Food Processing and Commercial Chemicals:
Their Potential Effects on the Brain, Nervous System, and Psyche during Childhood

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Introduction
ABOUT 40 YEARS AGO, childhood autism was so rare that most pediatricians had never seen a case of it. In January, 2004 both the US Center for Disease Control and Prevention and the American Academy of Pediatrics conceded that 1 of 166 American children were autistic.¹ With numbers still increasing, there is no end in sight. Still larger numbers in elementary schools are being classified as learning disabled.² Each year, several million prescriptions for stimulant medication are being written for children with attention deficit disorder with hyperactivity.³

Many of these autistic children will require life-long custodial care, and others will experience major social adjustment problems affecting their family, education, and careers. These challenges arguably make autism one of the foremost health problems of our times. It is the purpose of this article to offer evidence that we have been looking for answers in the wrong areas. The true primary causes are right under our noses, euphemistically speaking: the cumulative effects of commercial food processing and of neurotoxic chemicals in air, food, and water.

Commercial Food Processing
Between the years 1978 and 1983, a professional group associated with California State University-Stanislaus introduced a forward-thinking diet policy in more than 800 New York City public schools. This diet lowered student consumption of sucrose, synthetic food colors/flavors, and two preservatives (BHA & BHT). Candy and sodas in vending machines were replaced with fresh fruit and fruit juice, popcorn, cheeses, nuts, or whole grain crackers. The result? A 16%
increase in scores on standardized tests. This gain was dramatic. Nationwide, schools typically gained less than 1% per year. These results were obtained without any increase in school cafeteria budgets.

In the 1980s the same dietary policies were introduced into 12 juvenile correctional facilities in the USA resulting in a 47% reduction in antisocial behaviors including violence, theft, insubordination, disruptive horseplay, and hyperactivity.

Currently, we are seeing a trend toward improvement in school food, due in great part to concern over the obesity crisis among children. Very little attention is paid to the affect of these foods on behavior. Both educators and the criminal justice system have failed to recognize the importance—and the potential—of this simple intervention.

Volatile Organic Compounds (VOCs)
As outlined in the book, *Multiple chemical Sensitivity*, (1989) published by the National Research Council, over 70,000 chemicals were used in commerce at that time, of which many hundreds were known to be neurotoxic. However, with the exception of pharmaceuticals, only 10% of these had any testing at all, and only a handful of these had thorough evaluation. Very little has been done to improve the situation, and there has been continued proliferation of potentially dangerous, untested chemicals.

Among these is a large class known as volatile organic compounds (VOCs), or solvent-types of chemicals which evaporate into and contaminate indoor air of buildings. Most are derived from petrochemicals. They enter the human system mainly by inhalation but also easily through skin absorption. From the standpoint of human health, VOCs share one important characteristic: they are all fat or lipid soluble and therefore have an affinity for the fatty or lipid tissues of the body. The brain is a prime target of the VOCs due to the brain’s high lipid content and rich blood supply. The pervasiveness of VOCs has been reflected in a study demonstrating that 10 volatile chemicals were commonly found in indoor air, drinking water, and exhaled breaths of residents of New Jersey, North Carolina, and North Dakota.

Because the brain is a primary target of VOCs, many symptoms are
cerebral in nature including dizziness, forgetfulness, headaches, mental fogginess, mood changes, difficulty concentrating, poor coordination, and social alienation.\textsuperscript{9-11} Incapacitating fatigue may be another complication due to the vulnerability of cellular mitochondria (which produce most of the body’s energy) to VOCs.\textsuperscript{12-13}

Multiple chemical sensitivity (MCS) is another complication resulting from VOC exposure, commonly seen in adults, but sometimes also in children.\textsuperscript{14} In advanced stages patients must live in the proverbial “glass house” which must remain virtually free of air-borne “fugitive” chemicals, such as perfumes, fragrances, cleaning solutions, tobacco smoke, paints, and many other commercial products. Even small exposures can bring on symptoms of mental fogginess, muscle aches, incapacitating fatigue, and other symptoms. Although there are several theories, the exact mechanism for MCS has never been thoroughly studied. Its very existence as a disease entity is questioned by medical authorities. For these reasons the lives of MCS patients are often lonely and difficult, as if living in an alien world.

