

DENTON'S STRANGE MISTAKE

by Thomas H. Jukes, Ph.D.

The book "Evolution: A Theory in Crisis", by Michael Denton (Adler and Adler, eds., Bethesda, MD 1985, 368 pages) is much quoted by creationists, and there is even a creationist book, "Of Pandas and People", by P. Davis and D. H. Kenyon that uses its content freely. Denton writes glibly, and quotes liberally, out of context, from the scientific literature on molecular evolution.

Cytochrome c is a small protein that is found in many organisms: molds, yeasts, green plants, insects, vertebrates and even some bacteria. Its function is to transport electrons during the use of oxygen in respiration of cells. It contains about 100 amino acids, so it is easy to analyze. It has long been an evolutionary showpiece because it changes so slowly and is found in so many species, that an evolutionary phylogenetic tree can be constructed that extends from the bacterium *Rhodospirillum rubrum* to mammals. This is shown in Fig. 1, from Dayhoff's "Atlas of Protein Sequence and Structure", vol. 5 (1972) and elsewhere.

[Note for the electronic edition: Obviously, the illustrations have had to be omitted.]

Denton addresses himself (p. 279) to cytochrome c with the aid of a matrix table lifted from Dayhoff's atlas [Fig 2]. From this, he constructs (p. 281) a diagram showing descent from bacterial cytochrome (Fig. 3).

He then discourses as follows:

It means that no eucaryotic cytochrome is intermediate between bacterial cytochrome and other eucaryotic cytochromes. As far as the bacterium is concerned, all eucaryotes are equally distant. All the eucaryotic cytochromes are as a class isolated and unique. No intermediate type of cytochrome exists to bridge the discontinuity which divides the living kingdom into these two fundamental types. The bacterial kingdom has no neighbour [sic] in any of the fantastically diverse eucaryotic types. The "missing links" are well and truly missing.

Unfortunately for Denton, this is all wrong. Dayhoff's

data are for existing species. No cytochrome c sequences are available for extinct organisms. Denton confuses the existing *Rhodospirillum rubrum* with an ancestor that lived about two billion years ago. This is explained in Fig. 2-8 of Dayhoff's atlas (Fig. 1).

The existing species have not descended independently and directly from a single ancestor, as shown in Denton's diagram [Fig. 3]. They have come from a series of ancestors through a branching process. The molecular evolutionary clock says that amino acid replacements take place at a fairly uniform rate for a given protein, which is about one replacement per 40 million years for cytochromes c so that the distances are all about the same, average 66; from the common ancestor to *Rhodospirillum* and the other organisms.

Denton repeats the same mistake on pp. 282, 284 (with globins), p. 285 with cytochrome c which he calls cyclostome c (a cyclostome is a lamprey), p. 286 with globins and p. 294 (where his distances are erroneous). On p. 296, he says that the molecular clock hypothesis can account for "the observed equal divergence of, say, all vertebrate cytochromes from those of insects" but "no one has been able to explain in precise terms exactly how such a time constant process could work. Rather than being a true explanation, the hypothesis of the molecular clock is really a tautology..."

He is wrong about this, too. His statement that the molecular evolutionary clock is a "tautology" rather than a true explanation, is incorrect. Many scientific articles have been written to supply experimental information for the clock. An entire issue of "J. Mol. Evol.", 164 pages, 14 articles was published on the subject of the clock, vol. 26, November 1987.

The clock depends on two observations. First, DNA replicates ALMOST perfectly, but the few imperfections in its replication are a major driving force in evolution. These imperfections become point mutations, which are substitutions of one base or another, such as T by C. These substitutions occur essentially at random, and accumulate in DNA at a rate of about two to five per billion nucleotide sites per year. The effect of these substitutions on the genetic code in genes is to bombard proteins with amino acid changes. This takes place at a steady rate.

Many replacements are lethal, and so do not persist. Others are neutral or near neutral so that the protein can continue functioning. Because the changes are randomly scattered along DNA molecules, they occur at different sites in different species. As soon as divergence from a common ancestor starts, this differentiation between the two species is initiated. The consequence is the molecular evolutionary clock, which is a real and measurable process of evolution. The rate of the clock is fairly constant, for a given protein, especially when measured over long time intervals.

