responsible for much of the childhood hyperactive behavior at deep levels. Lead replaces calcium and even magnesium and zinc, which are the sedative elements. This means that the brain is lacking in these essential calming minerals.

Lead and horror. Cadmium and lead are associated with feelings of horror and disgust. Those who perpetrate horrible or disgusting crimes are often high in these toxic metals.

Lead in history. Beethoven’s Hair is an investigation of lead poisoning that was found in a lock of hair from the famous composer, Ludwig Von Beethoven. The Roman empire may have decayed, in part, due to poisoning of the people with lead due to the use of lead water pipes.

MERCURY

Mercury may be called the mad hatters toxic metal, as it was used in hat making 150 years ago and caused a form of madness, though not a violent type of mental disorder. It is even more widely dispersed than lead, perhaps. Major sources of mercury include eating contaminated fish, dental amalgams, congenital mercury that comes from one’s mother during gestation, and a few other environmental and occupational sources.

Fish. All fish is toxic with mercury. For the latest report on this, see the report Mercury in Fish, Bed Sediment, and Water from Streams Across The United States, 1998-2005 by the US Geological Survey, Scientific Investigations Report 2009-5109. The hair tests of everyone who eats a lot of any fish reveal high mercury. Some rivers and streams are better than others, but figuring out which are best is nearly impossible. Small fish have less mercury. Sadly, I can only recommend eating a few small, cold-water fish such as salmon and sardines, no more than
twice weekly. Large fish like tuna concentrate mercury a million times or more and are basically poisonous today for this reason alone. The federal government recently issued a warning that pregnant and lactating women should avoid tuna, shark, king mackerel, mahi-mahi, ahi and sashimi used in sushi. Sushi is one of the worst dishes because it often combines raw fish (parasitic and other infections), with tuna, mahi mahi or ahi, and nori (mercury toxicity).

**Shellfish worse than ocean fish.** In addition to mercury, most shellfish contain excessive cadmium, arsenic and other toxic metals. Please do not eat any shrimp, muscles, crab, scallops, lobster, oysters, eel or other shellfish. The problem is just getting much worse in most areas.

**Dental amalgams.** These are slowly being banned or phased out. However, millions are still placed in people’s mouths each year in America and elsewhere. The mercury slowly leaches out into the body every time one takes a bite of food. This outdated method of dental repair needs to stop now. It is one of the worst features of so-called modern medical care.

Do not remove amalgams with active cancers. If you have dental amalgams, have them removed as soon as possible. The exception is if one has active cancer. Some mercury will be vaporized and absorbed during removal, no matter how careful and knowledgeable the dentist is. The extra toxicity has caused the death of a few cancer patients. Therefore, if cancer is active, reduce its activity with the Kelley metabolic program, Protocel or some other method first before removing amalgams. Chapter 35 discusses cancer in much more detail.

**Other mercury sources.** Mercury is used in mining, fungicides, paper-making, pesticides and even contact lens solutions and other OTC remedies. Air pollution from factories, old incinerators and coal-fired power plants spew mercury into the air. American power plants have scrubbers to remove most mercury, but many other nations do not use them due to their cost. The mercury blows from nation to nation, landing in waterways and on food crops everywhere, poisoning the entire world with mercury. This is sad but true.

**Mercury symptoms.** These are extremely varied. Mercury particularly affects the kidneys, liver, brain, endocrine glands and muscular system. However, it can affect any organ and system of the body. Most neuromuscular diseases such as multiple sclerosis, most mental illness and hundreds of other conditions are related to mercury toxicity. A list of common symptoms of mercury toxicity are given in The Mineral Reference Guide in Appendix II.

**Mercury and the mind.** Mercury enhances thinking speed in many people. It may have an adaptive role in some way. Also, to release mercury it is helpful to slow the mind and be willing to surrender or change one’s mind. This is a spiritual exercise, mainly, that will assist mercury removal. Otherwise, elimination can be slow and often causes many symptoms.

**Nickel**

Nickel is a hard and very toxic metal. It can be called the cancer metal. It is found in some metal dental crowns and in dental wires used in bridges and braces. Have any nickel dental materials removed at once. I suggest avoiding all metal braces on the teeth!

Nickel is also used as a catalyst in the manufacture of margarine, commercial peanut butter, and other food products made with hydrogenated oils.

Rooibos tea, or red tea, is very high in nickel. This tea is often part of the cult diet or rape diet. This important topic is explained in an article at WWW.DRLWILSON.COM.

Nickel is found in small amounts in alcoholic beverages, hydrogenated oils found in commercial peanut butter, margarines, including soy margarine, and vegetable shortening. It can
contaminate wells and other waters supplies, as can all the toxic metals. Nickel fumes that are accidentally inhaled are also very toxic and associated with the development of lung cancer. Cigarette smoke and other types of smoke may contain some nickel. Nickel is also used for plating jewelry. Some women’s skin, for example, reacts with metals such as nickel and silver and causes it to come off and leave a mark on the skin. This can be avoided in most cases by painting the part of the jewelry that contacts the skin with clear nail polish or clear polyurethane varnish. Jewelry that pierces the body may release more nickel. Steel workers and those in a few other occupations may be exposed to nickel as well.

**Symptoms of nickel toxicity.** Nickel is subtle in its toxicity. It is associated mainly with depression, lung problems and cancers. It is an enzyme inhibitor, as are all the toxic metals, and nickel can replace vital minerals in enzyme binding sites.

**ALUMINUM**

Aluminum is the **soft in the head** metal because it is a soft metal that affects the brain. It is very widely distributed in the environment in industrialized nations. Common sources are:

- *Antacids and antiperspirants.* Most contain aluminum compounds. Beware of “natural crystal deodorants” and “deodorant stones”, as these often contain a lot of aluminum and can be quite toxic, no matter what the manufacturer or sales person may claim.
- *Cosmetics often use aluminum as a base.* It gives makeup a sparkly look.
- *Tap water and all prepared foods made with tap water.* Aluminum, at times along with copper, chlorine and fluoride, are added to almost all municipal water supplies. Aluminum causes dirt to settle out of the water to clarify it. Alternatives exist for all these toxic practices.
- *Table salt.* Aluminum is added to this mineral-deficient product as an anti-caking agent.
- *Aluminum cans, foils, and other packaging can cause some aluminum to rub off into the food unless the can or package is coated on the inside.*
- *Uncoated aluminum cookware.* Some aluminum will leach from this common restaurant cookware. Cooking acidic foods such as tomatoes in it is the worst. Steel spoons or spatulas used on aluminum cookware may cause significant etching of aluminum to occur into foods.
- *Handling aluminum in building materials, household items, tapes, insulating materials and other products will cause a little to rub off and be absorbed through the skin.*
- *Herbs such as peppermint, spearmint and wintergreen are naturally high in aluminum.*
- *Food grown on clay soils can contain high amounts of aluminum.*
- *Food items or drugs processed with aluminum machinery can become contaminated with aluminum.* Many dry animal feeds commonly are contaminated for this reason, as well.

**Aluminum toxicity symptoms.** The skin, the nervous system and the digestive tract are often most affected. Aluminum toxicity can affect memory and cognition, and is associated with some dementias. I have seen memory loss in teenagers that improves dramatically when the aluminum is removed with a development program. The sources of aluminum might be too much acidic soda pop in aluminum cans and lots of salty junk food. Aluminum is an astringent and used in medications to calm the stomach. Too much, however, is very toxic for the intestine. It is effective as an anti-perspirant because it is a drying agent and appears to inhibit sweating. Reducing sweating is an unhealthy effect of aluminum, however.
Aluminum is one of the easier metals to eliminate from the body with development programs. Lead, mercury, cadmium, arsenic and nickel take longer to be removed.

**FLUORIDE**

Fluoride may be called the *bone destroyer*. A tiny amount in food can be helpful for the bones. However, today everyone in America and Great Britain, gets far too much. The toxic dose is also very close to any therapeutic dose. The main source is adding fluorides to water supplies. The source of the fluoride is often smokestack effluent from plants that make fertilizers or refine aluminum and uranium. This waste product also adds a little cadmium, lead, benzene, radiation and other toxic chemicals to your tap water. Water fluoridation has been shown to be ineffective against tooth decay around the world, and has been phased out in almost all nations except America and Great Britain, where powerful lobbies hold sway over health authorities.

Other sources are fluoridated toothpastes and mouth washes, and fluoride treatments done at dental offices. These may be given to children without parental consent. All are very toxic and unnecessary for tooth decay prevention. Fluoride added to drinking water has found its way into all the groundwater, the food and the food chain in America and Great Britain. The idea that more is needed is insane, in my view. Studies indicate that some foods, such as reconstituted fruit juices and baby foods, can have as much as 40 parts per million fluoride. A ‘recommended safe level’ in drinking water is 1 ppm, which is too high, according to many studies.

**Symptoms of fluoride toxicity.** Fluoride is a powerful enzyme inhibitor. It replaces iodine in the thyroid gland and it forms calcium fluoride in the bones, which weakens them. A very common symptom is *fluorosis*, a brown discoloration and brittleness of the teeth. More serious symptoms include an increased risk of hip and other fractures, higher incidence of cancers in areas with fluoridated water, and a higher incidence of birth defects such as Down’s syndrome. Everyone in America has too much fluoride in their bones and elsewhere in their bodies as a result of stupid public health policies.

Another extremely common symptom is hypothyroidism from fluoride’s effect on iodine metabolism. A very unfortunate symptom is a lowering of the I.Q. of many people. This may have to do with iodine as well, since low iodine affects every organ of the body, not just the thyroid. Fluoride poisoning also has to do with cancer, other neuromuscular conditions, nervous system imbalances and bone diseases. Fluoride also decreases melatonin secretion and has other neurotoxic effects. Any mineral that interferes with calcium and iodine metabolism will have significant neurotoxic effects. I have mountains of research on the dangers of fluorides in the water, and it is amazing that the dental and public health community still believe the old lies that it decreases cavities and is safe. The recent research just does not support these ideas.

**Fluoride is corrosive.** Boiling fluoridated water in aluminum pots increases the etching of aluminum 600%. Fluoride in the drinking water also increases leaching of lead from solder in water pipes and increases lead toxicity. The only water free of it is distilled, RO or spring water. RO water, however, is not suitable for drinking as it does not appear to hydrate the body nearly as well as a good quality spring water or as well as most distilled water.
CADEMIUM

Dr. Eck called cadmium the pseudo-masculine mineral. It is extremely poisonous, with a toxic level an order of magnitude higher than most of the other toxic metals. It is used industrially in plating and other applications such as galvanizing. It is found with zinc in foods, and replaces zinc in many enzyme binding sites. Zinc, a healthy masculine mineral, is protective against cadmium, as is calcium. This means that as zinc and calcium deficiencies develop, the body absorbs more cadmium from the food, air or water. The main cause of calcium deficiency today is pasteurization and homogenization of dairy products.

Common sources of cadmium exposure are 1) refined and “junk” foods that have been stripped of their protective zinc and calcium, 2) contaminated well or tap water and 3) cigarette and marijuana smoke. Cadmium is used in cigarette papers. A little is also found in coffee, and in higher amounts in most shellfish. Galvanized and black plastic pipes can be a source of cadmium in drinking water in a few cases, particularly in soft water areas.