There is one objective method of studying patients with MCS: the triple-headed SPECT brain scan, which involves the intravenous injection of radioactive glucose. This is taken up by the brain and photographed by scintography (a process which has been used in mapping of brain functions). In a study sponsored in part by the US Department of health and Human Services, SPECT scans of patients exposed to neurotoxic VOCs showed a “random thinning of cortical gray matter” (tissue in the cortex of the brain). The authors concluded that symptomatic patients with a history of chemical exposures had significantly diminished cerebral blood flow and that “significant impairment of brain function may last for years after exposure to neurotoxic chemicals has ceased.”\textsuperscript{15}

Special classes of VOCs include pesticides and formaldehyde. Regarding the former, pesticides are specifically designed to poison the nervous systems of insects. The human nervous system, being incomparably more sensitive and complicated than those of insects, is also more vulnerable. Formaldehyde poses a special class because of its pervasiveness in commercial products including building materials (plywood and particle board), fabrics, paper products, glues, waxes, some paints, and many other sources.
Childhood Vaccinations, Pivotal in the Cause of Health Freedom

Although government health agencies steadfastly deny any causal relationship between childhood vaccinations and the increasing frequency of childhood autism, learning disabilities, and behavioral disorders, their positions are fundamentally weak and untenable because of gross deficiencies in vaccine safety testing, as revealed in a series of US Congressional hearings (1999-2004) on issues of vaccine safety. Because of these deficiencies it is impossible to rule out that many vaccine reactions are taking place unrecognized, and there is strong circumstantial evidence that this is precisely what is taking place.

Synthetic Food Additives as Excitatory Neurotransmitters

It has long been a matter of common observation that certain classes of food additives are associated with childhood hyperactivity and behavioral problems. Perhaps the first comprehensive review of the subject became available with publication of the book, *Excitotoxins: the Taste that Kills*, by neurosurgeon Russell L Blaylock. MD (1994). In his book Blaylock reviewed compelling evidence that certain food additives such as monosodium glutamate (MSG) and the sweetener, aspartame (main ingredient of Nutrasweet®), act as excitotoxins that assault and over-stimulate the brain, leading to a variety of mental and behavioral problems.

The first indications of problems came in 1957 when two ophthalmology residents tested MSG and aspartate on infant and adult mice while studying a particular eye disorder. What they found came as a complete surprise. After sacrificing the animals and examining tissues under a microscope, they found that in animals tested with MSG, nerve cells in the inner layers of the retinas had been destroyed. The worst damage occurred in newborns, but even adult mice showed significant injury. The also found similar, though less severe damage, from aspartate. In 1968 Dr John Olney, a neuroscientist at Washington University, St Louis, repeated the experiment and found that not only did MSG cause severe damage to retinal neurons of the eye but that it also caused widespread destruction to the hypothalamus and other areas of the brain. In spite of the fact that these findings were confirmed in a number of animal experiments across species, little attention has been paid to...
It has been confirmed that artificial food colors, such as synthetic red and yellow dyes, lead to hyperactivity by over-stimulating the nervous system through dopamine pathways (dopamine is a precursor of adrenaline).\(^{18-19}\) Fluoride has also been found to accumulate in the brain and act as a neurotoxin.\(^{20}\)

**Conclusion**

All classes of chemicals listed above, as well as other equally toxic environmental chemicals (such as lead, mercury, dioxins, and PCBs), have one thing in common: They are all potentially toxic to the brain and nervous system. It has been estimated that children may be up to 10 times more vulnerable to chemical toxins than adults because of the rapidly growing tissues and relative immaturity of their detoxification organs and systems.\(^{21}\)

About 15 years ago there was a news item stating that trees were dying in certain forested areas of northeastern USA. The problem was attributed to air pollution, which was thought to cause deterioration of the root systems of the trees. It was noted that, in certain stages, the leaves remained green even though the roots were dying.

This may or may not be occurring extensively in our forests, but it is a good analogy. One must wonder if this is happening to us as a society. Our children are our roots. Are we in the process of losing them, and with them our future? If we are, first and foremost it will be from unabated exposures to neurotoxic chemicals.

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**References**


6Personal communication, SJ Schoenthaler, ~1996


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