

UPCOMING TRAININGS & CONFERENCES

- **2019 NDAA Capital Conference**
Washington, DC / January 29–30, 2019
- **NDAA Digital Prosecutor Course**
Charleston, SC / February 18–21, 2019
- **NDAA Evidence for Prosecutors**
San Diego, CA / March 25–28, 2019
- **NDAA Prosecutor 101**
San Francisco, CA / March 25–28, 2019
- **Lifesavers National Conference on Highway Safety Priorities**
Louisville, KY / March 31–April 2, 2019

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THE MELLANBY EFFECT

Why Impaired Individuals Should Not Be Allowed to Be Behind the Wheel

By Miriam Norman

In an impaired driving case, a prosecutor typically must prove a defendant was operating or driving a motor vehicle while impaired. Alternative to showing the defendant was driving, a prosecutor must prove he or she was in physical control of the vehicle. The usual facts of a “physical control” case include the police finding an individual “asleep” in the driver’s seat of a non-running car, either on the side of the road or in a parking lot. This type of case can present challenges for the prosecutor because

jurors may agree with the defendant’s argument that he or she was being responsible by *not* driving and, therefore, find him or her not guilty. The Mellanby Effect explains why an impaired individual in physical control of a vehicle cannot be left to stay in the vehicle to just “sleep it off,” and the danger posed by such a situation.

It is well known that alcohol impairs judgment and the ability of thought process; alco-

Mellanby Effect, is exactly why it is dangerous to allow an impaired individual to be left behind the wheel: he or she will feel better, still be above the per se level, still be appreciably affected, and yet may still choose to drive.

The Mellanby Effect is a scientific principle first discovered by Sir Edward Mellanby in 1919.⁴ Mellanby found that perceived behavioral impairment at a specific blood alcohol concentration was greater when the blood al-

*Mellanby found that perceived behavioral impairment at a specific blood alcohol concentration (BAC) was greater when the blood alcohol concentration was rising than when it was falling.*⁵

hol is a Central Nervous System Depressant.¹ “Alcohol in small doses may cause performance of driving-related skills to fall off; in moderation to high amounts, alcohol diminishes performance across the board with general impairment of nervous function.”² Several studies observed a marked decrease in the ability to divide one’s attention safely, ability to track, ability to react, ability to maintain lane position, ability to appropriately apply the brakes, and ability to control the steering of the vehicle.³ Alcohol’s ability to impair higher level cognitive processing, coupled with the

cohol concentration (BAC) was rising than when it was falling.⁵ “Subjects feel less drunk during the descending limb of the BAC-time curve than at the same concentration of alcohol on the ascending limb. However, objective measures of impairment...were generally worse during the descending limb for the same BAC.”⁶ In easier to understand terms, the Mellanby Effect can be likened to the “highway effect.”

For example, imagine an individual who drives on a feeder road to the freeway. The speed limit on that feeder road is 45 mph.

¹ *Alcohol and the Driver*. Council on Scientific Affairs; JAMA. 1986 Jan 24-31; 255 (4): 522-7.

² *Id.*

³ *Id.*

⁴ Mellanby, E., Alcohol: Its Absorption Into and Disappearance from Blood Under Different Conditions. *British Medical Research Committee, Special Report Series*, No. 31. London: H.M.S.O., 1919.

⁵ *Id.*

⁶ Holland, MG; Ferner, RE; *A Systematic Review of the Evidence for Acute Tolerance to Alcohol — the “Mellanby Effect.”* *Clinical Toxicology (Phila)*. 2017 Jul; 55(6): 545-556.

While traveling on the feeder road, the individual feels like he or she is traveling at a good speed. Then he or she merges onto the freeway and drives at speeds from 65–70 mph for a period. When the individual reaches his or her exit, he or she exits back onto a feeder road. The individual decreases his or her speed to 45 mph, but now 45 mph feels painstakingly slow; it is practically crawling. This is the Mellanby Effect. In other words, the 45-mph felt fast before the individual drove faster.

When blood alcohol concentration is on the way up, a person will feel more impaired at a level of .08 g/mL than at the same level on the way back down.⁷ When a person is on the way back down, he or she will feel “better,” but will still be legally impaired. Because of this, in addition to the fact that alcohol affects all the processes that help a person make good choices, the person may choose to drive impaired. The Mellanby Effect highlights, therefore, why it is unsafe to allow impaired individuals to be left in a vehicle



The Mellanby Effect highlights, therefore, why it is unsafe to allow impaired individuals to be left in a vehicle along with the keys to it. Although a person may feel less intoxicated, his or her impairment is not similarly improved.⁸

along with the keys to it. Although a person may feel less intoxicated, his or her impairment is not similarly improved.⁸ One study described the impairment on the descending BAC in this manner: “Objective measures of impairment, especially those involving skills necessary for safe driving and those measured on driving simulators, were generally worse

⁷ *Id.*; Mellanby, E., Alcohol: Its Absorption Into and Disappearance from Blood Under Different Conditions. *British Medical Research Committee, Special Report Series*, No. 31. London: H.M.S.O., 1919.

