Science has discovered . . .The Amazing 7-Day Cycle By Kenneth Westby

By surprise, science has discovered amazing seven-day cycles in the very building blocks of plant and animal life. These newly found sevens, or "septans," also lie buried in us humans -- deep in our metabolic, hormonal, and neuronal networks. This startling discovery has wide-ranging effects that you will want to understand. The following article explores those effects by answering three questions. First, does the formerly unknown, automatic rhythm of sevens hold the secret to one of history's most perplexing enigmas -- the origin of the seven day week? Second, what could these innate, autonomous rhythms mean for us? And lastly, what will this new knowledge tell us about the biblical Sabbath and the Creator God?

Society's seven-day calendar week is the only major rhythm of human activity that is totally oblivious to external nature. This so-called "social week" rests on mathematical regularity alone. We may casually assume that our week is really a division of the moon cycle. If that is our assumption, we forget that the lunar cycle is not a twenty-eight-day cycle, but approximately twenty-nine days, twelve hours, forty-four minutes and three seconds -- or 29.5306 days between new moons. A precise quarter of the lunar cycle amounts to the uneven figure of 7.38625 days. So any week using that true length would begin at different times of the day every time the cycle started. There is just no way to neatly divide the lunar cycle into weekly blocks of complete days.

Then what about the sun? Doesn't the cycle of seven relate to the center of our solar system? Again, no! The 7-day week is also independent from the annual solar cycle of 365 1/4 days. A "year" of 52 weeks would have just 364 whole days. Nor is the week in harmonic sympathy with the star year of 366 1/4 days. Star days or "sidereal days" are about four minutes shorter than solar days (an observer will see a particular star at the same position four minutes earlier on successive nights). In short, there are no known external rhythms in nature that could explain the near universal existence of the seven day social week.

Yet, the importance of the seven-day week -- or heptad, a series of seven -- is monumental. Eviatar Zerubavel, in his book The Seven Day Circle (The History and Meaning of the Week), notes that "a continuous week, for the establishment of settled life with a high level of social organization [is indispensable] . . . . Only by defining the week as a precise multiple of the day, rather than as a rough approximation of a fraction of the lunar month, could human beings permanently avoid the problem of having to handle loose remainders and, thus, introduce into their lives the sort of temporal regularity that they could never attain with the quasi week."

Professor Zerubavel is saying that a regular, predictable week plays a major role in developing our civilization.

THE WEEK IN HISTORY

We take for granted the commonness of a world-wide seven-day week, but that hasn't always been the case. "Weeks" varying in length from three to nineteen days have existed in past cultures. In parts of Africa three, four (especially along the Congo river), five, six and eight day weeks are found, and always in association with market days. Along the Congo the word for week is the same as the word for market. In North America the Mayas of Yucatan -- skilled mathematicians and pyramid builders -- had clusters of five-day weeks. In South America the Muyscas had a three-day week, the Persians and Malaysians a five-day week.

The ancient Etruscans, who inhabited the land the Italians do now, had an eight day market week which they passed on to the Romans no later than the sixth century B.C. As Rome expanded it encountered the seven-day week and for a time attempted to include both. But the coexistence of two weekly cycles was unworkable. The popularity of the seven-day rhythm won out and the eight-day week disappeared forever. Emperor Constantine eventually established the seven-day week in the Roman calendar and in 321 A.D. set Sunday as the first day of the week.

Apart from the biblical record, historians have had difficulty placing the precise beginning of the seven-day week. It is simply acknowledged as an ancient practice of very early origin in the evolution of civilization. The historical record becomes specific, however, with the appearance of Israelite religion and culture. In the millennium before Christ the distinctive of Israel's (and Judaism's) seven-day week became widely known. Its special seventh day devoted to worship and rest -- the Sabbath -- became an identity trademark that has endured to the present.

Jeremy Campbell, in his comprehensive inquiry into the human nature of time, jauntily titled Winston Churchill's Afternoon Nap, gives Israel full credit for introducing the seven-day week. "In all the ancient world, so far as is known, there was no seven-day calendar cycle except for the Jewish week, which existed at the very beginning of the monarchical period in Israel [approximately 1000 B.C.] and perhaps even earlier than that. A seven-day week was unknown among the ancient Greeks, whose holidays were held at very irregular intervals, since they fell on the days of religious feasts in different cities up and down the country.

Besides the Israelite heptad, or seven day period, another tradition contributed to the forming of our modern seven-day week. Long before the Greeks, Babylonian astronomers began to identify and name the seven heavenly bodies (sun and moon included as "planets") which they observed moving about the sky. Lacking our modern telescopes, they did not spot Uranus, Neptune or Pluto. Neither did they name weekdays after those seven "planets." Assigning planets to the days of the week is attributed to the Egyptians. But once a planet became attached to a day, the seven day "planetary week" came into existence.

". . . The planetary week, however, was a relative newcomer compared with the Jewish week. . . [and] may have evolved from [it], and was undoubtedly influenced by it. Presumably the seven-day structure of the Jewish week came first, and later people began to call the days of the week after the names of the planets. Our modern week is a blend of both traditions."

Zerubavel concludes that "the astrological seven-day week, which evolved in Alexandria during the second century B.C., was introduced to the West through Rome sometime toward the end of the first century B.C. If it was Alexander the Great's conquest of Greece, Babylonia, and Egypt that, in bringing those three civilizations together, was indirectly responsible for the evolution of the astrological week in the first place, it was Julius Caesar's conquest of Egypt that, in making Rome heir to the glorious Hellenistic heritage, was responsible for importing that oriental cycle to the Occident."

He also concludes that while the Jewish and astrological weeks evolved independently, they were eventually joined together by another power. ". . . It was the Church that was responsible for integrating the Jewish and astrological weeks together and spreading the seven-day cycle throughout most of the world. Yet Christianity was by no means the only carrier that helped spread the Jewish week around the globe. Starting from the seventh century, Islam was responsible for importing this seven-day cycle to the east coast of Africa, the Sudan, Central Asia, large parts of North and West Africa, and even as far as to the Malay peninsula and parts of Indonesia."

