

# CRIME Times

Linking **Brain** Dysfunction to  
Disordered/Criminal/Psychopathic Behavior

Volume 16, Number 1, 2010

## Low prenatal folate linked to hyperactivity, peer problems in kids

Low levels of folate (the natural form of folic acid) during pregnancy may increase the risk of attention deficit hyperactivity disorder (ADHD) in children, new research suggests.

In a study involving 100 pregnant women, Wolff Schlotz and colleagues measured maternal red blood cell folate (RCF) at 14 weeks of pregnancy and tracked the women's total folate intake from food and supplements in early and late pregnancy. They also measured the head circumference and body weight of the women's children at birth and in infancy. In addition, the mothers assessed their children's behavior problems when the children were between seven and nine years of age.

The researchers report, "Lower maternal RCF and total folate intake in early pregnancy were associated with higher childhood hyperactivity and peer problems scores in the offspring." In addition, RCF was positively associated with head circumference at birth. This may suggest, Schlotz and colleagues say, that low folate leads to a slower rate of prenatal brain growth.

The results remained valid after the researchers controlled for a variety of factors

*continued on page 2*

## Abnormal fear response at age three raises criminality risk

Children who fail to show a normal fear response to unpleasant noises at the age of three are at heightened risk for adult criminality, according to a new study.

Yu Gao and colleagues studied nearly 1,800 individuals born in 1969 and 1970 on the island of Mauritius. The individuals are participating in the long-term Mauritius Child Health Project.

At the age of three years, participants were tested to see how they responded to unpleasant noises that normally provoke a fear reaction. When the participants were 23 years old, the researchers used official court records to see which participants had committed property crimes, crimes involving drugs, violence-related crimes, and serious driving offenses. (Petty offenses were not included.) Of the original group, 137 subjects had at least one court conviction.

After controlling for social adversity, age, ethnicity, and gender, Gao and colleagues found that "criminal offenders showed significantly reduced electrodermal fear conditioning at age three compared to matched comparison subjects." They note that two brain regions, the amygdala and the ventral prefrontal cortex (VPC), play key roles in the fear conditioning process.

"The findings are consistent with the hypothesis that poor amygdala functioning early in life, as indicated by poor fear conditioning, increases the risk for criminal offending," the researchers say, "and they demonstrate that this fear conditioning risk factor for crime is in place early in life and is not explained by social

adversity, ethnicity, or gender." They add that poor connectivity between the amygdala and VPC, rather than localized dysfunction in these brain areas, may underlie the impairments they detected in fear conditioning.

People who lack normal fear responses, the researchers say, are less likely to avoid situations that may lead to future punishment. Normal fear responses also play an important role in the development of conscience.

The findings, the researchers say, highlight the need for improved health care for young children and the importance of reducing exposure to brain-harming toxins during early development. They conclude, "Enhancing the early health environment of young children from ages three to five years with better nutrition, more physical exercise, and cognitive stimulation has been shown both to improve brain functioning six years later . . . and to reduce adult criminal offending by 35%; conceivably it could also improve amygdala functioning."

The researchers caution, however, that the roots of criminality are complex and that poor fear conditioning cannot be used to predict later offending.

—  
"Association of poor childhood fear conditioning and adult crime," Yu Gao, Adrian Raine, Peter H. Venables, Michael E. Dawson, and Sarnoff A. Mednick, *American Journal of Psychiatry*, November 16, 2009 (epub prior to print publication). Address: Yu Gao, 3718 Locust Walk, McNeil #483, Department of Criminology, University of Pennsylvania, Philadelphia, PA 19104, yugao@sas.upenn.edu.

---

## High lead levels may increase risk for depression, panic

High lead levels are strongly linked to academic failure and delinquent behavior, and a new study implicates the toxic metal as a culprit in mental disorders as well.

Maryse Bouchard and colleagues evaluated data on 1,987 adults participating in the National Health and Nutrition Examination Survey (NHANES) between 1999 and 2004. NHANES collects large amounts of data on participants' physical and mental well-being.

---

## Low prenatal folate linked to ADHD, peer problems

(continued from page 1)

including the use of alcohol or tobacco during pregnancy. They conclude that although more research is needed, "our data provide preliminary support for the hypothesis that lower folate status in early pregnancy might impair fetal brain development and affect hyperactivity/inattention and peer problems in childhood."

