**Appreciating Santa**

**“We shall soon be having Christmas at our throats,” says a grumpy character who is not the least bit like his creator, the novelist P.G. Wodehouse, who was preternaturally cheerful through all his 94 years. Today the nation begins its annual recovery from its collision with Christmas, vowing to shape up and sin no more, right after the next cup of eggnog.**

**And there you sit, stunned reader, knee-deep in the remnants of gift wrappings, somewhere in the drifts of which are buried the batteries and two or three tiny and indispensable plastic parts for a toy. Feeling put-upon? Consider how Santa is feeling this morning.**

**With the help of calculations from a science newsletter published by the National Association of Scholars, you can appreciate what Santa accomplished last night. Actually, he did it in 31 hours, thanks to the many time zones and the Earth's rotation, and assuming that he has the good sense to work from east to west.**

**If we count as children all people under 18, there are 2 billion of them. The NAS assumes, unconvincingly, that Santa does not deliver to Muslim, Hindu, Jewish and Buddhist children -- as though they don't see Santa at their local Neiman Marcus and demand to board the gravy train. But if the NAS is correct (and if civil rights laws do not get Santa prosecuted for having a “disparate impact” on various protected classes of people), Santa's constituency is just 15 percent of the world's children, or 378 million.**

**Assuming, on the basis of world census figures, 3.5 children per household, Santa must visit 91.8 million homes, or 822.6 households per second. That gives him 1/1000th of a second to tether the reindeer to the chimney, or perhaps the satellite dish, get down the chimney, distribute the loot, scarf down the Oreos and milk (or perhaps Stilton and port in the tonier precincts), and get moving again on his journey of (assuming an urban-rural mix of Santa's target audience and a distance of 0.78 miles between households) 75.5 million miles.**

**So his sleigh is moving 650 miles per second, which is 3,000 times the speed of sound -- a hop, skip and a jump ahead of the fastest thing made by man, the Ulysses space probe, which putters along at 27.4 miles per second. A conventional reindeer, on a good day and steroids, can hit 15 miles per hour.**

**However, the NAS judiciously notes that although no flying, sound-barrier-busting reindeer have been found, there are 300,000 species of living organisms yet to be classified. Granted, most are insects and germs, but even if 299,999 are insects and germs, we cannot rule out the possibility of a species of remarkable reindeer, even a species with a total population of eight. (Or 214,200. See below.)**

**The NAS suggests assuming that each child gets only, say, a medium-size Lego set weighing two pounds. David Maseng Will, age 5, who weighs his Christmas take on a truck scale, says the NAS should be better briefed on the modern child's expectations. But even on the NAS' weird assumption, the sleigh leaves the North Pole carrying 321,300 tons, not counting Santa, who, were he a she, would be delicately described as “full-figured.”**

**The NAS insists that a normal, walking-around reindeer can pull 300 pounds, tops. That is about what Santa probably weighs at the peak of an enlarging season of candy canes and pfeffernuesse cookies. However, the NAS assumes that Santa's unconventional reindeer can pull 10 times more than the conventional sort. Even so, Santa needs not eight but 214,200 reindeer. And that herd increases the weight on your roof to 353,430 tons, which the NAS says "is four times the weight of the Queen Elizabeth (the ship, not the person)."**

**Trouble is, air resistance from 353,430 tons traveling 650 miles per second generates terrific heat, so the two lead reindeer, who won't be that for long, each absorb 14.3 quintillion joules of energy per second. They instantly burst into flame, as then do the two behind them, and then the next two, and so on. Santa runs through 214,200 reindeer in 4.26 thousandths of a second.**

**Not that he notices. He is disoriented by deafening sonic booms and by experiencing centrifugal forces 17,500 times the force of gravity. Even if he weighs only 250 pounds, he is slammed into the back of his sleigh with 4,315,015 pounds of force.**

**The NAS concludes that Santa is dead, but cannot explain who put the lump of coal in its stocking.**

***(George Will is a Pulitzer Prize winner who writes a column for Newsweek magazine and is a contributing analyst with ABC news.)***
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**Experts have shown just how remarkable Santa Claus’s annual feat of delivering presents to the world’s good boys and girls really is. Sweco, a Swedish engineering firm, calculated that assuming Santa visits 2.5 billion homes every Christmas, he has 34 microseconds per household to get in and out; that’s about a tenth of the time it takes for a housefly’s wing to flap once. To complete his task in 48 hours, Santa’s reindeer must travel at a speed of 3,604 miles per second, the firm’s Anders Larsson tells Agence France-Presse. Another analysis makes Santa’s accomplishments seem even more astounding. It calculates that Santa’s sleigh, weighed down with presents and traveling at supersonic speed, would encounter such massive air resistance that it should burst into flame within 4 milliseconds of takeoff. The scientists could not explain how Santa manages to defy the laws of physics. *(The Week magazine, December 21, 2007)***

**4,796,250 mph - The speed Santa Claus must travel to visit all of the world’s households in a single evening. *(The Christmas List: A Holly, Jolly Treasury of Seasonal Stats)***

**Accounting for time zone differences, Santa has 31 hours to deliver gifts on Christmas Eve, but that still means he would have to visit 823 homes per second. (Noel Botham, in The Amazing Book of Useless Information, p. 18)**

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