

The Devil's Mark

The Evaluation of Evil, the Measurement of Morality, and the Statistical Significance of Sin

BY ROBERT STERN

ROOTING OUT EVIL IN EARLIER CENTURIES COULD BE A troublesome matter. The medieval farmer whose crops didn't fare well or whose family and livestock sickened and died naturally wanted an explanation, and something or someone to blame. Lacking better explanations, the unfortunate peasant generally blamed Satan and his imps, demons, and particularly his human followers—witches. Relief, or at least punishment was sought from the church, the final arbiter in matters of evil and morality. On the subject of witchcraft, the church was adamant: Witchcraft was a sin that clearly needed to be stopped! With parishioners in fear of losing their livelihoods, health, friends, family, or having their genitals shrivel up and drop off (the usual witch threats), priests had every reason to learn how to recognize witches, try them, convict them, and dispatch them back to their Master in Hell as quickly as possible. Imps and demons were harder to bring to trial.

Those accused of witchcraft tended to be single, poor, and unattractive women on the fringes of the community. However, with just about everyone being poor and unattractive from the 13th to the 18th centuries—the heyday of the Inquisition—the more damning attributes of witches were their sex and their social status as “other.” But just being female and unsocial usually were not enough; the local magistrates demanded some sort of proof.

Help came with the publication, and papal blessing, of Kramer and Sprenger's *Malleus Maleficarum* (The Witches' Hammer). At last, priests and witchfinders had an authorized list of signs and symptoms to assist them in determining who was a witch and who wasn't. Finding and disposing of witches even became a business. Witchfinders would travel from hamlet to hamlet seeking out and destroying the Devil's own—almost exclusively women. Voluntary confessions were preferred, but were often aided with the Rack, the Boot, red hot pokers to the genitals and environs, and other early methods of extraordinary rendition.

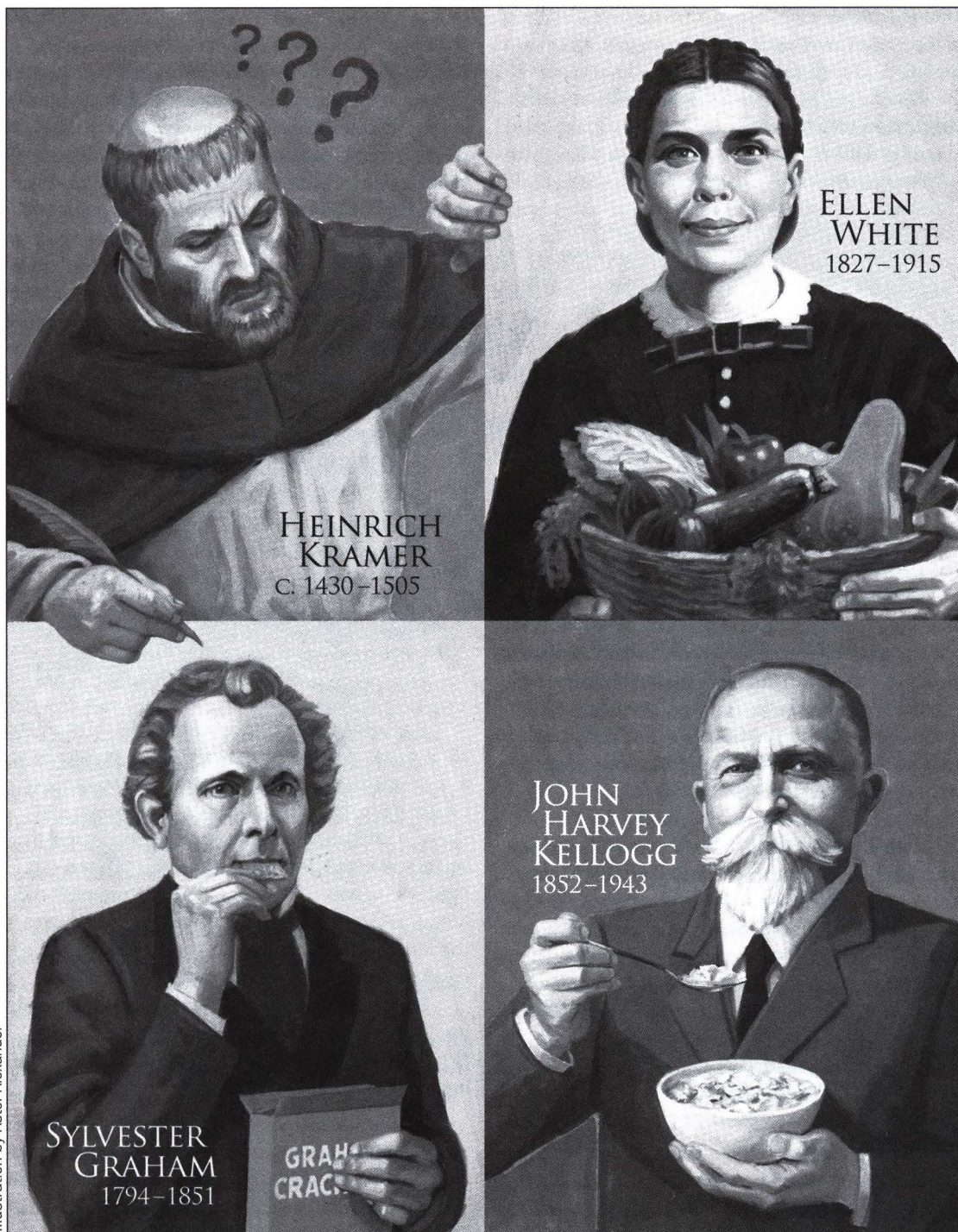
Equally important, physical examinations were