Symptoms of cadmium toxicity. Cadmium is associated with all of the modern ‘killer’ diseases. It tends to harden and inflame the arteries leading to arteriosclerosis, atherosclerosis, impaired circulation, hypertension and heart failure. Elevated hair cadmium is highly correlated with cancer, in my experience. It is also important for hypoglycemia, diabetes, mental illness and many other problems. Its neurotoxic effects are critical and are discussed in later chapters. It is called the pseudo-masculine element because it toughens, “hardens” and inflames the personality, just as it hardens and inflames the arteries and other tissues of the body. It does this by replacing zinc, a mineral known to help prevent inflammation. Other symptoms include bone pain, osteoporosis and other bone and tendon problems. It damages the kidneys, liver, bones and, in fact, all body organs.

ARSENIC

Arsenic may be called the slow death metal. It is used commonly in pesticides. It kills certain insects, but is also deadly for human beings. Even organically grown food may have residues because the crops were often grown on land that was formerly sprayed with arsenic-containing pesticides. Also, “organic” fertilizers today are allowed to contain a certain amount of sewage sludge that contains toxic metals. This needs to change, though it would increase the cost of organic food significantly. Chicken feed may still contain arsenic in the form of Roxarsone, an anti-parasite medication used on millions of chickens in America and around the world since the 1960s. This compound is not as bad as some, but still adds arsenic to the diet and sickens some people. The arsenic is excreted with the chicken manure, which is often sold as “organic fertilizer”. In this way, arsenic has spread throughout the food chain. To a greater or lesser degree, it now contaminates most water systems around the world.

Arsenic is used industrially in glass-making, insecticides, rat poison, tanning leather and to preserve wood. Lumber that is greenish in color has often been treated with arsenic to resist insect infestation. Arsenic was the poison of choice for many murderers years ago. It is not used much for this purpose today because it is now easily detectable with hair and even blood testing.

Symptoms of arsenic poisoning. Many are vague, which is why it was an excellent way to poison a person. They include weakness, malaise, aches and pains, sore throat, diarrhea, ringing in the ears, headaches, vertigo, pallor, coma and death.
URANIUM AND THE OTHER RADIOACTIVE ELEMENTS

The radioactive minerals may be called the **stealth killers** because they offer no signs or symptoms in low doses. They include about 60 radioactive variants or **isotopes** of common elements that are either shorter or longer-term emitters of radioactive particles. They include iodine-131, platinum-190 and -192, samarium-147,-148 and -149, rubidium -87, rhenium -187, thorium-231 and -232, strontium-90, uranium-235 and -238, potassium-90, vanadium-50, zirconium-96, lead-211 and others.

**Sources.** Environmental sources include nuclear bomb tests, medical use of radioactive materials, waste from nuclear plants such as runoff water used to cool the plant, cesium-containing smoke detectors, perhaps food irradiation equipment, and war-related nuclear material such as depleted uranium used as ammunition. Radioactive minerals are the most damaging to human health in that they damage tissue at the DNA level. However, they are not as toxic chemically as lead, mercury or cadmium, fortunately. All babies are born with some radioactive elements in their bodies, though they may be hard to detect.

Radiation toxicity receives little attention today even from holistic doctors. Reasons for this are that it is so silent, so subtle and hard to detect. Also, few methods exist to remove them.

**Development can help radiation toxicity.** Interesting benefits of development are its ability to 1) protect a person from some radiation, 2) remove radioactive minerals from the body, and 3) kill or weaken cells that have become mutated due to radiation toxicity. It does this better than any other method I am aware of, by the following methods:

- **Remineralizing the body** reduces the absorption of some radioactive minerals such as iodine-131 from the air. This has to do with the concept of *preferred minerals*.
- **Deep removal of toxic metals.** Development can go far deeper than chelation therapy and other methods to remove more of the radioactive minerals. This can be done quickly, sometimes within weeks to months.
- **Removal of ALL the toxic metals** gets rid of many unusual ones. In contrast, chelation, for example, mainly removes just a few toxic metals.
- **Improving adaptive energy or vitality.** This enables the deep removal of the metals.
- **Eating a very yang diet.** Radiation is extremely yin in Chinese terminology. By forcing the cells to be more yang, cells that contain radioactive particles are either killed or inactivated.
- **Sauna therapy.** This is extremely helpful to reduce radiation damage. Heating the body several degrees helps kill or disable mutated and weaker body cells. This can prevent them from reproducing, so the mutated cells are slowly eliminated. Other frequencies from the near infrared heat lamps may also be of help in reducing radiation toxicity.
- **Distilled water.** A unique property of distilled water is an ability to bind to some radioactive minerals. This is one of the reasons it is used in the beginning of development programs, though this was not part of Dr. Eck’s original research.
- **The use of kelp, along with other products.** Kelp, with its high alginate content, helps remove some radioactive minerals.
19. HAIR MINERAL ANALYSIS OVERVIEW

Tim, age 69, consulted me because he had been diagnosed with prostate cancer. He had already been to a clinic in Switzerland and to many holistic physicians who had given him many therapies and remedies. However, his PSA remained high, and he was tired and very worried about his prostate situation. He did not want to use conventional therapies.

I usually do not work with cancer using development, but made an exception in this case. Tim’s first hair mineral analysis revealed a very slow oxidation rate, a four lows pattern and a low sodium/potassium ratio. This is a very unhealthy combination of patterns that indicate extreme exhaustion, frustration, and “spinning one’s wheels and getting nowhere”. This was an apt description of Tim’s state of mind. However, he embraced a development program with complete dedication, and did well following the supplement program, the diet and doing coffee enemas and daily near infrared saunas.

Four months into the program, Tim had a severe healing reaction involving an infected tooth. I thought he would quit the program, but I was incorrect. He stayed with it, and the crisis soon passed. A deep and chronic infection had been cleared, and Tim’s mood and test results started to improve quite dramatically. His second hair mineral test showed he was no longer in a four lows pattern. On the following hair test, the sodium/potassium ratio normalized.

Three years later, Tim went through another healing crisis in which his shoulder froze. His medical doctor did x-rays and told him the shoulder was arthritic and he must have surgery. A deep bronchial infection from years before also flared up. These retracings took almost a year to completely go away, but healed completely with just some chiropractic care and natural methods. Tim slowly transformed from a sickly client until one day, at age 73, he told me he had so much energy and felt so young again he didn’t know what to do with himself.

This chapter begins a more detailed section of this text concerned with hair mineral analysis. It is a complex subject and I have only presented the basics for this reason. It is important to know that most doctors and nutritionists do not use hair analysis in the way described in this chapter. They use the test mostly to assess toxic metals and often little else. Dr. Eck pioneered a completely different way to interpret and utilize hair mineral analysis for the purpose of doing what may be called a stress analysis on the human body. This is an engineering method and not part of the current paradigm of medical care, though it uses all of their scientific knowledge and much more.

With a medical background, I was very skeptical about hair analysis, especially as Dr. Eck made use of it. It was confusing and a lot went against all my previous knowledge of biochemistry, nutrition and other subjects I had studied. I am glad, however, that I stuck with it,
as the method has, over time, proven itself again and again as an incredible breakthrough in science and healing.

WHAT IS A HAIR MINERAL ANALYSIS?

A tissue mineral biopsy. A hair mineral analysis is a tissue mineral biopsy. Biopsies are cellular tests. Some, such as liver biopsies, are used to find cancer or to check for high levels of iron and other metals that collect in the liver.

Testing the hair tissue for minerals has been used for at least 100 years worldwide for biological monitoring of almost all species on planet earth. For example, mineral levels and toxin levels can be easily measured in both domesticated and wild animals without inflicting harm by simply snipping a piece of hair and analyzing its mineral content.

A screening test. Hair mineral analysis is generally considered a screening test, rather than a diagnostic test. Screening tests are inexpensive, non-invasive and provide a lot of information rapidly. This is a good description of a hair mineral analysis. When performed and interpreted correctly, hair mineral testing is an extremely sophisticated method for assessing, monitoring and guiding the correction of body chemistry. Hair is also excellent for testing many drugs, toxic chemicals and is used constantly for genetic testing of DNA. These, however, are not the focus of this book.

Biological monitoring. At times, I hear doctors pronounce that mineral analysis by mass spectroscopy is not helpful for testing the body. This is laughable. Minerals are the basis for life and for all physical creations on earth. The identical test is used hundreds of times each day for:

- Testing for toxic metals and nutrient minerals in dozens of animal species around the world.
- Testing minerals in the soil for farmers and ranchers everywhere in the world.
- Testing the content of mineral ores for mining purposes.
- Testing the mineral content of plants of every kind.
- Even testing the mineral content of distant planets and stars.

Dr. Eck figured out that deep healing requires balancing the tissue minerals. This is the single most important science on planet earth if humanity is to survive into the near future.

WHY USE HAIR FOR ANALYSIS?

Hair is an excellent tissue for sampling for the following reasons:

- Hair provides a unique cellular reading and a ‘window’ into the inner workings of the body cells. The cells, not the blood or urine, are the major site of metabolic activity. This cellular reading is critical for development science.
- Hair is a very stable biopsy material, very easy to sample, and requires no special handling other than to keep samples clean. The cost is also very reasonable.
- The test is very accurate and reliable when performed properly. Computer-controlled mass spectrometer technology can easily assess parts per million and often parts per billion with excellent reliability. The controversy concerning the reliability of hair testing has to do with
the laboratory procedure in preparing the hair samples, not the testing of minerals itself. This topic is discussed later in this chapter.

- **Hair mineral values vary in the hair by a factor of ten or more.** By contrast, mineral levels are kept relatively constant in the blood, even when pathology is present. Hair is thus an excellent and very early indicator of metabolic imbalances.

- **Toxic metals are easier and more accurately detected in the hair tissue than in most other sites.** However, no test can reveal all the body’s toxic metals. This is important to recall.

**BASIC INFORMATION ABOUT HAIR**

Hair generally grows about one-fourth of an inch per month or more. All hair grows for a while, and then falls out. It goes through a resting period, and then grows once again. For this reason, some hair loss is normal. Some people experience seasonal hair loss or shedding, to a degree. This is normal, as well.

Hair color varies from light blond to black, with black the most common color. Selenium is slightly higher in blondes, while copper may be slightly higher in red hair, and iron or manganese slightly higher in black hair. However, these differences are rarely noticeable.

**Grey hair.** A recent study revealed that the concentrations of calcium, magnesium, sodium, potassium, zinc, manganese, copper and iron were somewhat lower in grey hairs compared to black hairs on the same person’s head (*J Health Science*, 2000, 46(1):46-48). However, the differences were small. This may help us understand graying of hair as a symptom of mineral depletion. However, I believe there is more to the problem of graying hair.