Denton's mistake is that he does not understand that his table, but

NOT his diagram, is an excellent illustration of the branching process in evolution. Instead of reproducing Dayhoff's diagram, he has made up a completely erroneous one of his own.

[THOMAS H. JUKES is professor of Biophysics at UC BERKELEY and has done extensive research in molecular evolution. He is a long time advisor to BAY AREA SKEPTICS.]

EXCITING *NEW* PSYCHIC PREDICTIONS! See Page 9
[Note for the electronic edition: The issue ended on page 8.]

PORTRAIT OF AN INTELLECTUAL ABUSER

by Yves Barbero

Some people are gracious enough to only abuse alcohol or drugs. Their only victims are themselves, their families and those they mug to obtain the funds necessary to perpetuate their habits.

On the other hand, there is a more sinister class of people who build little empires (some, not so little as in the case of Scientology or some of the Creationist outfits) based on an odd notion of the universe. Most of these people are dishonest and do it only for the power and money their hoaxes bring in. The smarter of these keep straight with the IRS and avoid obvious bouts with the law. These thieves are largely home free. The wide skirts of the First Amendment protect them. After all, no sane person wants to re-tailor the Constitution just to catch a confidence schemer. The occasional skeptical attack is rarely a bother. The skeptic must rely on truth and long-winded explanations. Few listen. The con-man can lie and over-simplify through his teeth.

There is another group which is much harder to quantify. They are sincere, occasionally have genuine credentials in science and seemingly enjoy no financial benefit from their activities. These intellectual abusers are, by and large, loners, having only persistence and mailing lists to sustain them. The vast majority make only minor waves. As with the substance abuser, it's difficult to understand why anyone would take such a course. While their psychology is hard to comprehend, their activities can be described.

The ones who really make an impact usually have some personal talent (perhaps they are great debaters or have excellent TV presence) and an advantage over the rational opposition (time on their hands due to personal wealth or an income from retirement) whereas the voice of reason is engaged in research or making a living.

They take on an issue which most people think is resolved. It is often obscure and seemingly of minor importance. Suddenly, an

individual intellectual abuser is on every talk show. He's pulled away from the pack. Organizations promoting science are flooded with his literature. At some point, he finds some ally in politics and scientists find themselves in front of a board of supervisors or a town council trying to recall the arguments they used three to four decades before when the issue was first resolved.

The scientists have their attention divided. They are worried that an established public policy designed, for instance, to protect children from disease will be undermined. They must suddenly re-configure their arguments so a complex issue will be understood by a population which is both scientifically under-educated and constantly reminded of some very real failures of science. This population doesn't read. Everything must fit in the small space between a commercial for a foreign car and one for fake Persian rugs.

The loner has found an opening. Armed with a righteous cause, as he sees it, he has dug out every minority report from way back then. He is relaxed. They are nervous. His political ally has been thoroughly indoctrinated. He's been fighting the good fight since the beginning. He knows everything about it. He's alert to every quarrel among the assembled scholars and carefully exploits them.

All his life, they've ignored his warnings and treated him with contempt and even laughed at him. Him, a healer and lover of humanity. His reasoned arguments had been, years before, shattered by Doctor So-and-So of Ivy League University. But that was then. People worshipped science then. It had bought an end to a war. It promised a bright future. Since then, scientists have been exposed as faking research. There have been melt-downs and everyone had seen "Dr. Strangelove." The Sputniks have been forgotten. The Salk vaccine sits quietly on the shelf next to the aspirin.

Like everyone in the last four centuries who's had a unique scientific claim laughed at by the establishment, the intellectual abuser goes directly to the political power base to find vindication. He has a complete list of the few oddballs who were right in defying the scientific establishment and is happy to make it generally available. There is no mention of the fact that this establishment has cleaned up the procedures and opened up the debate so real developments are less likely to be ignored.

In going to the power base, he's learned to use the media and even to trick normally upright public policy scientific groups into amplifying his claims. He's no longer the forgotten voice in the wilderness. He's arrived. There's no stopping him so long as the media needs something to feed on or the obscure politician finds his coat tails handy. His only real danger is of a rival using the same technique who's better at it than he is. But it's a small danger. There are plenty of talk shows and even more office holders.

