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Historical Vaccine Refusal

References:

Albert, MR, KG Ostheimer, and JG Breman. "The Last Smallpox Epidemic in Boston and the Vaccination Controversy, 1901-1903." *New England Journal of Medicine* 344.5 (2001): 375-379. Family & Society Studies Worldwide. EBSCO. Web. 28 Jan 2010.

The authors of this article begin with a brief epidemiology of the 1901-1903 outbreak as well as a comparison between the number of people who were vaccinated and got smallpox (11%) and those who got it but were not vaccinated (22%). It also claims that vaccines worked, based on numbers on the amount of children pre-school age who came down with the disease versus the number in school, where it was required to get the vaccine. It shows efforts to control the epidemic, how vaccination was implemented, the down-side of vaccination in that era (mainly that vaccine production wasn't regulated), and that the homeless were largely blamed for the spread of the epidemic. Next, the article examines those opposed to vaccination. The Supreme Court case *Jacobson v. Massachusetts* involved a man challenging a fine he received when he refused vaccination. The case was landmark in that the Supreme Court ruled 7-2 in favor of the state, claiming that though it couldn't pass laws regarding vaccination of individuals, the state could pass a law to protect the public. Lastly, it tells of a doctor (and anti-vaccinator) the chairman of the Boston Board of Health allowed to enter a smallpox hospital unvaccinated who later came down with the disease. Those for vaccination viewed it as a victory; those against it did not for the sole reason that they also did not

agree with that doctor's ideas. An epilogue gives a brief account of the smallpox disease following 1903.

This article provides a brief overview of the presence of vaccination in Boston at this time. Published in the *New England Journal of Medicine*, I find the facts reputable. The most interesting things though were the ones I didn't read elsewhere, such as the discussion of the *Jacobson v. Massachusetts* case and "the Pfeiffer Affair." I think both are great anecdotes that illustrate the tension between those that were for vaccination and those that were against it.

Allen, Arthur. *Vaccine: The Controversial Story of Medicine's Greatest Lifesaver*. New York: W.W. Norton, 2007. Print.

Chapter 1. Experimenting on the Neighbors with Cotton Mather

At this time in America, doctors were not fond of the new innovations; it was the spiritual leaders that encouraged vaccine. Mather was such a preacher who lived in Boston in the 1700s but was generally looked down upon. Many believed getting vaccinated, or sickening oneself, was "a way of preventing God from sickening you—that was a terrifying spiritual risk, an act of supreme arrogance" (27) and they were not willing to risk it. The Boston smallpox epidemic of 1721 helped change this notion. At this time, Mather convinced one physician, Boylston, to begin variolating. He received so much opposition, he had to go underground. Doctors were opposed to variolating because they felt those that were doing it, unlike them, were not professionals. The first medical debate over statistics arose when Boylston reported only 3% of those he variolated died, while 14% of those not variolated who got smallpox died. Douglas, a

doctor, said that 20-30 cases were concealed. The view of medicine was unfavorable at the time; many saw no reason to put their children in danger. Even Mather, when his son came into contact with smallpox, was conflicted about whether or not he should be variolated and eventually chose to do it in secret. Also during this time, other cultures were practicing variolation. However, many Oriental and African foreigners faced people like Douglas once in the U.S.—he called them liars and claimed they had never been variolated. Lady Mary Wortley Montagu did a lot for the “cultural spadework for variolation” in England. She had her son vaccinated in Constantinople and always spoke well of the simple process. She hated doctors though; she did not want the practice to be taken over by them. William Wagstaffe countered her, claiming variolation was a “practice of ignorant women” and was most likely designed by Britain’s enemies to depopulate the country (39). Other physicians, like Adam Thomson, set up a process variolation, which involved cooling regimes and ingesting mercurous chloride to keep smallpox away. In England, to counter such unpleasant measures, Robert Sutton (a physician) and his son came up with a new way that was less troublesome to the body involving minimal purging and small inoculation needles, which resulted in a franchise with 200 practitioners around the world. However, the colonies were slow to catch on. Pennsylvania became the only state that didn’t but controls on inoculation. Because of this, in 1764 when the first Continental Congress was to meet, the delegates refused to enter Philadelphia. Variolation was stopped. Variolation had unpleasant connotations. It didn’t help that the measures it required seemed less than safe. After 1760 though, smallpox wasn’t leading cause of death; variolation began to be used only in times of epidemics.

