

## The Tyranny of the Horn— Automobile, That Is

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I feel ambivalent about many artifacts of life. Take horns, for example. This most ancient of musical instruments evolved into the fantastic device which we call the French horn, the Germans call *das Orchester bläss horn*, and the French have appropriately named *le cor d'harmonie*. In any case, this instrument is a joy to hear. My friend Mel Weinstock, now head of the School of Librarianship, University of New South Wales, Australia, first introduced me to the subtleties of the French horn. Thanks to him, I occasionally enjoy the recordings of Dennis Brain playing Mozart horn concerti.

Up until then the word "horn" was, for me, synonymous with sax. A great jazz saxophonist plays a cool or mean horn and the term is used more often these days than sax. *Current Contents®* (CC®) readers know how much I enjoy that most melodious of instruments created by the Belgian clarinet maker Adolphe Sax in 1838.<sup>1</sup>

When we leave the realm of music and enter the hectic day-to-day world of modern technology, my feelings about horns change considerably. Unfortunately, once the horn became attached to a motor vehicle, such as the automobile or truck, it was transformed from an instrument of joy into an instrument of torture.

The idea of putting horns on moving vehicles predates the invention of the automobile. In fact, the first "car" to

have a horn did not even have a motor. It was an elaborate horseless carriage, built in the mid-seventeenth century in Nuremberg by a clockmaker named Hautzsch.<sup>2</sup> Although Hautzsch claimed his car was propelled by "clockwork," historian Edgar B. Schieldrop believes that it was actually powered by two workmen concealed under the hood pedaling, "in the same way as boys do now in their toy cars."<sup>2</sup> This mysterious carriage drew crowds of onlookers wherever it went. When they threatened to impede its progress, an ornamental dragon head in front "would squirt water on the busybodies, while the two angels at the sides raised bassoons to their lips and began to blow." The Swedish Crown Prince Karl Gustav purchased this vehicle and used it in his coronation procession.<sup>2</sup>

Two centuries later, with the advent of the first true automobiles, a variety of warning signals were adopted. This occurred not only because motorists wanted the roads cleared but also, in some cases, because of pressure from various groups of citizens. In England, where road-going "steam buses" were used on a limited basis during the mid-nineteenth century, public outcry against the hazards they posed resulted in the passage in 1865 of the "Red Flag Act," or "Locomotives on Highways Act." This law specified that all motorized vehicles be preceded by a man on foot carrying a flag during the day or a lantern at night.<sup>3</sup>

Some of the earliest proposals for regulating the automobile in the US were, from the point of view of the motorist, equally impractical. One Massachusetts lawmaker proposed that all cars be equipped with a bell that would ring with each revolution of the wheels.<sup>4</sup> Another suggested that motorists shoot Roman candles ahead to forewarn drivers of approaching horse-drawn vehicles. The Farmers' Anti-Automobile Society of Pennsylvania demanded adequate warning but added, "If a horse is unwilling to pass an automobile, the driver should take the machine apart and conceal the parts in the bushes."<sup>4</sup>

At the turn of the century, motorists could choose from a variety of signaling devices, including bells, whistles, and small, hand-squeezed "bulb horns." In America, most chose bells. Despite the noise made by these devices, the automobile was viewed as a quiet alternative to the horse and carriage. The clatter of horses' hooves and the bouncing of metal carriage wheels over cobblestones were great contributors to urban noise in those days. Autos, with their pneumatic tires riding over asphalt surfaces, were considered by some to be a panacea. In endorsing the auto, *Scientific American* pointed out, "Specialists have many times expressed an opinion that the nervous disorders which exist in the city are aggravated, if not caused, in many cases by the city's great traffic."<sup>5</sup>

Alas, as the number of autos began to increase after the turn of the century, cities, towns, and rural areas alike witnessed the rise of promiscuous bell-ringing. As early as 1900, a news item in the *New York Tribune* described an accident in which a nurse was struck and killed by an auto. According to the account, the driver of the vehicle did not slow down or steer out of the way, but "considered his responsibility fully discharged by ringing the gong."<sup>4</sup>

