***REFLECTIONS ON ENGINEERING OVERSIGHTS*:**
BACKTRACKING BEE KILL, INFANT AUTISM, AND CHEMICALLY-CONTAMINATED DUST IN THE WIND

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As the New Year 2012 ushers in, memories of the past bubble to the surface. Reflecting back to years ago and lessons learned helps me to better navigate moving forward. Having spent 40 years studying honey bee behavior, I can't even begin to describe how very important beekeeping has been to my life. The same is true of my work life, working directly, one on one with literally thousands of people, gaining insights into how humans behave and make decisions.

And now I wish to share my reflections with you. By putting pen to paper I hope to make dots out of the observations I have made in hopes that whoever reads this can connect them.

Early in my career I had the good fortune of working near a huge auto maker's proving grounds where the smartest, brightest minds test their designs. Even the best engineers know from experience that the complex interactions between many different systems that define a safe and functioning automobile can't always be predicted. For this reason, the automotive manufacturers spend millions to build proving grounds where cars are driven hundreds of thousands of miles to test the wear and stresses on the designed parts. What usually happens is that a part fails which reveals the oversight and identifies what needs to be

corrected. This is not only true of mechanical engineers but is also true of electrical and chemical engineers. The human mind is not capable of perceiving every problem so there will always be oversights. It is extremely important to test, study, and understand why things fail.

In retrospect, the electrical engineers back in the 1950s couldn't even conceive of the use and widespread acceptance of the personal computer let alone the nearly magical internet or smart phone. And chemical engineers who sought better living through applied chemistry likely could not conceive of the results of their work. The application of their chemicals was encouraged and permits easily granted but did they consider the long-term cost of their oversights? Apparently not.

The application of chemical sprays was accompanied by the uncontrolled polllution of our air and water. For example, in the late 1960s Michigan started spraying their roadsides with chemicals so that they could save money by not having to mow the ditches. The chemical engineers designed chemicals that would destroy foliage and the chemical lobby sold the Michigan legislature on the silly idea. What a mess. Not only did it look terrible, but it killed all the bugs and beneficial insects that would feed there. In those days, we lost our pheasants, blue birds, hummingbirds, and even the peregrine falcon. At that time, Michigan was the home of many chemical companies so it was easy for their lobbyists to infest Michigan's legislature and obtain permits for their destructive chemicals.

By 1970, chemical pollution was so bad that the Cuyahoga River started on fire in Ohio. That is when President Nixon and the Congress stepped in and commissioned the EPA to protect the land, air, and water in this country. On the surface these efforts were well intended and indeed progress was made in raising public awareness and curtailing the most blatant abuses. Thanks to these measures taken, Lake Erie is now a wonderful recreation area and also one of the world's best walleye fishing lakes. The residue, however, is still with us today. It has been over 30 years and we are getting our peregrine falcons back along with the blue birds and hummingbirds. Despite some success we still have a long way to go. The pheasant is still struggling to survive and even this past summer (2011) we here in Michigan were warned not to eat the lake trout because of contaminants. Michigan is trying to get it right with the slogan "PURE MICHIGAN" which is posted at the entrances to the state's highway system.

But now I am seeing the EPA undergo a mutation from being a servant of the people to becoming little more than a lackey for the chemical companies. The EPA is issuing permits to the Agrichemical Corporations to produce and disseminate systemic neonicotinoid insecticides and other genetically-modified products and organisms without proper testing, oversight, nor containment. Nature itself is now the proving ground, or a massive clinical trial. No concern is being given to the collateral damage on the air, water, soil, and other living organisms within the entire food chain such as native plants, honeybees,

butterflies, crickets, birds, aquatic species, animals, and ourselves. It is as if the automotive companies sold millions of untested cars and sought to learn from their breakdowns while ignoring the dangers and cost to the drivers and the public. It's hard to fathom the long-term effects of the ongoing accumulation of these agrichemically-engineered compounds considering that many scientists admit that they aren't "allowed" to properly study GMO crops, nor observe them, nor even walk onto fields where they are planted. Perhaps beekeepers have conducted better research and proving grounds than the chemical engineers have performed on their own products. We know that if we leave healthy beehives anywhere near GMO dust, our bees vanish. Obviously, these agrichemically-engineered products are far more dangerous to bees and human health and far more widespread than the Cuyahoga River fire that brought us the EPA.

Furthermore, it is interesting to note that the timeline for the dramatic increase in infant autism* perfectly matches the introduction of agrichemically-engineered crops (GMOs), leaving us today with one out of every 166 infants displaying symptoms of autism, *an unacceptable level for a modern civilizatio*n. Don't forget that neonicotinoids are nerve agents that attack the central nervous system. During every spring planting and fall harvest, a huge spectrum of agrichemically-engineered compounds are made airborne. The lightweight talc that is used to usher seeds through the planters absorbs the insecticides that coat the seeds and then is emitted through vents where it rides on the wind to wherever. During the fall harvest, the seed is removed from the plant and then the plant is chopped up and blown back onto the field. The agents embedded within these agrichemically-designed plants are suspended into the air. And all the activity in the field re-suspends the contaminated talc that lies in the soil from the previous spring and the cycle goes on and on . . . it's dust in the wind. The farmers can't prevent this agrichemically-contaminated dust from drifting which is a huge oversight on the part of the chemical companies. To realize the massive, increasing amount of contaminated dust being presented into our air, you can review the changes in crop acreage since the 1995 Farm Bill**. This is often called the "Freedom to Farm" bill because it removed most acreage constraints so that farmers could choose which crops they want to plant. It comes as no surprise that the data reveals a tremendous adoption of biotech soybean and corn seeds.

To make matters worse, agrichemically-engineered compounds are also used to treat managed landscapes such as yards and golf courses.

I sincerely hope that the younger chemical engineers can correct the oversights of the older chemical engineers and design a safer chemical that does not affect meiosis and the central nervous system. In my opinion, the current chemical engineers are 50 years behind the current electrical engineers. Hopefully they can correct their negative practices rather than enforcing them through lobby power and buyouts.

For now, we must do whatever we can to protect our bees and our children from the contaminated dust in the wind until the chemical engineers get their act together. Our grandchildren's future and Nature's future is at stake.

*Search chart on Google: "Number of children classified as having autism spectrum disorder (ASD) special education disability in Minnesota from 1981-1982 through 2001-2002"

*See (free) article: *Analysis of Prevalence Trends of Autism Spectrum Disorder in Minnesota*
Archives of Pediatrics and Adolescent Medicine www.archpediatrics.com

**See article: The Economics of Corn-Belt Agriculture" by Gary Schnitkey
http://garyschnitkey.blogspot.com/2010/03/acreage-changes-since-freedom-to-farm.html