performed to search for the “Devil's Mark,” a skin excrescence such as a wart, mole, or skin tag which, when pricked with a needle, didn't bleed or the accused didn't feel. The skin abnormalities were believed to be the sites from which imps and demons drank blood, providing the witchfinders with the necessary proof that the accused was indeed a follower of Satan. The skin tags were carefully examined. The underlying belief wasn't. Estimates of women condemned and burned as witches range from 30,000 to 300,000 from the 15th to the 18th centuries.

Sinful Signs and Symptoms of Sex

In the waning years of the Inquisition, the Church, aided by physicians, turned its sites on men and, of course, sex. Sex had always been synonymous with sin. One of the new targets was masturbation. Victorian era sin seekers didn't have to search for skin tags, sickened cattle, or withered crops to recognize the signs of this sin, though they certainly kept their interests fixed on genitals—withered or otherwise. Checklists of physical and behavioral symptoms were written by physicians and professors, but often dispensed to the religious leaders (and sometimes vice versa). The lists aided the new witchfinders in assessing whether or not someone, usually an adolescent male, was guilty of the sin of self-abuse. Like the witches, the accused men were almost always determined to be guilty after examination. And by a strange coincidence, the “treatments” differed only slightly from the tortures used on the witches—pins, acid, surgery, wire cages, etc.

Masturbation's signs and symptoms were more numerous than those of witchcraft, and only expanded over time. *Onania*, the first quasi-medical checklist to warn the public of masturbation's dangers, grew from a pamphlet of just a few pages in 1712 to a roach-squashing 26th edition of over 300 pages. Benjamin Rush, the Father of American Psychiatry warned fellow physicians: “in onanism, it produces seminal weakness, impotence, dysuria, tabes dorsalis, pulmonary consumption, dyspepsia, dimness of sight, vertigo, epilepsy, hypochondriasis, loss of memory,



When evil was fought with food.

menalgia, fatuity, and death.”¹ Doctors and clergy were adamant: self-abuse was clearly a sin which needed to be stopped!

The war against masturbation was taken up by preachers Sylvester Graham (inventor of the tasty cracker originally marketed to prevent lust), and

Ellen White (founder of the Christian Science Church) who warned that masturbation caused “nervous diseases, liver diseases, lung diseases, rheumatism, cancer, diseased kidneys, spinal weakness, insanity, and finally death.”²

White’s checklist was adopted and expanded by

John Harvey Kellogg—physician, surgeon, director of the Battle Creek Sanitarium, vegetarian, and anti-sex fanatic. Today, Kellogg is primarily known as the founder of a breakfast cereal empire; however, in the late 19th century, he was America's most famous guru of healthful living. In his best-selling book, *Plain Facts for Young and Old*, Kellogg listed 39 signs of self-abuse:

General debility; consumption; defective development; change in disposition; lassitude; dullness in the eyes; sleeplessness; decreased mental capacity; fickleness; solitude; bashfulness; untrustworthiness; boldness; mock piety; easily frightened; confusion; fear of other sex or wantonness; round shoulders; weak backs; paralysis; gait disturbance; poor sleeping positions; decreased breast development; capricious appetite; fondness for spicy foods; eating clay, plaster and chalk; avoidance of plain food; use of tobacco; paleness; acne; biting finger nails; sunken eyes; moist cold hands; heart palpitations; hysteria; chlorosis; epilepsy; bed wetting; unchastity of speech.³

The masturbation hysteria eventually collapsed under the pseudomedical absurdities of its doctors, and the often hilarious hellfire and brimstone warnings of its preachers. But mostly it died because sex researchers and more enlightened physicians failed to find the evidence that masturbation caused any maladies or disorders whatsoever. Science was beginning to break our religious yoke.

Devilish Displays of Diseases and Disorders

Like the phoenix, the Devil's Mark was reborn in America from the ashes of the previous moral-medical panic. In the 1980s, Satan and his followers were accused of ritually torturing, physically, and (especially) sexually abusing children throughout the country. The new witchfinders were psychotherapists, who managed to diagnose their clients with Satanic Ritual Abuse (SRA)—a disease that didn't exist. But the therapists were adamant: Satanic Ritual Abuse was clearly a sin that needed to be stopped! There was the problem that no forensic evidence that such crimes had actually been committed had been found, and oddly, the victims were unable to remember any of the abuses and tortures they had supposedly endured at the hands of Satanists. At least the victims couldn't remember any abuses until after they ended up in the offices of modern witchfinders who specialized in uncovering and "validating" the forgotten abuse.

Therapists claimed that Repression prevented the victims from remembering their abuse. Repression, a Freudian concept used to explain the unconscious forgetting of the unacceptable, has never been

shown to exist. But that didn't stop therapists from invoking it to explain their clients' lack of memories. Overwhelmed with Ritual Abuse checklists, hypnosis, regression therapy, guided imagery, and "anatomically correct" dolls (all touted as being valid and reliable means of retrieving those unacceptable memories), clients eventually came to believe that they had been the victims of Satanic Ritual Abuse.

The signs and symptoms of SRA bear an uncanny resemblance to those of the anti-masturbation checklists. Compare Kellogg's signs and symptoms of self-abuse (above) with Holly Hecor's *Symptoms and Other Indicators of Ritual Abuse*:

Sleep disorders, High pain tolerance, Seizures/epilepsy with or without organic evidence, Liver malfunctions, Digestive tract disorders, Genito-urinary problems, Chronic bladder/kidney infections, Frequent skin irritations or disorders, Headaches/migraines, Asthma, Overweight, Gynecological maladies, Unusual scars, Exaggerated reactions to olfactory stimuli, Significant pain/numbing/ paralysis, Self-mutilation, Suicidality, Chemical dependency, Eating disorders, Extreme Mood Swings, Avoids or seeks out physical contact, Sexual dysfunctions, Bedwetting... [it goes on for another 6 pages].⁴

It would be easy to dismiss this checklist. After all, it wasn't written by an academic or published in a peer-reviewed journal. But even academics got caught up in the Satanic Ritual Abuse panic, and they did publish in peer-reviewed journals; mostly social work and psychology journals. They were harder to ignore. The more cautious professional literature dropped the *Satanic* and eventually even the *Ritual* adjectives. Even so, the correlations of child abuse with medical disorders marched on.

In a recent overview of two hundred (primarily psychology) papers cited in PubMed and Google Scholar, child abuse was correlated with the following medical disorders and abnormalities:

Brain—lateral prefrontal cortex, medial prefrontal cortex, cingulate gyrus, hippocampus, amygdala, hypothalamus, pituitary gland, motor cortex, visual cortex, corpus callosum, neurotransmitter changes, headaches, decreased memory, decreased logic, decreased performance; *Eyes*—smooth muscle movement; *Musculoskeletal*—osteoarthritis, rheumatoid arthritis, chronic fatigue; *Skin and Hair*—psoriasis, alopecia; *Lungs*—COPD, asthma, cancer; *Cardiac*—congestive heart failure, hypertension, heart attacks; *Endocrine*—hypothyroidism, cortisol dysfunction, adrenal failure, metabolic syndrome, diabetes, obesity, elevated lipids and triglycerides.

