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BIOTECH NEWS

Inside Information on Important Innovations in BioScience and Technology

Oh Say Do You C?

If you don't, you should! This little-known, life-enhancing, life-lengthening, life-saving information—much of which has been kept virtually out of sight for more than 50 years!—will convince you beyond a shadow of a doubt...

[EDITOR'S NOTE: "Why hasn't somebody told me about this before? Why doesn't the whole world know about this?" After you've read about halfway through this important two-part **Special Report**, we're convinced you'll be asking yourself these questions and others like them. Plus, you'll probably be *angry* about the fact that this critical, life-saving information has been there—right under our collective nose—for more than fifty years! Since about 1941, early researchers determined they may have discovered a way to prevent—and even *reverse*—cardiovascular disease (our number one killer) simply by using sufficient quantities of a well-known, all-natural, completely harmless, nutritional substance. Not long after that, others concluded that many viral diseases could be almost completely wiped out by using this substance in appropriate doses. And, other researchers have deduced that a whole host of chronic problems, such as arthritis and other joint-related diseases, could be virtually eradicated, simply by employing this familiar substance on a daily basis.

The **Bio/Tech News** is one of the "grand daddies" of the health newsletter industry. We're well into our second decade of research and publishing on important health-related matters. We're confident that we have a reservoir, a storehouse of knowledge we bring to the table which cannot be supplied by any other newsletter. Our subscribers get to read information that will *never* be seen in the mass media. And yet, that said, we're quick to admit we don't know everything. This recently came home to us with sledgehammer force as we happened to stumble upon some little-known information having to do with a rather common nutritional substance which most of us—our savvy readers included—think we already know quite a bit about. But we want to assure you in the strongest of terms: **In the following pages you will be reading some extremely important, life-saving information that very few people will probably ever know. You will discover reasons that will convince you beyond a shadow of a doubt why you will *never* want to go without having a substantial quantity of this misunderstood, little understood, life-enhancing, life-saving substance as part of your daily regimen.**

Although we were familiar with it from one standpoint (i.e., its antioxidant properties...but there are other,

Subscription rates: Domestic - $195 per year; All others - $235 (US Funds)
Editorial Office (West Coast): Box 30568 • Parkrose Center • Portland OR 97294

stronger antioxidants out there), little did we know that we had missed the one really crucial, all-important fact that it is *far more* than an antioxidant. It is one of the most versatile, widely-employed molecules to be found hard at work almost everywhere in the human body. It does *far more* than merely scavenge free-radicals (again, there are other, more powerful free-radical scavengers which have been discovered). **The bottom line is that most of us desperately need large quantities of this substance in order to insure that our bodies won't literally fall apart on us as we grow older!**

So why the widespread ignorance? After doing an extensive amount of research into the matter, we are convinced this sad state of affairs has come about in large measure because **this essential substance was given the wrong name!** By the time you've finished reading through this important two-part issue of the **Bio/Tech News**, you'll understand why we say this. More than that, though, you will also know more about this amazing substance than most doctors and other health practitioners. And, most important of all, **you will understand why you must determine to incorporate relatively high doses of this powerful "multi-tasking molecule" into your daily diet in order to insure that your body has all it needs to help maintain itself at the highest, optimum levels of health and vitality.**

In the words of one researcher, if we would only take sufficient quantities of this remarkable substance—

"We'd have fewer virus colds and other ailments ranging from hardening of the arteries and asthma to ulcers and varicose veins. Greater resistance to infections. Fewer aches, pains, and discomforts. Healthier skin, tissue, and bones. Faster healing of wounds, burns, and fractures. Better complexion, fewer wrinkles. Better disposition, more interests, and greater peace of mind. Improved general health and longer life, with improved intelligence and delayed senility. Less time lost in hospitals and in the waiting rooms and offices of doctors, dentists, chiropractors or psychoanalysts. Less time off work, less lost pay. Fewer drug and medical expenses. More money to spend and more time to spend it."

Does this describe the way you'd like to go through life? Then **we urge you to read on to find out more about this remarkable, all-natural, nutritional substance**, which has been given the unfortunate name, *ascorbic acid*, otherwise known by the equally unfortunate name, *Vitamin C*. You will now discover a number of reasons why you will never *ever* want to go another day without it...]

Although material contained in this newsletter is based upon extensive scientific, technical and medical research, this report is *for informational purposes only* and is not to be understood as nor construed to be any attempt whatsoever on the part of the publisher to either prescribe or "practice medicine". As always, it is our stated policy to encourage our readers to consult with a competent, well-informed health practitioner before making any significant decisions regarding one's health.

There are more than ten thousand published scientific papers that make it quite clear that there is not one body process (such as what goes on inside cells or tissues) and not one disease or syndrome (from the common cold to leprosy) that is not influenced—directly or indirectly—by vitamin C.

—Dr. Emanuel Cheraskin
Dr. W. Marshall Ringsdorf, Jr.
Dr. Emily Sisley

The medical profession itself took a very narrow and very wrong view. Lack of ascorbic acid caused scurvy, so if there was no scurvy there was no lack of ascorbic acid. Nothing could be clearer than this. The only trouble was that scurvy is not a first symptom of a lack but a final collapse, a premortal syndrome and there is a very wide gap between scurvy and full health.

—Albert Szent-Gyorgyi
Nobel Prize Winner
Discoverer of Vitamin C
[Emphasis added]

What's in a name? When it comes to a substance like Vitamin C, absolutely everything. Although a "rose by any other name" may smell just as sweet, **naming the rather simple molecule ($C_6H_8O_6$) "ascorbic acid" and then going on to call it a "vitamin" has turned out to be a *tragic* mistake.**

In the next few paragraphs, we'll give you some of the historical background behind this incredible "multitasking" molecule that will help you understand why this unfortunate misnomer—although, no doubt, completely unintended—has ended up robbing countless numbers of people of the opportunity of being able to enjoy optimum health.

The story begins and is intimately connected with the nutritional disorders, or dietary deficiency diseases: Scurvy, Beriberi, Pellagra and Rickets. We'll be focusing primarily on Scurvy because of its critical connection with Vitamin C.