According to the motoring periodicals of the day, the proliferation of vehicles and the fact that so many of them used

bells contributed to the likelihood of accidents. As one columnist wrote, "Automobile bells...might easily be taken, by their sound, to belong to cable or trolley cars, to bicycle [hot rods], even to bakers' wagons, at greater or lesser distances."<sup>6</sup> To counter the "exasperating indifference of the public to a small bell," motorists needed a more distinctive warning signal. Many writers suggested that the best alternative would be the bulb horn.<sup>6-8</sup>

After the turn of the century, the bulb horn, which was already popular in France, gradually became standard in most American cities. Though it was first hailed as being more "novel and penetrating"<sup>7</sup> than the bell, a predictable thing happened. Any usefulness that the horn had was quickly negated by the fact that people in cities were constantly tooting at one another. In 1913, Charles Johnson, of *Motor*, complained, "The dull, monotonous and utterly innocuous droning of the bulb horn has become such a continuous noise in many sections and cities that people pay no more attention to it than one does to the buzz of machinery in the building where he may be located."<sup>9</sup>

After 1910, motoring periodicals were once again calling for a more effective warning device. Particularly on country roads, it was argued, one needed a signal clearly audible "at least an eighth of a mile ahead."<sup>10</sup> Manufacturers were quick to oblige by developing a variety of powerful new warning signals. These included whistles, chimes, sirens, and horns which ran off of exhaust gases.<sup>11</sup> One of these was a "one-mile signal" called the Sireno. Its name comes, of course, from *siren*, originally the Greek term for the mythological creatures who lured mariners to destruction with song. Another custom horn was the Godin, for which advertisements read, "You press as you steer and your pathway is clear."<sup>11</sup>

Probably the most famous horn of the teens and 1920s was the Gabriel. This

multitoned exhaust horn was publicized by the manufacturer as being both powerful and pleasing to the ear. "Everybody likes its organ-like tone and cheerfully moves aside as it sends forth its warning."<sup>11</sup>

Some people, however, preferred the harsher and more abrupt tone of a device called the Klaxon. This horn got its name from the Greek word *klaxo*, meaning "to shriek."<sup>12</sup> It consisted of an electrically powered vibrating metal diaphragm. According to the manufacturer, the Klaxon actually reduced annoyance. Whereas other horns had to be sounded continuously, "one touch on the Klaxon was enough." With a Klaxon it was "a rare thing to have to apply the brakes or slow down as there never seems any apparent reason to." Moreover, the Klaxon was touted as "the only horn which would instantly move cows and bullocks."<sup>11</sup>

Although today air horns are still used on some trucks and diesel trains, it was the Klaxon-type, diaphragm horn which survived and evolved into the modern-day automobile horn. In fact, in French the word "klaxon" has become the generic term, meaning "automobile horn," or "hooter." Modern diaphragm horns are powered electrically. They typically consist of an electromagnet and contact breaker wired to a circuit. When the circuit is completed by pressing the horn button, an electromagnet rapidly goes on and off, making a piston-like armature move rapidly up and down. The piston causes an attached diaphragm to vibrate a column of air which in turn begins to vibrate a sound chamber.<sup>13</sup> In some models, this consists of a coiled "bugle" device. In others it is a "resonator plate." The sound chamber amplifies the sound produced by the diaphragm and augments it with a second, higher pitched tone.<sup>14</sup>

Horns are engineered this way to make them audible over background traffic noise. Although a powerful, low-frequency note can carry long distances

in the absence of interference noises, this type of sound can get lost under the low-frequency rumble of traffic.<sup>14</sup> A higher pitched tone penetrates better at greater distances on busy city streets and on the highway where there is a great deal of sound interference. For any given sound intensity, in fact, the most penetrating signal for a car moving at highway speed would be tuned to roughly 4,000 cycles per second. According to *Automobile Facts*, this high-pitched sound is so unpleasant to the ear that engineers have compromised and tuned most horns lower.<sup>15</sup> Until the mid-1960s many American cars were tuned to the musical notes E flat and C, a combination deemed to be pleasing to the ear. Since then some manufacturers have moved up the scale to the notes F sharp and A sharp.<sup>16</sup>

