

Alex Stout

Tech 1010 – R. Winter

Dynamite: The Big Bang

A World Without Dynamite:

Can you imagine the modern world without the widespread of industrialization? Can you imagine it without some of mankind's most monumental constructions? Without the Panama Canal, we would still have to sail all the way around the southern tip of South America. New York's market wouldn't be what it is without the New York Harbor. Mount Rushmore wouldn't be one of America's favorite historical monuments; rather, just another of our nation's many majestic mountains. All of these things are here today, thanks to one man and his idea; Alfred Nobel and his revolutionary invention of dynamite.

The Need For A Bigger Bang:

It was the 1860s; Alfred Nobel, a Swedish industrialist, engineer, and inventor built bridges and buildings in Sweden's capital, Stockholm. ¹ A major part of Nobel's work was to blast away rock to accurately construct his projects. Leading up to the 1860s, the only explosive material made popularly available was gun powder. Gun powder just didn't quite cut it. It took several attempts to blast rock away with gun powder and it took a lot to get the job done. Nobel knew there had to be something that could do the job more effectively. He sought a more efficient explosive to do the demolition work for bridges, mining, engineering and industrial projects.

¹ "History of Dynamite" (2003); Mary Bellis; http://inventors.about.com/od/dstartinventions/a/Alfred_Nobel.htm

The Discovery & Invention of Nitroglycerin:

In 1843, Nobel studied in Paris where he met an Italian chemist by the name of Ascanio Sobrero. Just three years later, Sobrero made a name for himself by inventing nitroglycerin. He discovered that mixing nitrate and glycerin created a very volatile material. This yellow, oily substance was not detonated by spark or flame; rather, by impact or percussion. This made for a very risky, unstable material. Sobrero said the substance is “too dangerous” and would “never serve for any practical use.”²

When he caught ear of this discovery, Nobel became very intrigued by its power. Nitroglycerin has a high detonation velocity exploding at 8077 meters per second; whereas, gun powder is measured around 3200 meters per second. Alfred and his father, Immanuel Nobel, began manufacturing and distributing nitroglycerin because of its promise of explosive power.

A Highly Volatile Material:

Nitroglycerin became highly popular. It was being used all around the world for various things including lamp oil, greasing wagon wheels, and even as shoe polish. You can only imagine the consequences. Explosions were taking place all around the world, blowing up transport ships, factories, and warehouses. Even in some cases, lives were lost. In one popular event, some curious employees at a Wells Fargo office opened a recently delivered crate of nitroglycerin. “The resulting explosion leveled the office killing fifteen people within its proximity.”²

One incident in particular hit too closely to home for Alfred Nobel to ignore. In the midst of Nobel’s scientific studies, an accident took place killing five of Nobel’s

² “*People & Events: Nitroglycerin*” (2002); Josh Daniel; http://www.pbs.org/wgbh/amex/tcrr/peopleevents/e_nitro.html

helpers including his younger brother Emil.³ By this time, the government had become wary of the substance and began to ban its possession and transport. Nitroglycerin, it seemed, wouldn't be a technology accepted by society due to its high risk factors.

A Revolution for Explosives:

Alfred and his father were some of the largest distributors of nitroglycerin, so they knew they needed to make the dangerous material safer if they wished to stay in business. The Nobels were known for being successful entrepreneurs and businessmen, so they wouldn't just let the potential of nitroglycerin slip away. They began experimenting with absorbents to reduce nitroglycerin's volatility. The material they found to be most effective was a special mineral, mostly found in the Krümmel Hills of Germany, called kieselguhr.⁴ They would take nitroglycerin and mix it with the mineral resulting in a dough-like substance which could then be molded into whatever shape or form desired. The desired shape was a long, thin stick—about eight inches long and one inch thick—perfect for placing into drilling holes for mining.