Some of the early symptoms of Scurvy which begin to appear at its onset include: **weakness, rapid exhaustion, restlessness, irritability, depression, muscle pains, joint pains, anemia, swollen/bleeding gums, bad breath, a tendency to bruise easily, skin hemorrhages, and slow wound healing** [Don't be surprised if you think we've just described some of your personal symptoms! We are convinced that lots of folks here in the U.S. have a condition which can best be described as "sub-clinical scurvy". More on that later—Ed.].

You are probably familiar with the stories about many of the early sailing crews that suffered terribly high death tolls while on long voyages. In 1497, for example, the famed explorer Vasco de Gama took a crew of 160 men on an extended voyage around Africa to India. On the way, he lost 100 men to Scurvy. Nautical history records the 1577 discovery of a Spanish sailing ship floating adrift in the Sargasso Sea. All the crew members had died of Scurvy. A 1740 sailing expedition commanded by British admiral George Anson began with a crew totalling 961 sailors. In less than a year, only 335 men were left who had not died of Scurvy. Stories like this could easily be multiplied.

It took a long time before it became common knowledge among mariners that Scurvy was somehow connected with diet. During those difficult years when sailors could anticipate that significant numbers of their crew would end up dying from Scurvy, the diet at sea consisted mainly of biscuits, salt beef and salt pork. Eventually, it was discovered that laying up a stock of fresh fruits and vegetables for long sea voyages did much to reduce the Scurvy death toll. Word spread and it wasn't long before ships began carrying supplies of oranges, lemons, limes, etc. When crews would land somewhere enroute to their destination, captains would order them to gather fresh fruits, vegetables, berries and green plants in addition to other supplies.

By the early 1800's Scurvy had pretty-well disappeared from the British Navy [By then, each crew member was required to consume a daily ration of fresh lime juice. These "lime juicers" were later given the nickname, "Limeys"—Ed.]. Eventually, sometime before the turn of the century, Scurvy on the high seas was, for the most part, conquered. But beyond what seemed to be an obvious connection between these fresh fruits and the absence of the disease, nobody knew exactly why this was the case.

The Vitamines

In 1911, a Polish biochemist by the name of Casimir Funk published his theory of *vitamines*. At the time, Funk was working at the Lister Institute in London and had been studying diseases that were known to be somehow associated with poor nutrition. He found that an *amine*, an organic compound derived from ammonia, was the element that cured the disease, Beriberi. He then went on to postulate that four particular substances could be found in natural foods which provided protection against these four particular diseases: Beriberi, Pellagra, Scurvy and Rickets. He suggested these diseases could be prevented with these *vital amines* or *vitamines*. He coined this word by putting together the Latin

word for "life" (*vita*) with the chemical term, *amine*. He published his research under the title, "**The Vitamines**". Further research showed that not all of the necessary nutritional substances are *amines* and therefore the term was later shortened to "vitamins".

It wasn't long before various researchers began isolating these necessary food substances. Today, we know that Beriberi is caused by an insufficient amount of Vitamin B_1 (thiamine). Pellagra is caused by a lack of Vitamin B_3 (niacin). Rickets is caused by a lack of Vitamin D. And, as noted above, Scurvy is the result of an insufficient supply of Vitamin C.

In 1922, Hungarian scientist Albert Szent-Györgyi began researching the process which caused sliced apples and bananas to turn brown over time. This process is called "oxidation". Szent-Györgyi later discovered that cabbages contained a substance that prevented this oxidation from occurring. This same substance was also found in the adrenal glands of animals [This is an *extremely* important point to note. We'll return to it later in **Part II** of this **Special Report** when we deal with the matter of ***Stress***. Suffice it to say for now that the highest concentration of Vitamin C in the body is found in the adrenal glands—Ed.]. In 1928, he managed to isolate this unique substance, and he initially called it *hexuronic acid* ($C_6H_8O_6$). In 1932 it was determined that this was apparently the substance that prevented Scurvy.

Not long after that, Szent-Györgyi changed its name, employing a contracted form of "anti-scorbutus" (*scorbutus* being the Latin term for Scurvy) and called it *ascorbic acid* ["anti-scorbutic acid", i.e., the acidic substance that prevents and cures scurvy—Ed.]. **Although this was a perfectly logical name, it was, at the same time, a name that would pidgeon-hole this remarkable molecule in such a way that its broad range of crucial, life-enhancing activities would tend to be overlooked, neglected and ignored for many years to come. Much unnecessary suffering and premature death has occurred, as a result.**

Its other name, "Vitamin C", didn't do us any long-term favors, either. [Note: we'll be using the terms "Vitamin C", "ascorbate" and "ascorbic acid" interchangeably and will remind you of this from time to time—Ed.]. Compared with Vitamin C, other vitamins play significant, but much more limited roles. Most of them function as co-factors in various metabolic processes, and therefore *relatively small amounts of them are required by the body*. Thus, the very word "vitamin" presents an additional problem for the reputation of ascorbic acid, since it carries with it the idea of "usage in small amounts".

This limited-use concept was only reinforced when it was determined that a relatively small amount of ascorbic acid (i.e., "anti-scurvy acid") taken on a daily basis would keep a sailor from getting full-blown Scurvy. From that point on, the dominant bent, bias, direction and mindset of health practitioners has been to use or recommend small amounts of Vitamin C. It should come as no surprise, therefore, that the official RDA (Recommended Daily Allowance) for Vitamin C (about 60mg) is the minimum amount required to prevent Scurvy and *does not take into consideration what amount might actually be required to satisfy all the rest of the body's needs in order to maintain optimal health.*