Still, the compromise is not a perfect one. Levels of background noise have continued to increase, and automobile manufacturers at the same time have made efforts to "soundproof" their products. The replacement of the old wood and cloth auto bodies with modern glass and steel significantly cut down on the amount of noise from the outside which can penetrate a car's interior, whether this is traffic noise or the sound of a horn. More recent attempts to assure a quiet ride have, in fact, been so successful that under certain conditions, even the sirens of emergency vehicles, which are far louder than conventional horns, cannot be heard.<sup>17</sup> This is particularly true if the driver you are signaling has the windows rolled up and the air conditioner or radio turned on. Interestingly, at high speeds, rolling down windows may not improve, and may even detract from, one's ability to hear a horn or siren since it greatly increases the background interior noise level in the car. Another problem with horns at high speeds is that the car may "catch up" to the sound too fast. According to *Popular Science*, horn manufacturers are concerned that highway drivers may be "overdriving"

their horns. "At 65 m.p.h., they say, a signal may be heard only one to two car lengths ahead."<sup>13</sup>

On the other hand, pedestrians and residents along urban thoroughfares have no problem hearing the sound of automobile horns. In my opinion, this is one of the most irritating types of noise. I have previously discussed the adverse effects of pervasive loud noise.<sup>18</sup> Noise can cause not only hearing loss, but cardiovascular stress and a host of other physiological and emotional problems.<sup>19</sup>

At various times in the history of the automobile, and in various places, people have attempted to curb the noise problem either by making it illegal to honk too much, too loud, or in particular locations at certain times of the day. By 1912, a number of cities in America, among them Chicago, St. Louis, Los Angeles, Cincinnati, Seattle, and Dallas, had laws requiring motorized vehicles to have audible warning devices, on the one hand, but forbidding the excessive use of these devices, on the other.<sup>9</sup> Some cities made it illegal to use loud electric horns within city limits.<sup>20</sup>

A law enacted in Paris during the 1920s went somewhat further, by making it illegal to use a horn after midnight. The law stated that drivers must "slacken the pace of their vehicle everywhere needed, in particular at crossroads, so as to make it useless to use a horn." In 1954, the ban was extended to daytime driving as well.<sup>21</sup>

Though many cities have antihorn laws on the books, Memphis, Tennessee, has one of the most successful records of enforcement. According to one story, this began around 1940. A newspaper editor was ill and had to stay home from work for some time. Every evening the girl who lived across the street had a rendezvous with her boyfriend. He would sit in his car and honk until she came out. The editor, upon returning to work, prepared scathing editorials about the unnecessary horn-

blowing that was going on in the city. A wider publicity campaign followed, coupled with a vigorous policy of ticketing offenders. As a result, Memphis earned a reputation as "the quietest city."<sup>22</sup>

Other cities have not been so successful. In New York City, where antihorn laws no less strict than those in Memphis have been on the books for years, enforcement has been sporadic. During the 1950s, New York's Committee for a Quiet City decided that the city's highest priority should be to eliminate unnecessary horn-honking. The committee organized a publicity campaign which lasted three months. During this time the media publicized the fact that New York had antihorn-honking ordinances, and police issued warnings to offending drivers. The project culminated in "Q-Day," on March 15, 1956. Q-Day was a success. Decibel readings at the busiest intersections dropped 75 percent. The committee concluded, "Needless hornblowing can be drastically reduced and could eventually be virtually eliminated when an intensive educational campaign is combined with...periodic enforcement."<sup>23</sup> This goal, however, proved elusive. In 1973, the city took a new tack in its battle for quiet. It planned to regulate the decibel output of the newly manufactured horns themselves. During 1974, however, this legislation was abandoned as the quieter horns it was calling for could not be heard over the noise of traffic. Today, according to Mark Simon, Department of Environmental Protection, Division of Noise Abatement, antihonking laws remain on the books but citations are rarely issued unless someone files a complaint against a delinquent driver.<sup>24</sup>

There are still some places where it is not only legal but customary to honk to your heart's content. On a recent trip to China, my limousine driver used the horn once every five seconds or less for a half hour. Driven to distraction, I asked

him to stop for a short break. During our conversation I then bet him that he could not reach our destination without using the horn at least three times. Remarkably, he used the horn just twice. When I offered to pay the bet, he politely refused. But he then explained that if he had hit a pedestrian or bicyclist he would have been held liable for not having used his horn as a precaution. This policy appears to be totally counterproductive. Drivers consistently overuse their horns, and the masses of people in the streets completely ignore them.