**WHAT DOES HAIR TESTING MEASURE?**

Hair mineral analysis assesses the chemical elements deposited in the cells and the spaces between the cells, also called the interstitial spaces. It provides a reading of the deposition of minerals in the hair tissue during the months during which the hair grew. It does not measure the total body load of any mineral, as some claim. At least 20 or so elements are measured, depending on the laboratory. They are in three groups:

- **The macrominerals** include calcium, magnesium, sodium, potassium and phosphorus.
- **The trace minerals** include iron, zinc, copper, manganese, selenium, chromium, and perhaps others, depending on the laboratory.
- **The toxic minerals** include lead, mercury, cadmium, arsenic, aluminum, nickel and perhaps antimony, beryllium, bismuth, tin, uranium and perhaps others depending on the laboratory.

**Ratios and patterns.** The hair mineral levels are just a small part of the value of the test. The ratios and patterns of the minerals, while more complex, provide far more information than the mineral levels. This is discussed in the next few chapters.

**HOW ARE THE READINGS REPORTED?**

A somewhat confusing situation is that different hair mineral testing laboratories report the mineral values in different units. The most common ones include:
• **Milligrams per 100 grams**, written as mg%.
• **Parts per million**, written as ppm. The numbers will be 10 times higher than those in mg%.
• **Micrograms per gram**, also written as ug/g. The readings are the same as parts per million.

**Converting the units.** To convert parts per million to milligrams per 100 grams, divide the parts per million reading by 10 or move the decimal point one number to the left. To convert mg% to parts per million, simply multiply the number by 10 or move the decimal point one place to the right. For example, a level of 16 mg% is equal to 160 parts per million or ppm or ug/g. Ppm and ug/g are the same, in terms of the numbers, and need no conversion.

**ACCURACY AND RELIABILITY**

Hair is analyzed for minerals using atomic absorption spectroscopy, induction-coupled plasma or the newest method, mass spectroscopy. These are standard laboratory procedures. Newer, computer-controlled testing instruments easily measure in parts per million or parts per billion with accuracy of about plus or minus 3%. This is equal to and often significantly better than most blood tests, for example. Controversy involving hair testing is not due to the testing method, but rather to the hair preparation procedure.

In a 300-page review completed in August 1979, *The United States Environmental Protection Agency* reviewed over 400 studies of hair mineral testing. The authors concluded that hair is a "meaningful and representative tissue for biological monitoring for most of the toxic metals". Some of those studies, along with many recent ones, are listed in the references.

Anyone who suggests that hair mineral analysis is “inaccurate”, “unreliable”, “unproven” or that it “lacks documentation” is not knowledgeable regarding the test.

**How often do laboratory errors affect hair mineral readings?** In my experience, the answer is extremely rarely when one uses Analytical Research Laboratories. The testing is done very carefully, the laboratory director is a stickler for accuracy and their quality control procedures are superb. I cannot say the same for all the laboratories, although overall the accuracy is not bad in my limited experience with some of the other labs that offer hair testing.

**HOW IS THE HAIR ANALYZED?**

The procedure described here is used at Analytical Research Laboratories in Phoenix, Arizona. Most of the other labs probably use somewhat similar procedures. However, almost all of them add another step. They wash the hair in various ways. This ruins the accuracy according to a number of studies that are discussed below. The basic analysis procedure is:

• **Hair samples arriving at the laboratory are first cut into small pieces with surgical scissors.**
• **A precisely weighed amount of hair is placed in a test tube with nitric and perchloric acid and left overnight to dissolve.** The acids dissolve away all of the hair except the minerals.
• **The following day the sample is rehydrated precisely and placed in the measuring instrument, which is often an ICP-mass spectrometer.**
• **Inside the test instrument, the dissolved sample is burned at a high temperature.** Each mineral gives off a characteristic spectrum or frequency of light. This is picked up by
detectors in the instrument. Precision calibration and control of the flame temperature are essential to obtain accurate readings.

- **The ICP-mass spectrometer is a highly sophisticated hybrid, computer-controlled machine costing several hundred thousand dollars.** This is not a home or office unit. Any doctor who runs this test in his office is not using the same equipment and results will not be as accurate.

**LICENSING AND QUALITY CONTROL**

In America, hair mineral analysis laboratories are inspected annually by the U.S. Department of Health and Human Services, Health Care Financing Administration, Division of Health Standards and Quality. An operating license is issued only if personnel and procedures meet their standards. They must have certified personnel in charge of the lab, and the lab is required to run blind test samples and submit them periodically to the government for checking the lab’s equipment.

**Other quality control at the lab.** Analytical Research Laboratories runs control samples and blank samples at the beginning, middle and end of every batch. *Control samples* are samples whose value is known. *Blank samples* contain only pure, triple-distilled water.

All licensed labs must also participate in an industry-wide quality control program. In addition, ARL offers automatic retesting of any mineral value that is far out of range, at no extra cost. This service is not provided by any other laboratory that I am aware of.

**HAIR MINERAL ANALYSIS FOR ANIMALS AND VETERINARY CARE**

Development is superb for animals and veterinary care. All the principles in this book apply to most animal species. Animals are much easier to work with because their diets are easy to control, their mental and emotional makeup is simpler, and their stress levels are lower in most cases. For those who work with animals, a few pointers may be helpful:

- **Normal mineral values differ for each species and, at times, for different breeds of animals.**
- **Be sure to obtain a clean hair or fur sample.** A simple way is to wipe the sampling area with rubbing alcohol first to clean it. Do not use water, as this may wash out some water-soluble minerals.
- **Sodium/potassium ratios are lower in animals for complex reasons.** They can rise very high in some pets when the animal is under stress, however.
- **Often changing the feed is enough to cause significant changes in the body chemistry of animals.** This, plus a few simple supplements, often causes rapid healing. The fine-tuning and years of retracing required with some people are rarely required, greatly simplifying the application of development therapy.
- **In my experience, development veterinary science would save farmers, ranchers, livestock and pet owners billions of dollars in unnecessary disability and cost.** It would also greatly extend the lifespan of many animals.

**Contact people for veterinary use of hair mineral analysis.** To locate veterinarians and others who offer development and hair analysis for both small and large animals, please visit www.drlwilson.com.
CONTROVERSIES WITH HAIR MINERAL ANALYSIS

IS HAIR DIRTY AND THEREFORE UNRELIABLE AS A BIOPSY MATERIAL?

Some say hair is not a good biopsy material because it is inherently dirty, greasy and otherwise contaminated by contact with shampoo, soaps, hair brushes and other implements. This is not our experience, assuming the hair is washed with a mild shampoo no more than 24 hours before sampling it. Any sample that is obviously dirty should be rejected, and a new sample requested of the client. Research indicates that:

- **Light sweating and air pollution do not significantly affect hair readings.**
- **A lot of the sample comes from inside the hair shaft, which is insulated from contamination.**
- **Most shampoos, conditioners, tints and dyes do not contain minerals that can contaminate the sample.** In fact, many shampoos contain EDTA or other chelating agents that remove minerals. This is why I only recommend using a simple shampoo before sampling the hair.
- **If one just had a bleach or permanent on the hair, wash it at least five times before cutting the hair sample for mineral analysis.** Bleaching and permanents can damage the hair slightly.

Occasional sources of environmental contamination include:

- **Swimming in pools regularly can raise the sodium and/or copper levels.**
- **Heavy sweating immediately before cutting the sample can raise the sodium and potassium readings somewhat.**
- **Rarely, bathing in water treated with a water softener may increase the levels of sodium or potassium, depending upon which mineral is used in the water softening equipment.**
- **'Grecian Formula' and 'Youth Hair' hair dye contain lead.** They will elevate the lead level (and should absolutely be avoided!). Other dark hair dyes may also contain lead.
- **Head & Shoulders shampoo can elevate the zinc level.**
- **Selsun Blue shampoo can elevate the selenium level.**
- **Very rarely, occupational exposure to dust and grime is a problem.** This can be avoided by washing the hair shortly before sampling it after one has been exposed to metal or other dusts.

Asking the client which products are on the hair will usually be sufficient to rule out abnormal readings due to hair products. Other than the situations above, which are easy to identify in most cases, the hair is a very stable and clean biopsy material.

SHOULD PUBIC HAIR BE USED FOR HAIR MINERAL TESTING?

Most labs allow public hair to be used for sampling. However, it should be used only as a last resort, in my view, as it appears to be less accurate. Phosphorus levels, in particular, are often extremely high in pubic hair. However, other readings may be affected as well.

SHOULD THE LABORATORY PROCEDURE INCLUDE WASHING THE HAIR?

The biggest area of problems with hair mineral testing center around how the hair is
handled prior to testing its mineral content. Dr. Eck learned early on that one must not wash the hair at the lab for accurate results. However, the danger of environmental contamination prompts most hair testing laboratories to wash the hair before analyzing it. This removes up to 50% of the water-soluble minerals, and can affect all the levels to some degree. Studies that show this include those by:

- Leroy, R. (J Ortho Med., 1986;1(2)). These studies are found in Appendix V.
- Seidel, et al. (JAMA, 2001, 285, #1). The authors compared hair test results from about six labs. The results of the two laboratories that do not wash the hair samples showed excellent correlation, unlike some of the others. One must obtain the actual test numbers to realize this, as it is not mentioned in the study.

The arguments in favor of washing the hair at the laboratory include:

1. Only ‘exogenous’ minerals are being removed. These are minerals that are on the surface, and not really part of the hair shaft itself. However, the argument is incorrect because hair is 10-15% porous, so chemicals used on it will penetrate inside the hair to some degree.

2. Washing at the lab is no different from taking a shower at home to clean the hair. This argument is flawed for a number of important reasons:

   - Washing chemicals. Most shampoo, clarifiers, and rinses are mild to avoid irritating the skin. In contrast, laboratory cleansing agents include pure alcohol, intense solvents such as acetone, and harsh detergents such as Triton-X used at Doctor’s Data, for example. These penetrate the hair far more than plain shampoo and tap water.
   - Distilled versus mineralized water. Most water used for bathing has minerals in it. Most labs wash the hair with laboratory-quality, double or triple distilled water. This removes many more minerals from the hair, as this is one property of distilled water.
   - Duration. A less important factor is that during showering, the hair may only be washed for a minute or less. The laboratories, however, often wash the hair for 3-10 minutes.

ARE REFERENCE RANGES OR IDEAL VALUES BEST FOR HAIR ANALYSIS?

Most laboratories offer mathematical reference ranges on their graphs, such as one or two standard deviations from a normal. Development science depends on the use of ideal or optimum mineral values rather than reference ranges. The reasons for this include:

- Average or normal levels are not helpful because they are based on “average” people who are often unhealthy. Development seeks optimal or ideal health, not average health.
- Higher standards are needed. A healthy future of mankind on earth requires tighter or higher standards than are currently used in post-modern medical care.
- Normal ranges are not precise enough. In development, subtle imbalances are often very important.
- False confidence. With mathematically-defined reference ranges, if the numbers fall in the “normal range”, doctors may assume their patient is healthy, when this is often not the case.
Sadly, Analytical Research Labs is the only hair testing laboratory at this time that even offers ideal hair mineral values on their graphs.

**CAN ONE REALLY RECOMMEND FOODS AND NUTRIENTS BASED SOLELY ON A HAIR ANALYSIS?**

Some uninformed doctors object to the use of hair testing to suggest diets, lifestyle changes, vitamin doses, drinking water and other healing modalities such as sauna therapy. However, the explanation is simple. For example, if copper is too high one may suggest methods and remedies such as vitamin C to reduce the level of copper. Other ways to lower the copper might include distilled water, coffee enemas, sauna therapy and changing the diet to reduce copper intake.