Chapter 2: The Peculiar History of Vaccine

This chapter provides a history of how Jenner came to create the smallpox vaccine. It mentions that it originally started as folklore that cowpox could prevent smallpox, and then goes on to detail his encounter with the farm folks that had cowpox as well as his successful experiment in 1796 on James Phipps with the first vaccine. Henry Cline was the first London physician to vaccinate and by 1801, 100,000 people had been vaccinated in Europe. Because cowpox didn't exist in the new world, all vaccines had to be shipped from Britain. Demand was greater than the supply so people started vaccinating from each other's sores. This brought about opposition when those who thought they were safe put themselves in dangerous situations, and got smallpox. The worst failure for this particular vaccine happened in 1800 in Massachusetts where a doctor was supplied with contaminated or inactive vaccine and an epidemic resulted, sickening 1000 and killing 68. One of the main problems of the era was no one knew what cowpox was; the second was that people were vaccinated arm to arm, cow to arm, with things that had been dried on stone or scraped from the belly of a cow, etc. and so there was varied physical reactions to the process. This was pre-germ theory, so even Jenner had no definite explanation for how it worked. It was here that the opposition the anti-vaccinationists came about, arguing that it went against nature. Fear of the unknown and irrational panics played a part. Opposers such as John Birch, Benjamin Moseley, and James Gillray became Jenner's main critics. Another setback came in the 1860s when a group of children vaccinated in Italy came down with syphilis. These kinds of occurrences pointed out the need for some type of regulation. This chapter shows an

attempt by a physician in 1812 but sites the Franco-Prussian War and the Civil War (where as many died from smallpox as fighting the enemy) as what finally resulted in the push for a good vaccine supply. So came the 1871 Vaccination Act in England, which said goods of poor families could be taken if they refused vaccination, the 1874 law in Germany that required all children to be vaccinated by age 2, the first mandatory vaccine law in the U.S. in Boston in 1827, and the allowance of New York schools in 1860 to exclude students who hadn't been vaccinated (though few enforced this because "it could empty classrooms). Vaccine farms were created in Europe to ensure "fresh from the cow" that were kept clean and where the cows were tested for other diseases. Adding glycerine to the lymph also became popular in order to kill some pathogens. The chapter goes on to tell of Britain's Antivaccine movement, covering topics such as the 1889 Royal Commission on Vaccination, some outbreaks that occurred, and how the British society was "deeply split" on the subject. It also references a few key people like H. Rider Haggard, who wrote a novel called *Doctor Therne*, a farce about anti-vaccinators; Lord Alfred Russel Wallace, who made arguments against vaccination that became the model for years to come; and George Bernard Shaw, who wrote a preface to the play *The Doctor's Dilemma* calling vaccination a cult because doctors defended it despite its flaws. Finally, conscientious objection was introduced in 1898 and vaccination rates continually decreased over the next 50 years, as did the incidence of the disease. By 1960, the chapter says, more Brits were dying of vaccine side effects than smallpox itself.

Chapter 3: Vaccine Wars: Smallpox at the Turn of the Twentieth Century

Those opposed to vaccination had many instances to fuel their arguments in this period. Philadelphia was a center of all the smallpox and vaccination happenings, though medicine was still in poor shape there. The book suggests there was a “lack of support and moral indignation of the physicians, engineers, educators, clergy and businessmen’ who might have provided leadership to improve conditions” (74).