Multi-tasking Super Molecule

The role of Vitamin C ("ascorbate" or "ascorbic acid") **in preserving and maintaining health and vitality far exceeds that of merely preventing the vitamin deficiency disease called Scurvy.** Over the past 60-70 years researchers have only begun to discover some of the many, many different roles played by Vitamin C, and there is every indication that we've only just scratched the surface. Perhaps its most important role is that Vitamin C is essential to collagen formation (see below) and therefore helps to maintain the integrity of the connective tissue, bones and teeth. It is absolutely essential for wound healing and facilitates recovery from burns. It is a strong, free-radical scavenging antioxidant. It activates enzymes. It protects folic acid. It facilitates the absorption of iron. It has anti-inflammatory properties. And, not only does the list of Vitamin C's known functions and properties go on and on and on, but new discoveries are being added. For example, researchers recently discovered that Vitamin C has the capability of stimulating stem cells to transform themselves into heart muscle cells [Scientists tested 880 different bioactive substances, including various drugs and other vitamins, and only one of these—Vitamin C—caused this phenomenal response. Although scientists don't understand how Vitamin C does this, there is no denying that it looks like the potential implications for cardiovascular health are tremendous. We know of testimonials, for example, where EKGs have returned to normal or near normal for heart attack victims who have availed themselves of a regimen which mainly includes high-doses of Vitamin C (more along these lines, below)—Ed.]. In a nutshell, the role of Vitamin C in human physiology is incredibly more varied and complex than originally thought and there seems to be no end to the continuing discovery of all of the various ways it acts to promote, maintain and guarantee an optimum state of health, *so long as it is present in sufficient quantities.*

The point we're trying to make is that Vitamin C ("ascorbate" or "ascorbic acid") is a phenomenal, "multi-tasking" molecule. It is intimately and critically involved in a whole host of different life-maintenance functions and therefore our job in this **Special Report** is to get you to disabuse yourself of the unhealthy, restrictive influence of the "small dose mentality" and encourage you to see the vast, health-giving potential this amazing molecule has to offer if it is only taken in sufficient quantities. Later on in this **Special Report**, we'll help you to understand the distinction between "optimum dose" *versus* "minimum dose" and we'll do our level best to get you to start thinking more along the lines of "what daily dose of Vitamin C is going to contribute the most to my optimum health?" We are more than confident that once you start thinking this way, and once you start practicing what you've learned, the ensuing positive changes and improvements in your health and well-being will make you a glad and grateful believer, which has been the case for many others who have come to understand this critically important distinction.

As we've stated above, Vitamin C is the great "multi-tasking" molecule. To quote researchers Cheraskin, Ringsdorf and Sisley again, "There are more than *ten thousand* published scientific papers that make it quite clear that there is not one body process (such as what goes on inside cells or tissues) and not one disease or syndrome (from the common cold to leprosy) that is not influenced—directly or indirectly—by vitamin C."

In what follows, we'll be focusing primarily on Vitamin C's absolutely crucial role with respect to Collagen synthesis, formation and maintenance and therefore its ability to help *prevent*—and even help *reverse*—Cardiovascular Disease (as well as the "collagen diseases", such as arthritis). In **Part II**, we'll be taking a look at Vitamin C's anti-viral and anti-bacterial characteristics; and, Vitamin C's role with respect to Stress [Read carefully, and by the time it takes you to get through these two installments of the **Bio/Tech News** you will end up knowing more about the importance of Vitamin C than most doctors; and, you will understand why you should not miss a single day without taking it in significantly large doses—Ed.].

The REAL Matrix

Vitamin C is essential for the building of collagen, the most abundant protein built in our bodies and the major component of connective tissue. This connective tissue has structural and supportive functions which are indispensable to heart tissues, to blood vessels—in fact, to all tissues. Collagen is not only the most abundant protein in our bodies, it also occurs in larger amounts than all other proteins put together. It cannot be built without Vitamin C. No heart or blood vessel or other organ could possibly perform its functions without collagen. No heart or blood vessel can be maintained in healthy condition without Vitamin C.

—Roger J. Williams, Ph.D.

Collagen is a highly specialized fibrous protein found in both humans and animals. From individual cells to various organs and organ systems, to connective tissue such as cartilage, tendons and ligaments, to blood vessels, and even to bones and teeth, collagen provides structural support and flexibility to the body. Collagen gives stability to all the tissues of your body. It is collagen that provides the contours and gives your face its unique shape. Collagen is the primary component of the cornea of your eye. Collagen plays a major role in the motor centers of your brain. Collagen gives strength and flexibility to your tendons and joints.

In a nutshell, collagen makes up the connective tissue that holds our bodies together. As we age, collagen begins to weaken and lose its elasticity. For example, every time you smile or frown, stress is placed on the collagen in your skin. Eventually, as the collagen wears down, age lines and wrinkles appear on the face. Aging skin can be telltale for a premature wearing down or loss of collagen which may be taking place elsewhere throughout the various tissues of the body [This is happening prematurely for far too many Americans. Recently, we reviewed a videotaped lecture by the eminent scientist and two-time Nobel Prize winner, Dr. Linus Pauling. We were struck by the fact that his face looked so youthful and his skin looked so healthy and fresh...he was only 92 years old at the time! Dr. Pauling had obviously found a way to maintain the health and integrity of his collagen. If you want to keep your skin as healthy, supple and wrinkle-free for as long as possible and if you also want to insure that your body maintains a continuous supply of healthy collagen, make sure you pay attention to the information in this **Special Report**—Ed.].

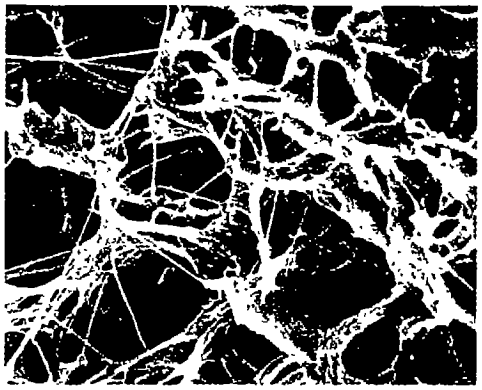
To give you a helpful way to think about the incredibly important collagen *matrix* which holds you together and allows you to function, think of a sponge. A sponge is incredibly porous—it is mostly "air cells", as it were—with its *structure* being defined by a substance that makes up the exterior of all of these millions of little vacant compartments. Although this mental picture is a bit simplistic (collagen is far more complex in the various ways it is employed), it does help to give one a feel for this crucial, structural "ground

substance" or *matrix*, which makes up so much of the human body. To change the picture just a bit, the collagen matrix is like the mesh in a screen and cells fill the holes in the mesh.