**WHY ARE HAIR TEST RESULTS OFTEN DIFFERENT FROM BLOOD AND URINE TEST RESULTS?**

Their meaning is not different, but requires that one interpret the hair and blood tests correctly to understand what is occurring. Few understand both types of tests well enough to do this. Some of the major differences between hair testing and blood or others tests include:

- *The hair and the blood measure different body compartments*, each with their own metabolism.
- *The blood is maintained at the expense of tissues such as the hair*. This means the hair will change first, often years before the blood.
- *The hair is a storage and to some degree, an excretory tissue. The blood is a transport medium.*
- *Blood, urine and saliva provide short-term or even instantaneous readings, whereas a hair test provides an average and a longer-term reading.*
- *Homeostatic mechanisms at work in the blood such as buffering of pH and osmotic balance are extremely different from homeostatic mechanisms at work in the tissues and at the cellular level.*

**IF HAIR TESTING IS SO HELPFUL, WHY IS IT NOT USED MORE?**

Hair testing is used hundreds of times daily throughout the world for biological monitoring, forensic testing, drug testing and other purposes. Mineral analysis by mass spectroscopy is also the standard method of measuring minerals in geology, mining, astronomy, environmental sciences, all chemical laboratories and hundreds of other industrial and governmental applications.

It is not used more in post-modern medical care because allopathic licensing boards may not approve of it, doctors are not trained in its use, and most doctors and other medical personnel are horribly ignorant in general about nutrition, toxicology, biological monitoring, screening tests and the use of this excellent test for these purposes.

**HOW VALID ARE SEVERAL WELL-PUBLICIZED NEGATIVE REPORTS ON HAIR ANALYSIS?**

Over the past 25 years, the *Journal of the American Medical Association* published two very biased studies about hair analysis. They were widely publicized and are still referred to as “definitive proof” that hair testing is unreliable and fraudulent. The reader can decide for himself:
The August 1985 study. (JAMA, 254:8). Fifty-six hair samples were sent to 13 different laboratories and the results analyzed for consistency. Based on the fact that some results correlated excellently, but others did not, the author claimed that all hair analysis was probably a fraud. The results were highly publicized in the media. Flaws in this study included:

- **Long hair was used.** To obtain the hair samples, the study’s author cut several very long strands of hair from his two teenage daughters. He then cut them into small pieces to obtain 56 supposedly identical samples. This violates standard protocol because hair should be cut close to the scalp and samples should be no more than 1 to 1.5 inches long. The ends of long hair are far less reliable for testing because they are several years old and are often severely damaged by repeated washing, bleaching treatments, coloring and other factors.

- **Mixing pieces of hair together by hand does not produce identical samples.** Hair is very electrostatic and cannot be mixed easily by hand. The correct protocol to obtain identical samples is to powder the samples in a special machine, and then mix the powdered samples.

- **Hair was “washed” under the kitchen tap after it was cut.** This violates hair analysis protocol from all laboratories that I am aware of. Standard protocol that all labs insist upon is to wash the hair before sampling, but not afterwards. Even if washing were a good idea after sampling, one would never dream of using tap water, as it is often rich in minerals that can be absorbed into the hair upon washing. This should have ended any interest in the study by the editors of the Journal of the AMA, had they been interested in a quality study.

- **The study compared different procedures that always yield different results.** Hair was sent to 13 different laboratories. Some do not wash the hair at the lab, while others wash it in various chemicals for differing lengths of time. This has to produce differing results. However, no mention was made of the fact that labs prepare the hair samples differently and the author did not discuss the results in terms of the labs that wash in alcohol, those that wash with detergents or acetone, and those that do not wash the samples at all. Either the study’s author was unfamiliar with hair analysis protocols or he did not care.

- **The author admitted in the study that he had no expertise in hair mineral testing, and had never run a hair test.** This seems extremely odd. Would this journal print a study of brain surgery by a doctor with no experience in this field? I strongly doubt it.

- **Very poor referencing.** The author cites 8 references and, among them, at least three were not scientific studies. Two referred to a legal case involving a testing laboratory and one was a book about statistical methods. This should have disqualified the study for publication if it were truly peer-reviewed. As mentioned earlier in this chapter, the US Environmental Protection Agency had completed a study of hair analysis only six years earlier in which they reviewed over 400 scientific papers on hair analysis. Traditional medical doctors are often quick to criticize non-mainstream studies if the references are scanty, but somehow this one passed muster and was spread far and wide.

- **The author of the study had a clear conflict of interest.** At the time he did the study, and I believe presently as well, this author is affiliated with and has been the director of Quackwatch, an organization paid for by mainstream drug and other interests that regularly denounces newer, holistic methods of health care.

The January 2001 study. A second study that claimed to “revisit” the 1985 study was published in 2001 (JAMA, 285;1). Some of the flaws in the old study were corrected, but there were other problems with it. Six hair samples were cut from one woman’s head hair and sent to
six laboratories for analysis. The samples were the right length and were not washed under the kitchen tap before being sent to the laboratory. The authors again concluded that hair analysis is unreliable and probably a fraud. Flaws in this study included:

- **Only one patient was involved.** I learned in medical school that the use of one person to draw any conclusion is merely anecdotal, and does not constitute a study at all. Mainstream medical groups often criticize small studies by alternative practitioners. Somehow, this “study” managed to be peer-reviewed and printed in a leading mainstream medical journal.

- **An illegally-operating laboratory was included in the study.** This is so bizarre it is almost unbelievable, and of course, should invalidate the study. Imagine a study of a brain surgery technique that deliberately used an illegally-operating hospital or a doctor who was not properly qualified to do the work. Would this have ever gotten published anywhere? I highly doubt it.

   Oddly, the use of the illegal lab was noted in the study, but no explanation for it was given. Several other legally-licensed laboratories could have been used, instead. The illegally-operating laboratory also happened to report the worst results, which caused the authors to draw their conclusion about hair analysis. Using an illegally-operating laboratory only makes sense if the goal was a deliberate attempt to discredit hair mineral analysis.

- **Very poor referencing.** Only 39 references for hair analysis are given. Of these, at least two had nothing at all to do with hair analysis, but were books or papers on statistics. As stated above, hundreds of studies of hair mineral testing exist and were ignored.

- **Comparing apples and oranges.** The authors mentioned that some laboratories wash the hair while others do not. However, they ignored this fact in their conclusion. Instead, they just compared the numbers, which cannot really be done between labs that wash the hair and labs that do not wash the hair.

- **Ignoring positive results.** When one examines the results carefully, the two laboratories that do not wash the hair, Analytical Research Laboratories and Trace Elements, Inc., showed superb correlation between their results. Six of the nine major elements were identical in parts per million. The rest were well within standard laboratory ranges of accuracy. This fact was not even mentioned. In other words, this anecdotal report found that among the hair testing laboratories that do not wash the hair, hair mineral testing was extremely accurate and reliable.

   The fact that these two “studies” were published at all, let alone in a leading post-modern journal, is a sad reflection on the quality of mainstream medical research. It indicates either gross ignorance and negligence within the peer review and editing processes, or perhaps a hidden motive to discredit a newer test that threatens the status quo in medical care.

**The CDC report on hair analysis.** Another shameful government pronouncement on hair testing took place in 2001 at the Centers for Disease Control and Prevention. A panel was assembled to evaluate “the state of the art of hair analysis”. It involved seven “experts” in toxicology and other fields and 50 public observers.

   The experts reviewed 7 studies of hair analysis to prepare for the meeting. In addition, another 25 studies were cited during or after the meeting. Based on this “review”, the panel concluded that hair analysis is not effective or reliable as a method of biological monitoring for toxic metals, with the exception of methyl mercury. Flaws in this report include:
• **Extreme lack of references.** A review of only 32 studies of hair analysis should have disqualified this panel right away. In addition, of the 32 papers, one was a CDC paper on toxic chemicals, one was a report on the anatomy and physiology of hair, and one was an article about controlling hair growth. Another concerned Napoleon Bonaparte’s exposure to arsenic in 1816, while another was about regeneration and rate of hair growth in men. One was also the 1989 recommended dietary allowances. Totally ignored were literally hundreds of studies, many of which are in the reference section of this text.

• **Overlooking their own research.** There was no mention or citation of the government’s own 300-page review of over 400 studies of hair analysis conducted in August of 1979. This was a real review that could have been updated by the CDC, had they cared to do so. The earlier review concluded that hair testing was “meaningful and representative for biological monitoring for the major toxic metals”.

• **Unqualified experts.** The 7-member panel of ‘hair mineral analysis experts’ included 1) a professor of emergency medicine, 2) the president of an internal medicine consulting service, and 3) an employee in the Department of Health Education and Promotion at the ATSDR. Also among the experts was Dr. Seidel, one of the authors of the second *JAMA* study described above. This might be seen as obvious bias, since she was the lead author on a very negative study of hair analysis. The reference for this panel discussion is www.atsdr.cdc.gov/hair_analysis/.

The only way to evaluate a method such as development properly is with what are called prospective, retrospective or tabular studies. These are fancy words for looking at cases over time, without regard to anything except the outcomes. I encourage all practitioners to review their files and publish such case histories.
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### MIXED OXIDIZER

### FAST OXIDIZER

### SLOW OXIDIZER

N/A = NOT AVAILABLE, REPORTED IN Ng/L. Testing by ACCUTRACE LABORATORIES, INC. • CLIA #05/034188 • Phoenix, AZ USA 85021. COPYRIGHT © 1981-2002 by ANALYTICAL RESEARCH LABORATORIES, INC. ARL-74-02/02
20. HAIR ANALYSIS INTERPRETATION PRINCIPLES

William, age 56, came for a consultation five months after his first heart attack. His symptoms included angina or chest pain, fatigue, obesity, joint pain and hypertension. He had done many chelation treatments, but these only provided temporary relief of his angina. His first hair analysis revealed a sodium/potassium ratio of 0.53:1 (normal is about 2.5). This is a severe cardiac stress indicator.

William made slow progress, first noting a reduction of arthritic pain and angina. His first retest hair analysis actually looked a little worse, but he felt a lot better. This occurs, at times. In his instance, toxic metals were acting like crutches, propping up certain mineral readings. As they were eliminated, the hair patterns often temporarily look a little worse, but the client feels better. Later charts showed a much better sodium/potassium ratio, indicating a normalization of this important vitality indicator. William's blood pressure slowly came down to normal, the angina subsided and his energy began to return.

Hair tissue mineral analysis is the major assessment method used in development. It is not perfect, but it is quite effective and even remarkable in what it can reveal. This chapter is divided into 1) principles that apply to each mineral reading individually and 2) those that apply to the readings in general. The next chapter discusses components of the hair analysis readings. In addition, Chapters 40 through 43 discuss psychological aspects of hair analysis interpretation.