Unfortunately, public health officials didn’t have power to afford the entire population and not many children were actually vaccinated, though law required it. Many graphic reports were released on people who died from vaccine.. In 1901, there were two strains circulating, Variola major (which caused 3 deaths in 10) and Variola minor (which caused 1 death in hundreds or thousands). The presence of the minor version created a false sense of security (though it may have been just as immunizing to Variola major as a vaccine) and so those people did not see a reason to vaccinate. Vaccinators resorted to going door to door to ensure children were vaccinated, but unfortunately for them, the batch they used was contaminated with tetanus bacilli. Earlier, in 1895, Walter Reed had examined needles from the six biggest vaccine companies and found pathogenic bacteria in all. This chapter explains that even the sterile new vaccines were not always effective or safe.

Government pushed through these setbacks and as a result, passed the U.S. Biological Control Act to allow the Hygiene Laboratory to regulate vaccines sold across state lines, as well as The Pure Food and Drug Act of 1906. It references John F. Anderson’s of the U.S. Public Health Service statement that before 1902, anyone could make a product, label it as “vaccine,” and sell it. It also touches on the 1986 National Vaccine Injury Compensation Act. The years of 1907 and 1909 saw passage of bills to

overturn compulsory vaccination laws. Chapter three explains the Cleveland Experiment, where the chief health officials used disinfection and isolation to seemingly rid the city of smallpox.

Anti-vaccination societies formed around America; many were composed of angry parents. There was even an idea that the disease came from “filthy foreigners.” In 1902, Joseph MacFarland investigated a tetanus outbreak and found it came from one distributor because of shortcuts. An artist who claimed vaccination had killed his daughter made her doll, now known as Raggedy Ann, which became the symbol for vaccine-damaged children. John Pitcairn was a big proponent of anti-vaccination he provided financial backing for their efforts and attempted to create Anti-Vaccination Leagues. Lora C. Little was a feisty woman who fought vaccination and led many campaigns on the subject. Their arguments plus the presence of V. minor had some success. Porter Cope’s group compiled a “183 page dossier of vaccine injuries and deaths gathered from interviews in poor neighborhoods in Philadelphia” (107), but it didn’t work to convince a commission to change compulsory vaccination laws. A big victory for pro-vaccinationists occurred at Niagara Falls, where J.W. Hodge had convinced the towns to not vaccinate. A smallpox outbreak led the New York state Board of Health to intervene. When the smallpox spread to six other counties, the commissioner ordered quarantine, closing of facilities, and notices to be posted titled “Smallpox at Niagara Falls.” Opposition continued into the 1920s though; the chapter gives statistics regarding how parents waited until the very last moment to vaccinate their children.

Chapter 4: War is Good For Babies

Trust in medicine had increased by the 1930s along with the quality. Because of this, vaccine saw little resistance. People thought good health was a citizen's duty. Pasteur produced the rabies vaccine with large publicity (though the dogs that bit the children he was famous for saving may not have even been rabid). With this, vaccine became the "rifle-bearer of nationalism" (122). Diphtheria was tackled next with creation of an antitoxin. Skeptics claimed, though, that it had no effect—that the fall they saw in cases was part of a natural cycle. At this time, children's welfare became a big topic in government and then a celebrity cause. Between 1929 and 1931 500,000 New York City children were immunized with a real vaccine—a toxoid. Historically, wars were good for vaccination. The chapter gives specific examples, such as the Revolutionary War, when unvariolated American troops suffering from smallpox were pushed back in Quebec in 1775 by British troops who had been variolated. In 1777, it became mandatory that all troops be variolated. There are also examples from the Civil War, a war with Spain and typhoid fever, and World War II and the push for a flu vaccine. The application to the military also increased the popularity for a tetanus shot as well as a typhus vaccine (though this was short lived as the vector soon became the number one target, leading to the usage of DDT). Scientists also developed yellow fever vaccines for the military. Unfortunately, there were many instances of them causing jaundice and being contaminated with Hepatitis B. All in all though, soldiers returned from overseas stronger and, having seen first hand how vaccinations can help, encouraged the public and their own families to get vaccinated.