He'll often ally himself to the willing and unwilling. He'll call

himself a skeptic challenging the overfed establishment unwilling to look at new evidence. Maybe, he'll become a religious individual defying godless scientists or he'll become a humble citizen who's accidentally stumbled onto the truth while checking out the academic bureaucrats. He knows how to get the goat of the true believers who hang around skeptic groups. These individuals, he recognizes, are ready to step into the breach to mindlessly defend sacred science. He's learned which buttons to press to get himself attacked by them so as to bring his cause public sympathy.

Challenged, he becomes enraged, ready to sue at the drop of a hat while crying to the media that the giants of the establishment are unfairly picking on him. Whenever attacked, it's always personal, not at all the issue. It's difficult for him to lose since the scientist cannot call himself a skeptic without explaining what it really means.

If the scientist is an atheist, he prefers to keep it to himself. After all, his research grants come from the public treasury. If he has religion, he is careful to compartmentalize his life least his beliefs interfere with his research. Nor can the scientist adjust his arguments to suit the audience. And all his statements are trimmed by a series of procedures developed to make language truly well defined so other scientists understand him with precision. Precise language is not necessarily colorful or powerful. On top of all this, the scientist does not know how to handle personal attacks, either aimed at him or attributed to the scientist by the intellectual abuser.

The intellectual abuser is under no restraints. There is no peer review. Illogical connections are valid if they make for powerful public pronouncements. He doesn't have to separate his personal beliefs from his alleged science. His claims can be absurd. He can treat intellectual attacks as personal attacks. His only possible problem is that as the novelty wears off, his pronouncements have to become stronger to keep in the limelight.

The scientist, meanwhile, has made a decision (perhaps through a professional association) to ignore the intellectual abuser, figuring that he can't win in such a climate and that the fringe element, in one form or another, is here to stay. While this saves him valuable time and irritation, it contributes nothing to public education on scientific issues.

The real fight, the scientist reasons, is not the occasional loose screw but with well-organized groups which pose a threat to secondary education by insisting that biology textbooks print patent falsehoods. Grudgingly, he'll sign a petition placed in front of him by his colleague from the history department to prevent a revision of an historical event by a fascist academic. But that's as far as he'll step out of his field of interest.

The intellectual abuser wants attention. He's passionate, genuinely believes what he says and truly has no financial interest in what

he does. In fact, it often costs him deep in the purse. He rarely tries to create an organization beyond the infrastructure for the newsletter he puts out. As an amateur, he intuitively knows how to manipulate social communications. He may be well-trained in some scientific discipline (and may even hold important prizes in his own field) but that is not usually the discipline he challenges. And the scientists are correct about one thing. He is here to stay.

The intellectual abuser, like the drug addict, initially gets pleasure and is then trapped in the lifestyle. That he is wrong is inconsequential. Without checks and balances, the social process becomes primary.

KLASS TO SPEAK

PHILIP J. KLASS will speak before a meeting of the Eastbay Astronomical Society at 8 p.m., Friday, January 4, 1991 at the Chabot Observatory, 4917 Mountain Boulevard, Oakland.

Klass' topic will be "UFOs: Fact or Fantasy". Weather permitting, free observing through the telescopes follow this program. To inquire about dinner with the speaker at a local restaurant the same evening, call BETTY NEALL at 415-533-2394 by Thursday morning, January 3rd.

Klass is well known to skeptics, having written four books on the subject of UFOs. A retired senior avionics editor of "Aviation Week and Space Technology" magazine, Klass' most recent book is "UFO Abductions: A Dangerous Game". He is a founding fellow of Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP), a member of its Executive Council and chairs its UFO Subcommittee.

This and all EAS meetings are free and open to the public.

