the FELIX Letter

A COMMENTARY ON NUTRITION

No. 120 Summer 2002

THE HEALING DARK

Kids sleep like rocks. One night long ago when I was eight and my brother 11, we were zonked out in heavy slumber on the front and back seats of the family Chevy, parked across from our parents' grocery store on a rural street in New Jersey. Soon, the folks would shut up shop and Pop would drive us all home and to bed. My brother and I finally got dredged up from slumbrous depths by the noisy crowd around the car. About a half-hour before, a driver had careened into the Chevy with a big enough crash to bring our folks and all the neighbors running. Once Mom and Pop saw we were okay they didn't bother to wake us.

Oh, to be able to sleep like that now! This sleep thing we do all our lives turns out to be, from the scientist's view, infinitely complex. *LIGHTS OUT* by T.S. Wiley with Brent Formby PhD [Pocket Books, New York, 2001] stresses this complexity: it took Wiley 5 years to write the not-easy-to-follow ~200-page text with its more than 100 *pages* of scientific references. The insights I've gained seem fresh to me, but I've never explored sleep science – these may be old hat to experts. *LIGHTS OUT* reminds us that before the 20th century cheap electricity to illuminate homes and streets did not exist. Forced to rely on firelight, candles, oil or gas lamps, etc., people were not in the habit of staying up late.

It wasn't until 1879 that Thomas A. Edison created a practical incandescent lamp, then in 1881-2 the first permanent central electric-light power plant in the world (in New York City). Wiley writes: "A 100-watt bulb costs 33 cents at any Home Depot. In 1883, the same amount of light would have cost the consumer $1,445...In 1910, the average adult was still sleeping nine to ten hours a night."

The sun's energy, she says, "is the catalyst for all life. The amount of light that hits you informs your 'system controls' about the rotation and orbit of the planet we live on ..." When you don't sleep in sync with seasonal light exposure, you "fundamentally alter a balance of nature."

The Hibernation Hypothesis

How so? Well, it seems we humans still are hardwired to respond to summer's *longer days and shorter nights* as the proper time to gorge on its seasonal fruits, berries, starchy roots, tubers, etc., in order to *store a lot of it as fat in preparation for winter's scarcity.* *

She writes: "Obesity was the key to survival, the key adaptation for all mammals. In order to put on enough fat for the winter, ***you had to become insulin resistant.***" [My emphasis CF.] As a consequence of insulin resistance, the receptors in your *muscle* cells become less responsive to insulin, taking in less blood sugar (glucose). Thus glucose is free to go to tissues where more of it can be turned into fat.**

In the natural world of winter scarcity, mammals gradually use up stored fat or, as many animals do, sleep it off. "Mammal studies concur that once you start the hibernation preparation cycle, *hyperlipidemia (high cholesterol), high blood pressure, and insulin resistance (leading to obesity) are normal states that resolve themselves with the extended sleep that follows in nature."*

But the "unending artificial light we live in registers as the long days of summer" on our sensitive internal sundial. Now "we don't sleep and we don't starve, either; at least, we don't starve for carbohydrates. That's why we're fat and getting fatter. It's endless August," Wiley informs us.

"The diseases that we know to correlate with obesity—high blood pressure, heart disease, diabetes, cancer, and depression—are all really the result of a *vestigial hibernation instinct* brought on by too much artificial light."

Close To Home/John McPherson

Skewed Hormones!

She tells us that "one of the evolutionary functions of melatonin [a hormone we make during sleep. CF] is it enhances the appetite-suppressing effect of leptin [another molecule we make. CF] so you stay asleep instead of roaming around hungry all night. It's a feedback loop: melatonin enhances leptin and leptin keeps your brain in the 'fed' stage, so you stay asleep and make more melatonin."