Chapter 5: The Great American Fight Against Polio

The first case of polio occurred in 1894; before that it wasn't a problem because the virus was ubiquitous, which allowed babies to become immune early on. However, the introduction of clean filtered water prevented routine exposure of babies. In 1906, the first epidemic occurred and, like smallpox, it was thought to be a disease of filth. They had crude treatments at the time, such as the Iron Lung, where the person was placed in an iron cast around their torso. War helped this vaccine much in the same way it helped others, though there were a few unsuccessful trials. Jonas Salk was the one to develop the polio vaccine. The National Foundation funded most of his work for Infantile Paralysis and President Franklin D. Roosevelt. This chapter discusses in depth the background to the vaccine. Salk had three competitors. They claimed the monkey kidney tissue he used to cultivate his vaccine could "stimulate autoimmune-mediated organ damage." They also challenged Salk's vaccine to the largest field trial ever performed. The children included in this were volunteered by their parents and came to be known as the "polio pioneers." Just before the trial, it got out that live virus was found in some of the vaccines—this resulted in many people pulling out. Ultimately though, it was a success in that the trial proved the vaccination to be 90% effective against paralytic polio. The vaccine saw another setback when one manufacturer produced vaccine that paralyzed 164 people and killed ten. The government tried to quiet this. Another problem was that people were having trouble just getting the vaccine. One of Salk's competitors, Sabin, had success soon after in producing an oral polio vaccine. However, this too faced problems when Hilleman found SV-40, a virus thought to cause cancer, in his shot.

While the success of the polio vaccine is well known, it did not exist without its problems.

Chapter 6: Battling Measles, Remodeling Society

Chapter 6 looks at measles, the most contagious common disease of that time, and the issue of vaccination surrounding it. At this point, a big worry became safety of vaccines. Hilleman (a leading scientist in vaccination development) added fuel to antivaccinators' fire when he jokingly made a statement in 1986 about not realizing he brought AIDS to the US when importing monkeys from Africa for his studies. This of course was not true, but anti-vaccinators latched on to the statement as if it were. Also, some people who received the killed-vaccine got "atypical measles syndrome," which turned out to be a reaction to the formaldehyde used in batches by Pfizer and Lilly. Later that decade, Hilleman's daughter got mumps and from it, he created a vaccine. Also feared was rubella, a disease dangerous to the unborn; instances of rubella, like polio, rose with better sanitation. Instances of abortion also rose as the fetuses of women who contracted rubella were often deformed. The MMR vaccine, which included all three, was licensed in 1971.

In the '60s, C. Henry Kempe, who had created the field of child abuse prevention, fought to end routine smallpox vaccination by asserting the risk of getting the disease were much less than the risks of the vaccine. By 1972, most states had abolished the routine vaccination. Also around this time, the vaccination system and laws were spotty—low enforcement and no one kept track of adverse reactions—and some diseases began to creep back. People were apathetic about vaccination (this was the problem, not

resistance). Because of this, laws were tightened and compulsory vaccination was enforced. Walter Orenstein put it best when he said, “It wasn’t forcing vaccination on people that opposed it. It was making vaccination a priority for people who didn’t have it as a priority” (246).

Chapter 7: DTP and the Vaccine Safety Movement

In 1982, NBC aired “DPT: Vaccine Roulette,” a documentary about the dangers of the whooping cough vaccine. The chapter gives three accounts from three different parents, all who saw a change in their child’s behavior or a severe reaction after having the shot. None of them made the connection until they watched the program. Together, with many other well-connected individuals, they formed Dissatisfied Parents Together (later the National Vaccine Information Center). Serious reactions to the pertussis vaccine had been documented since 1933, but it was not until this documentary aired that people started filing lawsuits and refusing to vaccinate their children, which led to manufacturers refusing to sell the vaccine. Admittedly, vaccine safety standards weren’t up to par—the demand for mass-produced batches led to substandard shots and there was little effort to monitor the side effects of given vaccines. Vaccines kept taking hits: for example, when political figures found out that a soldier had swine flu, they got Congress to give them \$135 million for vaccines and passed a law for Congress to assume all responsibility for the vaccine. However, there was never another case of that flu. Reports arose in 1976 of egg proteins in the swine flu vaccine causing Guillain-Barre syndrome. Some vaccine manufacturers stopped producing vaccines while other refused to continue until parents were required to sign a consent form. Geraldo Rivera exposed

