

Professor Johnson



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Professor Johnson Western Civilization II Section 301 22 April 2013 A History of Medicine: 16th-21st Centuries In this paper you will find the exploration of medicine from the 16th century all the way through to the 21st century. It will look at the different medical advances through each time period as well as doctors, surgeon's, physicians as well as scientist. It will look at several important and influential people that were responsible for the medical advances we have in today's world. It looks at history makers such as, Giovanni Battista Morgagni, Joseph Lister, Sir Alexander Fleming and many more. It also looks at several different countries including The United States, England, Germany and several others, to show the different levels of advancement in different areas during the different time periods. I intend to have a better understand of how medical procedures and medicine were used throughout each of these centuries as well as, the failures and advances made by many of these great men that paved the way for future of medicine, from early times, through WWI and WWII up until our time in the 21st century. * 1628- William Harvey studies the motion of the heart and of blood. * 1656- Sir Christopher Wren experiments with canine blood transfusions. * 1670- Discovery of blood cells by Anton van Leeuwenhoek. * 1701- Giacomo Pylarini tries to reproduce smallpox (History Timelines of Events). * 1763- Claudius Aymand performs the first successful removal of the appendix. * 1796- Edward Jenner creates the first smallpox vaccine. * 1818- The first successful human blood transfusion done by James Blundell. * 1857- Louis Pasteur discovers germs as cause of diseases. * 1881-1882 Louis Pasteur creates the first anthrax and rabies vaccines (History Timelines of Events). * 1901- Karl Landsteiner creates the system to classify blood type (A, B, AB, and O). * 1923-1927- First vaccine for diphtheria, whooping cough,

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tuberculosis and tetanus are developed. * 1928- Discovery of penicillin by Sir Alexander Fleming. * 1950-1952- Invention of the first cardiac pacemaker by John Hopps, developed by Paul Zoll. * 1953- James Watson and Francis Crick study the structure of DNA. * 1954- The first kidney transplant is performed by Dr. Joseph E. Murray. * 1967- First human heart transplant by Dr. Christian Bernard (History Timelines of Events) * 2005- First human face transplant was done in France (Stibich). * 2006- Cervical Cancer vaccine HPV was created (Stibich). * 2012- Discovery of growing cells to make different parts of body tissue (NobelPrize. org 2012). William Harvey, was born in England in 1578 was the oldest of seven children and the only one to pursue medical interests (Nuland, " Doctors" 121). William Harvey was the first to discover the circulation of blood (Nuland, " Doctors" 119). Although, many before him had a somewhat small understanding of it Harvey was the first to fully understand the circulation processes. In the Galenic Doctrine it was though that " blood is constantly being made anew in the liver from ingested food, and sent out to drench the tissues. " However, Harvey estimated that " Fluid capacity of the human ventricle to be approximately two or three ounces. Given a normal cardiac rate of seventy two beats per minute, over the course of one hour the heart must expel 8, 640 ounces that is, 540 pounds of blood into the aorta. " This theory ultimately disproves the Galenic Doctrine (Nuland, " Doctors" 129-30). If we were to look into studies today about blood circulation you would find that William Harvey wasn't to far off in his studies. Giovanni Battista Morgagni, was born in Northern Italy in 1682 he was patronage and an assistant to Antonio Maria Valsalva, a pronounced anatomist. Morgagni, was a well-known and well liked physician, who cared about his patients very deeply (Nuland, " Doctors" 146-47). It is said that he