Collagen makes up the connective fibers between cells and is a major component of tendons, ligaments, spinal discs, heart valves and blood vessels, cornea and eye lens, skin, teeth, bones and cartilage [Cartilage is composed of fibrous collagen in an amorphous gel. The non-mineral content of bone is made up largely of collagen fibers with calcium salt crystals lying adjacent to each segment of the fiber; the fibers and salt crystals combine to form a structure with compressional and tensile strength comparable to that of reinforced concrete!—Ed.].

There are several different types of collagen which provide various structural and other functional properties throughout the body. So far, at least 13 different kinds of vertebrate collagen have been discovered. Some collagens have the capability of forming into extremely strong molecular "cables" in order to strengthen tendons [These collagen "cables" have a tensile strength greater than steel wire of the same weight!—Ed.] and some collagens form into resilient, elastic, flexible "sheets" that support the skin and internal organs.

Collagen acts as a scaffolding for our bodies. It also plays a central role in controlling cell shape and differentiation, cell migration and the synthesis of a number of different proteins. Collagen is the main reason behind the regeneration of broken bones and the healing of wounds. It is the reason why blood vessels grow to feed areas of the body in need of healing. The collagen matrix not only provides the blueprint, as it were, but it has been said that "collagen is also the road map and the way".



Collagen Matrix
(5,000 times magnification)

In spite of its wide variety of critical functions, collagen is a relatively simple protein which the body synthesizes on an ongoing basis. Due to wear and tear, trauma, and demands for growth, the body must continually replace collagen, the rates of turnover for some tissues being quite high [We've seen one study of rats which showed the turnover rate for collagen in the skin was between 3-5% per day and that rates greater than 10% per day were observed in lung and other tissues—Ed.]. **Failure to synthesize collagen means certain death. Scurvy is nothing but the final stage in the breakdown of the crucial collagen manufacturing, collagen replacement process. Scurvy is a condition in which the body cannot produce collagen due to a lack of Vitamin C** ("ascorbate" or "ascorbic acid"). As a result, cartilage and tendons become weak, causing joints to fail, blood vessels deteriorate and hemorrhage, and ulcers form on the gums, making the teeth fall out.

Since the middle of the twentieth century, it has been known that **Vitamin C is absolutely *essential* to the critical, life-maintenance process of the manufacture of collagen.** Vitamin C not only plays the role of a catalyst, facilitating various collagen synthesizing reactions, but it has also recently been shown that it plays a significant role in regulating the various aspects of collagen synthesis. What's more, it is also required as a co-factor in a process known as "hydroxylation" in which necessary "pro-collagens" are first created out of the amino acids *proline* and *lysine*. Vitamin C is consumed as these hydroxylated molecules are then converted into collagen ["Hydroxylation" is the chemical reaction wherein a molecular structure is modified by taking a hydrogen atom (H) and replacing it with a hydroxyl group (OH). **This process must occur for the production of collagen and, of necessity, requires the destruction of one molecule of Vitamin C for each H that is replaced by OH**—Ed.]. Whether you remember your chemistry or not, the bottom line here is that these are two major reasons why consuming large amounts of Vitamin C should be considered necessary to the maintenance of optimum health: **1)** the constant turnover and resulting demand for collagen repair and replacement; and, **2)** the loss of copious amounts of Vitamin C as a result of the hydroxylation process.

We have just pointed out that the body can and *must* synthesize collagen on an *ongoing* basis. We have also pointed out the fact that the body is not able to synthesize collagen *without having sufficient amounts of Vitamin C at its disposal.* Now, whatever you do, don't miss this next crucial point: Although most animals have the ability to do so, humans *cannot* synthesize Vitamin C! Therefore, the only way for us to be able to provide our bodies with sufficient quantities is to *consume* it in relatively large amounts on a daily basis. Otherwise, we run the risk of living in a chronic, ongoing state of "sub-clinical scurvy". This observation was first made more than thirty years ago by the biochemist, Irwin Stone, who said "There can be no doubt about the intimate association of ascorbic acid (Vitamin C) and the collagen diseases."

It doesn't matter if you are a man or woman nor does it matter what your race or ethnic background happens to be: Cardiovascular disease ("**CVD**"—primarily heart disease and stroke) is the **number one killer in this country for Americans age 35 and older.** Heart disease chalks up an annual death toll of more than 700,000 with approximately 15,000,000 per year being newly diagnosed as having CVD. Strokes kill somewhere between 150,000 and 200,000 per year. **Nearly every other death in this country is a result of CVD** in one form or another. **One person dies every 30 seconds from CVD.** The death toll from CVD is horrendous, but *the situation is even worse*: **One out of every four Americans has CVD**. And, many of these folks struggle with symptoms and complications, rendering them incapable of being able to enjoy life to the full, while left wondering whether or not death is just around the corner. About 6,000,000 Americans are hospitalized each year for Heart Disease and Stroke and about 10 million Americans age 65 years and older are disabled as a result of CVD.

But...Take Heart!

Before you conclude that you've got a 50% chance of becoming a CVD statistic, we're glad to report that, according to a small but growing number of cutting-edge researchers, things don't need to remain as bleak as they are. The initial research behind this conclusion goes back for more than 60 years. For example, at least as early as 1941, the **Canadian Medical Association Journal** published an article by Dr. J.C. Paterson whose research indicated that ascorbate deficiency was a prominent risk factor for CVD. In 1954, the same journal published an article by Dr. G.C. Willis, Dr. A.W. Light and Dr. W.Q.S. Gow which demonstrated that ascorbate reduced atherosclerotic plaques in man [Between these years, and along a completely different track, some additional, remarkable discoveries were made showing the powerful effects of ascorbate in combating various viral diseases. We plan to deal with this important aspect of Vitamin C in **Part II** of this **Special Report**. So, make sure you keep your subscription current!—Ed.]. Since these early years of research, others have continued and have been able to build upon these discoveries to the point where **there is great confidence on the part of a number in the "Ascorbate Vanguard" that large, daily doses of Vitamin C can in fact *prevent* CVD and, more than that, can actually help *reverse* it!**

For example, in a more recent piece of research, Dr. James Enstrom and colleagues from the University of California Los Angeles (UCLA) demonstrated the link between CVD and low levels of Vitamin C when they studied the vitamin intake of 11,000 Americans over 10 years. Funded by the US Congress, their study demonstrated that those taking at least 300mg per day of Vitamin C in their diet or through supplementation cut their risk of heart disease by up to 50% in men and 40% in women. One would think news of this study would have made the headlines the world over. Think of the implications of this single piece of research: the possible, drastic reduction in the number of deaths from the leading killer disease in the Western world! Unfortunately, this good news came and went, and didn't even make it to your family doctor, much less the man in the street.