The researchers say low folate status is a particular concern in low-income populations in which mothers are less likely to take folate supplements before becoming pregnant.

—  
"Lower maternal folate status in early pregnancy is associated with childhood hyperactivity and peer problems in offspring," Wolff Schlotz, Alexander Jones, David I. W. Phillips, Catharine R. Gale, Sian M. Robinson, and Keith M. Godfrey, *Journal of Child Psychology and Psychiatry*, October 28, 2009 (epub prior to print publication). Address: Wolff Schlotz, School of Psychology, University of Southampton, Southampton SO17 1BJ, UK, ws@southampton.ac.uk.

—and—

Attention-deficit/hyperactivity problems associated with low folate levels in pregnant women," news release, Wiley-Blackwell, October 28, 2009.

The researchers looked at participants' blood lead levels and determined which participants had diagnoses of major depressive disorder, panic disorder, or generalized anxiety disorder. Participants were in their 20s and 30s and had low lead levels overall, averaging 1.61 micrograms per deciliter. (The current threshold for lead toxicity is 10 micrograms per deciliter.)

The researchers report that after they adjusted for sex, age, race and ethnicity, education status, and income, "increasing blood lead levels were associated with higher odds of major depression and panic disorder but not generalized anxiety disorder." Participants with blood lead levels in the highest quintile were 2.3 times as likely to have major depressive disorder and 4.9 times as likely to have panic disorder as those in the lowest quintile.

Cigarette smoking correlated with higher blood lead levels, but the researchers note that "models that excluded current smokers also resulted in significantly increased odds of major depression and panic disorder with higher blood lead quintiles."

They conclude, "Exposure to lead at levels generally considered safe could result in adverse mental health outcomes."

—  
"Blood lead levels and major depressive disorder, panic disorder, and generalized anxiety disorder in US young adults," Maryse F. Bouchard, David C. Bellinger, Jennifer Weuve, Julia Matthews-Bellinger, Stephen E. Gilman, Robert O. Wright, Joel Schwartz, and Marc G. Weisskopf, *Archives of General Psychiatry*, Vol. 66, No. 12, December 2009, 1313-19. Address: Maryse Bouchard, Department of Environmental Health, Landmark Center, 401 Park Drive, Boston, MA 02446, mbouchar@hsph.harvard.edu.

---

## Gasoline vapors linked to increased aggression, brain chemical alterations

Exposure to fumes from gasoline may increase aggression, according to a recent study at Cairo University.

Amal Kinawy evaluated three groups of male rats, exposing them to leaded-gas fumes, unleaded-gas fumes, or clean air for 30 minutes a day over a six-week period. In addition to observing the rats' behavior, she performed post mortem biochemical and physiological analyses.

Kinawy found that rats exposed to vapors from either kind of gasoline showed increased aggression compared to the clean-air group. She adds, "Rats exposed to unleaded gasoline showed indications of increased damage caused by free radicals and altered levels of neurotransmitters in the brain cortex region, in comparison with the control or leaded gasoline groups. Furthermore, inhalation of both fuels induced significant fluctuations in neurotransmitters in the hypothalamus, hippocampus and cerebellum."

Kinawy concludes, "Heightened aggression may be yet another risk for the human population chronically exposed to urban air polluted by automobile smoke."

—  
"Impact of gasoline inhalation on some neurobehavioural characteristics of male rats," Amal A. Kinawy, *BMC Physiology*, November 24, 2009 (epub prior to print publication). Address: Amal Kinawy, Psychology Department, Faculty of Arts, Cairo University, Egypt, aa\_behphys2002@yahoo.com.

—and—

"Road rage: Fuel vapor heightens aggression," news release, BioMed Central, November 23, 2009.

---

— A Decade of Reading: Selections from *Crime Times* Book Reviews, 2000-2010 —

***Optimum Nutrition for the Mind*,  
Patrick Holford, Basic Health  
Publications, Inc., 2004**

Holford—director of the Optimum Nutrition Center in London—explores how the food we eat affects our thinking, memory, mood, and behavior. **Quote:** “You can’t just psychoanalyze away deficiencies in essential fats, vitamins, minerals, and other key brain nutrients. We must think our way out of the box and wake up to the fact that chemistry directly affects how we think and feel.”