PRINCIPLES THAT APPLY TO EACH MINERAL READING INDIVIDUALLY

THE TISSUE BIOPSY PRINCIPLE

A hair mineral analysis is a biopsy or tissue test. That is, it is a measurement of reading of the cells and interstitial spaces of the hair tissue. Confusion occurs when one forgets that the hair test only measures minerals in the hair. It does not measure the level of minerals in the entire body, for example, or in any other organ or tissue. This is one of the most common errors among doctors who use hair testing. They assume that the high or low reading reflects the total body load of a mineral, but this is rarely the case. The readings, as explained elsewhere, constitute a “mineral system” that is kept in a particular balance. A low zinc means that sodium may be high, for example, and zinc compensates for it. A high copper may mean adrenal weakness, and so forth.

Hair analysis does not measure the total body load of a mineral. In fact, trying to assess the total body load of a mineral is not a particularly useful idea. Reasons for this include:
• The mere presence of a mineral is not that important. Nutrient minerals must also be in a bioavailable form to be utilized properly. Just knowing the total amount does not tell one how available the mineral is.
• Even the total load of a toxic metal may not be that important. For example, cadmium stored in the bones is far less of a problem than a tiny amount lodged in the kidneys or the brain.
• It is impossible with current technology to assess the total body load of a mineral. One would literally have to biopsy every cell and organ of the body.

Implications:

• Use care in any attempt to compare hair analysis with blood or other kinds of mineral tests.
• Those ignorant of tissue mineral testing claim the technique is invalid because it does not reflect the total body load of a mineral. However, no one claims that it does. The only claim is that one can infer certain information about mineral metabolism by knowing the stress response patterns as indicated on the hair mineral test. This is the goal of interpretation.

THE AVERAGING PRINCIPLE

Each hair mineral reading represents an average rate of mineral accumulation in the sample over the sampling period (8-12 weeks). This means that the actual mineral deposition in the hair tissue can vary from day to day and week to week. We only know the average accumulation. This must be understood to avoid confusion, at times. For example, a zinc reading may seem very high on one test, and then decrease on the next test. This may make little sense until one realizes that the level may have been decreasing constantly over the past six months, but we can only see the average reading during each period that the hair grew.

Advantages and disadvantages of longer-term, average readings. Advantages of longer-term readings are: 1) long-term trends and patterns are often easier to see and 2) readings are not affected by day-to-day ups and downs due to dietary changes, menstrual periods and other shorter term factors. The advantage of an instantaneous reading is it would give a more up-to-date reading. The best we can do if this is required is to use very short pieces of hair cut very close to the scalp. This will provide a more recent picture, but it will still not be an instantaneous report like a blood test.

Implications:

• A single hair test cannot reveal if a mineral level is increasing, decreasing or remaining steady over the three-month growth period of the hair.
• Identical readings on a person’s successive hair tests may have different meaning. For example, let us say the copper level on two tests is 4 mg%. It is possible that during the three months represented by the first test, the copper was rising, but averages 4 mg%. During the three months represented by the second sample, the copper level may be falling, but still averaged 4 mg%. The meaning is different, but the average reading is the same.

THE PRINCIPLE OF BIOAVAILABILITY

A very high or a very low hair level may indicate biounavailability of the mineral.
Bioavailability refers to the ability of the body to utilize a mineral or incorporate it into an enzyme or other binding site. Bioavailability is perhaps the most critical principle to learn in hair analysis interpretation and development science. Bioavailability is also one of the most important, most complex and least understood phenomena in medical science. Reasons a mineral may become biounavailable include:

- **Ionization state** – This means whether a mineral is in an ionic (free) state or a bound state. This applies to calcium, for example, as explained in Chapter 14.
- **Valence** – Some minerals can only be utilized when in an electrical state of matter with a particular number of electrons in its outer shell. This applies in the case of iron, manganese, chromium and perhaps other minerals. They may be toxic when in the wrong valence.
- **Synergistic co-factors** – Copper, vitamin C and other nutrients, for example, may be required to help fix calcium in the protein matrix of the bones.
- **The need for a mineral transporter** – Transporters are mechanisms or chemicals that move minerals throughout the body. Copper and iron, for example, require transporters such as metallothionein. Without enough transporter activity, a mineral will not be utilized correctly.
- **Binding proteins** – These are similar to transporters in some cases. Minerals must often be chelated or bound to a protein to be utilized.
- **Hormone levels** – For example, aldosterone is required to raise the tissue sodium level and reduce loss of sodium through the urine.
- **pH of the stomach or other compartment of the body.** Properly acidic gastric juices are helpful to chelate most minerals in the diet. Otherwise they may not be utilized well. The pH balance may also affect the ionization level and other properties of minerals.
- **Nutrient levels.** Other nutrients are frequently needed to synthesize mineral transporters or to facilitate chemical reactions that make minerals more bioavailable.

This principle explains many facts about hair analysis interpretation. For example, a person with a high level of a mineral often demonstrates symptoms of deficiency of the same mineral. The reason is that a very high reading of calcium, for example, often indicates biounavailability. Development science can help greatly to make minerals more bioavailable by balancing body chemistry.

**Implications:**

- It is not so much what one eats, but what is used by the body that is important.
- Bioavailability can help explain the phenomenon that a mineral level may jump from low to high on a hair test within just a few months, even though none of that mineral was given. The mineral level jumped because it was always present, but was sequestered and unavailable. Giving other nutrients and balancing the oxidation rate enabled the unavailable mineral to be utilized properly, or perhaps be released from a storage site.

**THE SUMMATION PRINCIPLE**

Each hair mineral reading represents a sum of metabolic events. Each mineral level is really a composite of factors, some of which elevate the reading while others decrease it. With
current technology, one can only read the sum of the effects influencing the mineral reading. The components of this sum are discussed in the next chapter, and may include:

- Normal hair mineral metabolism.
- Mineral retention, deposition or loss of minerals into the hair.
- Mineral retention elsewhere in the body.
- Displacement.
- Defenders.
- Effects of foods and dietary habits.
- Effects of emotions and upbringing or childhood patterns.
- Effects of prescription drugs.
- Effects of lifestyle patterns.
- Effects of genetics or other more subtle factors.

Possible implications:

- At times, mineral readings must be 'dissected' into their components to avoid jumping to premature conclusions about their meaning.
- At times, several hair tests in succession may be needed to understand a mineral reading.

**PRINCIPLES THAT APPLY TO THE TEST AS A WHOLE**

**THE SYSTEMS PRINCIPLE**

Always view all of the test readings together as a 'system', rather than as isolated numbers. This is a most important principle when interpreting a hair analysis with the method developed by Dr. Eck. One should view the individual minerals like pieces of a jigsaw puzzle. This takes some practice. Do not be concerned if the pieces of the puzzle don’t all fit together at once. Some readings may be left unexplained for the time being, perhaps until a retest is performed in a few months. This is absolutely acceptable in development science.

Implications:

- Hair analysis readings are often much more interdependent than blood test readings.
- Hair mineral readings may be much more complex to interpret than blood or urine tests.

**THE STRESS RESPONSE PRINCIPLE**

The macromineral and trace mineral readings on a hair analysis partially reflect the body’s recent responses to stress. This is a difficult principle for most practitioners. Instead of just measuring minerals in the body, one is measuring the body’s response to stress. In other words, stress causes the mineral values to shift in certain ways that are reflected on the test. This is not as true of most of the toxic metals.

Implications:

- Only with a basic understanding of the stress theory of disease and how to apply it can one appreciate hair mineral analysis and development science.
• **Readings cannot be compared to blood tests or other types of testing unless one has a deep understanding of what the hair mineral levels represent.**

**THE HOLISM PRINCIPLE**

A hair mineral analysis is a holistic test. This means it includes and reflects heredity, upbringing, lifestyle, diet, drinking water, attitudes, body chemistry, as well as health and disease states. Stated differently, the test reveals an overall picture that is influenced by many factors. In one person, a high-sugar diet may affect the readings the most. In another person, weak adrenal glands from birth, or intense fears due to a childhood trauma may be the dominant factors on the test. In another instance, a viral infection may be most critical.

**Implications:**

• To interpret a hair mineral test properly, one may require more than just the chief complaint and a physical exam. For example, lifestyle and dietary information can be crucial.
• To correct the numbers on a hair analysis, more than nutrition may be required. Perhaps the lifestyle and even a person’s thinking habits are important to correct in some cases.

**PRIMARY AND SECONDARY READINGS PRINCIPLE**

Certain levels, ratios and patterns on a hair test are primary or more important. Others are secondary and less vital to understand. For example, doctors often fixate on a high copper or mercury, and ignore the oxidation rate, which is far more important in most cases. In fact, a key to removing toxic metals is balancing the oxidation rate, not focusing on toxic metals.

Below is the rough order of importance of the hair mineral readings:

• **Most critical** are the calcium, magnesium, sodium and potassium levels, and their ratios. These are first because they are primary regulators of metabolism, and they reflect the whole system of the body and the stress response more than the others.
• **Next in importance** are zinc, phosphorus, and toxic metal levels when elevated. Zinc and phosphorus have to do with protein synthesis, another critical systems behavior.
• **Least critical, in most cases,** are the readings for iron, manganese, copper, selenium, chromium and other minerals. These can be important if elevated, but are often affected by other factors, making them less reliable. For example, to assess copper status properly, the copper level is often not important. Instead, one looks for the hidden copper indicators that are discussed in Chapter 15.

**THE DYNAMIC PRINCIPLE**

A single hair test is a “snapshot” of a dynamic, continuously-changing “moving picture” process of life. This is a reminder that our bodies are never static, but are always in a state of flux and change. A few patterns on a test, such as the sodium/potassium ratio, can indicate directional movement of the oxidation rate, for example. However, in general, one can only see the dynamic process by reviewing a series of hair tests taken over a period of months or years.
THE LAYERS OF ADAPTATION PRINCIPLE

In general, a hair analysis reveals the outer layer of many layers of adaptations or compensations that have occurred during a person’s life. Repeat hair tests, assuming one follows a properly designed development program, reveal ever deeper layers of adaptations that require correction.

Our bodies adapt to stress by altering themselves moment to moment, and day to day. These adaptations build up, layer by layer. Each adaptation requires more of the body’s energy, so as one ages, less and less energy is available for all other bodily activities.

Development reverses this process. The goal is to reduce the adaptations the body must make, which frees energy for more healing and for all other activities. Most layers must be corrected one at a time. As this is done, it frees the body’s healing power a little bit, which, in turn, uncovers or brings to the surface a deeper layer to be healed. This is a fascinating fact about our bodies. It can sometimes take years, in fact, to uncover the most superficial layers of human imbalances. As these layers are uncovered and unwound, all physical and emotional symptoms and diseases tend to vanish because they were simply evidence of adaptations and compensations.

Implications:

• In most cases, one cannot understand a person’s health condition from just one hair test.
• A single hair test can be confusing because most of a person’s adaptations are hidden. Thus, the cause for many symptoms may not be readily apparent.
• A retest hair analysis after several months on a development program may reveal quite different mineral patterns. This can be confusing unless one understands this principle.
• For best results, do not promise quick symptomatic results with development, except perhaps very generally. One may need to retrace several layers of imbalances before correction of a symptom occurs, and this may take weeks, months or, in some cases, it can even require several years.