As you continue reading, you'll be shaking your head in amazement as you see that there is a simple, straightforward, common-sense explanation for the way in which Vitamin C has the potential of playing a major role in making widespread CVD a thing of the past...

The Heart of the Matter

In order for you to better understand the vital relationship between Vitamin C and Cardiovascular Disease (CVD), it's important for us to review a few necessary facts about your heart and vascular system [i.e., arteries, veins and capillaries—Ed.]...

First of all, your heart is a muscle about half-again the size of your fist. On average, it beats about 70 times per minute. And, the strength of each beat is *substantial*. To get a feel for the kind of force your heart uses to pump blood, get yourself a tennis ball and squeeze it hard. The pressure you use to squeeze the tennis ball is the approximate equivalent to the amount of force your heart exerts with each stroke to pump blood throughout your whole body. If you want a heightened appreciation of the mighty little pump that sits in the middle of your chest, try squeezing the tennis ball 70 times in a minute. You'll quickly realize just how much work this is and how much strength and endurance it takes; and, you'll be astounded when you consider the fact that your heart never rests. As we said above, it beats about 70 times each minute, which adds up to about 100,000 times in a single day, and about 35 million times each year. During the average human lifetime, the heart beats more than 2.5 billion times. And this with no time off for rest beyond the momentary pause which occurs between the "lub-dubs" of each completed heartbeat.

And just how much blood does this pump pump? Your body has about 6 quarts of blood, which the

heart circulates through the vascular system (arteries, veins and capillaries) three times every minute. In one day, the blood travels a total distance of 12,000 miles and, in an average lifetime, the heart pumps about 1 million barrels of blood.

Then there's the matter of all the "plumbing"; the "pipes" through which the heart pumps blood to each cell in the body. These blood vessels range from the approximate diameter of a garden hose (the aorta is the largest artery in the body) all the way down to the capillaries, which are so small that it would take about ten of them to equal the diameter of a single human hair! If you took all of the blood vessels from an average child and laid them out end-to-end, you would have a total length of more than 60,000 miles [approximately 100,000 miles if you did the same thing for an adult!—Ed.].

It would be amazing enough if this vast, vascular network serviced a stationary machine. But such is far from the case. These arteries, veins and extremely fine capillaries have been tasked by our Creator to service a living, moving, human being. As a result, there is a constantly-changing amount of variable force applied to these vessels, moment-by-moment, day in and day out, throughout our entire lifetime. Depending upon the activity of the moment, these vessels are stressed by being bent, twisted, compressed, expanded and, in a myriad of other ways, put temporarily out of normal shape [Whether it be sitting on one's derriere in a chair making keystrokes on a computer (like I'm doing now), playing a round of golf (like I hope to be doing soon), or participating in a triathlon (which I never plan to do), or any other host of activities ranging from sedate to active...there are unceasing, variable, constantly-changing forces being applied to the blood vessels of the body every moment of every day throughout one's life—Ed.].

Now, it doesn't take a rocket scientist to come to the rather obvious conclusion that these blood vessels therefore need to be **strong**. But they also need to be far more than that: they need to be **supple, flexible, elastic, resilient**. When the integrity of the vascular wall is challenged by and subjected to various forces there is a need to quickly bounce-back and recover, in order to be always at-the-ready to carry out the task of delivering blood.

Having laid all of this preliminary, necessary groundwork, here comes the $300 Million question [Which is the approximate annual amount we lose in this country from loss and damage as a result of CVD—Ed.]: **What is it that enables blood vessels to retain their integrity? What is it that gives them strength, suppleness and flexibility? What makes them so resilient?** If you answered "Collagen", you're absolutely correct. And, about now, we're pretty sure the likely solution to the CVD problem is beginning to come clear for you. So let's keep moving...

We mentioned above that the aorta has a diameter about the size of a garden hose. Let's continue with this "garden hose" comparison for a moment. When you first buy that brand new hose and take it home, it is supple and flexible. Most of us know what happens after it sits out in the summer sun for a season or two, though: it starts to get brittle and small cracks soon start to develop at various stress points. Water soon starts to creep out of the cracks and eventually full-blown leaks begin to show. At that point, you either get yourself a new hose or break out the duct-tape to effect a temporary repair.

Although this is a rather simplistic illustration, it is very similar to the kind of thing which happens in our blood vessels when they do not have the capability of being continually supplied with the healthy collagen they need on an ongoing basis for repair and maintenance. Our bodies don't have the option of being able to go to the hardware store to get a brand new hose when cracks start to appear in the vessel walls. But they are able to maintain the vascular network in optimum condition *so long as they have all of the collagen they need to do the job.*

In the absence of the required collagen, our bodies resort to a far less effective means of repair: they start plugging the cracks from the inside by sticking up a homemade "mortar and straw" combination consisting of certain fatty proteins, cholesterol and fibrin. These internal scabs, or "plaques", don't have the kind of suppleness, flexibility and elasticity that healthy, collagen-rich vessels have and therefore *they are not resilient enough to handle the stress which is constantly being placed upon them.*

One of the most violently moving areas in the entire body is the heart, with its rhythmic, strong contractions. Unrelenting mechanical stresses are placed upon the network of relatively small vessels which feed the heart, providing it with the critical nutrients it must have in order to continue working so tirelessly. It is here, in this portion of the vasculature servicing the heart, where the maintenance and supply of healthy collagen is ultimately a matter of life or death.