***They Are What You Feed Them*,  
by Alex Richardson, Harper  
Thorsons, 2006**

Parents will enjoy this highly readable book on nutrition and behavior, authored by the chairperson of the Food and Behavior Research (FABR) charity in Britain. **Quote:** “Nutrients can actually affect the expression of many genes. This means that you might be genetically ‘at risk’ for something like ADHD or depression, but you won’t necessarily develop the symptoms if your environment (including diet) is good.”

***Evil Genes: Why Rome Fell, Hitler  
Rose, Enron Failed, and My Sister  
Stole My Mother’s Boyfriend*,  
by Barbara Oakley, Prometheus  
Books, 2007**

This quirky, entertaining, and highly informative book covers current findings about genes, brain structure, and the neurological roots of psychopathy, borderline personality disorder, and Machiavellianism. **Quote:** “Just as a child needs the neurological structure of the eye to process information from the electromagnetic fields that shimmer through the air around him, a child also needs the structure of the

orbitofrontal cortex and related neurological features to have a feeling of compassion. Psychopaths, it appears, may be born preprogrammed with a tendency to grow up ‘morally blind.’”

***Dyslogic Syndrome*,  
by Bernard Rimland,  
Jessica Kingsley Publishers, 2008**

In this no-holds-barred work, the late Bernard Rimland—a psychologist and leading authority on autism and other childhood neurodevelopmental disorders—argued that childhood behavior problems stem from dysfunctional brains reeling under biological insults including environmental toxins, poor diets, and misguided medical interventions. **Quote:** “Our failure to understand that dyslogical brains cause dyslogical thinking and behavior has devastating consequences, because no amount of psychosocial intervention can correct the distorted thoughts of a malfunctioning brain.”

***The Psychopath: Emotion and  
the Brain*, by James Blair, Derek  
Mitchell, and Karina Blair,  
Blackwell Publishing, 2005**

An excellent resource for professionals and students, this book is written by a team of leading investigators in the field of psychopathology research. **Quote:** “We believe that the amygdala is functioning atypically from an early age in individuals with psychopathy. Furthermore, we believe that it is this problem in amygdala functioning that leads to the psychopathic individual’s impairment in emotional learning. We believe that this impairment in emotional learning is at the root of psychopathy.”

***Snakes in Suits*, by Paul Babiak  
and Robert D. Hare, Regan Books,  
2006**

This popular book about psychopaths in the workplace is geared for lay readers. Hare is one of the world’s leading authorities on psychopathy, while Babiak is an industrial psychologist. **Quote:** “Evidence [of the strong influence of genes on psychopathy] does not mean that the pathways to adult psychopathy are fixed and immutable, but it does indicate that the social environment will have a tough time in overcoming what nature has provided.”

***Attention Deficit Disorder: The  
Unfocused Mind in Children and  
Adults*, by Thomas E. Brown, Yale  
University Press, 2005**

Explaining that “the core problem in ADHD is not lack of willpower, but chronic, often lifelong impairment of the ‘executive’ or management functions of the brain,” Brown describes how this impairment can make the responsibilities of adult life—holding down a job, raising a family, handling finances, and developing relationships—a constant struggle. **Quote:** “Many mental health workers assume that interpersonal problems are always caused by unrecognized emotional conflicts. For some individuals, however, interpersonal difficulties are more fundamentally rooted in an inability clearly to say what one is thinking or to understand correctly what others are trying to say.”

***Hardwired Behavior: What Neu-  
roscience Reveals About Morality*,  
Laurence Tancredi, Cambridge  
University Press, 2005**

The author, who is an attorney and a physician, poses challenging  
*continued on page 7*

---

## Treatment with dietary amino acids may reduce cognitive impairment after brain injury

**T**raumatic brain injury (TBI) is a common cause of disability and often contributes to serious impairments in thinking and behavior. A new study suggests that at least some of these impairments could be reduced by treating TBI patients with a combination of certain amino acids.