Both Christianity and Islam inherited the seven-day week from the Jews. Both established worship days separate from the Jews: Sunday for the Christians, Friday for the Moslems -- both days touching the original Sabbath. These three religions with their three worship days clustering together have played key historical roles in bringing the beat of a seven-day week to all the world.

"THE SEVEN-DAY WARS"

Because of the bond between religion (Christianity especially) and the week, there have been two major attempts in modern times to obliterate the seven-day week in favor of a different length week. The first attempt came in the late 1700s. The humanistic French Revolution promised the people a new Age of Reason to replace regressive religious superstitions. A new secular, "rational" week of ten days was devised and approved by the ruling Convention in October, 1793. The ten-day "decade" was patterned after the decimal principle, having ten days divided into ten hours, of 100 minutes each with each minute divided into l00 decimal seconds. Every tenth day, the "decadi" was reserved for rest and celebration of various natural objects and abstract ideas. Notre Dame was renamed the Temple of Reason.

"The real target of the reform campaign," notes Zerubavel, "was the Christian [Church]. . . and from a symbolic standpoint, the abolition of the seven-day 'beat' expressed the wish to de-Christianize France far more than the attempt to make life there more 'rational.'" During the Reign of Terror the ten-day "decade" was imposed by force. Churches were closed and allowed to open only on the tenth day. People were even forbidden to wear their good clothing on the traditional Sunday, with severe fines and even jail sentences given to violators. Religion, however, proved too resilient and the attempt to destroy the seven-day week (1793-1805) failed completely . . . as did the First Republic of France.

Not learning a thing from France's failure, the Communists ruling the Russian Revolution tried a second, even more radical experiment 140 years later. Their aim was the same: abolish religion by abolishing the seven-day week. The Soviet scene was a five-day continuous work week which called for 80 percent of workers to be on the job on any given day -- a plan which left 20 percent to share a day off. There was

no longer a national day off. The advertised reason for the new rotating five-day week was to increase production.

After eleven years of disappointing production and epidemic irresponsibility in the work place (1929-1940) Stalin called it quits and gave the Soviet people back their seven-day week. Concludes Zerubavel, "In both France and the Soviet Union, some desperate attempts were made by two of the most ruthless totalitarian regimes in history to completely destroy the Judeo-Christian, seven-day week. In both societies, to this day, it still remains the dominant 'beat' of social life."

CULTURE OR BIOLOGY -- WHICH CAME FIRST?

In light of these massive failures, we must face the question "why seven?" Since the seven-day cycle is not a naturally occurring event in our external environment, can culture alone explain how a whole society six billion strong now beats to a seven-day rhythm?

Tracking the development of the seven-day week in human events, as we have briefly summarized above, has been a far easier task for historians than explaining how the cycle originated in the first place. Researchers really have only two choices: 1) say that the week is a cultural/religious invention of unknown date which gradually took root in the ancient world, evolving with time to the near universal acceptance we find today; or, 2) take the biblical record of the origin of the week (Genesis, chapters 1 & 2) at face value -- it was made by God at creation.

For convenience we may call option one -- a standard, textbook explanation -- "the cultural/religious outgrowth model;" option two naturally becomes "the biblical model." It comes as no surprise that most modern historians reject the second, or biblical model, and spend their ink documenting the first one, attempting to explain the strange phenomenon of a seven-day week.

However one rates those attempts, recent discoveries revealing innate body rhythms of about seven days now call that cultural outgrowth model into question.

The relatively new science of chronobiology has uncovered some totally unexpected facts about living things, as Susan Perry and Jim Dawson report in their book The Secrets Our Body Clock Reveal. "Weekly rhythms -- known in chronobiology as "circaseptan rhythms" -- are one of the most puzzling and fascinating findings of chronobiology. Circaseptan literally means "about seven;" see chart. Daily and seasonal cycles appear to be connected to the moon. But what is there in nature that would have caused weekly rhythms to evolve?

"At first glance, it might seem that weekly rhythms developed in response to the seven-day week imposed by human culture thousands of years ago. However, this theory doesn't hold once you realize that plants, insects, and animals other than humans also have weekly cycles. . . . Biology, therefore, not culture, is probably at the source of our seven-day week."

Campbell summarizes the findings of the world's foremost authority on rhythms and the pioneer of the science of chronobiology: "Franz Halberg proposes that body rhythms of about seven days, far from

being passively driven by the social cycle of the calendar week, are innate, autonomous, and perhaps the reason why the calendar week arose in the first place."

What a bombshell!

THE RHYTHMS AROUND US

Mankind has always been aware of rhythms -- they surround us. We live with daily rhythms of tides, light and darkness, monthly rhythms of the moon, seasonal rhythms of birth, growth, harvest, hot and cold, and annual cycles of the sun, migrations, floods and drought. We have also observed cycles in our bodies which interact with those around us such as our daily sleep rhythms, daily temperature and blood pressure fluctuations, and the menstrual cycle which follows the lunar cycle precisely averaging 29.5 days.

However, until recently science has been aware of only the more obvious rhythms. Now the new science of chronobiology has begun to roll back frontiers revealing a universe replete with rhythms.

Franz Halberg, the brilliant scientist and founder of modern chronobiology, first began his experiments in the 1940s and now heads the Chronobiology Laboratories at the University of Minnesota. He offers us this rather detailed description of his field:

"Chronobiology is the eminently interdisciplinary science of interactions in time among metabolic, hormonal, and neuronal networks. It involves anatomy, biochemistry, microbiology, physiology, and pharmacology, at the molecular, intracellular, intercellular, and still higher levels of organization. The compounds coordinating a time structure -- proteins, steroids, and amino-acid derivatives -- provide for the scheduling of interactions among membrane, cytoplasmic, and nuclear events in a network involving rhythmic enzyme reactions and other intracellular mechanisms. The integrated temporal features of the processes of induction, repression, transcription, and translation of gene expression remain to be mapped . . ."