In a recent paper titled, "Strain Measurement in Coronary Arteries Using Intravascular Ultrasound and Deformable Images", Biomedical Engineers and Radiologists Alexander I. Veress, Jeffrey A. Weiss, D. Geoffrey Vince, Richard D. Rabbitt and Grant T. Gullberg reported the following:

"The phenomenon of plaque rupture, the structural failure of the plaque cap, is the primary event triggering myocardial infarctions and acute coronary syndromes... **Stresses in and near the plaque correlate with the location of**

plaque rupture. Cheng et al. found that 58% of *in vivo* plaque ruptures occurred in the areas of maximum stress, while 83% of failures occurred in high stress areas." [Emphasis added—Ed.]

These researchers confirm what should seem obvious to you by now: plaque rupture failures tend to occur in high *stress* areas. "Myocardial infarctions" are otherwise known as "heart attacks". Once the plaque breaks off the highly-stressed wall of the small, gradually narrowing arteries which feed the heart, this piece of plaque is pushed along with the blood until it hits a place too narrow for it to go any farther. At this point, blood flow is impaired. If the the blockage stops blood flow completely, the particular cells which were to be supplied with oxygen and nutrients are starved and die, instead.

"Angina Pectoris" and "Coronary Insufficiency" are "coronary syndromes" in which the vessels of the heart are occluded, or plugged, to such a degree by plaque that they are only capable of delivering greatly reduced amounts of necessary, nutrition rich, oxygenated blood to the heart cells, which must have an adequate supply not only for their survival but so that the heart can continue to pump with all the vitality it needs to do its life-maintaining job.

In addition to "heart attack", another form of CVD is the "brain attack", otherwise known as "Stroke". The events which occur to produce a stroke are similar to those producing a heart attack. When a blood clot blocks a blood vessel or artery in the brain, blood flow is interrupted to a specific area of brain cells. When a brain attack occurs, the affected brain cells begin dying within minutes after the stroke starts. A high percentage of strokes caused by blocked vessels in the brain occurs as a result of plaque which has broken off somewhere in the body and has migrated to the network of small vessels found in the brain. Heart attacks and Brain attacks can also be caused by the hemorrhaging (breaking) of heart or brain blood vessels. Again, **the common denominator here is the matter of a *loss of integrity in the vascular wall as a result of insufficient collagen***; the blood vessels are no longer able to maintain their needed strength, flexibility and elasticity.

By way of important and stark contrast, **animals don't die of heart attacks or strokes**, even though the makeup of the tissues of various animals is quite similar in makeup, structure and function to that of humans. The reason why animals don't have problems with CVD will not only surprise you, but should, by now, make an amazing amount of common sense...

Animals Don't Die of Heart Attacks or Strokes

The fact remains, however, that in none of the domestic species, with the rarest of exceptions, do animals develop arteriosclerotic diseases of clinical significance. It appears that most of the pertinent pathological mechanisms operate in animals and that arteriosclerotic disease in them is not impossible; it just does not occur. If the reason for this could be found, it might cast some very useful light on the human disease.

—Professor H.A. Smith
Professor T.C. Jones
Textbook of
Veterinary Pathology
[Emphasis added]

Smith and Jones note that, theoretically, animals *could* develop CVD. However, they *don't*. Although these professors were apparently not aware of it when they produced this textbook, we would like to be so bold to suggest that, in a nutshell, **the reason why animals don't die of heart attack or stroke is the same reason that animals don't get Scurvy. And, the reason animals don't get Scurvy is that, unlike humans, animals are capable of synthesizing all the Vitamin C they need** [There are only a few exceptions which cannot do this: guinea pigs, apes and monkeys, rainbow trout and Coho salmon, a particular fruit-eating bird and a particular fruit-eating bat...and that's about it—Ed.].

Because animals are able to manufacture all the Vitamin C they require, they are able to easily maintain the integrity of their vascular systems and therefore they have no problem with CVD. It's about that simple. More than one guinea pig has helped researchers demonstrate this to be the case. As was mentioned above, guinea pigs can't synthesize Vitamin C. They have to consume it in sufficient amounts in order to remain healthy. In one experiment, vanguard researcher Dr. Matthias Rath has shown that when guinea pigs are given the guinea pig equivalent of the human RDA for Vitamin C (60 mg), they develop arteriosclerosis (plaques in the arteries) which, for all practical purposes, is identical with that which is formed in humans. By comparison, when Rath fed a second set of guinea pigs an amount of Ascorbate that would be equivalent to 5,000 mg per day for humans, *their arteries remained clean and plaque-free!*

Now, here's where we put some more pieces of this puzzle together: Sailors died of blood loss within only a few months on sea voyages because of an Ascorbate deficient diet. What happened was that, due to their inability to synthesize sufficient amounts of collagen, blood vessels would deteriorate to the point of hemorrhage and the sailors would end up dying of blood loss. This is what happens with full-blown Scurvy. **Cardiovascular Disease**

(CVD) is essentially the same condition as Scurvy; only, it is a milder, prolonged "sub-clinical" state of this disease. You might call this chronic condition "pre-Scurvy".

Due to decreased collagen synthesis as a result of insufficient amounts of Vitamin C in the diet, the integrity of the vessel walls of the cardiovascular system becomes compromised. This process, of course, isn't as radical as the short few months it took to kill early sailors who were *completely* cut off from a daily supply of ascorbate. Instead, because the supply for most Americans is inadequate but not absent entirely, the "Scurvy process" of CVD is far more subtle, occurring over longer periods of time [Due to our modern, nutritionally deficient diets, this process is beginning earlier and earlier in life. It is worth noting that autopsies of young soldiers (age 25 years and under) during the Korean and Vietnam wars and autopsies of young victims of traffic accidents have shown the presence of arteriosclerotic plaques—Ed.]