To reach Chabot Observatory, take I-580 to the Seminary Avenue exit, and follow the little blue signs to the observatory.

| THE PSYCHIC ADVISOR |
| by Jean Lorraine |
| |
| My girlfriend thinks it's dishonest for me to show a |
| picture of a thin woman in a turban with eyeballs upwards |
| and hands hovering over a crystal ball in my newspaper |
| column, since I'm really a fat, balding man with a beard, |
| and a cigar hanging from my mouth. WHAT SHOULD I DO? |
| -- Lost in the Stars |
| |
| Dear Lost in the Stars, |

| ...and if that doesn't change her mind, read my new |
| book, "The Psychic's Image: It's All in the Mind" for |
| more tips. |

PALM READING

A PSEUDO-SCIENCE/ART FORM FOR AMUSEMENT

by Dennis R. Burke

About eleven years ago I was at a party in Berkeley and was asked, "... and what do you do?" Being evasive, I answered that I read fingerprints for a living. This delighted the people with whom I was talking and they asked me if I could read their palms? To their disappointment I had to admit that the only palms I read were those of criminals. (I'm a police officer whose expertise is in Latent Print Analysis.)

The subject of palm reading had sparked my curiosity and I decided to do some self study on the subject. As a skeptic, I believe that palm reading is a fake science and has no basis for predicting future events or exposing personality traits. At best, it is an art form for amusement; and at worse, a sham to perpetuate fraud.

AN EXPERIMENT: Using willing subjects, I took ink impressions of their palms and finger prints, and placed them on a "chart" (see photograph). I then applied a set of twelve stock statements to "characteristics" that I found in the prints. I had the subject rate them and give an overall evaluation of how well the statements evaluated them. The first two readings produced a score of 85 and 95 percent correct, and I received additional requests to do charts for their friends. This caused me to develop additional statements because I couldn't use the same chart for the friend. They would discover that the statements were the same.

The new set of statements was developed using ideas from HARRY BROWN's book, "How I found Freedom in an Unfree World". The statements were less successful but had a 75 percent or better rating. I knew that some of the statements were not general enough and identified them before giving the chart to the subject. When the subject stated that some of the statements did not fit, I would identify the statement as probably being the pre-identified statement and replace it with the stock statement: "You pride yourself on being an independent thinker and do not accept other's opinions about satisfactory proof." This would validate the "reading" and the subject was left with an impression that his or her palm held the key to his or her personality.

After having great success as a palm reader, I began to experience what RAY HYMAN described in his article for "The Skeptical Inquirer", 1977, "Cold Reading: How to Convince Strangers that You Know All About Them." Hyman was convinced, for a time, that he had a genuine power to read palms, except that he one day said the opposite of what he thought to test his powers. To his surprise, the subjects believed and validated the mis-information as being true. Somehow, he contended, people find more meaning in any situation than is actually there. I also found this to be true and saw people find more meaning in the statements than is actually there. The human mind has a tendency to make sense out of nonsense. This can be seen in the way we dream. We take bits and pieces of information and put it together to make a story.

I found that people want to hear things about themselves that they would like to be true, or perceived to be true. Most palm readers use the fishing approach: They get the subject to tell a little about themselves, what they want, and then feed it back to them. A psychologist in a family counseling session uses similar techniques to get his clients focused on their problems.

M. LAMAR KEENE, who spent thirteen years as a spiritualist medium, wrote from first hand knowledge that he believed that virtually all spirit readings, seances and medium messages from the dead are conscious deceptions by the medium.

Skepticism is probably as unfashionable today as in any other age. The "New Age" exploration of claims that we have a vast, untapped powers; or that unseen forces are about to save us from ourselves; or that there is an unacknowledged pattern and harmony to the Universe; has become for some, a new religion.

If you think you have the power, you may be ready to take up palm reading. If so, always give the impression that you know more than you are saying, and flatter your subject every chance you get. Body language will give you a good clue as to the acceptance or denial of what is being presented. Attitude, posture, mannerisms, and tone of voice will help you explore the subject, or allow you to decide whether to go in another direction. According to one book, the purpose of hand reading is for, "people who want to know success, money, love, and sex." They [palm readers] refer to themselves as disciples of an ancient science and are appealing to basic human desires.

WHAT I LEARNED: First, I had fun being a palm reader. People like to hear positive things about themselves and this process opened a door for self-examination for both the subject and myself. As far as it being an ancient science, it is not. It is merely a mirror for the mind to see what it wants to see. As an example, I was viewing photographs of the planet Venus and noted that the pattern formed on the surface was similar to the creases in the worn part of the palm, near the area below the thumb. By chance, the pattern on the palm chart for this area was labeled -- Venus. Of course

this was a coincidence and lends no scientific basis for the art of palm reading. The human mind unconsciously conspires to produce a biased response to this type of coincidence, and tries to make it into something that it is not.

