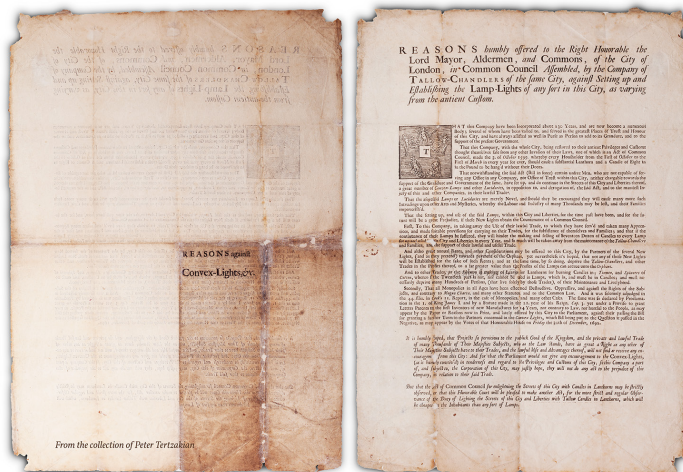


# The Candlemaker and the Coal Generator: A Tale of Transition and Innovation

By Helen Schreyer, HBA 2021



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## London, 1680 – The Candlemaker

I was five years old when my father first showed me how to make a candle. I remember it well. He sat me down and told me that I was a man now, that one day I would take over the family business. We didn't have much, so we made our candles from animal fat collected during the autumn slaughter<sup>1</sup> (Mother made Father promise to save that part of the lesson for when I was older). Father made his candles from sheep tallow because it didn't smell as bad as cows' or pigs' tallow.<sup>2</sup> Each year we needed 400 candles to light our home,<sup>3</sup> so Father kept these and sold the rest to The Tallow Chandlers' Company. The Company used our candles, along with those of many others, to maintain compulsory lighting for the City of London. They also traded in sauces, vinegar, soap, cheese, and herrings,<sup>4</sup> but we were less interested in those. All we had to give was our candles.

The night Father taught me how to make candles he showed me his crates of twisted cotton and linen wicks. We spent hours together, dipping wicks in tallow until each had a proper width and taper.<sup>5</sup> Father guided my hand, keeping me steady, then showed me how candles need trimming when they're burned—sometimes 40 times per night—to keep the wick short and the flame clear and bright.<sup>6</sup> At the end of the night Father handed me my first candle. My face was flushed, and his eyes were twinkling. "Well done, son," he said, "One day you'll make your old man proud."

## London, 1692 – Through the Looking Glass

It's been twelve years since I made my first candle. I don't make them anymore. Two years ago, I took an apprenticeship with Mr. Reeves, the glassblower in town. He makes lenses too. At first it was just spectacles but then he caught wind of a new technology called the 'convex lens.' Father thinks Reeves is nothing but a nonconforming, rebellious tinkerer. I think Reeves is a genius.

"The convex lens is going to change the entire lighting industry," I told my parents over dinner.

Father scowled. "Reeves doesn't know what he's doing. And neither do you. You should be preparing to take over the family business. I've tolerated your tinkering this long, but no more. Next month is your eighteenth birthday. I forbid you from continuing with these trivialities and expect to see you studying our books."

<sup>1</sup> Crawford, B. (NA). How Were Candles Made in the 1800s? Our Pastimes. Retrieved from <https://ourpastimes.com/how-were-candles-made-in-the-1800s-12148427.html>.

<sup>2</sup> Ibid.

<sup>3</sup> Ibid.

<sup>4</sup> The Tallow Chandlers' Company. (NA). Our History. The Tallow Chandlers' Company. Retrieved from <https://www.tallowchandlers.org/aboutus/our-history>.

<sup>5</sup> Crawford, B. (NA). How Were Candles Made in the 1800s? Our Pastimes. Retrieved from <https://ourpastimes.com/how-were-candles-made-in-the-1800s-12148427.html>.

<sup>6</sup> Ibid.

"Father, I refuse to take over our family business. It has no future!"

"How dare you – "

"Convex lenses are the future. And I can make lenses. I've learned all about it, Reeves taught me."

"You would – "

"I can change our business. I can make it better!"

"Now let your Father finish," Mother cut in as she spooned potatoes onto my plate.

Father gave a tired sigh. "William, the convex lens won't change anything. Just last night The Tallow Chandler's put in a petition to the councillors of the City of London to ban the convex lens. A thing like that would make lighting too efficient. Wick makers, candle makers, candle suppliers, all of us would lose our livelihoods. We can't allow an industry like this to change, not when it supports so many families as it is."

I stared at my father, incredulous. "Are you hearing yourself? Too *efficient*? Can't allow an industry to *change*? The only way we'll ever see progress is if we *enable* change. Eventually it'll happen either way, the question is whether or not you'll be left behind." I forked peas into my mouth. "Take the risk or lose the chance, Father," I said, then swallowed quickly after a pointed look from Mother. "Now's your chance to get ahead. *I'm* your chance to get ahead."