As this anecdote illustrates, to the extent that laws and social norms let them, drivers really can get addicted to unnecessary use of the horn. As *Automobile Facts* has stated, it is difficult to overcome people's tendency to use the horn as an instrument "for the amplified expression of social protest or gratuitous insult."<sup>15</sup>

Unfortunately, when some people get behind the steering wheel, they are simply out of control. I recall a BBC film I once saw on television dramatizing the accident-prone driver. The opening scene shows a timid family man kissing his very gentle wife good-bye after breakfast. He gets into his car and within 60 seconds his face gradually transforms, as in the classic film versions of *Dr. Jekyll & Mr. Hyde*, into an ogre, foaming at the mouth like a rabid dog and honking at everything in sight.

I've seen this behavior in some of my closest friends. An in-law of mine was transformed into a raging lion when he got behind the steering wheel. The slightest infraction of his "right-of-way" on the street or highway turned him into a raving maniac. One time the vehicle in front of him did not move out of the intersection fast enough to suit his temperament. When leaning on his horn failed to get instant action, he got out of his car, went up to the auto at the traffic light, and pulled the driver out by the scruff of his neck. When the driver

emerged he proved to be six feet four inches tall. In spite of that experience, my in-law continued to rant, rave, and honk at offending drivers.

I checked *Social Sciences Citation Index*<sup>®</sup> (*SSCI*<sup>®</sup>) to determine if there had ever been an investigation of this method of using the power of the auto to overcome frustration. In fact, horn-honking turns out to be one of the more studied aspects of driving behavior. In 1968, two psychologists, Anthony N. Doob, University of Toronto, and Alan E. Gross, University of Wisconsin, ran an experiment to study the various factors that inhibited and encouraged the expression of frustration in driving situations. Participants in the experiment were asked to drive cars to a particular intersection, wait for the light to turn green, and then sit at the intersection for 15 seconds or until the car behind them began to honk.<sup>25</sup> Three different types of cars were used in the experiment: a shiny new Chrysler Imperial, a rusty old Ford station wagon, and a grimy Rambler. The study found that people were less likely to honk at the "high-status" Chrysler Imperial than at the older, less impressive cars. Eighty-four percent of drivers stuck behind the older cars honked. Forty-seven percent honked twice. Of the people forced to wait behind the Chrysler, only half honked once and less than 20 percent did so a second time. The same study also found that men were quicker to blow their horns than women.<sup>25</sup>

Women, as it turns out, are not only less inclined to honk than men, but also more likely to be honked at. A 1971 study, performed by Kay K. Deaux, Purdue University, replicated the Doob and Gross experiment but varied the sex of the "frustrator" as well as the status of the cars used to block intersections. Deaux found the sex of the driver to be the most important influence on honking behavior. Only 52 percent of the male experimental drivers were tooted

at compared to 71 percent of the females. Deaux concluded from these findings that the "damn female driver" stereotype is "accompanied by behavioral manifestations."<sup>26</sup>

In another variation of the Doob and Gross experiment, Robert A. Baron, Purdue University, attempted to measure the effects of uncomfortably warm temperatures and a range of other stimuli on aggressive honking. On an unpleasantly warm day, drivers were quicker to honk at the experimental vehicle. But this reaction could be slowed down if, immediately prior to being stuck in traffic, drivers experienced one of several staged distractions designed to evoke amusement, empathy, or mild sexual arousal. The distractions were provided by a young woman who crossed the intersection during the red light hobbling on crutches, wearing an "outlandish, humorous clown mask," or dressed "in an extremely brief and revealing outfit of a very unusual type." As Baron had predicted, exposure to these stimuli lengthened the period of time subjects would wait before honking.<sup>27</sup>

Finally, Charles W. Turner, John F. Layton, and Lynn S. Simons, University of Utah, designed different versions of this experiment, in which they measured the effect of such variables as "victim visibility" and aggressive bumper stickers, paired with rifles hung in the rear windows of the frustrators' cars. In this experiment, subjects were far more likely to honk at the drivers of experimental cars if they could not see their faces or make eye contact. Aggressive bumper stickers and rifles encouraged honking

among some, but not all, groups of drivers.<sup>28</sup>

It would be interesting, if it were possible, to learn what effect the entire removal of horns would have on accident statistics. I have no documentation for this, but I am confident that taking away people's horns would reduce, rather than increase, accidents. It is not only annoying to have people constantly using the horn when they should simply release the accelerator or gently apply the brakes, but it is no doubt dangerous as well. Honking a horn may induce panic, thus causing, rather than preventing, accidents. And it certainly frightens pedestrians.