[DENNIS R. BURKE is a sergeant with the BERKELEY POLICE DEPARTMENT and is a twenty-five year veteran. He holds a degree in Business Administration from the State University at Hayward and a Master's Degree in Public Administration from John F. Kennedy University.]

ANOTHER SHAMELESS PLUG

William N. Eschmeyer's "Catalog of the Genera of Recent Fishes", ISBN 0-940228-23-8, all 697 pages, has been released after years of preparation by our own California Academy of Sciences.

This masterpiece of taxonomy can be gotten for \$55.00 plus tax by writing:

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Why the plug? Your editor had an extremely minuscule role in outputting the final drafts using the same computer program that puts out this newsletter. So there...

A HORSE'S HIND QUARTER IN THE TILTED WASTELAND by Earl Hautala

In the Vast Tilted Wasteland of TV talk shows, Rick Stack, author of "Out-of-Body Adventures" (Contemporary Books, Chicago, Ill., 1988) appeared on People Are Talking, KPIX-TV San Francisco, on election day.

Stack offers to teach others how to have out-of-body experiences, including the program's groin grabber, astral sex. Appearing with him were two other voyagers who journey through not only space, but time, and Loyd Auerbach, a Bay Area parapsychologist.

An audience composed mostly of believers and seekers, supplied questions designed to fan the flames of imagination. That's entertainment! A lone voice for skepticism came from Bob Steiner, founder of the Bay Area Skeptics. Steiner may not have gotten equal time, but his analysis of the subject more than made up for the difference. Steiner quoted from the preface to Stack's book, "This book is designed to take the study and practice of out-of-body

experiences out of the realm of research laboratories and esoteric mysticism and into the living rooms and bedrooms of the world where they belong."

With no rebuttal from the author, it would appear that Mr. Stack makes no scientific claims. He sells books! All you have to do is believe, right? WRONG! Steiner quoted from Stack's book (page 31). "Nothing accidental ever happens If you have ever been robbed or otherwise `victimized,' it is your own fears, feelings of worthlessness, or negative imaginings that have brought these unpleasant experiences into your life."

Steiner pointed out that Rick Stack was "Just one more in a long list of misguided philosophers who blame the rape victim for the rape." Steiner's logic failed to stir the faithful. Questions about out-of-body experiences continued as if no one had said anything contrary to the author's words. Even the promised titillation passed without comment when Mr. Stack allowed that "astral orgasm" was five to ten times better than the ordinary kind. There you have it, straight from some part of the horse. This slice of life drama suggests additional food for thought.

This audience of adults represented some portion of the gullible public. They would rather spend their time trying to escape astrally, than attempt to sort out their problems rationally. If we have some problems in this society, we need to bear in mind that most adults have the right to vote. Part of our collective future will be determined by people who have no interest in hearing, let alone examining, evidence of any kind.

TALBOT NAMED TO BOARD

Kate Talbot, a long-time supporter of BAY AREA SKEPTICS, has been named to the board of directors. She first involved herself by folding, stapling, and mailing this newsletter, but was soon promoted to meeting coordinator, and will continue in that position.

She replaces astronomer John Lattanzio, PhD, who is returning to Australia to teach mathematics at the university level.

Bob Steiner, a founder of BAY AREA SKEPTICS, said, "We appreciate Dr. Lattanzio's interest in and contributions to the group, and wish Kate much luck and success. We all know she'll do a fine job."

THE SKEPTIC'S ELECTRONIC BULLETIN BOARD

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ANTI-FLUORIDATION -- A LITMUS TEST FOR SKEPTICS

by Bob Steiner

JOHN R. LEE, MD, will address the BAY AREA SKEPTICS meeting this month on the topic "The Role of Skepticism in Science and in Understanding the Fluoride Problem." Dr. Lee's position is that fluoridation of our water supply does not help our teeth, and is otherwise dangerous to our health.