Father sighed. "Ah, Will. There is an old Chinese proverb, 'To guess is cheap. To guess wrong is expensive.' Let others do the guessing. We'll stay where it is safe."

"What about the other proverbs you taught me?" I countered. "'Those who say it can't be done shouldn't interrupt the person doing it?' Or 'Only the wisest and stupidest men never change?' We are doing it Father. *You* would be stupid not to change!"

"William! Do not speak to your Father that way!"

"But it's true! Times are changing. We need to change with them." Father set down his cutlery.

“Not in my lifetime. And not in yours. These things don’t happen overnight William, and I will not have you jeopardizing our family. You will take over the business, but as long as I’m living, I’m the boss. And you will make candles. If you want to make anything else, you can leave—the business and the family.”

“Andrew!”

“Father!”

“That’s my last word. Do not bring this subject up with me again, William. And certainly not at the dinner table.”

I got up from that table and stormed from the room. Father left shortly after. Mother’s pudding went untouched.

### **London, 2021 – Hindsight and Foresight**

The lecture hall is silent. I tell my student’s this story each year at the end of our class on transition and innovation. I read from my great-great-great-great grandfather’s journal, and I tell them what happened next. William was kicked out of the house but continued to study under Richard Reeves. In 1675 Reeves obtained a patent for a glass reflector to be used with candles and lamps.<sup>7</sup> Not much came of Reeves’ reflector, but in 1682 a newspaper announced a “new Project for Lights... (that) shall exceed six times the Light of the Candles.”<sup>8</sup> The advertisers were likely Samuel Hutchinson and associates, but before they could obtain their patent a man named Anthony Vernatty obtained his own patent for a “New Sort of Lanthorn and Lamps.”<sup>9</sup> Sometime between 1683 and 1689 Vernatty set up “the Glass Lights” in Cornhill, and in 1692 he was lighting the road from Clarendon House in Piccadilly to Kensington Place.<sup>10</sup>

“William and his father were both right,” I told my class, “Take the risk or lose the chance. But change doesn’t happen overnight. What are some parallels we can draw to this story today?” I gestured to a young man in the front row, “Nathan, go ahead.”

“One example is how businesses are being asked to pursue net zero strategies. My family has a long history in the coal mining industry, which peaked in the 1980s but has been declining ever since. In 2019 alone, 75% of new energy investments went towards renewables and coal generator usage fell dramatically.”<sup>11</sup>

In the second row, Eileen raised her hand.

<sup>7</sup> De Beer, E. (1941). THE EARLY HISTORY OF LONDON STREET-LIGHTING. *History*, 25(100), new series, 311-324. Retrieved January 2, 2021, from <http://www.jstor.org/stable/24401837>.

<sup>8</sup> Ibid.

<sup>9</sup> Ibid.

<sup>10</sup> Ibid.

<sup>11</sup> Bond, K. (November 5, 2020). The Energy Transition – The Time is Now. Carbon Tracker. Retrieved from <https://carbontracker.org/the-energy-transition-the-time-is-now/>.

“The transition to renewables was amplified by the pandemic too. I read a report by the International Energy Agency that said demand for fossil fuels collapsed by 8% in 2020, while demand for renewables grew by 15%.”

“And what does that mean for companies planning to grow in the fossil fuel sector?” I pressed.

“They’ll have excess capacity. That will lead to lower prices, which reduces profits and results in stranded assets.”

“Very good. There’s an entire legacy fossil fuel system with over \$30 trillion of fixed assets,<sup>12</sup> and countless organizations whose strategies are still based on rising demand. This makes them vulnerable to disruption as the industry moves from growth to decline, which is what we’re seeing now. In 2008 the European electricity sector collapsed, and we’ve spent the last decade restructuring and writing-down \$150 billion of fixed assets.<sup>13</sup> The hope of remaining fossil fuel companies is that the intermittency of renewables will cap growth. This has been their ongoing defense, but year-after-year renewables continue to increase their share of the energy sector.”<sup>14</sup>

I turned to my class. “Knowing this, I want you to think well about what you’re going to do as the future policy makers of our energy sector. How will you support innovation? How will you ensure families like Nathan’s aren’t left behind? Keep in mind that every economic development has social consequences, but it’s the economy that exists to support society, not the other way around. Many will put profits over people in their pursuit of progress. Be careful you don’t do the same.”

<sup>12</sup> The fixed assets listed here are valued in USD

<sup>13</sup> Musariri, D. (March 12, 2020). Here’s where the UK’s last remaining mines are still being operated – and where others are planned. NS Energy. Retrieved from <https://www.nsenergybusiness.com/features/coal-mining-uk/>.

<sup>14</sup> Ibid.