THE EARLY INDICATOR PRINCIPLE

Hair is often an early indicator of physical and emotional imbalances compared with blood, urine, saliva and x-ray examinations. Occasionally, someone tells me that hair testing is inaccurate because they cannot confirm the imbalances it reveals with a blood or urine test. A major reason for this is that hair testing is often a very early indicator. The hair test is often very accurate and reliable, provided the lab does not wash the hair and the test is interpreted correctly. Reasons why hair testing is often an early indicator include:

• The body deposits toxic metals in tissues such as the hair to get rid of them. This can go on for years, until the body can no longer keep up this adaptive behavior. Only then does the problem cause symptoms or imbalances that are revealed on a blood test, for example.
• The blood is generally maintained at the expense of the tissues such as the hair. This means that a zinc deficiency, for example, will show up far sooner in the hair because the body will literally reroute zinc from the less important tissues such as the hair to maintain the level in the blood and other vital organs.

Another example of how the blood is maintained at the expense of the tissues is that toxic
metals are removed from the blood within 90 days or less after a toxic exposure. They are shifted into the hair and other non-essential tissues, where they do much less damage. This protects the blood that touches all body tissues, at the expense of the hair. This is why blood serum is not a good place to locate toxic metals, unless the toxic exposure took place in the past month or two.

• The hair is a cellular biopsy. This means it provides information from the deepest level of metabolism, where most problems begin. For this reason, it often reveals imbalances long before symptoms or signs arise in the blood or elsewhere.

Other reasons imbalances on a hair test are not found on blood, urine or other tests. Hair analysis findings are trends or research associations, rather than diagnoses. Diagnosis is an allopathic approach to disease that too often waits until serious problems have developed before trying to correct the situation. The hair test picks up tendencies or trends. Often, the trend has not yet manifested as symptoms, so it may not be revealed on other types of tests. However, this does not mean that the trend or tendency is incorrect.

Implication of this principle:

• Do not expect hair analysis findings to be confirmed immediately by blood or other testing.

THE FLIGHT ANALOGY

A metaphor to help read a hair analysis is that of flying in an airplane. Here are the possible situations:

• The oxidation rate. Fast oxidation is similar to flying high and fast, while slow oxidation is flying much slower and lower. Problems with flying too fast and too high are that this exceeds the design specifications of the aircraft. A very fast oxidation rate is extremely hard on one’s airplane at any age, even as a small infant. The airplane is never the same due to the extreme stress this puts on it.

• Unlike a real airplane, in the body a very fast oxidation rate actually uses up or “burns out” many vital minerals or parts of the body. When the correct nutrient materials are not present to repair the plane, repairs are made instead with inferior toxic metal material such as lead, arsenic, cadmium, mercury and aluminum. These replace the better materials such as magnesium, zinc, selenium and others that make for an intact aircraft.

• Mineral deficiencies and toxicity develop. This forces the plane to begin to slow down. Either it just can’t fly as fast, or the damage to it makes it very unstable, like a person with ADHD, or panic attacks.

• Fast oxidation with a low sodium/potassium ratio. The plane begins to ‘stall’. The shape of the low sodium/potassium ratio on an Analytical Research Labs graph even resembles an aircraft wing in a stall position.

• Slow oxidation. This is when the plane is flying too low and slower than the way it was designed to fly. It makes a person feel sluggish and often somewhat depressed. The plane is much less maneuverable, meaning that coping with stress is more difficult.

• Hair calcium level rises. A crude analogy is smearing cement on cracks and damaged areas of the aircraft. This protects the aircraft, but weighs it down, causing it to fly lower.
• **Some develop a calcium shell.** This is like smearing cement all over the plane, either to protect it from damage or to try to blend in better, or disappear and withdraw from society. These are people who are often seeking to “fly under the radar” or become somewhat invisible.

• **Sympathetic dominance.** This is like revving the engines in a futile attempt to get back to flying high. However, the plane is too damaged physically or psychologically, so it does not work, no matter how hard one revs the engines.

• **Four highs** is akin to speeding up the plane to some degree. However, it is purely temporary and often very unstable and unsafe for health. The plane in this situation is really in bad shape. Fortunately, people in four highs pattern usually slow down easily with our help.

• **Four lows.** This occurs when the rudder or a stabilizer is broken. The plane just repeats endless end-over-end rolls that are difficult to stop. The plane goes nowhere fast and becomes more and more damaged.

• **A hill pattern occasionally occurs.** It is a feeling that one is soaring on top of the world.

• **The three amigos, along with copper, cadmium and a few other toxic metals.** These are special because they appear to support the plane, like little rocket thrusters to help keep a damaged plane flying. However, they are not part of the original design, so they further damage the plane in the process of keeping it flying.

• **Double low ratio and double high ratio patterns.** These are like having a biplane with two wings that are either in stall position (double low ratio) or dive position (double high ratio). In other words, these patterns reinforce the sodium/potassium ratio imbalances.

• **A step down pattern or a high sodium/potassium ratio are ‘dive’ positions.** They can be successful attempts to pick up some speed. These people often have dug in their heels and can continue this way for some time.

• **A step up pattern is a dive upward, an extremely dangerous maneuver that always fails and must be turned around fast.** It includes a low sodium/potassium ratio, which is the stalled wing pattern.

• **Spiritual defensiveness pattern.** This is a very high calcium/magnesium ratio. The imbalance seriously weighs down the plane, keeping one from soaring. In this pattern, the person defends a situation, behavior or attitude when it is time to move on.

• **The phosphorus level, along with the sodium/potassium ratio, are a little like fuel indicators.** When low, the plane is losing altitude due to lowered energy or vitality.

• **Elevated toxic metals.** This is like an airplane that is overloaded with heavy weights. It is never a helpful situation and every effort should be made to “lighten up”. This can help the plane gain more altitude. Those flying high (fast oxidizers) who are loaded with toxic metals are often just throwing them off, which is like the pilot jettisoning extra weight to fly faster.

• **Any change can be traumatic.** In time, each of us becomes used to his own speed of flight. Anything that changes the rate of climb or fall, or the speed or altitude may feel odd and can cause some anxiety or fear. This often slows one’s progress on this healing journey.

**The goal is to have a safe and happy flight.** A safe flight means to fly at an altitude that is comfortable and safe for the condition of your aircraft, neither too high and fast, or too low and slow. Ideally, your craft should be able to speed up when needed to avoid thunderstorms and other obstacles, or slow way down, at times, to relax the crew. This condition of health and vitality is termed balanced and flexible oxidation.
21.
COMPONENTS OF HAIR ANALYSIS READINGS

Jack, age 62, was retired and had worked cleaning up toxic chemicals, a very dirty job. His symptoms included constipation, diarrhea, gas, bloating, stomach pain, colitis and gall stones. He also complained of muscle weakness, hypoglycemia, sinus congestion, fatigue, feeling cold in winter, fungal infections, depression, mood swings, anxiety, insomnia, poor memory and a pain under his right shoulder blade that improved when he took some magnesium.

Jack had been to many doctors, both conventional and holistic ones. He had also been to clinics in Mexico and elsewhere looking for answers to his health concerns. His first hair mineral analysis revealed a four highs pattern with a balanced oxidation rate. Iron was extremely high at 6.4 mg%, along with slightly high manganese of 0.05 mg% and a high aluminum level of 1.29 mg%. The last three are called the ‘three amigos’ because they are often found together in the body and on hair tests.

Selenium was very elevated at 6.54 mg%. This is almost always due to using Selsun Blue shampoo, which contains selenium. In this case, however, I believe it was due to handling toxic waste for years. The test also revealed elevated lead at 0.12 mg%, high mercury at 0.13 mg%, and a very high nickel level of 1.29 mg%. This is quite a toxic load.

Jack did extremely well on a development program. He said it was the best program he had found to really improve his health. All his symptoms slowly improved. He started meditating as well, which improved some family problems he was having. He retested his hair about three times each year for five years. He tended to stay in a four highs pattern.

In 2007, he began to use magnesium oil on his skin, which had become somewhat popular among health-minded people. He said rubbing it on gave him extra energy. His next hair analysis showed a much lower sodium level and an extremely low sodium/potassium ratio of 0.58. This indicates chronic stress on the liver, kidneys and often the cardiovascular system. In addition, the zinc level was six, a dangerous level for anyone, but particularly a man of his age. His hair magnesium level was also outrageously high at 760 mg%, with a calcium/magnesium ratio of 0.13. This ratio must remain between about 5 and 9.5 or health problems will often occur.

When I saw this test, I asked Jack what he was doing and advised him to stop the magnesium oil immediately. I do not know if he complied. However, soon afterwards he had a massive stroke that left him partially paralyzed. The point of this case is to be very careful with new products of all kinds. If a product makes a person feel better quickly, it is likely acting as a stimulant, even if it is a “natural” substance or procedure. Especially in older people, this can be dangerous because balance is a key to health.
This chapter is an explanation of the summation principle from the previous chapter. It is a more detailed look at the components which make up a hair analysis reading. Components of a mineral reading may overlap, and can include the following:

<table>
<thead>
<tr>
<th>Normal hair metabolism</th>
<th>Effects of diet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mineral deposition in the hair</td>
<td>Effects of emotions</td>
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<tr>
<td>Mineral retention elsewhere</td>
<td>Effects of medications</td>
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<td>Displacement</td>
<td>Effects of lifestyle and genetics</td>
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<td>Defenders</td>
<td>Effects of mental development or other factors</td>
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**NORMAL MINERAL METABOLISM**

The normal deposition of minerals in the hair as it grows is represented on the hair analysis chart by the ideal value or optimum range. Dr. Eck decided to use a single set of ideal or optimum hair mineral values for everyone, even though he knew well that babies and small children, for example, tend to have faster oxidation rates than adults. Also, he knew that women tend to have a slightly slower oxidation rate than men, and tend to have a higher copper level than men. As this science becomes more precise, perhaps we will use slightly different ideal values for young children, but for now the current system works excellently.

**MINERAL LOSS, DEPOSITION OR EXCRETION THROUGH THE HAIR**

Mineral loss, deposition, or excretion through the hair raises the hair reading. A mineral may be deposited or excreted through the hair for different reasons:

- *A certain amount of any mineral that is high in the blood will find its way into the hair.* For example, in the alarm stage of stress or fast oxidation state, sodium and potassium are retained by the kidneys as part of the stress response. A certain quantity of this sodium and potassium are deposited in tissues such as the hair.
- *Toxic minerals are deposited in the hair to remove them from circulation.* Toxic metals such as aluminum, arsenic, lead, mercury, cadmium and nickel are deposited to some degree in hair tissue to minimize their harmful effects.
- *Biounavailable minerals may be deposited in the hair.* In slow oxidizers, for example, some calcium and magnesium precipitate out of the blood and deposit in soft tissues including hair.
- *Zinc, in particular, is often elevated when toxic metals are present in high quantity.* The zinc may come out along with the toxic metal, usually copper, or it may buffer or protect the body in some way.
- *On a development program, previously stored minerals are often released and excreted through the hair.* This may include any mineral, not just the toxic metals. When a vital mineral is excreted through the hair such as copper or iron, it is very often a biounavailable form of that mineral that the body cannot convert to a usable form, so it must remove it.
- *Phosphorus may be elevated in pubic hair.* This appears to be a characteristic of some pubic hair and not related to any other phenomenon.
- *Environmental or occupational contamination.* A high level is rarely caused by a shampoo, a hair dye, bathing in water with a water softener, or something else.