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was put on this earth to carry out a mission and to bring the message that “ it is useless to seek the causes of disease among the foggy vapors of the four humors or any variations of such theories. ”(Nuland, “ Doctors” 143) This message was pertaining to bloodletting. It was said that good health required a perfect balance of the four humors which was blood, phlegm, yellow bile and black bile. When there was thought to be an overabundance of one of these humors it would cause a person to be sick, a vein would then be opened with a sharp object and blood would be let out according to how sick you were (Gre10). Morgagni, used anatomy to understand diseases rather than speculating like so many others did during that time. “ His deep interest in clinical medicine and his ongoing experiments in physiology led him to seek reasonable and observable explanations for the phenomena of disease, with the aim of classifying and explaining each disease process as a distinct entity. ” By the end of Giovanni’s life he had become known as the “ Father of Modern Anatomical Pathology. ” (Nuland, “ Doctors” 147) John Hunter was born in Scotland in 1728 was a renowned scientist and surgeon (Nuland, “ Doctors” 168). He transformed the image of surgeons as well as medicine. Hunter believed that by curiosity and hard work he would be able to answer any question and that in order to know mankind the entire animal series must also be understood (Nuland, “ Doctors” 166, 174). He joined the army in 1760 as a surgeon during the Seven Years War, most of his time was spent taking care of soldiers but, when he wasn’t fulfilling those duties he studied whatever animals he could find (Nuland, “ Doctors” 172-73). Hunter demonstrated that surgery is a profession worthy of the best minds (Nuland, “ Doctors” 167) “ John hunter worshiped nature with profound humanity. He was not just a disciple of natural history—he was its high priest. ” He always

wanted “ to know all about the clouds and the grasses, and why the leaves change color in the autumn” (Nuland, “ Doctors” 191). The Italian ambassador said of him, “ Hunter is our Leonardo da Vinci” (Nuland, “ Doctors” 168). Ignac Semmelweis was born in Hungary in 1818 he was a genius man of innovation before it was his time (Nuland, “ Doctors” 129). He presented the concept of disease based on the spread of bacterial contamination, nine years before Louis Pasteur’s discovered that bacteria is the cause of purification (Nuland, “ Doctors” 230). Semmelweis also discovered that infection could be spread from on patient to another by the very doctor treating it. However, that was twenty years before Joseph Lister would prove that because wound infections are caused by bacteria it can be transmitted by the doctor (Nuland, “ Doctors” 230). Semmelweis’s discoveries should have been the foundation stone of medicine but, he failed in the final analysis. It was not just because he was too early in his discoveries but because he was too stubborn. Because of his self-righteousness, the experiments were never done that could have helped his cause nor could he convince the rising number of skilled laboratory researchers that his ideas were worth the investigation (Nuland, “ Doctors” 230). Rudolf Virchow was born in Prussia in 1821 he was a pathologist under autopsy pathologist Robert Froriep (Nuland, “ doctors” 292, 294). At the age of twenty-four he was making major discoveries that modern physicians associate with his name today. In 1845 Virchow discovered leukemia and in 1846 did a demonstration on the process of how blood clots cause thrombosis and embolisms (Nuland, “ doctors” 294-95). The thrombosis clot forms within a blood vessel at the site it is occluding, and the embolus which is a thrombosis that has detached itself from its point of origin and traveled

through the bloodstream to occlude a distant vessel. With this demonstration he solved a problem that had puzzled pathologists for generations; "...The origin of the large clot that is so often found obstructing the major artery to the lung of a patient who has died suddenly" (Nuland, "Doctors" 295).

Virchow took a lot of criticism for his finding by the older generations of scientists and pathologists. Joseph Lister, was born a Quaker in England in 1827 he was a surgeon and studied the microscopic characteristics of blood with close friend Thomas Hodgkin. Together they discovered that red blood cells (corpuscles) are biconcave in shape, and that under certain circumstances the "disk shaped structures tend to line up against each other like stacks of coins, formations called rouleaux" (Nuland, "Doctors" 332-33). Lister by himself discovered the Law of Aplanatic Foci, which was and enabled him to create a lens combination that overcame the technical difficulties of chromatic aberration which plagued microscopists for years. Before this discovery microscopes had not been as useful to the world of science as it was intended (Nuland, "Doctors" 333). Lister also pioneered the discovery of antiseptic surgery. In a paper he wrote about this new antiseptic surgery he wrote that "Before the antiseptic period, 16 deaths in 35 cases; or 1 death in every 2 ½ cases; during the antiseptic period, 6 deaths in 40 cases; or 1 in every 6 2/3 cases" (Nuland, "Doctors" 346-47). During this time only one thing was certain about disease "It spread a furious redness through its victim's incised tissues with enormous rapidity, killing more often than not" (Nuland, "Doctors" 325). Sir Alexander Fleming was born in Scotland in 1881 he was a medical captain in the army throughout WWI. Earlier in life he became interested in the natural bacteria of blood and antiseptics. Fleming discovered that tissues and secretions had an important