⁸ *Alcohol and the Driver*. Council on Scientific Affairs; JAMA. 1986 Jan 24–31; 255 (4): 522–7.

during the descending limb for the same BAC. Slowed reaction times may recover somewhat during the descending limb, but accuracy falls. When these decrements are combined with a perceived improvement in ability to drive and a loss of inhibitory control, the likelihood of driving while impaired increases, and may explain the binge or problem drinker's increased risks for motor vehicle crashes.”⁹ This study clearly explains that the Mellanby Effect will increase the likelihood that a driver will choose to drive while intoxicated.

This hypothetical example illustrates the Mellanby Effect. A 200-pound man is found “sleeping it off” behind the wheel of his vehicle. Imagine the best-case scenario of facts for him: (1) the nap was planned (*i.e.*, he did not just pass out), (2) he is in the elimination phase of alcohol metabolism (*i.e.*, post-absorption phase of all the alcohol he consumed), and (3) he has an elimination rate (*i.e.*, alcohol burn-off rate) of .02 g/mL BAC

per hour rate of elimination.¹⁰ If this man went to sleep with a BAC of .16 g/mL, he would need to sleep for four hours for his BAC to reduce to .08 g/mL, a level that still represents legal impairment in every jurisdiction. This impaired man may wake up, however, at a .10 g/mL or .12 g/mL BAC, feel great because of the Mellanby Effect, and choose to drive, hence the danger of allowing him to sit behind the wheel with access to keys.¹¹

The Mellanby Effect is an interesting and enlightening scientific principle. To understand it helps to better understand the dangers posed by individuals in physical control cases and, therefore, the importance of holding these defendants accountable. Prosecutors in need of assistance with impaired driving cases—or any other traffic safety matter—may contact the National Traffic Law Center, a division of the National District Attorneys Association through the website at <https://ndaa.org/programs/ntlc/>.

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⁹ Holland, MG; Ferner, RE; *A Systematic Review of the Evidence for Acute Tolerance to Alcohol — the “Mellanby Effect.”* *Clinical Toxicology* (Phila). 2017 Jul; 55(6): 545-556.

¹⁰ BAC levels dropped 0.020% per hour for heavy drinkers and 0.017% per hour for moderate drinkers on the falling BAC test days. This difference is to be expected in terms of the increased metabolism rate for alcohol typically found in chronically tolerant heavy drinkers. Moskowitz, H; Daily, J; Henderson, R.; *The Mellanby Effect in Moderate and Heavy Drinkers*, Pages 184-170.

¹¹ Keep in mind that the American Medical Association (AMA) has supported a drop in the per se level to 0.05% for decades. In May 1982, the AMA issued to state and medical specialty societies a document titled, “Drunk Driving Laws,” urging state medical

associations to consider supporting legislation strengthening DUI laws in their respective states. Studies support this position; one study showed that “[i]mpairment of judgment by alcohol was demonstrated at BACs as low as 0.04% when skilled bus drivers misjudged their ability to drive a vehicle through space...” narrower than perceived. “Skills related to driving show that both information acquisition and information processing are rendered slower and less efficient, and the ability to carry out a divided-attention task that requires intellectual time sharing is impaired.” Everyone is affected by alcohol at very low levels and should not drive above a .05 g/mL. Alcohol and the Driver. Council on Scientific Affairs; *JAMA*. 1986 Jan 24-31; 255 (4): 522-7.

NATIONAL DISTRICT ATTORNEYS ASSOCIATION
WELCOMES THE RETURN OF JOANNE THOMKA AS
DIRECTOR OF ITS NATIONAL TRAFFIC LAW CENTER

The National District Attorneys Association (NDAA) welcomed back Joanne Thomka as Director of its National Traffic Law Center (NTLC) on November 26, 2018. Ms. Thomka previously served as NTLC Director (2006–2015) before leaving to join the National Association of Attorneys General (NAAG) as a Program Counsel.

With Ms. Thomka’s return to NDAA, she brings her vast experience in the traffic safety community. Her past work includes serving as the Bureau Chief of the DWI Unit in the Onondaga County District Attorney’s Office in Syracuse, NY, and participation and membership in several traffic safety related committees including the Transportation Research Board’s (TRB) Traffic Law Enforcement Committee as well as the Alcohol and Other Drugs Committee, the National Sheriffs’ Association’s (NSA) Traffic Safety Committee and the Traffic Injury Research Foundation’s DWI Working Group. Ms. Thomka continues to teach prosecutors, law enforcement and other traffic safety personnel on issues pertaining to impaired driving, trial advocacy and other highway safety issues.

NDAA Executive Director Nelson Bunn stated, “I’m thrilled that Joanne has agreed to return to NDAA to lead our National Traffic Law Center and its great work in the field providing training and technical assistance to prosecutors and other traffic safety professionals to save lives on our Nation’s roads each and every day”.