

How Fluids Changed the World

The study of fluids has changed the world more drastically than what meets the eye. The world's knowledge of fluids has changed the face of history repeatedly. Everyday tasks like taking a shower, drinking clean fresh water, and pumping gas for an automobile would be arduous. These are just a few luxuries that people take for granted. But how did studying fluids really shape the world? Civilization would not be as advanced as it is today without aqueducts. On the other hand, some of the biggest events in the world were made possible through advancements in the understanding of fluids. Such tragic turning points in history are the atomic bombings of Hiroshima and Nagasaki and the terrors of what happened on Sept. 11, 2001. Studying fluids has far reaching ramifications. Our social and political systems have changed in ways that were unimaginable a mere 100 years ago. This paper will tell how the most fundamental fluid discoveries changed humanity just as much as the more recent, complicated findings.

What would the world be like if people had little access to drinking water? The environment would probably be a lot healthier since there probably wouldn't be as many people living, therefore there would be less pollution. This is because the human race as we know it would not exist. The population in 500 B.C. was one-hundred million people, and to this day there are about 6.5 billion people and the population is still climbing.

According to Abraham Maslow, a famous psychologist, the two primary things human beings need to survive are air and water, which the body's most basic needs. While the lack of the oxygen prohibits people from living underwater and on the moon, people were able to populate almost the entire planet. But, what really defined where people lived from the beginning of time was their access to drinking water. What did some of the first great empires such as Ancient Egypt and Ancient Greece have in common? The answer is pretty obvious, they all were formed in their respected locations bordering water. Ancient Egypt evolved around the fertile Nile River, while Crete, which is where the Greek empire formed, is surrounded by the Aegean Sea. Also, the Tigris and Euphrates rivers were the foundation of the first civilization in Mesopotamia. From these humble beginnings people spread to other regions in the Middle East, then to Europe and Africa, and much later to the lands that now form North and South America. The first great empire in the world depended on water. Rome started in the peninsula of Italy, but they ended up conquering the known world at the time. From Spain to Scandinavia to northern Africa, Rome built a civilization that is still unequaled even today. The only way this was possible was the making of aqueducts to supply the Romans the essentially water needed to help nourish their dynasty.

An aqueduct is an artificial channel that is usually built above ground which allows water to be transported from one place to another such as from a river to a town or city. This allowed cities that were congested along the banks of their water source to move away from the water, thus expanding the lands that were uninhabited in years past. The first basic fact known about water as a fluid is a very fundamental concept that allowed civilization to flourish. As long ago as the 7th century B.C. the Aztecs, Romans,

and Egyptians took advantage of the principle that water flowed downhill. With the invention of the aqueduct, cities' limits were stretched beyond the imagination. The key was that farmer's could farm away from water sources with the help of the aqueducts to allow the population to blossom. The spread of populations across the globe enabled our social and political systems to grow into what is seen today.

Some people feel that aqueducts are outdated and were used only centuries ago. However, those people might be surprised to know that aqueducts also shaped the U.S. in the 21st century. Aqueducts were built largely to provide water to blossoming cities and to industries that consumed a lot of water. The Colorado River Aqueduct spans almost 250 miles to connect the Colorado River and Los Angeles. Without this aqueduct, Los Angeles would not be the metropolis that it is today. Also, the majority of the state of California between San Francisco and Los Angeles was mostly barren land. Now, thanks to aqueduct and irrigation technology, those lands have been transformed to nourishing farmlands. California is among the nation's leaders in cow farms. With that comes cheese, milk, meat and other products necessary now for living. Orange fields and other fruit and vegetable producing farms contribute to the dietary needs of a people that have become in the last half century more health conscious.

The concept of water running downhill, as simple as it seems to today's mind, proved to be instrumental in the development of numerous technologies that enabled man to achieve one of the great advances in history: the ability to take to the skies. Although the complicated task of getting the plane in the air, the pitot tube really helped the pilots be one with their aircraft. The pitot tube is a piezometer which is a device that measures the pressure of a fluid in a column. Armed with this simple device, it aids in flight of

airplanes and other airborne transports. This instrument is used to determine the airspeed of an aircraft. Measuring airspeed is of course vital to flight and contributed to many historic events, both good and bad.

Air travel changed the way our civilization functions. What was once a trek of many weeks and certain peril to travel from the east coast to the west coast was turned into a mere 6 hour flight. The ramifications of faster travel are huge. Families can keep in touch easier. Also, one could argue that flight led to the advancement of our social economic and political systems. Business has gone global because of air travel. Corporations can now realize the advantages of a global economy and because of that, capital is increased and money leads to a better business environment. Companies can now function with offices on both sides of the country as well as the world. Deals can be accomplished faster, and when time equals money, airplanes seem like the best transportation possible for long distances.

On the political side, government officials can go many places. This is vital to campaigning and solving the ills of our society. Before flight, politicians from different countries depended on communication systems that lacked personal attention. With face-to-face confrontations, now more accessible than ever because of flight, diplomacy reigns supreme in solving conflicts and it can be said that numerous armed conflicts were prevented by the art of personal communication. An example of this was when Raoul Cedras, the ruler of Haiti from 1991-1994, gave up his power over his country. At the time, President Clinton gave the ultimatum that Cedras will either step out of power or be invaded by the U.S. army. With both sides refusing to back down, former President Jimmy Carter flew to Haiti and persuaded Cedras to step down to avoid an U.S. invasion.

With the use of the airplane, and a little persuasion many lives were not go lost due to a war.

While the study of fluids in many ways helped people survive, sadly enough the studies were used throughout history to cause much destruction. While the morality of using atomic weapons in warfare is a continuing debate, it cannot be denied that the dropping of the bomb on Hiroshima and Nagasaki did essentially end the second World War. But, in the process the bombs killed 80,000 people in Hiroshima alone and completely destroying approximately 68% of the cities (over sixty-thousand more people died from the aftermath of radiation poisoning and other diseases). The use of fluids in a pitot tubes helped in the calculations of how and when to drop the bomb to hit its primary targets. On a darker note, the terrorist attacks of September 11th, 2001, were also achieved this way. Calculations of airspeed and altitude were crucial to guiding the terrorist-flown airplanes into both of the buildings of the World Trade Center and the Pentagon.

This paper barely scratches the surface of how the study of fluids not only benefits science, but humanity itself. Without the knowledge that is known today, who knows what this world would have become. Without small discoveries such as water runs downhill, and larger findings such as how an airplane flies and the how pitot tubes help navigate airplanes, the world would be a much different place. Would human beings still be around, would they be extinct, or would they be struggling to survive along the banks of bodies of water? Thankfully, this question is a mute point, and it shows that fluid studies helped shape the past and will definitely have an equally great impact until the rest of the human race's existence.

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