Perhaps there are occasional freak accidents which might have been avoided by a timely horn signal. And there are winding mountain roads where it is often obligatory to sound the horn, but one wonders if in most instances horn-honking isn't a poor substitute for simply slowing down. In discussing the horn back in 1912, a motor columnist wrote, "It is far better to depend upon your own ability to get out of the other man's way than upon his ability to get out of yours."<sup>10</sup> This is an aphorism which some contemporary drivers would do well to remember.

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#### REFERENCES

1. Garfield E. Everything you wanted to know about sax but were afraid to ask. *Essays of an information scientist*. Philadelphia: ISI Press, 1981. Vol. 4. p. 193-9. (Reprinted from: *Current Contents* (25):5-11, 18 June 1979.)
2. Schieldrop E B. *The highway*. London: Hutchinson, 1939. 248 p.
3. Maccucci M. *History of the motor car*. New York: Crown, 1970. 392 p.
4. Karolevitz R F. *This was pioneer motoring*. Seattle: Superior, 1968. 192 p.
5. The horseless carriage and public health. *Sci. Amer.* 80(7):98-9, 1899.

6. A signal needed. *Horseless Age* 6(20):10-1, 1900.
7. Automobile alarms. *Horseless Age* 8(12):254, 1901.
8. The "noise" question. *Horseless Age* 2(2):1-2, 1896.
9. Johnson C. The motor car warning signal. *Motor* 20(2):66, 1913.
10. Chase J. Horns and warning signals. *Motor* 18(4):11, 1912.
11. Turner E S. Make way for a gentleman. *Punch* 245:560-1, 1963.
12. History of the auto horn. *Automob. Topics* 56(5):20-1, 1956.
13. Arctander E H. How an auto horn works. *Popular Sci.* 175(4):90, 1959.
14. Setright L J K. Horn: an audible warning device. (Ward I, ed.) *Anatomy of the motor car.* New York: St. Martin's Press, 1977. p. 134-5.
15. How the voice of the auto changed from clang, to oorah, to beep, to...  
*Automob. Facts* 15(3):8, 1956.
16. Processes/products. *Ward's Quart.* 1(11):16, 1965.
17. Eldred K M & Sharp B H. *Are present horns, whistles and sirens necessary for communications?*  
Unpublished paper, 1972. 23 p.
18. Garfield E. Quiet restaurants and noisy discos—there's a time and a place.  
*Essays of an information scientist.* Philadelphia: ISI Press, 1981. Vol. 4. p. 305-8.  
(Reprinted from: *Current Contents* (44):5-8, 29 October 1979.)
19. Brody J E. Noise poses a growing threat, affecting hearing and behavior.  
*NY Times* 16 November 1982, p. C1; C5.
20. Warning signals are of various types: trend of the times among the horns.  
*Motor Age* 21(2):46-8, 1912.
21. Baron R A. *The tyranny of noise.* New York: St. Martin's Press, 1970. 294 p.
22. Kavalier L. *Noise: the new menace.* New York: John Day, 1975. 206 p.
23. Wood S G. Traffic noise regulation: a comparative study.  
*Brigham Young Univ. Law Rev.* (3):461-642, 1979.
24. Simon M. Telephone communication. 26 May 1983.
25. Doob A N & Gross A E. Status of frustrator as an inhibitor of horn-honking responses.  
*J. Soc. Psychol.* 76:213-8, 1968.
26. Deaux K K. Honking at the intersection: a replication and extension.  
*J. Soc. Psychol.* 84:159-60, 1971.
27. Baron R A. The reduction of human aggression: a field study of the influence of incompatible reactions. *J. Appl. Soc. Psychol.* 6:260-74, 1976.
28. Turner C W, Layton J F & Simons L S. Naturalistic studies of aggressive behavior: aggressive stimuli, victim visibility, and horn honking. *J. Personal. Soc. Psychol.* 31:1098-107, 1975.