The substance was much, much safer now from spontaneous detonation. But there still existed a dilemma; how were they to get this new material to detonate safely? Nobel found the answer quite abruptly when trying a blasting cap he had invented a year earlier that could detonate the device from a safe distance with the use of mercury fulminate by simply lighting a fuse.¹

³ "Alfred Nobel - His Life And Work" (????); Nils Ringertz; http://nobelprize.org/alfred_nobel/biographical/articles/life-work/index.html

⁴ "World of Invention: Dynamite" (2005); Nelson Timmons; <http://www.bookrags.com/research/dynamite-woi/>

¹ "History of Dynamite" (2003); Mary Bellis; http://inventors.about.com/od/dstartinventions/a/Alfred_Nobel.htm

His invention was tested and proven to be a much safer option providing nearly the same powerful results. The mixture of the mineral with nitroglycerin caused it to be almost twenty-five percent less powerful than pure nitroglycerin. Nobel patented the invention naming it dynamite, named after the Greek word *dynamis* meaning 'power.'⁴

Gaining The World's Trust:

It's now 1865, the Nobels are back in full swing producing tons of dynamite per year, distributing to dozens of countries worldwide. Some governments were, at first, sketchy of nitroglycerin-based products being back on the market, but after a few years, they noticed other countries using dynamite for military power.⁴ Dynamite was then essentially accepted worldwide. Nobel was agitated at the fact that his invention began to be utilized as a weapon, as he was a pacifist.

The Double-Edged Sword:

It was evident that Nobel had created one of the first double-edged swords in technology. Dynamite was ideal for demolition in the means of construction. Man had moved from the wheel, to the plough, all the way to dynamite. Man now possessed the power to move entire mountains. Nothing could stand in his way; unless, of course, there stands another man before him who, too, possesses the power of dynamite. He was quoted saying, "Perhaps my factories will put an end to war sooner than your congresses: on the day that two army corps can mutually annihilate each other in a second, all civilized nations will surely recoil with horror and disband their

⁴ "World of Invention: Dynamite" (2005); Nelson Timmons; <http://www.bookrags.com/research/dynamite-woi/>

troops" when commenting on one of his dynamite manufacturing factories.⁵ It seemed quite possible that soon, armies would completely destroy one another with the existence of such destructive power.

Military scientists thank Nobel for his invention of dynamite still to this day just as they did in the 1800s. "Dynamite was essential to warfare; the explosive power of bombs in World War II was made possible by Nobel's invention."⁶ Without the invention of dynamite, military weapons today wouldn't be nearly as powerful due to many of our weapons being nitrate-based or based on similar matter. Perhaps our soldiers would still be lining up at the frontlines using canons and muzzle loaders. Who knows where military power would be today?

The Winners & The Losers:

The winners in the invention of dynamite are Alfred Nobel, humanity, construction, mining, demolition, etc. Overall, a big winner is explosive technology. The explosives department owes a lot to the invention of dynamite; more specifically, to Sobrero's invention of nitroglycerin.

The losers are the victims of the tragic accidents, Alfred Nobel, and humanity—yes, I listed Nobel and humanity under both categories, but with good reason.

Nobel was a winner because he was one of the most successful men of the nineteenth century, but he was a loser because he was a pacifist and surely struggled seeing that he had created the most powerful weapon in the world (at the time).

⁶ "A Most Damnable Invention: Dynamite, Nitrates, and the Making of the Modern World" (2005); Stephen R. Brown

Humanity is a loser because we have suffered several tragic deaths. Do we blame the deaths of most explosions since 1865 on dynamite? It's hard not to. The total deaths from the atomic bombs the U.S. Dropped on Japan totals near 200,000. It's difficult to outweigh the countless deaths. But humanity really owes a lot to be able to possess such magnificent power. Today, technology owes a great deal to Alfred Nobel. Without dynamite, the Industrial Revolution may not have been nearly as significant.