on ABC that Saul Krugman had been feeding students hepatitis virus obtained from other students' stool in experiments at a school. QuadriGen, a vaccine for diphtheria, pertussis, tetanus, and polio, was developed but a proper preservative was hard to find. Parke-Davis's solution caused pertussis to release its toxins, and so was pulled of the shelf in 1968. A court case, *Reyes v. Wyeth Laboratories*, in 1974 decided that those choosing vaccination must be properly warned—not just by the companies, but by the doctors and nurses as well. A pertinent quote from page 266 states, “Vaccines were a victim of their own success—they had wiped out the diseases they were designed to defeat. Therefore, the social good of vaccination was no longer automatically accepted.” Pertussis proved to be difficult—2/3 of those vaccinated with the whole-cell vaccine had some sort of reaction. New hope of an acellular vaccine rose, but it was slow to enter the US. *Roulette*, however, did some good: within a year, a vaccine injury compensation system had been put in place, oversight had been expanded, and the system for monitoring adverse reactions was improved. The chapter details how the program came about and how eventually, pertussis injuries were taken off the list for various reasons.

Chapter 8: No Good Deed Goes Unpunished

The beginning of this chapter touches on some of the reasons people do not vaccinate, centered on the measles vaccine and an epidemic in the early 2000s. These include religious reasons and too high a cost. It mentions the court case *Prince v. Commonwealth of Massachusetts*, which decided that parents can choose to be martyrs but cannot make their children martyrs. With new science came new vaccines, such as ones for *Haemophilis influenzae* type B, chickenpox, rotavirus, and a pneumococcal

vaccine. The mechanism for each disease as well as the reason a vaccine was created is detailed. Rotashield, the vaccine for rotavirus, was soon pulled because of an adverse side effect. In 1994, medical experts from the Institute of Medicine released a report establishing certain but infrequent links between vaccines and medical problems.

Chapter 9: People Who Prefer Whooping Cough

The author tells of his own explorations throughout the country and interactions with those that refuse vaccine. He tells of the “Waldorf perspective,” where people believe children must become sick with diseases to be spiritually whole, those that believe vaccine is spiritual pollution or that mother’s should decide if they want to vaccinate their child instead of the government, those inspired by paranoia and those more interested in alternative medicine. People interested in homeopathy—treatments by solutions that resemble disease—account for a large amount of anti-vaccinationists. Despite the time he spends on them, he notes that in the early 2000s, less than two percent of parents refused vaccination. He says those that resist usually are clumped into groups geographically. He then focuses on a Pertussis outbreak in 2001, and notes that the spread isn’t just with non-vaccinators.

Chapter 10: Vaccines and Autism

Chapter ten explains how the link came about between vaccine and autism, mainly with Thimerosal in MMR. It began with Bernard Rimland, but didn’t end there. For years, officials worked to determine if the link was true. Many studies eventually concluded there was no link, but thimerosal was removed from the vaccine. Despite this,

incidences of autism have continued to increase. He references a survey done that indicates people still believe there is a strong link between thimerosal and autism. The cause of autism is not known. Because of this, the accusation badly hurt the efforts for vaccination because it suddenly provided a tangible explanation for the disorder and so people believed.

Vaccine would be a valuable resource for many of the sections of this research. It proves useful for providing a history of how specific vaccinations came about, such as polio, MMR, and yellow fever. While its focus was not anti-vaccination sentiments (it is obvious the author is pro-vaccination from the perspective the text is written), it did include information strewn throughout regarding them. It also is very detailed about the science of the creation of each vaccine. The last section of the book, entitled Controversy, is most pertinent to our research. Not only is the history of refusal touched on, but he describes current sentiments and the reasons behind them, such as alternative medicine and web discussions. The final chapter is called “Vaccine and Autism,” which gives a summary of how the autism link to vaccines came about. Throughout the book, the author includes many first-hand accounts from scientists who developed vaccines, people directly opposed to them, and even the man who began the autism controversy. These personal accounts convince the reader that the book is a reliable source.