Simply put: Chronobiology is the study of how living things handle time.

Chronobiology is no longer a minor science. Perry and Dawson note that it ". . . is now being studied in major universities and medical centers around the world. There are chronobiologists working for the National Aeronautics and Space Administration (NASA), as well as for the National Institutes of Health and other government laboratories. Chronobiology is becoming part of the mainstream of science, and it is changing our way of looking at life and time."

"Don't confuse the science of biological rhythms with the quackery of biorhythms," warn Perry and Dawson. "The two are as unlike each other as astronomy and astrology."

There are five major rhythms that beat in our bodies to insure our health and happiness (see chart). The daily or circadian rhythm (from the Latin for "around a day") is the easiest to detect and measure. We are born with our own set of circadian rhythms that in time become synchronized with our environment. Our rhythms vary slightly from individual to individual (23.6 hours, 24.3 hours, 25.4 hours,

etc.) and they usually shorten as we age. For some unknown reason, women tend to have shorter circadian cycles than men.

If all our individual cycles vary from a precise 24 hour day or 168 hour seven-day week, wouldn't we in time get terribly out of sync?

"Fortunately," write Perry and Dawson, "our bodies are able to reset themselves each day to the twenty-four hour rhythm, thanks to many powerful time cues. Chronobiologists call these cues zeitgebers, German for 'time givers.' Some can be found outside our bodies, some are located within, and others are part of our daily lives . . . .

"As if we didn't have enough zeitgebers to keep our bodies in sync with the world, our internal rhythms also help synchronize each other, for none of the myriad rhythms within our bodies works in isolation. Some rhythms rise while others fall -- like a modern dance in which the dancers move seemingly independently of each other, but which actually has been carefully choreographed. The dance is so complex that chronobiologists are only beginning to understand the interrelationships of the rhythms."

MYSTERIOUS WEEKLY RHYTHMS

The most intriguing of all biological rhythms are those set to a clock of about seven days. In his chapter "The Importance of Time," Jeremy Campbell reports: "These circaseptan, or about weekly, rhythms are one of the major surprises turned up by modern chronobiology. Fifteen years ago, few scientists would have expected that seven-day biological cycles would prove to be so widespread and so long established in the living world. They are of very ancient origin, appearing in primitive one-celled organisms, and are thought to be present even in bacteria, the simplest form of life now existing."

One of Franz Halberg's amazing discoveries is that of an innate rhythm -- about seven days -- occurring in a giant alga some five million years old on the evolutionary time line. Because this microscopic cell resembles a graceful champagne glass, the alga (plant) is popularly known as mermaid's wineglass (Acetabularia mediterranea). When this "primitive" alga is subjected to artificial schedules of alternating light and dark spans of varying length over many days, this single intact cell is somehow able to translate all that manipulation of light and darkness into the measurement of a seven-day week!

As Campbell says, this inherent rhythm has to do with the internal logic of the body, not with the external logic of the world. Many more examples could be given. Involved experimentation with rats, face flies, plants and other life have revealed circaseptan rhythms similar to that of the mermaid's wineglass.

If the seven-day week is an invention of culture and religion, as most historians would have us believe, how do we explain innate circaseptan rhythms in "primitive" algae, rats, plants and face flies? These forms of life have no calendar, can't read the Torah and don't know Saturn from Santa Claus.

[The next installment will relate what has been discovered regarding our human body clocks, and whether those clocks have anything to do with the Sabbath. You won't want to miss it!]

PART II

Last time we looked at what science has uncovered concerning the innate seven-day (circaseptan) rhythms of living things and how these new discoveries are forcing us to reconsider the reigning theories on the origin of the seven-day week. We learned that this mysterious seven-day beat is entirely independent from environmental cycles of sun, moon and stars -- the only major rhythm of human activity that is totally oblivious to external nature, resting on mathematical regularity alone.

We saw that history credits ancient Israel as the culture that bequeathed the seven-day week to the rest of the world. In his book The Seven-Day Circle, Eviatar Zerubavel plainly states the "continuous seven-day cycle that runs throughout history paying no attention whatsoever to the moon and its phases is a distinctively Jewish invention." Modern attempts by the French and Soviets to erase the seven-day week -- with its imbedded religious ties -- ended in complete failure.

But was it culture and religion alone that eventually moved earth's six billion people to now harmonize in a universal seven-day rhythm? The new and respected science of chronobiology (the study of how living things handle time) says no. Its discovery of circaseptan ("about seven") rhythms in human and other life forms points toward a biological explanation for the mystery of the week. In his study into the human nature of time, Jeremy Campbell states: "Inner time structure, in certain of its manifestations, seems to determine outer time structure, rather than the other way round. Rhythms of about seven days arose in living creatures millions of years before the calendar week was invented, and may conceivably be the reason why it was invented."

AN ORCHESTRA OF RHYTHMS

Chronobiology is continuing to document just how highly rhythmic we humans are. Most of our many ticking clocks are difficult to detect; they operate just below our conscious awareness. Innate and hidden in our cell structure, the mysteries of biological time have waited for the resolving power of modern computers to appear. Just as the electron microscope allowed scientists to peer deep into the structure of living cells, computer "magnification" and analysis now make visible internal clocks we didn't even know existed. The most surprising of them all is the circaseptan.

Campbell explains that "certain biological clock systems have been discovered only through the use of sophisticated computer programs, and when they are brought to light in this way, often surprise us. By showing us these invisible restrictions on our temporal freedom, scientists modify our knowledge of human nature, and they do not always do so in predictable ways. They are drawing a new map of the temporal anatomy of body and brain, and the map tells us truths we could not know otherwise."

"It would be a big mistake," Campbell warns, "to assume that this time anatomy is simple, that the clocks of the body all tick to a single measure, like watches in a jewelry store. A better image is that of an orchestra, a silent orchestra made up of numerous players under more than one conductor, each contributing in special ways to the harmony and complexity of the whole."