Please see flier describing the talk, as well as information about date, time, and location elsewhere in this issue of "BASIS".

I have taken more heat on this speaker and topic than on any speaker and topic in the nine year history of BAY AREA SKEPTICS.

At the suggestion of many people, and with the able assistance of EARL HAUTALA, we attempted to locate a knowledgeable pro-fluoridation health professional to appear on the platform with Dr. Lee. Our quest included contacting The Centers for Disease Control, the American Dental Association, and the University of California at San Francisco Dental School. These sources, as well as others, would not or could not field someone to appear with Dr. Lee to oppose his views.

Many of the people contacted strongly urged that we not allow Dr. Lee to address our group at all. We replied that BAY AREA SKEPTICS provides an open forum for many points of view on many topics.

Some skeptics felt it was critical that we have an opposing speaker on the platform with Dr. Lee. When I explained that we could not obtain one, some of these people, otherwise intelligent and open-minded skeptics, implored me not to allow Dr. Lee to address our organization.

Upon my reply that Dr. Lee was indeed going to address BAS, one person urged that we set ground rules for him. I inquired, "What kind of ground rules?" The answer was that we must restrict Dr. Lee's talk to the scientific aspects of the fluoridation question; we must not allow him to address the personalities involved in getting fluoride into our water, and he must not address the political aspects of this subject.

I replied that, in the nine-year history of BAS, we have NEVER set ground rules for our speakers. I assured this person that, if Dr. Lee were to enter the audience for the purpose of punching someone in the nose, I would most assuredly step in. Short of that, there will be no ground rules.

Are you a skeptic? Do you have an open mind? Do you believe that a speaker who opposes fluoridation of the public water supply must be censored? Do you believe that it is the proper function of BAY AREA SKEPTICS to protect the public from hearing ideas that differ

from the prevailing bureaucratic opinion in this country? Are you REALLY a skeptic?

[BOB STEINER is a founder of BAY AREA SKEPTICS and knows how to take and dish out the heat.]

CREATIONISTS TO HOLD CONFERENCE

Billed as a Christian Conference, "Back to Genesis", the Redwood Chapel Community Church will host the heavy hitters of Scientific Creationism, DUANE GISH, KEN HERN and JOHN D. MORRIS in Castro Valley January 11th and 12th.

The church is located at 19300 Redwood Road, Castro Valley, CA 94546 and the registration fee is \$20.

=> FRIDAY'S session will be between 7-9:15 p.m.

=> SATURDAY'S session will be between 9-11:45 a.m. and 1:30-5:30 p.m.

STANFORD COURSE IN MEDICAL FADS

Wallace Sampson, M.D., a founder and long-time advisor to BAY AREA SKEPTICS, has announced the first four lectures of the annual course in medical fads.

=> Jan. 8: Analysis of Anomalous Claims -- Wallace Sampson, M.D.

=> Jan. 15: Visual Foolery and Magic -- Richard Goode, M.D. (and magician)

=> Jan. 22: The Physics of Firewalking and other Miracles -- Bernard Leikind, Ph.D.

=> Jan. 29: Perseverance of Beliefs -- Lee Ross, M.D.

For information regarding the exact location and possible course changes, call Dr. Sampson at 415-961-5548, or The Skeptic's Board BBS at 415-648-8944. Future classes will be announced in these pages.

A VOICE IN THE WILDERNESS?

Is it an example of the "Lone Crusader" taking on an unwilling or unwieldy scientific establishment? Is it a crackpot theory making a comeback after decades of sleeping quietly as a footnote to the history of public health?

A sigh of exasperation has escaped the lips of the scientific community as JOHN R. LEE, M.D. single-handedly (nearly) takes up the cause of anti-fluoridation. Armed with reams of studies and minority reports, he will address the BAS January meeting,

insisting that the debate, which everyone else thought long closed, be reopened!

Does fluoridation cause cancer? The mainstream scientific community doesn't think so, but Dr. Lee does.

Come and hear JOHN R. LEE speak on his challenge to the "scientific establishment." Dr. Lee had a family practice in Mill Valley for thirty years and chaired the Marin Medical Society Committee on Environmental Health in 1972 which was charged with reviewing the pros and cons of fluoridation.

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