Durbach, Nadja. *Bodily Matters: The Anti-Vaccination Movement in England, 1853-1907*. Durham: Duke University Press, 2005. Print.

Chapter 1: The Parliamentary Lancet

This chapter introduces the Compulsory Vaccination Act of 1853, which mandated the vaccination of all English infants against smallpox, as well as the 1858 Medical Act. It discusses the rise of alternative medicine and how anti-vaccinationism fueled and was a source of this. Medicine was seen as a consumer good and at that point, it was bad practice. This chapter explains how bad practice coupled with unfavorable views of doctors played large parts in people resisting vaccine. Also at this time, alternative medicine journals were published which gave people a place to debate the issue. Chapter one explores major political reasons as to why people began to refuse and campaign against vaccination.

Chapter 2: Fighting the “Babies Battle”

Chapter two discusses the many leagues that were formed around the anti-vaccination movement, as well as the movement’s alignment with alternative medicine. Other movements also latched on to anti-vaccination as a cause, such as the feminism movement, which integrated its fight for bodily autonomy with refusal of vaccines. Propaganda was an important instrument used by these groups; they produced posters, periodicals, and most interestingly, sent postcards to new moms with warnings against vaccines. Both men and women played a big role; anti-vaccinators appealed to them differently in their campaigns. For example, fathers were appealed to as the protector of the bloodline and family; mothers as the caregiver of their babies, etc. This chapter ultimately focuses on the home-front aspect of the fight and the way anti-vaccinators appealed to it.

Chapter 3: Populism, Citizenship and the Politics of Victorian Liberalism

This chapter discusses the cross-class alliance anti-vaccinationism created as people became extremely resistant to the government stepping in to their lives. The government claimed children as their own in efforts to force vaccination; this invasion of privacy was rebelled against. Then shown is how both sides of the fight used citizenship as an argument—doing things for the good of others and the sense of duty one should feel towards their country. It explains how there was a foreign fear element and how British imperialism played a large part. In addition, the ideas of Old Liberalism and New Liberalism are compared and contrasted in the way they played into anti-vaccinationism.

Chapter 4: The Body Politics of Class Formation

The chapter starts off with detailing how vaccination differently affected each class and how this influenced how they dealt with it. Strongest support came from the working class, mainly because companies said to them: vaccinate or lose your job (“vaccination or starvation”). The New Poor Law was introduced as well as the 1832 Anatomy Act, which many saw as compromising bodily integrity. Also because of these acts, vaccination became linked with poor relief. Many feared getting contaminated by paupers since all were vaccinated in the same, dirty place. Vaccinators became known as “baby hunters” since they tracked and fined those that did not vaccinate. For this, some claimed that vaccination turned good men into criminals. The Penal Servitude Act was put into place which improved conditions for those imprisoned because of refusal to vaccinate. These jail sentences also played into the body integrity argument. Class

played a huge role in how those who refused to vaccinate were treated, despite the alliance refusal had created between them.

Chapter 5: Vampires, Vivisectors, and the Victorian Body

Chapter five really explores the bodily integrity and autonomy arguments. It seems some thought vaccination would turn their children into monsters. W.J. Furnival even published a “collection of photographs of children allegedly contaminated through vaccination and left disfigured.” Many stories were published around this time from people who had bad experiences with vaccination as well (Ida Connell, Mr. Cunningham). They even used a biblical reference, calling it “the mark of the beast.” Emphasis was on the contamination of blood. They cited animals, paupers, syphilitics, and degenerates as sources of contamination. For example, since vaccines came from animal lymph, some believed that those vaccinated could start to exhibit cow-like tendencies or even contract animal disease. They thought such practice would lead to devolution. The government’s method of distribution at the time lead to further fear. A child was vaccinated, brought back eight days later to see if the vaccine had “taken,” then the child was used as a “stock baby”—lymph from its arm was taken and put into many others. Because of this, vaccinators were recommended to use a certain type of “legitimate” child. Many feared that this practice would lead to degeneration, that skin color would be transmitted, or that it would lead to the collapse of the Anglo-Saxon race and the downfall of Imperial Britain.