Aside from all the *additional* reasons we will be giving you in **Part II** of this **Special Report**, from the single standpoint of the need to maintain our capability to produce adequate quantities of healthy collagen on an ongoing basis, we assume we've made a reasonable case for taking more Vitamin C ("ascorbate", "ascorbic acid"). The question now becomes one of just how much we should be taking...

Vitamin C has been under investigation, reported in thousands of scientific papers, ever since it was discovered...Even though some physicians had observed forty or fifty years ago that amounts a hundred to a thousand times larger (than the RDA) have value in controlling various diseases, the medical profession and most scientists ignored this evidence.

—Dr. Linus Pauling
Nobel Prize Winner

If the RDA for Vitamin C is really only enough to keep us from succumbing to full-blown Scurvy, then we should be asking ourselves, "What should be the *optimum* daily dosage to help us insure the very *best* of health and vitality?" Well, since we don't know all of the hundreds, perhaps thousands, of different functions and roles Vitamin C plays in the human body, it's not an easy question to answer. What complicates matters even further is the fact that, since human beings do not have the ability to synthesize Vitamin C, we therefore can't determine our need by measuring non-existent, synthesized quantities. Unlike most animals, in order for us to get our Vitamin C we humans have to *consume* it. As we mentioned above, most animals, by way of stark contrast, have the capability of synthesizing all of the Vitamin C they need.

This being the case, one way for us to make a determination of dosage would be to compare the amount of Vitamin C ("ascorbate" or "ascorbic acid) synthesized by various animals and then extrapolate from there to calculate approximate amounts we should consider to be optimal for us.

The C *Synthesizers*

As it turns out, the levels of Vitamin C which animals synthesize varies considerably with the amount of stress exposure they have. For starters, take your common lab rat. The rat will synthesize about 40 mg per kilogram of bodyweight per day (mg/kg/day) when he isn't having to deal with much in the way of stress. Under stressful conditions, the amount synthesized jumps to almost 200 mg/kg/day, a five-fold increase! [Since rats can synthesize their own Vitamin C, with an available diet of biscuits, salt beef and salt pork (and, eventually, dead sailors), you can bet there were lots of fat and happy seagoing rats found aboard aimlessly drifting ships during those early days on the high seas!—Ed.]. The case is even more dramatic for the rabbit. A rabbit under little stress synthesizes Vitamin C at the rate of about 10 mg/kg/day. Add a little stress and that number rockets to well over 200 mg/kg/day, a twenty-fold increase! Dogs and cats go from 5 mg/kg/day under no stress to 40 mg/kg/day under stress, an eight-fold increase [As an aside, the fact that domesticated dogs and cats are relatively low producers is consistent with the fact that they are more susceptible to Vitamin C deficiency related problems–Ed.].

You no doubt see the obvious implications regarding the increased need for Vitamin C under stress but, for our immediate purposes, we can extrapolate some numbers for a typical 70 kilogram (155 lb) adult human. The rate of synthesis for a rat suggests a range in human terms of 2,800 mg per day (40 mg/kg x 70 kg) under relatively *low* stress to 14,000 mg per day under *high* stressloads. For a dog and cat comparison, we get a range of 350 mg per day (no stress) up to 2,800 mg per day (stress). So, using this method of extrapolation, we come up with a range of about 350mg per day on the low side (no stress) to 14,000 mg per day on the high side (stress) for a typical adult. Although this may only be a rough way to calculate daily need for Vitamin C, two things are surely worthy of note: **1)** Even at the very minimum amounts cited, 350 mg/day is about five times the government-specified, RDA dosage for Vitamin C; and, **2)** in view of the wide ranges of dose required, it makes complete sense for us to rec-

ognize that our daily requirements for Vitamin C may vary greatly, especially with reference to the kinds of stress loading we are experiencing on a day-to-day basis [We'll deal more with the matter of Vitamin C and Stress later in **Part II** of this **Special Report**—Ed.].

The C *Consumers*

Another way we can extrapolate to dosage is by measuring the amount of Vitamin C consumed by primates in the wild [Remember: monkeys and apes cannot synthesize Vitamin C—Ed.]. One South African study found that, in order to maintain the same blood levels of Vitamin C measured at the time of their capture, baboons required a daily dose of 10mg/kg. Again, calculating for a 70kg (155 lb) human adult, this works out to a dose of 700mg per day. Please note, however, that since the baboon presumably would have been captured in the wild while enjoying relatively normal stressloads, the stress of captivity would more than likely initially require even greater amounts of Vitamin C until the animal managed to settle down and adjust to its new accommodations.

In a paper presented to the **14th International Congress of Anthropological and Ethnological Sciences** ("Eating What Comes Naturally: An Examination of Some Differences Between the Dietary Components of Humans and Wild Primates"), University of California researcher Katharine Milton reported,

"Now let's consider vitamin C, a vitamin of particular interest when discussing anthropoids. An insufficiency of vitamin C can cause numerous health problems in humans (e.g. scurvy) and lead to death. Though most mammals synthesize their own vitamin C internally, anthropoids (monkeys, apes and humans) are one exception...Curious about the vitamin C content of wild plant foods eaten by primates, Robert Jenness and I analyzed various species and compared our results with similar data for domesticated fruits and vegetables.

"Results show that wild leaves and fruits are rich in vitamin C—on average, Panamanian leaves and fruits have a higher content of vitamin C than foliar cultivars (domesticated leafy vegetables); on average, wild leaves actually have a higher vitamin C content than fruit juice from a mix of cultivars (lemon, orange, mango, papaya; Milton and Jenness 1987).

"We estimate that a 7 kg howler monkey takes in 88 mg of vitamin C per kg of body weight per day for a total of 600 milligrams of vitamin C per day (7kg x 88 mg per kg). For an 8 kg spider monkey at 106 mg/kg/day, this figure totals 744 mg of vitamin C per day. Mountain gorillas which are estimated to take in some 20-30 mg of vitamin C per kg/day therefore are estimated to take in some 2 to 4 to even 6 or more grams (not milligrams) of vitamin C per day (100 to 160 kg, weight of an adult gorilla x 20-30 mg per kg) (Milton and Jenness 1987).