So chronically shortened slumber time means you make less melatonin--*secreted only in the dark* – and less leptin, *which heightens your appetite for munchies.*

Wiley writes: *"In the hormonal state brought on by long hours of light, the urge to consume carbohydrates or drink alcohol to put on a fat base for upcoming winter becomes metabolically and psychologically impossible to resist.."*

*In case you've forgotten, glucose derived from natural sugars and starches, i.e., from dietary carbohydrates, is metabolized in your body to become an energy producer by a series of enzyme-driven steps ("glycolysis") that produces pyruvic acid. Pyruvic acid and a huge molecule called coenzyme A then can combine to form **acetyl-CoA,** which happens to be the starter molecule from which our clever bodies can make ***fats.*** (Acetyl-CoA also is retrieved when fats are metabolized.)

Acetyl-CoA is a key molecule because (1) it's needed to make fats, as noted; (2) it's required for ***cholesterol*** synthesis; and (3) *it's the "starter" for the great Krebs or Citric Acid Cycle—the final common pathway for the oxidation of carbohydrates, lipids, and protein that provides your cells with magic ATP molecules that get transformed into **energy** to drive your whole mechanism.*
(You can make fat not just from carbos, but also from dietary fat. By some hard-to-fathom reasoning, T.S. Wiley says dietary fat *can't* make you fat [p. 184], but all my biochemistry texts dispute this.)

**The extra fat not only becomes fuel for energy and heat during leaner, chillier times, it also serves to insulate your internal organs from the cold. From high carbo intake, you'd make extra cholesterol, too, that would stabilize your cell membranes, plus protect them from freezing. Also, abundant glucose in blood would act like anti-freeze does in a car.

Another reversal of hormonal rhythm caused by staying up late means insulin and cortisol stay high during sleep when they should be flat, while "cortisol falls so late it won't come up normally in the morning." That's a big reason, she says, for the morning grogginess countless people endure.

Sleep Enhances Your Immune System

A theory by scientist Carsten Korth[1] described in the book says your gut bacteria, the friendly ones, nevertheless exude endotoxins over the course of each day, which could get you into trouble by breaching your blood-brain barrier and harming nerve tissue. He suggests that when a threshold level of these endotoxins gets into the central nervous system (CNS), it triggers fatigue and *sleepiness.* During slumber, your immune system kicks in to clear the toxins, etc. from the CNS and restore impermeability of your blood-brain barrier. (This theory helps to explain your great need for sleep when you're sick.)

What Can You Do?

To struggle with your human heritage may not be easy, but in the face of today's epidemic of Type II diabetes and obesity—all tied in to insulin resistance--it makes sense to search for clues in wiser sleep and diet patterns.

•*For seven months of the year starting in fall,* Wiley says to eat meat, fowl, fish, eggs, cheese and green stuff and very little carbohydrate, 25 to 45 grams per day.

> Samples of 9-gram portions of carbos: 1 cup green beans, 1/4 cup lentils or cooked beans, 1 peach, 1 tangerine, 1/2 slice bread.

•Go to bed earlier, turn off TV after 9 p.m., shield all blinking lights.

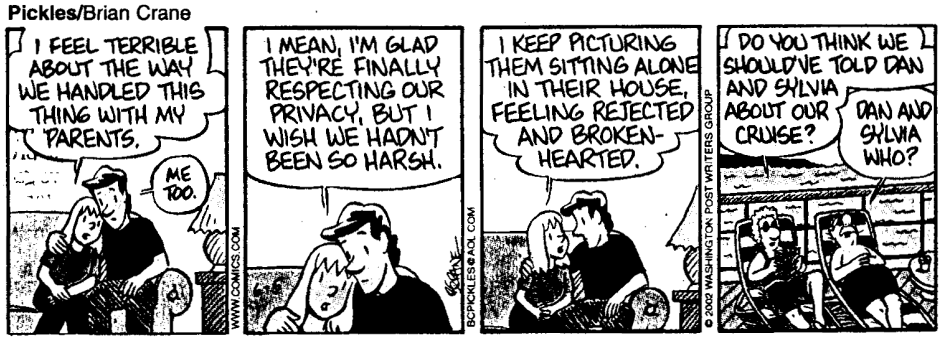
•**Push for 9.5 hours of sleep in a really dark room.**

As compensation, come summer, she says it's okay to stay up later and live it up.