And this is only a partial list. The psychologic and social sequelae include just about every mental and behavioral disorder in the *Diagnostic and Statistical Manual* (DSM), of which there are over 600. Contemporary checklists, giving correlations between (Satanic Ritual) child abuse and multiple physical and mental disorders were, and still are, distributed to attendees in therapists' conferences and published online.

Minding Your Statistical P's (and Q's)

Abuse research reasoning is generally of the *post hoc* variety, not unlike the logic of the medieval farmers: Z occurred after A, therefore A caused Z. However, there can be a lot of decades and a lot of variables between A and Z. The association between A and Z is claimed to be statistically significant based on a $P < 0.05$. But, there are almost always other causal variables to consider, and without all other such variables (B, C, D, E, etc.) being taken into account, the association is, at best, contrived.

Consider the numerous publications which associate child abuse with smaller hippocampal volume in adults. The hippocampus is an area of the brain involved in the formation of memory. Using a *priori* logic, trauma researchers hypothesized that a smaller hippocampus might explain repressed memories of abuse. In the majority of studies, adults who had reported child abuse were matched up with controls of similar age and sex. Sure enough, researchers found smaller hippocampi in abuse victims, with statistically significant differences of $P's < 0.05$.

But in a related and well-designed study, John Gilbertson (Gilbertson, 2002) compared the hippocampal volumes of soldiers diagnosed with trauma-related symptoms (PTSD) to their twin brothers who had not been in combat. Same nature. Same nurture. At least, prior to combat. Trauma researchers couldn't match that. A matched group of controls were included as well. The soldiers diagnosed with PTSD indeed had smaller hippocampi than the controls. So did their non-combat, non-PTSD brothers. Rather than PTSD causing smaller hippocampi, smaller hippocampi seemed to be a factor (one of many) causing PTSD.⁵

We have since come to realize that abuse is not the sole factor in determining hippocampal size or volume. The hippocampus' size is not only genetically determined, but changes throughout a person's life in order to meet the challenges of its environment. Sometimes it enlarges (the result of taking steroids or amphetamines, or even exercise), and sometimes it

decreases (in depression, anxiety, PTSD, schizophrenia, dementia, age, certain drug use).

Crime and the Carotid

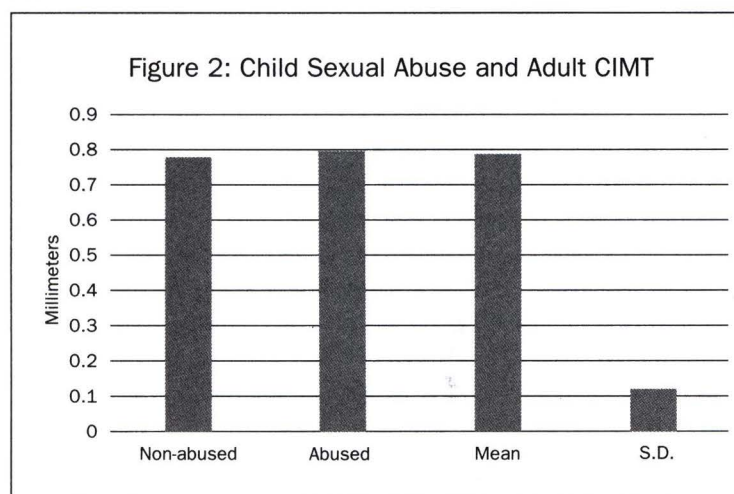
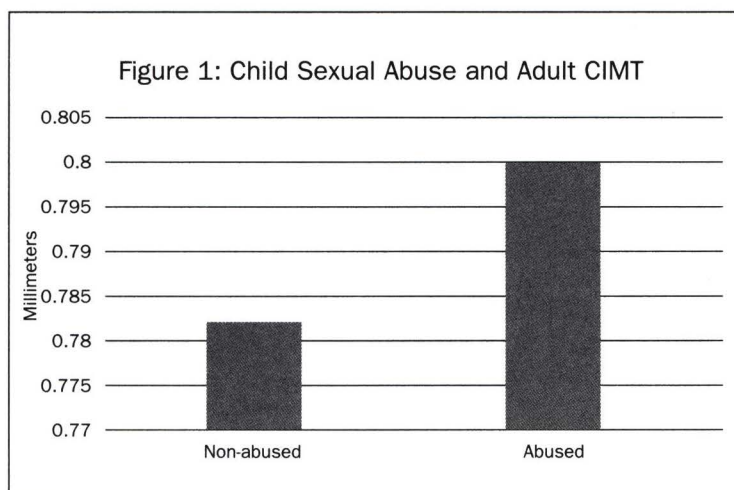
The majority of papers reporting correlations of abuse with psychiatric, social, and emotional disorders are published in psychology and social science journals, though some occasionally get accepted into medical journals. One recent paper (Thurston, et al., 2014) demonstrated a correlation of women who claimed abuse with thickened carotid intima media thickness (CIMT), as well as increased carotid artery plaque.⁶ A critical evaluation of the paper is in order to show the bias beneath the studies. But first, some background.