**MINERAL RETENTION ELSEWHERE IN THE BODY**
Mineral retention or mineral loss elsewhere in the body causes a lower than expected reading on a hair test. It may occur in the following situations:

- **Mineral loss through the kidneys or another route can reduce the hair level of a mineral.** For example, in the alarm stage of stress or fast oxidation, calcium and magnesium are excreted through the kidneys as part of the fight-or-flight reaction. This eventually causes a decrease in the amount of calcium and magnesium deposited in the hair. This is an actual loss of calcium and magnesium from the body.
- **Certain minerals are deposited in sites other than the hair.** For example, copper often deposits first in the liver, the brain, the joints or the female organs before showing up in the hair. Mercury and cadmium collect in the kidneys, brain and elsewhere. A year or more of development may be needed before cadmium is revealed in the hair as it is mobilized from tissue storage sites.
- **During nutritional therapy, it is not uncommon for levels of essential minerals to decrease temporarily.** In some of these instances, the initial reading was rather high, perhaps due to displacement upward by a toxic metal. In other instances, the mineral level in question is lower on a retest because it is being retained elsewhere in the body. Most often this occurs as vital elements such as zinc or chromium replace toxic metals in critical enzyme binding sites somewhere in the body. This is common and not a cause for concern.
- **Biounavailable minerals often read low.** This is discussed in a paragraph below.

**DISPLACEMENT**

A hair mineral level may be elevated because it is being displaced by another mineral. Henry Schroeder, MD wrote:

> “Cadmium avidly displaces zinc and changes or inactivates zinc enzymes, causing disease; arsenic displaces phosphorus, causing disease;...bromine displaces chlorine; beryllium displaces magnesium;...strontium displaces calcium; lithium replaces sodium;...rubidium displaces potassium, as does cesium in bacteria...” (*The Trace Elements And Man*, p. 7).

The most important displacements I have observed include:

- **Iron** can displace zinc, chromium and other minerals, causing higher zinc, chromium and perhaps other mineral readings.
- **Cadmium** displaces zinc, copper and other minerals as well. The zinc level on the test may look normal or even high. As cadmium is removed, a lower, and truer zinc reading occurs.
- **Lead** can displace many minerals, particularly calcium, phosphorus and zinc.
- **Copper** can displace zinc, selenium and chromium at times.
- **Arsenic** can displace magnesium, calcium and other minerals.
- **Mercury** can displace magnesium, calcium and perhaps other minerals.

**DEFENDERS**

> A defender is a mineral that is acting to balance or maintain another mineral level or
ratio. It can either raise or lower hair mineral readings. All minerals act to some degree as defenders, as part of the normal homeostatic mechanisms of the body. It is an aspect of the body’s mineral system, which is discussed in Chapter 10. If we did not have complex buffering systems, drinking a glass of milk that is high in calcium, for example, would easily kill a person by unbalancing the minerals in the body.

Maintaining normal sodium levels. The concept of defenders is related to the stress response in many cases. Maintaining the minerals in balance is a key to reducing stress on the body and keeping the body functioning well. One of the most important minerals to maintain is sodium. Most of the defenders that Dr. Eck found relate to maintaining the level of sodium, and keeping the sodium/potassium ratio in balance. The body uses many ways to do this, such as raising copper, cadmium, arsenic, lead, aluminum and other toxic metals. It also may convert to a biounavailable form iron, manganese, chromium or selenium. These I call the amigos or friends. They might also be referred to as the irritants, because they appear to irritate the adrenals or the sympathetic nervous system. This can help keep the sodium level and the sodium/potassium ratio in a better range.

Defenders complicate hair analysis interpretation. At times, all minerals act as defenders. The trick is to figure out when this is so, in order to properly interpret a hair reading. Otherwise, one may be confused and may supplement a mineral that is not needed, or overlook one that is needed. Most of the time, sorting this out is not difficult. For example, one should assume that some or all of the amigos or irritants are present in excess in most slow oxidizers, as these are the people who tend to have a low sodium level. Also, most fast oxidizers today have at least some of them as well, as most are not healthy fast oxidizers.

Attempting to correct defenders. Doctors who are not familiar with the idea of defenders often try to correct a defender. For example, if zinc is low, they give zinc. If copper is high, they give molybdenum to lower copper. This is called replacement therapy and it doesn’t work well. In fact, attempting to correct a defending level often makes the patient worse, as Dr. Eck discovered on himself and others. The reason is that the body’s normal homeostatic mechanisms will resist every effort to alter the defending mineral. Examples of defenders are:

- Zinc. The body may raise zinc to lower a high sodium or lower an elevated sodium/potassium ratio. This would reduce inflammation as well. The body may lower zinc, at times, to raise a low sodium or raise a low sodium/potassium ratio. Supplementing excessive zinc to raise a hair zinc level may cause depression by unintentionally lowering sodium and lowering the sodium/potassium ratio.

  Zinc also defends against the physical and emotional effects of copper, mercury and other toxic metals. This commonly causes a high hair zinc level. It normalizes by itself when the toxic metals are gone. No attempt should be made to alter an elevated zinc in most all cases.

- The amigos or friends are special cases of defenders that raise sodium. The body appears to accumulate aluminum, iron, manganese and, at times, selenium and chromium to help boost sodium and adrenal activity. These minerals may accumulate in the form of oxides, which are biounavailable and toxic.

- Copper, cadmium, lead, aluminum, arsenic and other toxic metals often also raise the sodium level and the sodium/potassium ratio. They accumulate more in slow oxidizers, perhaps in part because slow oxidizers have lower sodium levels. Attempting to remove toxic metals with chelation, for example, does not take into account these complex defending roles of the toxic minerals. It makes chelation less effective and, at times, dangerous.
• Calcium can defend against too much stress or an inability to handle stress properly. Eventually, this can lead to a *calcium shell pattern* and psychological withdrawal.
• Copper and mercury may also defend against infections in the body, as these minerals have a powerful antiseptic effect. This is a different type of defender, however, because the minerals are not defending specific mineral levels or ratios.
• To some degree, all the minerals defend each other as they are part of a unified system.

**Correcting defenders is tricky.** A major problem with replacement therapies is that correcting defending minerals is not easy. *One must remove the need for the defender.* This requires knowing what the defender is really doing, and then correcting the underlying situation.

**Tricking the body.** Sometimes we can be very clever and give nutrients that will not only correct the critical hair mineral ratios and levels, but also correct a defender as well. This is what Dr. Eck’s formulas such as Limcomin do. This is why skipping one of these products because it seems redundant or for any other reason is not a wise idea.

**EFFECTS OF EMOTIONS ON TISSUE MINERAL PATTERNS**

Emotions have powerful effects on biochemistry, often through the action of the sympathetic nervous system. The condition of this nervous system can be read on a hair analysis in many instances. A person's chemistry and hair analysis may reflect attitudes and emotions as much as they reflect one’s food intake, lifestyle, medical conditions or any other factor. The large and important topic of how thoughts and emotions affect hair mineral analyses is discussed in much greater detail in Chapters 36 through 43.

**PRESCRIPTION DRUGS AND THEIR EFFECT ON HAIR MINERAL READINGS**

Prescription medications will affect hair mineral readings to the degree that they affect the stress response and body chemistry. Most drugs act at fairly superficial levels, though there are exceptions such as hormones, antibiotics, adrenergic blockers and others. The effects of medical and recreational drugs on hair tests is a complex area, especially when combinations of drugs are involved. Here are just a few possible effects of drugs on hair mineral readings:

• Mercury found in thiazide diuretics, contact lens solution and perhaps a few other drugs or cosmetics can possibly alter the hair mercury level, though the amount in them is not large.
• Aluminum is high in some anti-acids, anti-perspirants, and it is used as a base for many cosmetics. Prolonged use can definitely raise the hair aluminum level.
• Fluoride is found in anti-depressant drugs such as Prozac, and in some antibiotics such as Cipro. This may account for some of their therapeutic effects as well as some side effects.
• Drugs may also contain toxic metals introduced during manufacturing procedures.
• Drug effects on a hair test are dose-dependent and can depend on the duration of use.
• Hormone replacement therapy may initially boost sodium and the adrenal ratio. Later, the effect is often the opposite as the adrenals are weakened by the drug.
• Ritalin, Adderall, other amphetamines and all stimulants tend to increase adrenal activity at first, but eventually contribute to adrenal exhaustion. Ritalin may raise the sodium/potassium ratio. This may be why it works on certain children and not on others.
• **Cortisone-containing drugs initially raise the sodium level.** They may raise phosphorus by increasing protein catabolism. Eventually, they cause a lower sodium level, a lower phosphorus level, and a much lower sodium/potassium ratio.

Corticosteroids, in particular, lower calcium and copper in some cases of slow oxidation. This can relieve some symptoms, but may lead to osteoporosis and connective tissue problems later. Those on corticosteroids also may require more vitamin D.

• **The effects of combinations of drugs are harder to evaluate.** I don’t even try in most cases.

• **Most drugs deplete nutrients, at times horribly.** Cancer chemotherapy, for example, is a common treatment that depletes many nutrients. At times, patients are warned not to take certain supplements with chemotherapy as they may interfere with the anti-cancer effects of the drugs. This can be because a major part of the drug’s effect is to deplete certain nutrients.

I do not take clients off drugs, as that is not my area of expertise. It is a decision each must make, in conjunction, perhaps, with the prescribing doctor. I advise doctors to just base their recommendations on the hair readings as they appear on the test, since drug effects are often complex. With development science, most drugs are not needed, eventually. Our goal is to enable the client to reduce drug use, and this occurs in almost all cases.

**EFFECTS OF LIFESTYLE ON HAIR MINERAL READINGS**

Lifestyle is often a major cause of hair mineral readings. Always inquire about habits of sleeping, exercise, eating and others. A person’s occupation is also important in some cases.

• **Exercise** temporarily raises sodium and potassium, and lowers calcium and magnesium (by stimulating adrenal activity). However, excessive exercise weakens the adrenals and eventually causes adrenal burnout.

• **Resting** has the opposite effect of exercise. In the short term, it lowers the sodium and potassium levels because the adrenals rest more. Over a period of months, however, it will slowly enable the adrenals and thyroid to rebuild, and thus it is one of the most potent ways to help speed up and normalize the oxidation rate.

• **Fatigue or acute lack of rest can increase** the oxidation rate in a fast oxidizer. This is part of the fight-or-flight response to more stress. Eventually, however, inadequate rest always slows the oxidation rate in both fast and slow oxidizers.

• **Lack of emotional control** is associated with depletion of zinc, and with copper toxicity. The oxidation rate may fluctuate.

• **Common occupations** where there may be toxic metal exposure include plumbing, electrical work, welding, auto repair, painting, other arts, printing, machine shop work and others where there is exposure to metal dusts. Other occupations may also possibly expose workers to toxic chemicals that may influence a hair analysis in complex ways.