Scientific think-tanks including the National Institutes of Health have been looking into the subject seriously for at least a decade.

Wiley writes: "When we asked Dr. Thomas Wehr, the head of the department studying seasonal and circadian rhythmicity at the NIH in Washington, whether he felt the public had the right to know that on less than 9.5 hours of sleep at night—i.e., in the dark—they will (a) never be able to stop eating sugar, smoking, and drinking alcohol and (b) most certainly develop one of the following conditions: diabetes, heart disease, cancer, infertility, mental illness, and/or premature aging, he said, "Well, yes, they do have a right to know. They should be told; but it won't change anything. Nobody will ever turn off the lights."

Pickles/Brian Crane



Yes, but obesity + Type II diabetes now approach epidemic levels *in our kids.* Television, video games, net-surfing, etc. are the new bedtime stories. The primary message these electronic signals keep sending to young brains is: "You don't need to sleep." ❐

1. C. Korth, "A Co-Evolutionary Theory of Sleep," *Medical Hypotheses,* 1995, vol 45, 304-10.

THE SUNNY SIDE OF CYANIDE

"Broccoli chemical kills stomach cancer bug" was a nice-sized *San Francisco Chronicle* headline on May 28, bringing joy to veggie-lovers everywhere, and to *Felix Letter aficionados* in particular. The findings reported in the May 28 *Proceedings of the National Academy of Science* showed that the chemical, **sulforaphane**, "killed helicobacter pylori, a bacteria that causes stomach ulcers and often fatal stomach cancers.

"And the good news is there appears to be enough of it in broccoli sprouts and some varieties of broccoli to benefit people who eat the vegetables."

Dr. Paul Talalay of Johns Hopkins U. School of Medicine "had previously reported sulforaphane is an effective anti-cancer agent and the new studies extended that work to the bacteria that cause stomach cancer and ulcers."

And Closer To Home...

My 'investment' in alerting readers to healing powers in plant substances closely related to sulforaphane goes back to *FL#* 69 in 1993, which first explored the history of medical uses of **sulfocyanate**, an earlier term for ***thiocyanate.***

Sulphoraphane in broccoli, it so *happens, is an* ***isothiocyanate***, i.e., a derivative of **thiocyanate**. Sulphoraphane and thiocyanate both have the same fundamental cyanate and sulfur components. ("Theion" means "sulfur" in Greek.)

Thiocyanate normally is found in your body fluids such as plasma, saliva, urine. Plasma thiocyanate levels appear to be related to your intake of thiocyanate and/or cyanate from edible plant sources, which happen to be extraordinarily plentiful in nature and attractive to many creatures including humans. Since cyanate (from cyanide) can be toxic, your body attaches *sulfur* to it (mainly from sulfur-containing amino acids like cysteine in protein foods), transforming it handily into thiocyanate.

It Seems to Have Many Uses

Conventional medicine since the 1940s has shown minimal interest in thiocyanate. This may change, now that a derivative of thiocyanate is being hailed as both anti-bacterial and anti-cancer agents. But in the 1930s and '40s, potassium thiocyanate was prescribed medically to *lower high blood pressure.*

From *FL#69:* "Other early medical reports said thiocyanate was a strong *bactericide* (this was before the penicillin era) and a useful remedy for dysentery. It also reduced the frequency and severity of migraine headaches."

Closer to our own times, in the 1974 *Proceedings of the First National Symposium On Sickle Cell Disease,* scientists in the National Institutes of Health reported thiocyanate to be the best *anti-sickling substance* (in test tubes) of all likely substances tested. Its effects, they concluded, were "profound."

In recent experiments, Oklahoma biochemist Oji Agbai employed highly magnified scanning electron micrographs to demonstrate similarly "profound" resistance to sickling of red blood cells [rbc's] from sickle cell patients, *but only after he added an optimal concentration of thiocyanate to test tubes containing their blood samples.* A less-than-optimal concentration did *not* stop sickling of rbc's.