What is CIMT? The intima and media are the innermost and overlying layers of the carotid artery. They can get clogged up due to any number of well known risk factors, with genetics being the most important. If your parents had thickened carotid arteries, you've probably got thickened carotid arteries. Genetic factors are estimated to account for between 40% and 60% of CIMT thickness. Age is the second major factor, estimated to account for about 23% of Intima Media thickness. On average, CIMT increases 10-20 microns yearly. Other factors include systolic blood pressure, cholesterol levels, smoking, diabetes, stress on the artery, hypertension, and others. Cardiologists generally accept a CIMT thickness below 1.0 mm. to be normal in middle-aged women and men.

The Study. Between 1996/7 and 2008/9, over 1,500 women were enrolled in this study. They had to be perimenopausal, between the ages of 42 and 52, have at least one ovary, not have had a hysterectomy, not be pregnant, not be breast feeding, and not be on hormone replacement therapy. In the 12th year, they were given the following questionnaire on childhood and adult sexual and physical abuse:

- As a child, were you ever beaten, physically attacked, or physically abused?
- As a child, were you ever sexually attacked, raped, or sexually abused?
- As an adult, were you ever beaten, physically attacked, or physically abused?
- As an adult, were you ever sexually attacked, raped, or sexually abused?

Subjects could answer Yes, No, or *I Don't Know*. That same final year, the subjects were given a carotid ultrasound to assess their CIMT as well as to scan for carotid plaques. Based on the ultrasound results, the researchers concluded that there was a statistically significant association ($P < 0.05$) between childhood



sexual abuse and CIMT, and an increased odds ratio that adult sexual abuse was related to increased atherosclerotic plaque.

The Problems. Questions arose about the research design. The authors had excluded nearly 10% of their study population—149 women—in the final year because they had developed angina, suffered a heart attack, or had a stroke, the first two strongly correlated with, and the last being the result of the very conditions which the authors were attempting to prove! The excluded subjects had cardiovascular diseases in spades. So why *subclinical* but not *clinical*? Wouldn't the excluded women's cardiac/stroke status strengthen the authors' argument? Isn't *subclinical* a less severe form of *clinical*?

As other variables were examined, the study only became stranger. Smoking was monitored throughout the 12 years. Each year subjects were asked, "Have you smoked since the last visit?" If a subject answered Yes she was counted as a smoker; however, if she answered No she became as a non-smoker, even if she had a 100-

pack/year history! Depression was apparently only determined in the final year, not during the entire study. Depressions can come and go throughout a person's lifetime. Financial strain was a variable, but no time frame was ever given: *Never? Ever? Always? Just last year?* Diet was assessed in only a small percentage of the women, and not published. What about medications? Illnesses? Surgeries? Exercise? *What about...*?

The Measurements. The laboratory measurements were particularly odd. Insulin resistance was determined by HOMA—Homeostatic Mechanism of Action—an equation in which fasting blood sugar is divided by 22.5 to give an estimate of an individual's insulin resistance. HOMA is rarely used in clinics or hospitals because it's not as sensitive as other means of measurement.

Strangest of all were the blood pressure data (and here I'm quoting): "Given the high correlation between systolic and diastolic blood pressure, the measure with the strongest association with the outcome was included." In other words, *they used the number that fit best with their conclusion!* However, despite the shocking honesty, there are differences in correlating systolic or diastolic blood pressure with CIMT. Systolic blood pressure is strongly associated with increased CIMT; diastolic is not. What was not assessed in these studies? Genetics—the overwhelming cause of CIMT. The authors had designed, executed, and published a study with at least half of the variables missing. The published data were presented in an impressive graph, similar to Figure 1 (top left).