Noting that a TBI can upset the balance between excitatory and inhibitory neurotransmitters in the brain, Jeffrey Cole and col-

leagues administered a mixture of three branched-chain amino acids (leucine, isoleucine, and valine) to brain-injured mice. Branched-chain amino acids are precursors of the neurotransmitters glutamate (which excites neurons) and GABA (which inhibits them). The amino acids were added to the drinking water of the mice.

When the researchers compared the untreated mice with TBIs to non-

injured mice, they found that the untreated mice showed evidence of learning deficits. Treated mice, however, responded to testing in the same way as non-injured mice. Examination of the hippocampal tissue of the treated mice also showed that the amino acid "cocktail" restored a normal balance of neural activity.

Previous studies reported only mild benefits when TBI patients received the same amino acids intravenously. Cole and colleagues suggest that administering them as a dietary supplement, as in this study, may be much more effective. The researchers plan to conduct clinical trials of dietary amino acids in humans with mild to moderate TBI over the next year.

—  
"Dietary branched chain amino acids ameliorate injury-induced cognitive impairment," Jeffrey T. Cole, Christina M. Mitala, Suhali Kundu, Ajay Verma, Jaclynn A. Elkind, Itzhak Nissim, and Akiva S. Cohen, *Proceedings of the National Academy of Sciences*, December 7, 2009 (epub prior to print publication). Address: Akiva Cohen, cohen@email.chop.edu.

—and—  
"With amino acid diet, mice improve after brain injury," Yahoo! News, December 7, 2009.

---

## Lead damages brain regions affecting behavior, emotions

**C**hildhood exposure to high levels of lead can cause life-long damage to areas of the brain involved in emotions and decision-making, according to a new study.

Kim Cecil and colleagues performed functional magnetic resonance imaging (fMRI) scans on 33 adults who were enrolled as infants in the Cincinnati Lead Study. The 14 women and 19 men who participated were around 21 years of age at the time of the new study, and their mean blood lead levels ranged from 5 to 37 micrograms per deciliter with a mean of 14. (The current threshold for lead toxicity is 10 micrograms per deciliter, but recent research indicates that even levels over 5 micrograms can cause behavioral or academic problems.)

Cecil and colleagues scanned the brains of the participants as they performed two tasks that measure the brain's executive functioning—that is, its ability to pay attention, control impulses, plan, and make decisions. The researchers found that in order to succeed at a task requiring impulse inhibition, participants with increased blood lead levels had to use additional brain regions within the frontal and parietal lobes.

"This tells us," Cecil says, "that the area of the brain responsible for inhibition is damaged by lead exposure and that other regions of the brain must compensate in order for an individual to perform. However, the compensation is not sufficient."

A task measuring attention showed an association between elevated lead levels and reduced activation in the parietal lobe and other brain areas.

Cecil notes that the frontal lobes, which are the last part of the brain to develop, are powerfully affected by multiple insults from lead exposure as they mature. "Many people think that once lead blood levels decrease, the effects should be reversible," she says, "but, in fact, lead exposure has harmful and lasting effects." She says the new findings add support to research indicating that neurological damage caused by lead exposure, rather than a poor social environment, is primarily responsible for the cognitive and behavioral problems of lead-exposed individuals.

—  
"Childhood lead exposure causes permanent brain damage," news release, Radiological Society of North America, December 2009. Findings presented at the December 1, 2009 Annual Meeting of the Radiological Society of North America (RSNA).

---

## Quotable....

"Police, courts and prisons will test all adult offenders for attention deficit disorders in a bid to reduce reoffending rates and cut aggressive behavior in prisons . . . .

"Professor Philip Asherson, chair of the UK Adult ADHD Network, welcomed the initiative: 'ADHD should be considered as a mental disorder that may impair criminal responsibility. They are vulnerable at every stage in their interface with the criminal justice system.'"

—The Guardian (UK), Dec. 27, 2009

---

**Book Review:  
THE ULTRAMIND  
SOLUTION**  
by Mark Hyman, M.D.

Scribner, 2009  
Hardback, 445 pages

While the title and tone of Dr. Hyman's new book are geared for a popular audience, physicians and researchers also will find valuable information about the powerful effects of nutrition, toxins, and other environmental influences on the brain and body.