Then arose the idea of the Vaccination Vampire, which began with a handbill by Wilkinson in 1881 and portrayed doctors as blood thirsty because of the practice of blood

letting. It didn't help that vampires came into popularity around this time. Anti-vaccinators began to use vampires as foils for vaccination (pierced skin, drew blood; economic parasites). Vivesectors were thrown into this argument as well—seen as mad scientists, butchers, and mass murderers—and added to the grotesque images anti-vaccinators used. Because some feared experimentation, they avoided hospitals; some saw vaccination as “diabolical rape.” Anti-vaccinators capitalized on these gross depictions of vaccination and doctors and spread these ideas in their campaigns.

Chapter 6: Germs, Dirt, and the Constitution.

Many people identified the two causes of disease as dirty environments and compromised constitutions. Around this time, Charles Dickens wrote Bleak House, which shows how people of the time viewed smallpox and how it came about. Many theories of disease arose, including the Miasmatic Theory (disease caused by gaseous material given off from decomposing organic matter) and the Zymotic Theory (disease caused by introduction of specific animal poisons into blood stream). This is where “Sanitation not Vaccination” became popular. Anti-vaccinators incorporated many of these theories and manipulated them to their way of thinking, but there was no one theory that was widely believed. In the 1880s, there came new explanations for disease based on microbiology, but anti-vaccinators believed they were a fad and a way to get people vaccinated. Glycerination of lymph was introduced in 1891 to kill bad bacteria (even though they didn't know what it was killing!). Bacteriology became a new way of “coding cleanliness.” Some asserted vaccination wasn't needed if environment was kept clean, which led to anti-vaccinators using the germ theory to promote environmental

cleanliness. In addition, healthy blood was seen as the best natural defense. Also in 1891, a report by Elie Metchnikoff introduced the ideas of immunity, resistance and acquired tolerance. Alfred Russell Wallace used this to emphasize the importance of sanitation and a healthy constitution. Despite the existence of the smallpox vaccination, little was known about the microbiology of disease at this point. Many theories arose which gradually influenced the way people treated sickness.

Chapter 7: Class, Gender, and the Conscientious Objector

After seven years of debate, the Royal Commission on Vaccination introduced the Conscientious Clause in 1889. It said that anti-vaccinators could get certificates of conscientious objection by applying to magistrates. By the end of that year, 203,413 had been issued. Most were to working & lower classes; most were to women. The issue of how to define the conscience came into question, especially with whether women were able to claim a conscience or not. Because there was no strict definition, it was left to the magistrate to decide. Anti-vaccinators lobbied to the Home Office and, after 500 complaints, they clarified that the magistrates didn't have to agree with the appeal. However, the issue of gender came to a head when an amendment to the bill was later passed that changed the wording of the law from "either parent" to "he." The Local Government Chronicle, fortunately, decided to allow both interpretations of the bill. Class also was an issue—some certificates cost a lot of money, allowing only higher classes to obtain them. Later, the 1907 Vaccination Act was passed; the government went for a bill by John Burns that let people get a certificate if declared for the health of the child. The act also limited the cost of the certificate. Though class biases were

eliminated, anti-vaccinators still protested it. After this act, the number of the certificates tripled. Getting one was as easy or difficult as getting a vaccine. This laid the foundation for conscientious objection clauses in later acts, such as the Military Service Act or 1916.