These myriad synchronizing rhythms give substance to the well worn phrase "harmony of the body." The "loudest" of the body's oscillating frequencies is the 24-hour cosmic cycle of day and night -- and until recently this circadian rhythm received most of the attention.

The surprise appearance of an internally generated seven-day rhythm, independent from all environmental influences, provides chronobiologists with intriguing possibilities for a new understanding of how the body's complex orchestra of rhythms works.

Our bodies are carefully designed for self-protection even in matters of time. On the one hand we are an orchestra of rhythms, on the other our bodies demand stability and sameness --an automatic pull to homeostasis (the maintenance of a beneficial equilibrium, a self-regulated norm). Campbell explains: "The two regulatory systems, one imposing sameness in time, the other providing orderly change, are complementary rather than being in conflict. A body function alters in a rhythmic fashion, and homeostasis stabilizes the altered state of that function.

"The clocks are able to generate regular periodic variations because homeostasis resists random, irrelevant variations. Both systems collaborate in maintaining the special time structure of the body rather than simply surrendering to the time structure of the environment."

We organize time on our own terms and to our own advantage.

Most, if not all, of the millions (literally!) of daily functions that occur in our bodies are organized within some rhythmic system. Some bodily tasks occur quickly in seconds, minutes or hours, others slowly over months. How can this orchestra of cycles governing such bodily activities as diverse in time as metabolism, maintenance, growth, defense and reproduction possibly be coordinated?

OUR INTERNAL SEVEN-DAY CLOCK

Chronobiology has found the answer. As Campbell explains: "A particular function of the body may have a spectrum of rhythms with a dominant frequency that is very different from the dominant frequency of the spectrum of rhythms in another function, perhaps widely separated in space. Yet no matter which frequency component is the primary one in any given function, all rhythmic systems of the body probably possess an innate circaseptan frequency so that when they cooperate to perform a specific task which is body-wide, say, an immune reaction, the reaction occurs on a weekly schedule.

"That schedule is a compromise between too much time and too little. A day and a night, which is the dominant frequency in the spectrum of many routine body chores, would not be long enough to complete the complicated array of chemical and other activities that compose the immune defense reaction, and a month would be too long."

In addition to being the key coordinating rhythm for the rest of the body's many rhythmic interactions, a seven-day cycle has been found in fluctuations of blood pressure, acid content in blood, red blood cells, heartbeat, oral temperature, female breast temperature, urine chemistry and volume, the ratio between two important neurotransmitters, norepinephrine and epinephrine, and the rise and fall of several body chemicals such as the stress coping hormone, cortisol. "In fact," Perry and Dawson note,

"weekly rhythms appear easiest to detect when the body is under stress, such as when it is defending itself against a virus, bacterium, or other harmful intruder. For example, cold symptoms (which are really signs of the body defending itself against the cold virus) last about a week. Chickenpox symptoms (a high fever and small red spots) usually appear almost exactly two weeks after exposure to the illness.:"

Doctors have long observed that response to malaria infection and pneumonia crisis peaked at seven days. Organ transplants face similar crises as the body's immune system attack the foreign organ. Campbell explains: "When a human patient receives a kidney transplant, there is a rhythm of about seven days, a predictable rise and fall in the probability that the body's immune system will reject the new kidney. A major peak of rejection occurs seven days after the operation, and when a serum is given to suppress the immune reaction, a series of peaks occurs, with increasing risk of rejection, at one week, two weeks, three weeks and at four weeks, the time of the highest of all."

Chronobiology's pioneer, Dr. Franz Halberg, made another startling discovery -- a three and a half day, or circasemiseptan harmonic of the circaseptan (seven-day) frequency. This phenomenon seems to occur when the living organism is under extreme attack or has somehow been critically altered. When the giant one celled alga "mermaid's wineglass" (described in Part One) had its nucleus removed, it doubled its seven day frequency to one of about three and a half days.

He has also found that when cancer strikes humans our circaseptan frequency is doubled to its circasemiseptan harmonic. Why? Campbell believes there must be rhyme and reason: "Circaseptan and circasemiseptan rhythms are not arbitrary, even though they seem to lack counterpart rhythms in the external environment." Dr. Halberg calls the move to a three and a half day harmonic of seven a "spectral compromise . . . the system does its own reshuffling."

The deeper we investigate the inner workings of life, an even more complex, intricate and absolutely marvelous display of design begins to appear. Out of the mind-numbing complexity of life a certain organizing rhythm starts to surface. The millions of living parts begin to respond to a rhythmic resonance broadcast on certain set frequencies. These parts innately know to tune their receivers to the proper sympathetically vibrating frequency -- their beat. Just as we tune our radios and music suddenly springs to life, every living cell has imbedded in its primal genetic material a rhythm, a clock, a beat, a frequency, a resonance that helps it get in sync to live and function as designed.

Now we discover that the beat all life is tuned to is seven.

"In Franz Halberg's view," summarizes Campbell, "a central feature of biological time structure is the harmonic relationship that exists among the various component frequencies. A striking aspect of this relationship is that the components themselves appear to be harmonics or sub harmonics, multiples or submultiples, of seven, a number that has played a disproportionately large role in human culture, myth, religion, magic and the calendar."

How did seven come to be imbedded deep into the ancient genetic building blocks of life? Why is seven the key coordinating rhythm for life's myriad complexities?

LIFE BEGINS AT SEVEN

We've seen that the cultural/religious model doesn't sufficiently explain why humans organize their activity around a seven-day weekly cycle -- a rhythm divorced from the environment. The biological model buttressed by the recent discoveries of circaseptan rhythms in life forms "millions" of years older than ancient Israel, clearly puts biology before culture. The further uncovering of circaseptans in plants and animals leaves the cultural model relevant only to humans, and then after the fact.