"Now what about humans? Unfortunately, worldwide, most human populations take much of the daily diet from a single grain or root crop—e.g., rice, wheat, manioc—and grains and roots are notoriously low in vitamin C. Even in the United States, where fresh fruits and vegetables are readily available, the average American diet is estimated to supply only some 1.5 mg per kg of ascorbate per day or a total of some 88 mg of vitamin C per individual per day. This is the same amount of vitamin C in total as wild howler monkeys take in per kilogram. Thus wild primates routinely consume vitamin C in amounts considerably higher than humans."

Do you see what Milton is saying here? Although she may have been a bit reluctant to tell her peers what seems to be a rather obvious conclusion, her reported data suggests that human consumption of Vitamin C ("ascorbate" or "ascorbic acid") is woefully inadequate, RDA's notwithstanding. If we go back to our average 70 kilogram human and convert the amount of Vitamin C (mg/kg) Milton observed primates consuming on a regular daily basis, *an equivalent human dosage would then run somewhere between 1500 and 7000 milligrams per day!* And, given the fact that others have measured increased Vitamin C synthesis under conditions of stress, it's probably fair to assume these daily amounts would also be significantly greater during stressful periods.

So How Do You C?

The reality we're facing these days is that our diets consist of foods which have been treated or processed in so many different ways that it's next to impossible to get sufficient amounts of ascorbate on a daily basis. Therefore, in order to get the quantity of Vitamin C we need, we think the only reasonable, convenient alternative is to use dietary supplementation.

It seems as though the general rule of thumb we've been able to discern from various researchers in the "Ascorbate Vanguard" is that a normal adult should be taking somewhere between 3,000-5,000 milligrams (3-5 grams) per day for normal maintenance (with higher doses for varying stressloads). This, of course, will vary from individual to individual (Linus Pauling took a daily maintenance dose of 18,000 mg per day, for example).

And, the growing consensus seems to be that **the very best way to take these higher doses of Vitamin C orally is *by taking pH balanced mineral ascorbates.*** By buffering the ascorbic acid in this way, it is far more gentle on the stomach in large doses. In fact, many folks can take much higher doses of this form of Vitamin C when compared with using non-buffered, ascorbic acid [The importance of this will become much more apparent when you read through **Part II** of this **Special Report**. We've established a rough "guesstimate" of a daily maintenance dose ranging somewhere between 3,000-5,000 mg for a normal adult. In **Part II**, we'll deal with the fact that your body can actually tell you whether you need more or less, and how much. Even more fascinating, your need for Vitamin C can easily change from day to day, depending upon what kind of challenges you are facing (physical, emotional, psychological, chemical, microbial, you name it!). You will be amazed at how much variation there can be under different kinds of circumstances; and, of course, the key is to insure that you are taking all the ascorbates your body requires at any given point in time. We'll also mention an extremely important protocol for Vitamin C that you will want to keep handy in case of any kinds of problems with viral outbreaks, epidemics or, God forbid, bioterrorism. Although we don't have the space to get into it here, we have good reason to worry that influenza could easily be turned into the next weapon of mass destruction. Genome sequencing for the virus which killed 40 million people during the 1918 flu epidemic is now nearly complete, giving unscrupulous scientists the potential of producing an even more potent virus than that which caused the deadly Spanish flu. We can assure you that you don't want to be without the crucial information in **Part II**. So keep that subscription current!—Ed.].

Among the pH buffered ascorbate products, you can find either pills or powders. We like the powders for the following reasons: First, it normally takes a small handful of capsules to equal the amount of ascorbate you will get in a rounded teaspoon of a powdered product. Second, encapsulating adds to the cost of the product, so you normally get more bang for your buck with the powders. Third, if you can find an effervescing, pH balanced powder, once you add it to some good, clean water, you not only get the desired buffering, but you also have a *more active and bioavailable solution.*

In addition, you'll want to get yourself a product which includes "bioflavonoids", which are important, naturally-occurring co-factors for Vitamin C. Since the discovery of Vitamin C by Szent-Györgyi, it has been known that ascorbic acid is more effective in the presence of its co-factors.

Which brings us to the matter of OPC. If you really want to do this Vitamin C thing right, we remind you here of a previous issue of the **Bio/Tech News** entitled, "OPC—The Super Protector Nutrient" [If you don't have a copy handy and would like one, give us a call (1-800-321-3721) and we'll send another copy to you (free of charge to current subscribers)—Ed.]. The important application of OPC (Oligomeric Proanthocyanidin) to our presentation here is the fact that **OPC is Vitamin C's most powerful co-factor**. OPC works in synergy and cooperation with Vitamin C in such a way that it actually helps boost the effectiveness of Vitamin C as it fulfills it myriad of vital functions in the human body. And, OPC has an important, sparing effect on Vitamin C so that a given quantity of Vitamin C taken together with OPC is able to do more than a much larger amount of Vitamin C acting alone.

A Final Word

Much to our initial surprise, Vitamin C has turned out to be far more crucial to life and vitality than we ever thought it could be. Truly, it is a **life-enhancing, life-lengthening, life-saving** substance.

Once we started doing the research for this 2-part **Special Report**, it didn't take very long for us to determine that we would never again want to go a single day without taking at least 3-5 grams (3,000-5,000 mg) of Vitamin C. We want to encourage you to think seriously about doing the same.

We trust we've more than made our case for taking larger, daily doses of this phenomenal, super multi-tasking substance. So, don't waste another moment: **get yourself some good high-dose, pH-buffered Vitamin C** (don't forget the OPC) and start reaping the benefits this multi-tasking supermolecule has to offer. While you're at it, get enough for your family members and other loved ones so that you can help them grow old gracefully and in optimum health right along with you!

Don't Miss Part II!

In **Part II** of this **Special Report**, we will reveal even *more* crucial information about Vitamin C which has been virtually hidden from the general public for more than 50 years. You don't want to miss this forthcoming issue of the **Bio/Tech News!** Make sure you renew your subscription as soon as possible. Act *now* and we'll take $100 off the regular $195 subscription price (your cost: $95). To order, call us toll-free:

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