He says this implies sickle cell patients need to make conscientious efforts to keep their own plasma thiocyanate high enough to discourage sickling of rbc's.. (Sickled rbc's not only cause poor delivery of oxygen to tissues, but are so fragile they rupture easily, creating intractable anemia.) Dr. Agbai believes plant foods supplying thiocyanate and/or cyanate may need to be consumed at every meal. To augment this, he developed and patented a thiocyanate supplement, Dioscovite. *

*Dr. Agbai can be contacted re Dioscovite and his book, *Sickle Cell Anemia: A Solution At Last,* at Natural Health Research Institute, 6390 E. 31st St., Suite E, Tulsa, OK 74135. Tel & FAX: (918) 627-7997.

Pickles/Brian Crane

A Remedy From Nature?

Last summer, Dr. Agbai, who grew up in West Africa, was invited by the governor of Ebonyi State to give talks across Nigeria to doctors, scientists, and educators about native foods that traditionally prevented inheritors of sickle cell genes from suffering the life-threatening forms the disease has taken in urban Africa today, similar to its lethal aspect in the USA. He also described case studies of Dioscovite's effectiveness and safety in improving hemoglobin and hematocrit levels *without transfusions* in terribly anemic sicklers in the USA

To doctors in Nigeria, his talks about the healing powers of thiocyanate *derived from their own traditional plant foods* came as a revelation--they were all trained in *western* medicine which, of course, doesn't yet have a clue!

The splendid news is Dioscovite has just been accepted and registered as a *food supplement* by the Office of Drug Registration & Regulatory Affairs in Lagos, Nigeria. Soon, a number of doctors in Nigeria will be conducting their own trials, observing effects on sickle cell patients of Dioscovite and regional foods such as African yam, manioc, and sorghum.

Cherished foods, not just broccoli, turn out to be sources of thiocyanate and/or potentially toxic cyanate, including **mung bean sprouts, lima beans, chickpeas, bitter almonds, apricot kernels, radish sprouts, cabbage, mustard greens, collard greens, kale, brussel sprouts, turnip, turnip greens, cauliflower, macadamia nuts, flaxseed, blackberries, and raspberries.**

Maybe, just maybe, there are lessons for us to learn from nature's design.**

❐

**All of the above probably is familiar stuff to longtime *FL* readers, but a refresher course is available from *FL* issues 69, 71, 72, 75, 77/78, 82, 85, 86, 87, 105/106, 107, 108 (to correct my errors in 107!), & 118.

I'M SPLASHING IN THE NEW FOUNTAIN OF YOUTH!

Two whole kitchen shelves are filled with my supplements—a fact I've found somewhat embarrassing over the years, but the stuff seems to be doing its job, and the expense compared with that of prescription medicines (which, except for Armour's thyroid, I don't take) is bearable. So I was tickled when two of my favorites made the international media's Hit Parade.

Alpha-lipoic acid (often referred to simply as lipoic acid) and **acetyl-L-carnitine** are molecules your body makes because it needs them for all sorts of cellular magic. There's a growing body of research literature on each, including. UC Berkeley's Dr. Lester Packer's work on lipoic acid.

I added supplemental alpha-lipoic acid (100 to 200 mg) to my daily stash some time ago after I learned we make much less of it as we age. (Lipoic acid contains 2 sulfur groups, so it's also called "thioctic acid.") And nutritionist Robert Crayhon made an irresistible case for supplemental acetyl-L-carnitine in his 1998 book *The Carnitine Miracle* [see *FL*#100] and at earlier seminars, so I've been taking 500 mg/day ever since.

Thus it was with a certain smugness I read the headline in the Spring 2002 UC Berkeley paper *Cal Neighbors:* **"New hope for aging rats – and humans too?"** A team of researchers, "led by Bruce Ames, professor of molecular and cell biology, fed older rats two chemicals normally found in the body's cells and available as dietary supplements: acetyl-L-carnitine and an antioxidant, alpha-lipoic acid.

"In three articles in the Feb. 19, 2002 issue of *Proceedings of the National Academy of Sciences,* Ames and his colleagues report the surprising results. Not only did the older rats do better on memory tests, but they had more pep and the energy-producing organelles in their cells worked better.