The Beginning of Several Revolutions:

Dynamite is often accredited for being the first stepping stone into the Industrial Revolution as it was before Edison's light bulb.⁷ Dynamite allowed for quicker production of roads, railways, buildings, bridges, tunnels, factories, buildings, and even the removal of entire mountains, if needed. All of which increased at an incredible rate in the late nineteenth century with a large appreciation owed to Alfred Nobel and his dynamite invention.

Nobel is recognized as an inventor who sparked a revolution of inventors to follow in the decades to come.⁷ Would Edison have been the same inspired inventor without seeing what Nobel had done first? Nobel, much like Edison, invented much more than dynamite. He's also "recognized for the invention of synthetic rubber and leather, artificial silk and several other chemical inventions."⁷ By the time of his death in 1896, he had 355 patents. He was known as "the richest vagabond in all of Europe."³

⁷ *"Inventing the 19th Century: 100 Inventions That Shaped the Victorian Age, from Aspirin to the Zeppelin"* (2001); Stephen Van Dulken

³ *"Alfred Nobel - His Life And Work"* (????); Nils Ringertz; http://nobelprize.org/alfred_nobel/biographical/articles/life-work/index.html

Dynamite is still used to this day for various things. The modern formula for dynamite is slightly different from that of Nobel's. It's been adapted for the purposes of safety and to provide a variety of different explosion powers. The ingredients today are "nitroglycerin, ammonium nitrate and sodium nitrate, wood pulp, and a little bit of calcium carbonate which neutralizes acids that may develop during storage."⁸

What does the future have in store for dynamite? Probably not much more than what we use it for today. There will probably continue to be ways to make it safer and more powerful, but specifically with dynamite, there probably won't be too many advancements. Although, there will likely continue to be newer and more powerful explosives with the use of nitrates and other substances.

Conclusion:

He created one of the most controversial inventions in the history of mankind. He strived for worldwide peace. Knowing he had invented something capable of destroying armies, in his death will, he wished for his wealth to start a foundation that awards people for accomplishments in sciences, literature and politics that help humanity in the name of peace. This prestigious award is known as The Nobel Peace Prize.

⁸ "Dynamite" (????); Mara Skujins; <http://stephan.grandpre.net/dynamite.html>

Works Cited

- ¹ “*History of Dynamite*” (2003); Mary Bellis; http://inventors.about.com/od/dstartinventions/a/Alfred_Nobel.htm
- ² “*People & Events: Nitroglycerin*” (2002); Josh Daniel; http://www.pbs.org/wgbh/amex/tcrr/peopleevents/e_nitro.html
- ³ “*Alfred Nobel - His Life And Work*” (????); Nils Ringertz; http://nobelprize.org/alfred_nobel/biographical/articles/life-work/index.html
- ⁴ “*World of Invention: Dynamite*” (2005); Nelson Timmons; <http://www.bookrags.com/research/dynamite-woi/>
- ⁵ “*War and Peace in the Thinking of Alfred Nobel*” (1999); Sven Tägil; http://nobelprize.org/alfred_nobel/biographical/articles/tagil/index.html
- ⁶ “*A Most Damnable Invention: Dynamite, Nitrates, and the Making of the Modern World*” (2005);
Stephen R. Brown
- ⁷ “*Inventing the 19th Century: 100 Inventions That Shaped the Victorian Age, from Aspirin to the Zeppelin*” (2001); Stephen Van Dulken
- ⁸ “*Dynamite*” (????); Mara Skujins; <http://stephan.grandpre.net/dynamite.html>

Other Resources

Bankston, John; *Alfred Nobel and the story of the Nobel Prize* (1974)

Grady, Sean M.; *The Encyclopedia of Discovery and Invention-Explosives: Devices of Controlled Destruction* (1994)

http://en.wikipedia.org/wiki/Alfred_Nobel

<http://en.wikipedia.org/wiki/Dynamite>

<http://en.wikipedia.org/wiki/Nitroglycerin>