Ad Interim

No. 21 June 2004
ELECTRONIC EDITION

There was a young lady named Bright,
Who traveled much faster than light.
She started one day
In the relative way,
And returned on the previous night.

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May 18, 2004. You will be reading this in July, so it is the June issue "in a relative way." The May AAPA bundle arrived at Los Osos today, and Ad Interim for June should be already at the mailers, but alas, such is not the case. The Scriptorium was unavailable during the first and critical half of May.

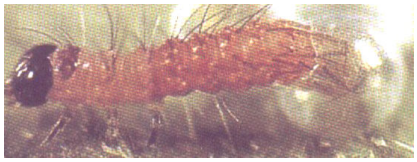
It would be advisable to have an issue of Ad Interim done and out the door before the monthly bundle arrives, as I always suffer a period of humiliation upon reading the excellent essays by other AAPA members and comparing them with my own unfulfilled hopes, dreams, and aspirations[1]. If there are 40 journals in a bundle, 20 or more are certain to strike a resonant chord in my cosmos.

Spiders Again

In my last, I erred slightly in noting a spider that cartwheels by stiffening its eight legs into the spokes of a wheel. I learn from *The Nature of Spiders*, by Adrienne Mason, that the African wheel spider bends its legs and rolls down on its elbows, so to speak. It attains an rpm so high that if it were the wheels of a car, it would be speeding at 153 mph. Enough to baffle any wasp and make it fly off to seek another spider. The photos in this book on spiders are marvelous, as unlike most insect close-ups, there is no sense of looking at the object through a magnifying lens, but rather, the viewer seems shrunk to the size of the object, and contemplating the fearsome monster huge, close, and ready to pounce.

Several favorable reviews of *For Love of Insects* by Thomas Eisner caused me to order the book and delight in its contents. Eisner is an entomologist who asks himself questions such as "Why doesn't the Bombardier beetle scorch its insides with the heat of its discharges?"[2] or "How many shots does it have before it runs out of ammunition?"[3] and proceeds to set up a series of experiments to get the answers. (One reviewer gave the title as *For Fear of Insects*, which tells you where HE stands.) Two things struck me about the book. One; when the Lover of Insects has attained the rank of Professer, he is rewarded by having a number of bright grad students, each eager to be assigned to some insect (or spider) behavior, trivial perhaps to such as me, but with sufficient *gravitas* in the world of entomology to enable the successful student to become Professor in his/her turn. Eisner's book gives credit and praise to a number of these disciples who shared his love of the six (and eight) legged world.

The other thing is the photo on page 358 which shows a *Utethesia* (moth) larva emerging from the egg. I have scanned the photo to show what I mean. Compare the



size of the visible larva with the egg. How did all that bulk come out of that tiny capsule? It is like those six circus clowns who jump out of a toy automobile, but even more impressive. One more instance of "the insects did it first."

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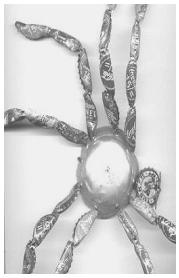
Before leaving the subject of spiders, I would be remiss if I didn't introduce you to my eight legged mascot, which dangles from its "drag line" over my shelves of "Bug Books" – given that "Bug" is an acceptable collective term for the needed "insect and spider" category. My mascot is composed mostly of bottle caps from Coca Cola Bottling; at Nairobi, Kenya. A much traveled spider. Coca Cola is still sold somewhere in the old snap-cap bottle?



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Books

Added to "The Books of May" in my library are two more books on quite different subjects, but "everything is intertwingled" as Ted Nelson has observed. There may or may not be intelligence in insects, and it may or may not be possible to program intelligence in man's creation, the digital computer. It's all in how you define "intelligence." I first became fascinated with the subject in 1962 when I found a book with a curious title: "Principles of Self Organization" – Von Foerster & Zopf. A score of thinkers shared their ideas on how the human brain works, how it "self-organizes", and how it might be modeled with arrays of unreliable neurons. Ten years later, Pamela McCorduck, whose husband is a computer scientist, thought that there ought to be a book on the subject of "Machine Intelligence" for ordinary readers. Some scientist friends disagreed: "It is too difficult – and in five years you will find everything different anyway." But some (I honor their names): Herb Simon, Allen Newell, Ed Feigenbaum, said "Do it." And so *Machines Who Think* was written and pub-

[1] "Thus Was Adonis Murdered" Sarah Caudwell

[2] Hydroquinone meets an oxidizer at the nozzle to generate 212ºF over a small hardened part of the nozzle