"'With the two supplements together, these old rats got up and did the Macarena,' said Ames, who is also a researcher at Children's Hospital Oakland Research Institute.

"'The brain looks better, they are full of energy – everything we looked at looks more like a young animal,' Ames said."

Former Berkeley post-doc fellow Tory Hagen, now at Oregon State University, who worked with Dr. Ames, said the old animals given both supplements are more active and seem to have much more vigor.

"'And we also see a reversal in loss of memory,' he added. 'That is a dual-track improvement that is significant and unique...'"

Possible causes of this rejuvenation? The two molecules "tune up" the energy-producing organelles—the mitochondria--that power all cells.

"Ames said there is increasing evidence that deterioration of mitochondria is an important cause of aging."

Iron Burden

Studies of the aging brain in animals show a big increase in iron– not a good sign. Excess iron churns out free radicals that can gum up organelles like mitochondria. In older humans, oxidative stresses triggered by excess iron could affect brain functioning and increase chances of Alzheimer's and Parkinson's.

The spring/summer 2002 issue of *The Linus Pauling Institute Newsletter* from Oregon State U. describes Institute work by Jung Suh, under the direction of Drs. Balz Frei and Tory Hagen, examining "whether supplementation with lipoic acid can reverse the age-dependent increase in the iron content of the brain and also decrease oxidative stress."

Jung Suh writes: "We found a significant decrease in the total iron content in the brains of old animals fed lipoic acid compared to their age-matched controls not given lipoic acid. In fact, the iron content in old rat brains was no longer significantly different from the iron content in the young unsupplemented animals...We also found a 30% increase in vitamin C levels in the brains from old rats treated with lipoic acid. Consistent with this observation, lipoic acid also increased the amount of glutathione in its reduced form. [Lipoic acid is able to regenerate glutathione and vitamins C and E in your tissues. All three of these major antioxidants are good news, for rats *and* people. CF]

"Although the mechanisms responsible for the observed decrease in iron by lipoic acid in the aging brain are not known, our results provide a basis for studies in humans on the use of lipoic acid as a therapeutic agent in either slowing or preventing neurodegenerative disorders."

Suh concludes: "Lipoic acid may be a safe and effective means to lower the age-related increase in iron content in the brain and also bolster protection against free radical damage, but much more work needs to be done before any recommendations for humans can be confidently made."

Fearless experimenter Clara Felix will continue to take her 100-200 mg daily – until she learns higher amounts may be more effective. ❐

I FIND MY MISSING LINK!

Truth is, despite my cupboardfull of supplements and sundry conscientious efforts, my left knee resisted flexible movements and continued to ache. If I wasn't a believer in vitamin D's magic before, I am now. Three months of super supplementation with D3 from fish oil (including rubbing capsule contents on the soles of my feet) were needed to pull my serum levels of 25-hydroxyvitamin D out of the dumps. That's when my knee stopped hurting and got flexible again, after 8 years. (Just *watch* me squat now.) My hair got thicker and is staying that way. *Nothing* about sunlight and vitamin D will surprise me ever again.

Some of the weakness and unsteadiness leading to falls and fractures in older folks may reflect natural decline in functions with age. However, *an overlooked vitamin D deficiency* may be responsible for *avoidable* loss of muscle strength. That's what medical researchers in the Netherlands conclude in their review article, "Vitamin D deficiency, muscle function, and falls in elderly people." (Hennie CJP Janssen et al. in the April *Am J Clinical Nutrition,* vol 75, pp 611-615.) E-mail: h.c.j.p.janssen@azu.nl

Skeletal muscles have receptors that bind specifically to vitamin D metabolites in the circulation. *The adequacy or inadequacy of your vitamin D levels thus directly influences growth and strength of your muscles—at all ages.* In study after study, low serum 25(OH)D3 in the elderly was associated with poor handgrip strength, inability to climb stairs, increased falls and broken bones.

The good news: *even older people can reinvigorate muscles when their vitamin D levels are brought up to snuff.* Studies show they gain knee-extension strength, can walk longer distances, and have fewer falls and fractures. (That's why I'm tap-dancing again in my bumbling 1940s fashion.)