Hyman, the editor-in-chief of *Alternative Therapies in Health and Medicine*, is affiliated with the Georgetown University School of Medicine's "Food as Medicine" training program. In his new book, he argues that a wide range of diseases of the mind and body—from depression and ADHD to conditions such as diabetes and Alzheimer's disease—stem from biological causes that can often be pinpointed and treated.

Hyman makes the case that many illnesses stem from the interaction of genetic vulnerabilities and environmental insults including nutritional deficiencies, allergens, infections, toxins, and stress. He outlines a six-week program of nutrition, exercise, and lifestyle changes designed to improve physical and mental health.

In her foreword to the book, Martha Herbert, M.D., Assistant Professor of Neurology at Harvard Medical School, says that Dr. Hyman's book offers "a clear approach to supporting and healing our core functional systems." She adds, "While more research is important, we know enough to deal intelligently with these challenges right now, and Dr. Hyman shows not only why but how."

**Quotes from  
THE ULTRAMIND  
SOLUTION:**

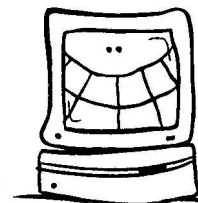
"[Y]our genes are not fixed but capable of dynamically responding to information or instructions that come from your diet, lifestyle, and environment. The 'information' you send your genes determines whether you stay well or get sick, and just how well you function day to day."

"Some of the most exciting research on the brain in the last decade has clearly shown that the brain can heal, renew, repair, and regenerate itself. You *can* make new brain cells (neurogenesis), you can wake up and activate damaged brain cells, and you can improve connections between brain cells (neuroplasticity), all of which lead to improved cognitive function and remarkable recoveries."

"The key to optimal brain health is doing more of the things that help generate new brain cells, and less of the things that kill brain cells."

"Today, even with our 'enriched food,' more than 92 percent of Americans are deficient in one or more vitamins. That doesn't mean they are receiving less than the amount they need for optimal health. It means they receive less than the minimum amount necessary to prevent deficiency diseases."

"Genes load the metabolic gun and the environment pulls the trigger . . . [W]hether we pull the trigger or not is largely dependent on us. You may have genetic predispositions to certain diseases, but that doesn't mean you *have* to get sick."



**CHECK OUT  
THE  
CRIME TIMES  
WEBSITE!**

**www.CrimeTimes.org**

Features include:

• Current and past issues that can be downloaded in PDF format

• Index to individual articles searchable by title or issue number

• Site search to locate current and past articles

• An online survey—let us know what you like about Crime Times, and what we can improve

• RSS Feed

• All content is accessible free of charge.

• Although we can't respond to emails, we'd like to hear from you. Email us at:  
**crimet@aol.com**

• If you'd like to be placed on our email list, send your email address to us at **info@CrimeTimes.org** or sign up on our website, and we'll email you each time our website is updated.

---

## Animal study: high levels of omega-3 fatty acids may protect against sensory overload

A diet high in omega-3 fatty acids may help people avoid sensory overload, a new study suggests. An inability to process incoming sensory information efficiently is seen in a wide range of nervous system conditions including attention deficit hyperactivity disorder (ADHD), bipolar disorder, obsessive-compulsive disorder, and schizophrenia.

Irina Fedorova and colleagues fed different diets to four groups of

The abnormal sensorimotor gating of omega-3-deficient mice, the researchers say, may cause them to be easily overwhelmed by sensory stimuli. "It only takes a small decrement in brain DHA to produce losses in brain function," study coauthor Norman Salem says.

pregnant mice and their offspring. One diet was high in the omega-3 fatty acids docosahexaenoic acid (DHA), eicosapentaenoic acid (EPA), and  $\alpha$ -linolenic acid (LNA). The other diets contained no EPA or DHA but were high, low, or deficient in LNA. LNA is a precursor of DHA and EPA; however, the researchers note that the body converts less than 1% of LNA into DHA and that DHA makes up more than 90% of the omega-3 fatty acids in the brain.

The researchers tested the offspring by exposing them to a sudden, loud noise. Animals normally flinch when they hear the sound, but they react less violently if they are exposed to a softer tone beforehand. This adaptive blunting of the nervous system's response to future

stimuli after a first exposure is called "sensorimotor gating."