[3] More than 20 times – the effect is identical to that of the motor for the "buzz bombs" used by Germany in WW II

lished. Now, 25 years later, most of the contributors to "Self Organizing Principles" have passed on, as well as some who were featured in MWT. After taking ridicule from critics and undergoing name changes to Cybernetics, Automata, etc, it is now "Artificial Intelligence" or AI, and Pamela McCorduck has updated MWT with an account of what has happened in the interim. Needless to say, machines are not yet intelligent, though they have surely become pervasive

Alan Turing (b. 1912, d. 1954) was a British mathematician who in his short life developed two classics: the Turing Machine, and the Turing Test. The Test was his answer to the question, "Will there ever be thinking machines?" and the Machine was a simple thought device to prove that any method of computing will be faced with non-computable problems. Incidentally, his Machine is the germ from which the modern digital computer evolved. As a mathematician, he led a team breaking the "code" of the Enigma encryption device used by the Germans in WW II. It is a fascinating story. On June 23, 2002, a group of logic experts (to give them the best name I can think of) met at Lausanne, Switzerland to deliver papers on "Continuations of Alan Turing's Ideas." The papers were combined in a book, "Alan Turing: Life and Legacy of a Great Thinker" and it is a wonderful volume. Put aside the math, the codes, the "machine" that exists only in the mind: the tests to separate "thinking" from "non thinking," what is the connection with insects? (you may ask). Well, toward the end of Turing's life, he thought about Nature's laws of Phyllotaxis and a phenomenon called parastichies The first is the arrangement of leaves on a stem, and the second is the term describing a spiral drawn through the leaves (left and right). Turing studied the Fibonacci Phyllotaxis in which the numbers of left and right parastichies are invariably a pair from the Fibonacci sequence. (3,5) is an example. Parastichies exist in the patterns of florets in a sunflower head (34, 55), and Turing (according to his correspondence) extended his interest in this subject to the way in which "dappling" or the distribution of spots on an animal's hide, is generated in Nature.

The huge photo of the eyes of a robber fly, on the cover of *For the Love of Insects*, shows the pattern of the myriad of ocelli on the dome-like eyes, and looking closely at the eye on my left, I can see that they are formed in spirals: one conspicuous vertical (as the head sits on the page) with a counter spiral leading across and down. I'm sure that there are parastichies in the eyes, but how to prove it? And if true and I find a Fibonacci pair, they will be very large integers indeed

The Turing memorial volume will need a lot of reading, and I'll have another Turing note in the next *Ad Interim*..

E-JOURNALS

Where are they? Each of J. Hill Hamon's "E-WC" experiments has invited others to join the fun, and Hugh Singleton has issued several e-journals: his "Seeker's Journal" plus short essays of absorbing interest. If there are other AAPA e-journals, I know them not. My experiments with *WEE ONE* were clumsy and merited the resounding no-applause that they received. This "Electronic Edition" of *Ad Interim* is one more experiment. As for distribution: J. Hill announces availability on his Web page, and Hugh writes "e-mail SEND and ye shall receive." I like Hugh's method best.

Speaking of "Intertwingled"

Remember, this is written in May. Yesterday, a mayfly clung to the inside of the parlor drapery. Today (being an ephemera) it lies dead on the floor. I picked it up, curious to view the *halteres* in my pocket lens. These are little knobs on stalks, one under each wing (in the place of what would have been a rear wing on a four-winged insect) Their function (or so I find in a book) is to give flight stability; effective gyro stabilizers, so to speak. My specimen obligingly took its place on my scanner set at 255%, and here is one *haltere* on the left side, in position just behind and under the wing. Each haltere is an inverted pendulum, obeying the same laws as a normal bob on a string pendulum. This makes it an exemplar of the same family as Galileo's famous swinging lamp, Foucalt's pendulum proving that the earth rotates, and the sensitive inverted pendulum that a Dutch scientist used undersea in a U.S. submarine to measure the gravity profile of the earth's oceans to complete a catalog of continental gravity measurements. Just a month ago, a rocket ascended from Vandenburg, 40 miles or so south of my home, bearing a missile whose sole experiment was to measure the "gravity sphere" surrounding the earth in near space. Aboard the missile, and key to the measurement process, was a "ring" of four small crystal balls, the size of oranges. Somehow, and my curiosity burns to find out, the motion of the mass of the balls, in response to varying gravity as the vehicle moves smoothly in its orbit, results in displacements which are sensed, translated into meaningful numbers, and saved or transmitted earthside.

Be sure that when I find out how the principles first employed by the mayfly's *halteres* are now used aboard a measurement missile, I'll be sure to let you know. Meanwhile, just remember F=MA; (etc).

Ad Interim #21 May 2004 (prelim)
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