Bodily Matters book gives an incredibly detailed look at vaccine in nineteenth century Britain. Its focus is the anti-vaccine sentiments that arose around the smallpox vaccine and is written such a way that I began placing myself on the anti-vaccine side of the debate. The details it provides are perfect for the history section of the research. The problem that I ran into was the book is only divided into seven sections and, though there are smaller divisions within the chapter, they become a little lengthy with all the information provided. Overall, it probably is more in depth than what we are doing, but it provides a fantastic picture of why so many refused vaccines. There is a lot of basic information we can pull from it as well as small details, such as pictures and anecdotes that reflect the events of that time (e.g. the postcards sent to pregnant women urging them not to vaccinate). It is obvious from the detail that extensive research went into this book. This would be my number one source for information surrounding smallpox vaccination in England in the late nineteenth century and early twentieth.

“Immunization Timeline.” *Keepkidshealthy.com*. Keep Kids Healthy, LLC, 2 July 2008. Web. 21 Jan 2010.

This source provides a timeline of vaccines spanning from 1798 to 2008 with the introduction of the Rotarix, Pentacel, and Kinrix vaccines. It is pretty extensive; it begins with the “First Generation of Vaccines” and then lists in categories mostly by decade. The year, name of vaccine, and note regarding what about the vaccine it’s referencing

(ex: vaccine licensed or vaccine distributed). Also included is information regarding major epidemics, such as the last case of polio, and other major happenings regarding diseases and their vaccines.

Keep Kids Healthy claims to be a “Pediatrician’s guide to your children’s health and safety.” The information is reputable; not only is it a pediatrician run sit, but it also lists its sources as the CDC and Mandell: Principles and Practice of Infections Disease, 5th ed. The main reason I chose this timeline, other than the information it provides, was it allows us to see the information being given to parents. The website speaks positively of vaccines and seems to use the timeline to showcase how vaccines have conquered many terrible diseases over the two centuries. The one draw back to this timeline is there are no notes about any vaccines that have come about in the last two years. Any information about the recent swine flu epidemic is absent. However, I find this timeline incredibly helpful. We can see the evolution of vaccines, the amount developed, other small tidbits about the diseases, and can examine just how this information is being presented to parents on the internet..

“Muslim Groups Urge Resistance of Polio Vaccination.” *UN Integrated Regional Information Networks*. 15 July 2003. Web. 15 March 2010.

The article reports that two Muslim groups, the Kaduna State Council of Imams and Ulama and the Supreme Council for Shari’ah in Nigeria, have found evidence that polio vaccines were meant to sterilize children and control population growth in an effort to persuade the population to refuse vaccination. Sheik T. Sulieman claims their doctors’ research has confirmed that the vaccine is an attempt by the Western World to reduce the

population of Nigeria. A UNICEF-Nigeria spokesman, though, says that the vaccine has been proven safe. Agencies in combination with top Muslim doctors have worked to convince the public that the vaccines are safe. Resistance to vaccination has also come from some people claiming the vaccines contain HIV. Nigeria is one of five countries that account for over 85% of new cases of polio.

I thought this was a reliable article (it is from the UN Integrated Regional Information Networks). Though this was seven years ago, it shows that vaccine resistance is still a big problem and much in the same way it was with smallpox. There is not enough proper education and people continue to fear the government. These are two themes that run from Jenner's vaccine to the present, which this article clearly illustrates.

Poland, GA and RM Jacobson. "Understanding those who do not understand: a brief review of the anti-vaccination movement." *Vaccine* 19.17-19 (2001): 2440-2445. MEDLINE.EBSICO. Web. 26 Jan 2009.

This article asserts that the anti-vaccination movement has been fueled by things such as cultures intolerant of any sort of risk, information being too readily available, anti-authority sentiments, people poorly educated in risks, and failure of public health officials to educate. It looks at Pertussis and Hepatitis B vaccines and the effects of the movement on these. The authors note societal and individual decisions seem to be based on a "pyramid model," which says the base can be seen as the widespread benefit of the public health policy (the majority) and the tip can be seen as the risk or harm; although it is a small percentage of the pyramid, it is seen as severe and acute. I believe this article would be a great source for the section of research on the movement itself.