substance that he named Lysozyme. Around this same time he developed methods of titration which is the determining of a concentration of a substance (Company) and analyzed human blood and other body fluids, which he used for the titration of penicillin (Nobelprize. org 1945). While Fleming had been working on the influenza virus he discovered that mold had accidentally grown on a staphylococcus (a parasitic germ) culture plate, the mold had created a bacteria-free circle around itself. Inspired to experiment further he found that a mold culture prevented growth of staphylococci (a parasitic germ). He then decided to name this active substance penicillin. Fleming had many papers published in scientific and various medical journals, including original descriptions of penicillin and lysozyme (Nobelprize. org 1945). Archibald McIndoe was born in New Zealand in 1900 he was a surgeon who reshaped the world of plastic surgery by treating burn victims. During WWII McIndoe set up a center for plastic and jaw surgery, he worked on airmen with facial disfigurements and serious burns (Heritage). Many of the patients that arrived at this center had deep burns to their faces and hands caused by exploding aircraft fuel. Terribly burnt pilots were sent to this center for treatment; at this time treatment for burns was just covering the wounds in tannic acid which was often very painful and left bad scarring (Heritage). Convinced there was a better solution McIndoe started bathing the burn victims in saline, which proved to be a much gentler treatment it also improved healing time and survival rates. McIndoe saw the importance of rehabilitating soldiers and always encouraged them to wear their military uniforms proudly (Heritage).

November 2005 France became the first country ever to successfully do a partial human face transplant on Isabelle Dinoire. She was attacked by her

own dog earlier that year and had lost her lips, nose, chin and parts of her cheeks. The transplant involved taking facial parts from a deceased woman and reconstructing them to fit her facial structure (Guardian). In December of 2008 in Cleveland Ohio after a long twenty-two hour procedure a woman named Connie Culp had almost all of her face replaced. Five years earlier her husband had turned a shotgun on her, shattering her nose, cheeks, the roof of her mouth and an eye. Five months after the surgery she was able to talk, smile, smell and taste again. So far this had been the most elaborate of operations (Guardian). On March 2010 in Spain a man had accidentally shot himself five years earlier he was unable to breathe or eat on his own. The man underwent a 24-hour operation where doctors lifted an entire face, including jaw, nose, cheekbones, muscles, teeth and eyelids, from a donor and placed it mask-like onto this man. This was the first full facial transplant (Guardian). While painting a Church in 2008 Dallas Wiens was burnt so badly by a high-voltage wire that he had been left blind, without lips, a nose or cheeks. He had a full facial transplant at hospital in Boston in 2011. Everything was able to be restored except for his sight (Guardian). After researching the medical advances through the 16th to 21st centuries you can see the struggle with the different types of advancements as well as the criticism that many of these men took throughout their discoveries. From The discovery of blood circulation, bloodletting, concepts of disease and infection, to the discovery of blood clots, what a blood cells look like and how to treat severely burned people correctly; until now when a human is has a horrible facial disfigurement that can be totally restored, the possibilities are endless for what kind of advancement is going to happen in the future. These influential men I have researched would not have developed the

scientific community as well as the world into what it is today without the persistence to help people and to look for the answers as well as accept their many failures. Without these renowned scientists, doctors, surgeons and pathologist the world we live in today would be farther behind in its medical understandings. " Learn from yesterday, live for today, hope for tomorrow. The important thing is not to stop questioning. " Albert Einstein Bibliography Company, Houghton Mifflin. TheFreeDictionary. com. 2005. Web Dictionary. 20 April 2013. <http://www.thefreedictionary.com/staphylococcus>

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