Fedorova and colleagues say the mice who received DHA and EPA exhibited normal sensorimotor gating, showing a reduced startle response to the loud tone when a softer tone preceded it. The mice in the other three groups, however, were unable to "downshift" their response to the second tone. Mice in the deficient-LNA and low-LNA diets exhibited a substantial deficit in sensorimotor gating, while those receiving the high-LNA diet exhibited a smaller but still significant deficit.

This abnormal response, the researchers say, may cause omega-3-deficient animals to be easily overwhelmed by sensory stimuli. "It only takes a small decrement in brain DHA to produce losses in brain function," study coauthor Norman Salem says.

Omega-3 fatty acids are essential for brain and eye development. The body needs to obtain these nutrients through food or supplements because it cannot synthesize them from scratch. Salem says, "It is an uphill battle now to reverse the message that 'fats are bad,'" *continued on page 7*

---

## Kids in North America deficient in brain-building omega-3s

North American children's diets are deficient in omega-3 fatty acids, according to a recent study. These nutrients are essential for proper brain and eye development, and some research links deficiencies of omega-3 fatty acids to hyperactivity, depression, and learning disabilities.

Sarah Madden and colleagues evaluated the omega-3 intake of 41 typically developing Canadian children ranging in age from four to eight years. They compared the children's omega-3 intake to the suggested daily intake recommended by the Institute of Medicine, which is 90 mg per day—a standard many researchers believe to be too low. (The American Dietician Association recommends 351 mg per day.)

The researchers found that 78% of the children they evaluated had intakes significantly below 90 mg per day. Madden and colleagues say this finding is consistent with data showing that the average daily omega-3 consumption by U.S. children is only 50 mg per day.

They conclude, "There is an apparent need to create greater awareness of the importance of the long-chain omega-3 polyunsaturated fatty acids among both health professionals and the general public as well as the existing gap between actual and recommended intakes from various sources. This gap can be readily filled with an increased consumption of fish/seafood containing (omega-3) DHA (docosahexaenoic acid) and EPA (eicosapentaenoic acid), the increased availability of foods that have been nutritionally enriched with various delivery forms of [these nutrients], and the use of supplementation where necessary."

—  
"Direct diet quantification indicates low intakes of (n-3) fatty acids in children 4 to 8 years old," Sarah M. M. Madden, Colin F. Garrioch, and Bruce J. Holub, *Journal of Nutrition*, Vol. 139, No. 3, 2009, 528-32. Address: Bruce J. Holub, bholub@uoguelph.ca.

—and—  
"North American children are omega-3 deficient and may be at risk for suboptimal health," Newswire, March 2009.

---

## A Decade of Books: The *Crime Times* Bookshelf (cont. from page 3)

ing questions such as: How does the physical brain work to develop moral decisions, and are specific moral rules innate? **Quote:** "How many of us would accept the idea that our personal choices in life are influenced, even determined, by brain biology? We resist this notion even if we've known older people, perhaps in our own families, who have suffered stroke or a serious disease such as Alzheimer's, and we've seen how such physical brain injuries can affect not only their ability to move but their ability to think rationally."

### ***Evidence of Harm*, by David Kirby, St. Martin's Press, 2005**

A *New York Times* science reporter tackles a highly charged issue: whether or not the vaccine preservative thimerosal, which is 50 percent mercury, is one culprit in rising rates of autism and other neurodevelopmental disorders. **Quote:** "Autism, by most accounts, is epidemic. And there is no such thing as a genetic epidemic."

### ***Biosocial Criminology*, edited by Anthony Walsh and Lee Ellis, Nova Science Publishers, 2003**

A comprehensive, multidisciplinary review of biosocial criminological theory, this book is an excellent addition to the library of researchers. **Quote:** "Critics are quite right, there are no genes 'for' crime, and no biosocial scientist claims that there are. There are genes, however, that lead via various neurohormonal routes to traits (e.g., low levels of empathy, IQ, self-control, conscientiousness, and fear, and high levels of sensation-seeking, egoism, negative emotionality, and aggression) that increase the probability of criminal

behavior." (*Anthony Walsh in his chapter, "Introduction to the Biosocial Perspective"*)

### ***The Blank Slate*, by Steven Pinker, Viking Press, 2002**

An MIT professor, Pinker is widely considered to be one of the world's leading cognitive scientists. In this book, he argues that parenting has far less influence on children's behavior than do genes. **Quote:** "'All traits are heritable' is a bit of an exaggeration, but not by much."