But the biological model, while having the evidence for the "very ancient origin" of circaseptans, still doesn't have an answer for why. Why seven? And why seven in "primitive" one-celled organisms, in bacteria? Why seven in all life forms?

Is this not compelling evidence for a common beginning, for common design, for a common designer who could so powerfully program his creation to a cycle he set in motion? To a rhythm tuned to his own activity of work and rest? Let's see if yet another model can answer the remaining questions and better fit the evidence of history, culture, religion and biology.
For that model we will now draw evidence from one of mankind's oldest books -- the Bible. This book, which claims inspiration and direct revelation from an almighty God, begins with the story of creation. This story is framed within seven daily cycles.

In the first six days of evenings and mornings the Creator established orbits of sun, moon and earth for time, cycles and seasons; he prepared the earth to receive living things; he formed fully developed plant, marine and animal life; and on the sixth day made his creation zenith -- man, male and female.

"So God created man in his own image, in the image of God he created him; male and female he created them. . . . God saw all that he had made, and it was very good. And there was evening, and there was morning -- the sixth day" (Gen 1:27, 31).

God's work was now over, but the week wasn't. Nor was God finished with creating. As Dr. Charles V. Dorothy, ACD's Director of Biblical Research, has convincingly explained in his Genesis Classes (available on tape), there is no chapter division in the original Hebrew. What our English Bibles call 2:1-4 should be the conclusion, the apex of chapter one.

"By the seventh day God had finished the work he had been doing; so on the seventh day he rested from all his work. And God blessed the seventh day and made it holy, because on it he rested from all the work of creating that he had done" (Gen 2:2-3).

His last act in the creation week was to rest and make holy the seventh day as a memorial to his creation. He closed the cycle of creation at seven days and set the clock of time moving forward to this day. In all life resides that circaseptan beat echoing, like a rifle shot in a vast rock canyon, backward in time to the first seven days of dynamic creation.

Each living thing made testifies of brilliant design, of divine craftsmanship, of marvelous function, of intricate interactions with the environment and other life forms, of mystery, of beauty. From roses to

redwoods, from salmon to sharks, from elephants to eagles, all life cries to be inspected, admired and praised for its peculiar display of divine handiwork. Even man marvels in awe when he beholds himself:

"For you created my inmost being; you knit me together in my mother's womb. I praise you because I am fearfully and wonderfully made; your works are wonderful, I know that full well" (Ps 139:13-14).

The fingerprints of a divine creator cover his creation. To behold life on earth in its billions of varieties and go forth claiming it to be the result of blind, random, evolutionary accidents, takes a "faith" and a "belief" that defies understanding or logic.

Not only did the Designer/Creator leave his finger prints on everything he made, he left his calling card bonded to living cells telling us when he made life: in a seven-day creation week. That's when he wound up the clock of life and set it ticking in each of its forms to a rhythm of sevens.
He gave life the frequency of seven. It's the beat of creation, a harmonic that points directly to the life-starter, life-giver himself!

The more I look at creation and especially the miracle of life, I am forced to conclude with the psalmist that only "The fool says in his heart, 'There is no God'" (Ps 14:1). In the New Testament the Apostle Paul stops short of calling unbelievers "fools," but makes this point:

"For since the creation of the world God's invisible qualities -- his eternal power and divine nature -- have been clearly seen, being understood from what has been made, so that men are without excuse" (Rom 1:20).

Why, after exhibiting his divine power in six days of creation did God choose to rest? Did he "need" to rest? What can we learn about his divine nature in this different, yet creative act? What does God do to time to make it "holy"? Why did he think this cycle of six work days and a seventh of rest so important that he included it in the middle of the Ten Commandments?

Is there some information about the divine nature contained in the creation week that mankind and even Christianity has missed? Is there knowledge to discover in the seventh-day Sabbath that can help humans to spiritually get in sync with their Creator? Is there important data to discover that can put us in harmony with the Divine Nature?

What did Christ have in mind when he said the seventh day Sabbath "was made for man," and when he further declared himself "Lord even of the Sabbath"? (Mk 2:27-28).

[In the next and concluding installment we will answer the questions above and see how the number seven plays such a key role in everything from worship to wrath, from forgiveness to the final things in the plan of God. There is much more to learn from Scripture and science about the mysterious seven-day cycle.]

PART III

Preceding installments presented compelling evidence that a seven-day weekly rhythm actually exists in the building blocks of life. How did this amazing but hidden fact come to light?

The modern science of chronobiology (the study of how living things handle time) teamed with the resolving power of computers recently discovered--much to everyone's surprise--innate seven-day (circaseptan) cycles in a wide variety of life forms, including us humans.

Clearly then the seven-day cycle is not a cultural or religious invention. Rather, we can now say these four things about the rhythm of seven: 1) it is of "very ancient" biological origin; 2) it is independent from environmental cycles of sun, moon and stars; 3) it is imbedded in all living cells and in short, 4) it is the beat to which all life is tuned.
In humans, we found the circaseptan rhythm to be the key coordinating rhythm for a complex myriad of cycles, all harmonizing to make up our body clock. The biological base of seven-day cycles (also called heptads or circaseptans) clearly gives this amazing building block priority in time: it existed before culture or religion ever recognized a seven day week in history. Such an intricate, indisputable base and such a fundamental common design require us to reconsider this double question: is there a common beginning, a common designer of all life?

Last issue we suggested that the recently uncovered, stunning evidence of circaseptan rhythms should cause inquiring minds to look for answers in one of mankind's most ancient books -- the Bible. This book, as commonly known, claims to be an inspired and direct revelation from an almighty God. But what does it tell us about the Creator's relation to time? Does the Bible say anything regarding time cycles, especially one built on seven [days]? And most importantly, does this revelation say anything about the effect of life rhythms on the most neglected element in human beings: our spirit? [Put another way, the Bible reveals God to be Spirit (Gn 1:3; Jn 4:24). Is it logical that the Creator would leave his creatures with no spiritual avenue to reach him?]