**OTHER FACTORS THAT MAY AFFECT HAIR MINERAL READINGS**

In individual cases, other factors that may affect the mineral readings are:

• **Structural problems such as chiropractic misalignments.**

• **Genetic imbalances and imperfections of many kinds such as Down’s syndrome.**
Electromagnetic fields, even from cell phones and portable phones, if exposure is prolonged or severe. Some far infrared saunas also emit large electromagnetic fields.

The presence of chronic or acute illnesses such as infections, arthritis and many others.

Injuries, accidents, surgeries or other traumas.

Other stressors. These can even include “positive” stressors such as moving to a new house, getting married, a new child in the family, or others.

Development. As a person develops the subtle human bodies, there can be unusual effects on a hair analysis in response to changes at deep levels of mental functioning.

PUTTING IT ALL TOGETHER

Here is an example of how to put together some of the interpretation information from this chapter and the next few chapters. Use it as a sort of quiz, if desired. Mrs. Smith’s first hair mineral analysis revealed the following:

<table>
<thead>
<tr>
<th>Element</th>
<th>Amount</th>
<th>Ideal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>156</td>
<td>40</td>
</tr>
<tr>
<td>Sodium</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>Magnesium</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>Potassium</td>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>

Basic interpretation: First, identify the important patterns in these numbers, as follows:

- **Slow oxidation.** The calcium/potassium ratio is 156 (above 4) and the sodium/magnesium ratio is 0.28 (less than 4.17). This is the definition of an extreme slow oxidizer.
- **Biounavailable calcium.** The calcium level is greater than about 100 mg%.
- **Low sodium/potassium ratio.** The ratio is 2, less than 2.5.
- **Sympathetic dominance.** The potassium level is 4 mg% or less.
- **Burned out sympathetic dominant.** This combines a low potassium and a low Na/K ratio.
- **Triple burnout.** We have slow oxidation, a low Na/K ratio and a low potassium level.
- **Hidden copper.** Indicators are 1) high calcium, 2) low potassium, and 3) a low Na/K ratio.
- **Spiritual defensiveness pattern.** The calcium/magnesium ratio is way above 13.5:1.
- **Slow bowl pattern.** A bowl pattern combines a low Na/K ratio and a high Ca/Mg ratio.
- **Stress from within and without.** This is a newer pattern discussed in Chapter 22. It is present when both spiritual defensiveness and sympathetic dominance are present together. It was not part of Dr. Eck’s original research.
- **Likely ‘three amigos’**: Most slow oxidizers have this to some extent, especially by age 55.

The patterns above can be further interpreted in terms of any body system, such as:

- **Structural.** Slow oxidation is often associated with some muscle weakness. Biounavailable calcium is associated with muscle tension, tightness and perhaps muscle cramps. Copper imbalance commonly contributes to scoliosis and other back problems. Joint pain may occur due to low sodium and low potassium (weak adrenals), a low sodium/potassium ratio (excessive tissue catabolism or breakdown) and/or the three amigos (toxic metal accumulation or oxidant damage and inflammation).
- **Endocrine.** Mrs. Smith’s test indicates very weak adrenal and thyroid activity. She also likely has imbalances affecting the ovaries, pancreas and pituitary glands as well.
• **Cardiovascular.** Slow oxidizers are often cold, with poor circulation and low blood pressure earlier in life until arteriosclerosis sets in later and may raise the blood pressure. A low sodium/potassium ratio is associated with excessive tissue breakdown, which can affect the heart. Copper toxicity often affects connective tissues such as the arteries and veins.

• **Other body systems.** One could interpret the results in terms of the neurological, digestive, skin or integumentary system, eliminative, sensory or another system as well.

• **Autonomic.** The sympathetic nervous system is continuing to operate excessively, but is exhausted. Overall, Mrs. Jones has flipped into a parasympathetic state of slow oxidation. This is not a healthy parasympathetic state, but rather a consequence of almost total exhaustion of the opposing branch of the autonomic system, the sympathetic branch.

• **Mental and emotional.** This is a large area of interpretation with this particular chart:

  • **Depression possible.** We note how exhausted Mrs. Smith is, which often is associated with feelings of depression, and perhaps despair or even suicidal tendencies.

  • **Negative feelings.** The low sodium/potassium ratio usually indicates some degree of negative emotions such as frustration, resentment and hostility. It may signal she is “beating her head against a wall” or at least has significant chronic stress in her life in some way.

  • **Pushing hard physically or mentally.** Sympathetic dominance indicates that Mrs. Smith pushes herself hard, although in this instance she is quite exhausted from it, a pattern one may call a burned out sympathetic dominant pattern.

  • **Lifestyle.** Mrs. Smith may be holding on to an attitude or perhaps a job, relationship or something else that needs to change. According to the hair test, this is affecting her physical and/or emotional functioning to a significant degree.

  • **Feeling stuck emotionally or in some other way.** A bowl pattern tends to indicate a feeling of being stuck with few options. The pattern called stress from within and without may be telling us that she feels stressed or pulled in many directions at once.

  • **Cloudy thinking.** Hidden copper toxicity may be affecting her thinking, memory, emotional state and other aspects of mental “tuning” in particular, which is making all this worse.

• **Dietary.** Mrs. Smith most likely craves sweets, and perhaps salt due to her slow oxidation rate. Many in her condition crave chocolate for its copper and perhaps magnesium content. One would want to ask what she eats to also gain deeper insights into possible causes for some of the imbalances on her hair mineral analysis.

**Dissecting the readings.** In addition to all of the above, one can also “dissect” the mineral readings, in accordance with concepts such as displacement, defenders and others discussed earlier in this chapter. For example:

• **The calcium level.** Most of Mrs. Smith’s calcium level is likely due to adrenal and thyroid gland weakness. Some calcium, however, is also probably biounavailable when it is this high. Some of the reading may also be due to a tendency to withdraw psychologically.

• **The sodium level.** This reading is mainly due to adrenal exhaustion, and perhaps, in part, to frustration and depression. Hidden copper and the ‘three amigos’ may also be supporting the sodium and perhaps the potassium levels. This means the levels are really lower or worse than appear, but the ‘amigos’, and perhaps copper, are acting as crutches to hold them up.

Getting to know a client well will help a practitioner gain a deeper understanding of all factors that may be affecting hair mineral readings.
Greg, age 39, has been addicted to methamphetamines in the past. He is now living with friends, of whom one is a development practitioner. He feels and looks well on a development program. However, several times he has relapsed into drug usage. This case is interesting because Greg’s hair tests have consistently revealed a difficult resistance-to-change pattern or stalled transition pattern - fast oxidation with a very low sodium/potassium ratio. In spite of attempts to break through the pattern, it has persisted for over two years.

Greg is basically having difficulty transitioning from fast to slow oxidation. He may be attracted to stimulant drugs, in fact, to keep his oxidation rate fast. The main reason for this difficulty is that moving into slow oxidation is often accompanied by feelings of depression, perhaps in part due to greater self-awareness and perhaps a lower energy level. It can be frightening for some people. While Greg uses amphetamines to boost his oxidation rate, others might use dietary sugars, caffeine, cigarettes, lots of sex, loud music, cocaine or other stimulants to stay in fast oxidation.

On his latest retest, Greg is finally beginning to eliminate large quantities of lead, mercury and cadmium. Some of this may have come from drug use, but some was probably acquired at a young age or even in utero. Hopefully, as Greg continues to improve his body chemistry, and with the support of his friends, he will eventually be able to move into slow oxidation without needing to resist this more introverted condition of the body chemistry.

This chapter discusses the major electrolyte or macromineral patterns that can be identified on a hair mineral analysis. I have made an effort to keep the information concise. More thorough explanations for many patterns are at www.drlwilson.com. I noted which patterns are newer, since Dr. Eck’s passing about 14 years ago, to avoid diluting or confusing his original work. An important term used in this chapter is movement. It is how one handles situations that arise. For example, is the person responding vigorously, or is he stalled, perhaps.

Dr. Eck and I have tried to use common English words to describe the patterns. The idea is to convey technical concepts in simple language so that anyone can understand them. It is important to recall that the patterns are not merely numbers on a graph. They represent basic physiological, psychological and even spiritual tendencies or trends. The patterns are arranged from the simplest to the most complex. Others exist, but appear to be less important. The Initial Hair Analysis Checklist on the next page summarizes how to interpret a hair analysis and mentions the major patterns.
INITIAL HAIR ANALYSIS INTERPRETATION CHECK LIST

Name:__________________________________  Date:_______________

**Initial pattern:**
___ Four lows (needs a special program, so look for this pattern first)

**Oxidation Type and Rate**
___ Fast oxidizer  __ with sodium/potassium ratio below 2.5
___ Slow oxidizer
___ Fast mixed oxidizer
___ Slow mixed oxidizer

**Major Ratios**
**Sodium/potassium ratio (Na/K):**
___ excellent (2.5 - 5)
___ high (above 5)
___ low (below 2.5) (hidden copper)
___ extremely low (below 1) (trauma Na/K)

**Calcium/magnesium ratio (Ca/Mg):**
___ excellent (4 - 9.5)
___ high (9.6 - 13.5)
___ spiritual defensiveness (Ca/Mg > 13.5)
___ low (below 4)

**Other important patterns:**
___ sympathetic dominance  ___ bowl
___ spiritual defensiveness  ___ hill
___ poor eliminators  ___ step down
___ three amigos  ___ double low ratio
___ anchors/pivots  ___ step up

**Individual Mineral Levels:**
**Calcium (Ca)**
___ excellent (39-65)
___ high (65 + mg%) (hidden copper)
___ calcium shell (above 165 mg% for women OR above 155 mg% for men)
___ low (below 40 mg%)

**Magnesium (Mg)**
___ excellent (4.5-8)
___ high (above 8 mg%)

**Sodium (Na)**
___ excellent sodium (16-30 mg%)
___ high (above 30 mg%)
___ low (below 16 mg%)

**Potassium (K)**
___ excellent (9-14 mg%)
___ high (above 14 mg%)
___ low (5 – 8 mg%) (hidden copper)
___ below 5 mg% (sympathetic dominant)

**Zinc (Zn)**
___ apparently normal zinc (13-19 mg%)
___ high (above 19 mg%)
___ low (below 13 mg%) (hidden copper)

**Phosphorus (P)**
___ acceptable phosphorus (13-16 mg%)
___ high (above 16 mg%)
___ low (11-12 mg%)
___ very low (below 11 mg%)

**High Toxic metals:**
___ Lead (Pb) above 0.06 mg%
___ Mercury (Hg) above .035 mg% (hidden copper indicator)
___ Cadmium (Cd) above 0.008 mg%
___ Arsenic (As) above 0.008 mg%
___ Nickel (Ni) above 0.019 mg%
___ The amigos: Aluminum above 0.04 mg%, iron above 2 mg%, manganese above .04 mg%.

**Other Minerals:**
___ high copper (above 2.5 mg%)
___ high selenium (above 0.12 mg%)
___ high chromium (above 0.12 mg%)
___ high cobalt (above 0.002 mg%)
___ high molybdenum (above 0.002 mg%)
___ high lithium (above 0.002 mg%)