But the graph has been truncated: there is no baseline. Figure 2 (bottom left) shows the same data, re-graphed with a zero baseline, and the additions of the Mean and the Standard Deviation.

There's only an 18 micron difference between the non-abused and the abused women's CIMTs. Eighteen microns— $18/1,000$ ths of a millimeter—is approximately $1/5$ th the thickness of a sheet of paper, or two red blood cells end to end. That difference couldn't be seen without a high-powered microscope. Even the standard deviation was 6.7 times greater than the difference between the two groups. Incidentally, both groups had CIMT measurements fall within the normal range.

The unaided eye cannot see 18 microns. Can an ultrasound? In order to determine the ultimate resolution of ultrasound measurement it is necessary to know the wavelength being used. Doctors generally perform carotid ultrasounds using a frequency of 7 million cycles per second (7 MHz). The waves penetrate tissue at a velocity of 1,540 meters per second (there are several "fudge factors"; i.e., skin thickness,

muscle thickness, subcutaneous fluid, etc., which will vary from person to person). Applying the formula $v = \lambda f$ (velocity is equal to the wavelength multiplied by the frequency), plugging in the numbers and solving for λ , the velocity (1,540 mps) divided by the frequency (7 MHz) gives a wavelength of approximately 0.2 mm (200 microns). Ultrasound cannot detect anything smaller than the wavelength being used, and 18 microns is much smaller than 200 microns. So, no, the ultrasound could not detect any difference between the abused and non-abused women's CIMT.

The paper's second study suggested that adult (but not child?) sexual abuse increased carotid plaque. Shouldn't the purported toxic effects of childhood sexual abuse have had longer to clog the arteries with plaque if there was a causal relationship? This issue wasn't addressed, although the authors did recommend caution in assessing their data. A wise caution.

The Conclusion. The authors offered four possible causal mechanisms to account for the results:

- (1.) Standard risk factors (obesity, diabetes, smoking, HTN)—which they related to childhood sexual abuse;
- (2.) C-Reactive protein—a protein associated with obesity, and which they related to childhood sexual abuse;
- (3.) Depression—which they related to childhood sexual abuse;
- (4.) The Hypothalamic-Pituitary-Adrenal (HPA) axis—which they related to childhood sexual abuse.

Alas. Despite the low the *P*-value, there were no clinical differences in CIMT between the two groups of women. There were no clinical differences in plaque sizes or thicknesses. There was no correlation of CIMT with depression and anxiety. There were no differences in the C-Reactive protein levels. There were no differences in blood

pressure levels (either systolic or diastolic), triglyceride levels, lipid levels, cholesterol levels, or HOMA levels. And the H-P-A axis? It wasn't even evaluated. The group of women who reported abuse were completely indistinguishable from the controls. Nevertheless, the authors concluded:

Associations were most clearly observed for childhood sexual abuse. These findings are broadly consistent with other work. The reason for this more pronounced association for sexual abuse may be because childhood abuse is particularly toxic, more precisely recalled than other abuse types, or is a marker for abuse severity.

It might be helpful to remember epidemiologist Austin Bradford Hill's warning, "Statistical significance should not be mistaken for evidence of a substantial association."⁷ And there was no evidence of a substantial association. However, something was clearly demonstrated in these studies—the authors' belief that evil and illness are linked.

Science and Sin

Despite centuries of progress in the diagnosis and treatment of diseases, we still equate sickness with sin. Scientific methods and germ theory and amazing diagnostic machinery (MRI's and PET scans) might lead us to believe that we're more enlightened than Kramer and Sprenger or White or Kellogg, but that Old Time Religion still shows up in our thinking. And in our medical, social, and behavioral literature.

Maybe we can't help it; it's woven into our cultural fabric. Our scientific methods might be able to measure physical reality better than religious edicts or social morals, but those edicts and morals still underpin our perceptions, and often distort that reality. Researchers would be wise not to confuse the methods with the morals—a task easier said than done. Those who can't or won't make that distinction will still be seeking the Devil's Mark long into the future. **S**

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