TIME TELLS A STORY: AND A STORY TELLS TIME

When God created mankind he also created time -- or did he perhaps connect man to a paced rhythm already a part of his being? Ultimately we cannot know that answer, but we do know the following. As we learned in our Genesis class (see add below), the early chapters of Genesis portray the foundational relationships of our world. "In the beginning" the great Elohim gave man relationship to himself as Maker, to his mate, to all other living things. God also gave all humans, in their parents Adam and Eve, a relationship to the movement of life and action-- time.

Stephen W. Hawking, acclaimed as the most brilliant theoretical physicist since Einstein, in his work A Brief History of Time remarked:

"The concept of time has no meaning before the beginning of the universe. This was first pointed out by St. Augustine. When asked: What did God do before he created the universe? He didn't reply: He was preparing Hell for people who asked such questions. Instead, he said that time was a property of the

universe that God created, and that time did not exist before the beginning of the universe" [emphasis ours].

Whenever time might have begun, it is inseparably connected to human origins in the creation story. In fact, the story in Gen 1 is framed within seven daily cycles. The chronology of creation builds each day in this pattern: "evening and morning, day one;" "evening and morning, the second day" [fn: note the switch from "one" to "second"]. This building pattern reaches its next to last height with the making of man and woman on the sixth day (v 26-31). The crown and climax of the week, however, is the seventh day when God rests and hallows it as a memorial of all his hands had wrought (the account continues into 2:4, as commentators recognize). God who made time now made holy the time of the seventh day.

"And God blessed the seventh day and made it holy, because on it he rested from all the work of creating that he had done."

Later when the Creator established Israel as a nation (Ex 12-19), he gave his newly redeemed people ten commandments to be the spiritual and moral pillars upon which a national character could be built (Ex 20). In the middle of that law he thundered from a mountain top was a unique commandment, one which man would never have thought out for himself. "Thou shall not murder" makes civilized sense, but "rest on the seventh day" is another matter. Many who honor this great law code themselves assume that its basis must be arbitrary. Let us look carefully at the two versions (statements) of the Ten to see what reasons are given.

Remember the Sabbath day by keeping it holy. Six days you shall labor and do all your work, but the seventh day is a Sabbath to the Lord your God. . . .For in six days the Lord made the heavens and the earth, the sea, and all that is in them, but he rested on the seventh day. Therefore the Lord blessed the Sabbath day and made it holy (Ex 20:8-11).

Scripture gives a reason all right, but it is one grounded in the spiritual world: it pictures a divine act in creation itself.

Now Deuteronomy (the name means "second law" or repetition of the law).

Remember that you were slaves in Egypt and that the Lord your God brought you out of there with a mighty hand and an outstretched arm. Therefore the Lord your God has commanded you to observe the Sabbath day (Deut 5:15).

This time Scripture gives a quite different reason: the people who have the revelation of the Sabbath were delivered--given rest from slavery.

So Scripture presents two important motives behind the Sabbath. But no one, to our knowledge, has ever demonstrated a physical/scientific reason behind this law. Based on the brief summaries of a vast body of research given in the previous installments, we can now add a third reason to the two given in Scripture. In the ebb and flow of time, God has engineered-in a cycle of pause points -- places to stop from the mechanics of living to consider the purpose of life itself. The divine design calls for this life-

harmonizing pause to occur every seven days. The Hebrew verb shabath means to cease/rest; hence our name (noun) for the seventh day "Sabbath" also comes from Hebrew (shabbath).

Although the word Sabbath does not mean seven, it has become inextricably bound up the concept of seven--a significant number in the Bible. It will enrich our understanding of the importance of this numeric concept if we quickly trace a few of its uses throughout the Bible.

SEVENS, SEVENS AND MORE SEVENS

The number seven has special place among numbers used of God in Scripture. Till now we have had our focus on the seven-day (circaseptan) cycle in living things, on the biblical creation account and on the significance of the seventh-day Sabbath. But the number seven is associated with things and times other than the week.

Seven's place is eminent among "sacred" numbers in scripture. For example: the creation account, and thus the Bible itself, begin with seven Hebrew words which contain a total of 28 (4x7) letters in those seven words (Gn 1:1). The New Testament also opens with seven words introducing the genealogy of Christ (Mt 1:1). Beyond those beginnings, seven is typically associated with acts of completion, fulfillment and perfection. We can certainly see those meanings coming through from our study of creation.

The rhythm of seven is a pattern for even greater blocks of time. We find a sabbatical year cycle of letting the land rest every seven years; and there was a year of jubilee, which followed seven times seven years (the fiftieth year). There were seven sacred days on the calendar God gave Israel. The Feast of Unleavened Bread in the spring and the Feast of Tabernacles in the fall each lasted seven days. The Feast of Trumpets arrives on the first day of the seventh month -- which also marks the beginning to the civil year and is believed to be the day of the month when creation began. A congregation of annual holydays appears in the seventh month -- the Day of Atonement, Feast of Tabernacles and the Last Great Day, each bringing clear pictures of the coming Messianic age.

Old Testament worship ritual often came in sevens: the sprinkling of bullock's blood seven times and the burnt offering of seven lambs; the cleansed leper was sprinkled seven times. Diseased General Naaman was told by Elisha to dip in the Jordan river seven times to be cleansed of his leprosy. The priests encompassed Jericho seven times, Elijah's servant looked for rain from God seven times.

In the New Testament Jesus fed the four thousand from seven loaves of bread and a few fishes, the seven basketsful collected afterward may teach us that Christ can satisfy our hunger. He sent seventy disciples out to evangelize -- symbolically all mankind which was viewed as being comprised of seventy nations. Revelation, the great book of future events, if full of sevens. There are seven churches; seven golden candlesticks; seven stars; seven angels; seven lamps of fire; seven spirits of God; a book of seven seals; a lamb with seven horns and seven eyes; seven angels with seven trumpets; a dragon and a beast with seven heads; seven last plagues; and seven golden bowls full of the final wrath of God.