Waking Up the Medical Community

Personal experience strengthens my conviction that if periodic testing of patients' 25(OH)D3 serum levels were to become routine, and appropriate vitamin D repletion implemented, many stubborn ailments might lose their grip.

The wide range of 25(OH)D3 concentrations that different scientists say are desirable are based loosely on whatever will keep parathyroid hormone down to normal levels. (When D levels are too low, blood calcium drops. Parathyroid hormone then kicks in, signaling your bones to give up calcium to feed your bloodstream – a common but crummy scenario over the long haul.) One proposal for interpreting an individual's serum 25(OH)D3 concentrations uses this "gradual scale":

Pickles/Brian Crane

•Hypovitaminosis D: <[less than]40 ng/mL or <100 nmol/L
•Vitamin D insufficiency: <20 ng/mL or <50 nmol/L
•Vitamin D deficiency: <10 ng/mL or <25 nmol/L

In other words, if your serum 25(OH)D3 is 40 ng/mL (100 nmol/L) or, better yet, higher, you're home free. It's worth a try, dear readers; get yourselves tested. ❐

MDs EMBRACE OMEGA-3s!

Do you remember when the phrase "omega-3 fatty acids" meant absolutely nothing to the public, let alone to physicians? In 1987, people assumed *The Omega-3 Phenomenon* (the first book by Dr. Donald O. Rudin that I coauthored) was about *outer space.* (Our second one in 1996, more aptly titled *Omega 3 Oils,* is still available, thank goodness.)

Nowadays, hardly a month goes by without publication of yet another medical paper on newly-found benefits bestowed by my favorite fats. (It's uncanny how often they confirm Dr. Rudin's predictions of over two decades ago.)

•A 16-year study of 85,000 nurses found that women who ate fish five times a week had a 45 percent lower risk of dying from heart disease than those who rarely ate fish. [*JAMA*, Apr 10, 2002]

•Dr. Joseph Hibbeln is chief of a biochemistry lab at the National Institute on Alcoholism & Alcohol Abuse. In a presentation to other NIH scientists in Bethesda, Maryland on April 17, he said diets low in omega-3 (and too high in omega-6) are linked not just to heart disease but to mental and behavioral problems, including bipolar depression, suicide, and postpartum depression. Omega-3 is critical to the growth and maintenance of brain cell membranes, Hibbeln said, and to intercellular communication, including those related to feelings of well being.

•A major study emphasized the unique ability of long-chain omega 3s to prevent *sudden death*, brought on by fatal disturbances in heart rhythm which can occur even in persons who don't have cardiovascular disease. When long-chain omega-3 EPA and DHA are abundant in cell membranes of the heart, they exert a stabilizing, anti-excitatory effect on heartbeat. [*N Engl J Med*, Apr 11, 2002]

•Fatty fish consumption (i.e, the fatter the fish the more omega-3s) was related to lower rates of *prostate cancer* in a big population study of more than 6000 Swedish men. "During 30 years of follow-up, men who ate no fish had a two-fold to three-fold higher frequency of prostate cancer than those who ate moderate or high amounts did." [*The Lancet,* June 2, 2001]

Just a sampling, but ample cause for optimism. ❐

Dear Readers!

When I launched *The Felix Letter* in October 1981, I was propelled by the urge to make a fortune—no, no, I mean by the need to shine a light on nutrition research that was scorned or neglected in conventional clinical practice. Only a handful of newsletters, etc. existed that dealt with health issues from an 'alternative' perspective.

Today, bookstores and your mailboxes are crammed with such publications, while the Net offers answers, accurate or not, to all health questions on earth and maybe Mars.

So, beginning with #120, instead of 6 issues a year *The Felix Letter* becomes a quarterly and I'll have more time for lecturing, writing, and fooling around. Prices remain the same: $12 for six issues, $22 for 12. Your subscription will just last longer. Enjoy!

❐

Illustrations are by the late Clay Geerdes & other artists as noted.

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