### ***Are We Hardwired? The Role of Genes in Human Behavior*, by William R. Clark and Michael Grunstein, Oxford University Press, 2000**

Two UCLA professors of biology delve into genetic influences on aggression, learning, memory, and other aspects of behavior and cognition. **Quote:** "We can provide a secure and culturally enriched environment that will allow each child to optimize his or her innate abilities, but we cannot fundamentally alter these abilities."

### ***Sentencing: As I See It*, by Richard L. Nygaard, Copperhouse Publishing Co., 2000**

In these essays, the author—a Judge of the U.S. Court of Appeals for the Third Circuit and a member of the Crime Times Professional Advisory Board—focuses on the shortcomings of offense-based rather than correction-based sentencing. **Quote:** "The search for truth about behavior may lead us to facts about nutrition, neurotransmitters, toxins, testosterone levels, brain damage, genes and a host of other variables, hitherto unexamined, that explain behavior; hence may explain crime."

## Omega-3's may protect against sensory overload (continued from page 6)

and to increase omega-3 fats in our diet."

Salem notes that most humans eat diets very low in omega-3 fatty acids, which are found in foods including fish, nuts, flaxseed, and green, leafy vegetables. (See related article on page 6.) In addition, people typically eat diets high in omega-6 fatty acids, which reduce the body's ability to use omega-3. As a result, he says, "we have the double whammy of low omega-3 intake and high omega-6 intake."

—  
"Deficit in prepulse inhibition in mice caused by dietary n-3 fatty acid deficiency," Irina Fedorova, Anita R. Alvheim, Nahed Hussein, and Norman Salem, Jr., *Behavioral Neuroscience*, Vol. 123, No. 6, December 2009. Address: Norman Salem, nsalem@martek.com.

—and—

"New study links DHA type of omega-3 to better nervous-system function," news release, American Psychological Association (via Eurekalert), December 16, 2009.

### **Happy New Year from Crime Times!**

We are beginning our 16th year of publication. Our first issue came out in 1995.

—  
In 2009, there were 43,890 hits on the Crime Times Web site from 153 countries.

### **MOVING?**

Please let us know well ahead of time, so we can be sure your next issue reaches you!

## PROFESSIONAL ADVISORY BOARD

Herbert Needleman, M.D.  
Director, Lead Research Group  
University of Pittsburgh Medical Center  
Pittsburgh, PA

The Honorable Richard L. Nygaard  
Circuit Judge  
United States Court of Appeals for the Third Circuit  
Erie and Philadelphia, PA

Adrian Raine, D. Phil., Professor  
Department of Criminology  
University of Pennsylvania  
Philadelphia, PA

Ann Streissguth, Ph.D.  
Emeritus Professor  
Dept. of Psychiatry & Behavioral Sciences  
University of Washington School of Medicine  
Seattle, WA

Bernard Weiss, Ph.D.  
Professor of Environmental Medicine &  
Professor of Pediatrics  
Department of Environmental Medicine  
University of Rochester Medical Center  
Rochester, NY

Stuart C. Yudofsky, M.D., Chairman  
Department of Psychiatry  
Baylor College of Medicine  
Houston, TX

**QUOTABLE** "A fine balance exists between neurotransmitters and behavior, so slight changes can alter behavior in significant ways, most notably through affecting impulsivity and inhibition. As with so many biological issues, neurotransmitter imbalances that cause behavioral changes can sometimes be treated, in some cases with something as simple as a change in diet."

—Gail S. Anderson,  
*Biological Influences  
on Criminal Behavior*,  
2006

CRIME Times is published quarterly  
by the Wacker Foundation, a nonprofit organization.

Editor: A. K. Blake  
PMB 132, 1106 N. Gilbert Road, Suite 2 • Mesa, AZ 85203

© Copyright 2010

---

Volume 16, Number 1  
2010

---

The Wacker Foundation  
**CRIME Times**  
PMB 132  
1106 North Gilbert Rd., Suite 2  
Mesa, AZ 85203

Nonprofit  
Organization  
U.S. Postage  
PAID  
Phoenix, AZ  
Permit #1645