The prophet Daniel was told the Messiah would arrive after "seventy 'sevens'" and in the first chapter of Matthew the genealogy of Jesus is organized into three groups of fourteen (2x7) generations.

Scripture highlights other "sacred numbers" each having special symbolic meaning, but seven seems to rise above them all as the rhythmic action of a living God in the affairs of man. From creation, to a call to pause and worship, to the plan of God in prophecy we find a rhythm of seven as if a fingerprint, a calling card of God.

AN OASIS IN TIME

Billy Graham once summed up the two things he believed mankind needed most to know: 1) The nature of the One who created and orders the universe; and, 2) The nature of man himself. He is correct, of course, and this needed knowledge is at the center of all truth.

At the very center of the ten commandments, Yahweh ("the Lord") our God placed a unique seventh day rest law, forever enshrining in time and symbol the core truth that he is our personal Creator and Savior/Redeemer. This is the "holiness" of the Sabbath -- a remembrance and a personal reaction to the primal fact that we were made by God "after his image" for a divine purpose.

And what is that divine purpose? The Creator's purpose makes plain man's proneness to evil, his lack of virtue, his mortality-- and a divine purpose providing a graceful solution, a way of deliverance from evil and death, and, most importantly, a divine purpose that leads to eternal life as sons and daughters of God and brothers and sisters of Christ (Rom 8; Heb 2).

Just as chronobiology has discovered the harmonizing power of the seven-day (circaseptan) cycle to keep our bodies in sync --homeostasis, or equilibrium--the seventh-day Sabbath was given to keep us spiritually and morally in sync with ourselves, our Maker and his divine plan for us.

Desmond Ford in his book The Forgotten Day notes:

"The Sabbath, by putting all things in true perspective, meets that need of the soul to worship and adore the highest good. The distinction between Creator and creature is marked out by creation's memorial, and weekly the reminder is afforded that none of the things made are adequate to satisfy the human spirit, and therefore they should never receive first place in the soul's adoration."

The Sabbath serves as an oasis in time--given to refresh and nourish us on our journey through life.

This truth is supremely important; it is why God calls this time holy. Only the Sabbath commandment begins with the word "remember." This most critical knowledge under heaven is enshrined in the call to "remember" -- remember that there is a living God; that we are made in his image with great purpose; that he is a loving God who has given us a beautiful earth to enjoy; and as a Father he gives us guidance in how to live upon it. And remember that he has the power to deliver us from the captivity of sin and death, to create in us a new heart, a new character, and to give us life eternal in the never ending Kingdom of God.

Can we now grasp why God made the seventh day holy and included in the great moral/ethical package he delivered from Mt. Sinai? Seen from this perspective, is it any wonder that the Son of God would say "the Sabbath was made for man, not man for the Sabbath" (Mk 2:27)?

Ford offers a mini-sermon that God may have delivered to humanity's [the] first parents. "It is as though God had said to Adam after his creation on the sixth day, 'Adam, behold this wonderful world -- full of objects animate and inanimate which call for admiration; but beware -- none of them, nor all of them, can satisfy you, not even Eve. You were made for me, your heart can find rest only in me, its source; therefore let us spend your first whole day together as a pattern for your life hereafter.'

"At that juncture God ushered in sacred time with the glory of the first sunset Adam had ever seen. What a wonderful time that first whole day of existence must have been for Adam and Eve! They walked and talked with their Maker and found in him their fountain of joy and their source of truth and strength. That first Sabbath was God's acted-out invitation to all men to find their rest in him."

God has invited his creation to pause with him every seventh day for a walk in the cool of his garden. To commune with him and enjoy the nourishing fruit and clear water of his special oasis. Refreshed and in harmony, we then set forth for another six days of work, achievement and accomplishment.

HARMONY vs DISHARMONY: WHAT OUR MODERN WORLD HAS LOST

Mysteriously, the profound meaning of a seven-day weekly cycle and of a holy Sabbath are lost to our present world culture. The human suffering that flows from the loss of this primal knowledge is beyond calculation!

Instead of a world full of the knowledge of the Eternal, in worship, harmony and rest with him every seventh day, we have a world writhing in unrest and disharmony. We have a world that is characterized by its ignorance of God -- its pain and tears catalogued by a list of the commandments of God it wantonly or ignorantly breaks. This is the price paid for turning backs to God and his revelation.

The wrath of God is being revealed from heaven against all the godlessness and wickedness of men who suppress the truth by their wickedness, since what may be known about God is plain to them, because God has made it plain to them.

For since the creation of the world God's invisible qualities -- his eternal power and divine nature -- have been clearly seen, so that men are without excuse. ...Although they claimed to be wise, they became fools, and exchanged the glory of the immortal God for images made to look like mortal man and birds and animals and reptiles. ...They exchanged the truth of God for a lie, and worshipped and served created things rather than the Creator -- who is forever praised (Rom 1:18-26).

In our "savvy" age exchanging the truth about creation for a lie has been made quite respectable through the psuedo-science of evolution. It functions, however, as an intellectual idol just as effectively as wood totems did in past cultures -- a natural, earthy substitute for the Holy Creator God.

It seems easier, less threatening and more free for man to look inward to find a god. Man even fancies to make himself a god; to be his own lawgiver, his own maker, to make himself the sum of all things. Through a variety of philosophies he attempts to divine-up power, invent a purpose, discover a destiny and even pursue immortality.

If mankind looks outward (instead of inward or upward), another "goddess" offers herself. The modern goddess Evolution sits secure upon her throne in the temples of academia. Worshiped as the force "mother nature" who creates through the miracle of mutation, chaos, confusion and blind chance. She "creates" by some unknown, untestable and unobservable laws of disharmony is able to produce a universe of design and ordered life.

What great faith is required of evolutionists to explain creation. What devotion to storied theory! What belief! No longer need we look in churches for the prime examples of superstitious faith.

But we do not live in a vacuum. Our refusal to "remember" who the Creator is has set in motion a flow of thoughts and actions which in time destructively erupt into a variety of plagues. These ever present negatives that characterize the "human condition," that rob our race of its peace and happiness, are a woeful testimony that something is missing. When we humans reject God's wise instructions on how to live on his earth, we are doomed to march to another beat. We are resigned to learn from short term experience as we stumble along in moral and spiritual darkness. We are out of sync with our God and as a result, are out of harmony with ourselves and our environment.

By turning our backs on the majestic God and his revelation of the awesome program for his created sons and daughters, we have spun out of sync with God. We have reduced our horizon from an omnipotent, limitless God to a mortal man groping along in the continual accident of evolution. "Evolutionary" man, if such we are, has gotten out of rhythm with life itself.

A WEEKLY TRIP TO EDEN

A key control to keep humankind in harmony with the created order and with the Creator/Savior himself is the Sabbath institution. It isn't, by any means, the sole path to discovering God and his plan, but it has that as its prime purpose.

Here is how the biblical "circaseptan" [the Genesis heptad] could operate to accomplish a harmonizing rhythm between man and God. At the national societal level, a day of rest requires intellectual, philosophical, legal and moral commitment to its institution. Commercial and social affairs would be integrated into a six-day work, seventh-day rest cycle. The Sabbath would be used by society for physical rest and relaxation, for family and social bonding, for biblical teaching, for meditation and spiritual renewal.

At the personal level, a Sabbath would provide an organizing principle for daily life. God's seven-day cycle, [the biblical heptad] would become our cycle and thus our schedules, plans, and affairs would all be influenced by it. Rather than attempting to fit the things of God into our too busy world, we would instead, with purpose, be engaged in fitting our lives into the plan and rhythm of our Creator. Now that

we know of the biological base, the circaseptan of life, this would truly be "getting into the flow" of power, in tune with the pulse of God's universe.

Of course, mere outward adoption of a seventh-day rest cycle for a nation or an individual without real intellectual and heart involvement would yield only limited benefits. Without sincere spiritual involvement, a Sabbath institution would become in time an ossified relic of history, a cultural tradition. It would sink to a symbol devoid of message and power -- a one dimensional day like any other day of the week.

Witness how the Sabbath day impacts the average Jew in modern Israel today. Except for a few radical legalists, it is a secular day of nationalistic identity borrowed from the religious roots of an ancient past. Witness also how little the Western world is influenced by its substitute Sabbath -- Sunday. It's good to stamp our money "In God We Trust," but the power of the phrase is unlocked only when an individual or nation truly trusts in the living God.

Symbols can only point to the power, to the knowledge, to the message that stand behind them. In the case of the seventh day, we've been given a symbol of time, a rhythmic sign of time in unstoppable motion. We have in this day a symbol, which if examined, pondered and tasted, would tell us of creation and of the nature of the Creator himself. It would tell us of our salvation, of our future and of our eternity.

The seventh-day Sabbath also offers us a perfect picture of the soon-coming Kingdom of God, his Millennium of rest and peace on earth. Utopia follows the age of man that has ended in futile work, much suffering and many, many wars. The millennial Sabbath is a welcome relief coming as it does with the return of the Creator and Savior himself, Jesus Christ. He ushers in a new Garden of Eden that envelops the entire earth. He cleans the environment, and with his saints rebuilds a beautiful world -- as it has always been his plan to do. And once again, like Eden, God will walk with his people in the cool of the day. He invites us to enter that rest with him.

Therefore, since the promise of entering his rest still stands, let us be careful that none of you be found to have fallen short of it. ...For somewhere he has spoken about the seventh day in these words: "And on the seventh day God rested from all his work." ...There remains, then, a Sabbath-rest for the people of God; for anyone who enters God's rest also rests from his own work, just as God did from his.

Let us, therefore, make every effort to enter that rest, so that no one will fall by following their example of disobedience (Heb 4:1-11).

But if not pondered, if not entered, the Sabbath remains an unlocked symbol -- its benefits limited, its great message unpublished.

TIME TO GET IN TIME WITH GOD

Physicists labor to measure the rhythms, movements, orbits and energy of stars and galaxies in the hope of seeing back in time to the very origins of the universe -- to its creation, the "big bang." Astronomers

look heavenward with ever deepening penetration searching to find clues to when and how the universe was created. Steven Hawking has this insight:

With the success of scientific theories in describing events, most people have come to believe that God allows the universe to evolve according to a set of laws and does not intervene in the universe to break these laws. However, the laws do not tell us what the universe should have looked like when it started -- it would still be up to God to wind up the clockwork and choose how to start it off. So long as the universe had a beginning, we could suppose it had a creator.

God did "wind up the clockwork" leaving his fingerprints all over the clock. The new science of chronobiology has had some of science's most impressive successes in seeing back to creation with its discovery of "primitive origins" to the seven-day cycle found in human cells and other life forms.

God somehow coded into the infinite complexities of life a clock that ticks to the time of a seven-day rhythm. We humans have no control over these innate circaseptan rhythms and benefit best by simply living in sympathetic harmony with them. More importantly, the seven-day cycle in physical nature points beyond temporal reality to a far greater spiritual reality.

God, with masterful design, uses time itself and a seventh day rest to call his creation to pause and listen. He has a message which explains why we were created and for what special purpose. His words are so majestic, so exciting, so unbelievable, so beyond our mundane world that they could only be comprehended as coming from God himself. His message dispels ignorance, solves life's grand mysteries, and offers a future too beautiful to be true.

His personal message introduces himself as our creator, he gives us dignity and a special relationship to himself by declaring we have been made in his image, he then offers to save us into an eternity with him -- if we but follow him. He invites us to join him on his journey, to walk with him, to talk with him, to learn from him, to even rule with him. How could we refuse such an invitation?

The mystery of the seven-day cycle was never intended to be a mystery, but a call from the Creator to get in harmony, in sync, with him. It is high time we get in step with God.