The struggle to alleviate pain is not a new one. The modern day science of anesthesia provides this remarkable ability with great success. The present era began in 1846 with the reported use of ether as an anesthetic during surgery. The field blossomed quickly and the field of surgery grew exponentially. However, the history of anesthesia does not begin here; an exploration through antiquity is required to gain a true understanding of the foundations of this impressive science.

Throughout history and across civilizations, the use of herbal remedies as medicines is well documented. Even though the anesthetic capabilities of some of these methods is debatable, it is worthwhile to explore the history of the science of anesthesia. Herbal remedies as analgesics and sedatives have a rich history. Indeed, before ether, chloroform and nitrous oxide there was hemlock, mandrake and dwale. Physical attempts at anesthesia were also frequently employed, including a literal blow to the head. Although they were often unsatisfactory these methods withstood the test of time in the pre-modern era. Finally, several breakthroughs in anesthesia occurred as civilization marched onward towards the modern era. Attempts at sedation took many forms in ancient times. It is these antiquated methods of anesthesia that are the subject of investigation in this paper.

The chimera is a mythical beast whose body is composed of parts of natural animals. The French surgeon Velpeau describes a chimera of pain and surgery. He argues that they are combined into one entity that is impossible to separate. In the modern era of anesthesia pain is separated from surgery with great ease. However, prior to modern anesthesia humankind still partook in surgical interventions. The problem of pain during surgery has victimized humans throughout the ages. The history of anesthesia will provide an interesting and impressive account of how this problem was addressed.

Before discussing the history of anesthesia it is necessary to explore the state of surgery in the pre-modern era. Surgery in ancient times included amputation, caesarian section, treatment of hernias, hemorrhoids, tumours and tooth extraction\(^1\) as well as attempts to cure epilepsy, serious headaches, insanity, and depression fractures of the skull.\(^2\) It was not unusual for a surgeon to approach a patient with several strong men to literally hold the patient down. A good surgeon is one who can perform quickly and one who has strong nerves to withstand the screams of the patient. The concept of surgery without anesthesia is expected to cause some shock to those who practice modern medicine. However, the testimony of patients screaming during an operation and the intense psychological distress caused to patients awaiting surgery establishes that the problem of pain was very real.\(^2\) It is therefore highly likely that for as long as patients were subjected to surgery people have searched for methods of anesthesia.

Medicinal plants have been used throughout the ages to treat many diseases.\(^3\) Medicinal plants alone or in combination were often utilized as anesthetics. Dioscorides, a Greek physician in the first century AD recorded hundreds of plant preparations for use in medicine. Pliny the elder, a Roman of the same era as Dioscorides recorded the use of opium and henbane.\(^4\) These therapeutic plants were well...
known in antiquity and there are many records of their use.¹

The first description of a preparation used for anesthesia is found in the 9th or 10th centuries AD where the spongia somnifera or the soporific sponge is first mentioned in the context of anesthesia.⁵ This concoction was made with the following ingredients: mandrake, opium, hemlock and henbane. The plant extracts were dissolved in water and soaked in a sponge. The sponge was then left to dry in the sun. When needed the sponge was placed in warm water and then placed under the patient’s nostrils to be inhaled, putting him to sleep. Once the surgery was complete the patient would inhale vinegar fumes and awaken.⁵

Mandrake or Mandragora was a popular agent with many references throughout the ages.² Its particularly curious physical characteristic bifid root resembled the form of man, which undoubtedly added to the mystique surrounding the plant.⁶ The medicinal activity of the mandrake was well known to many ancient civilizations including the Egyptians, Greeks, Assyrians, Babylonians, Hindus and Chinese. Babylonians are believed to be the first users of mandrake in pain relief more than 2000 years B.C..² The Greeks described its use mixed with wine and given prior to surgery to avoid pain. There is no doubt as to potency of the mandrake root and its use during surgical procedures of ancient times is well documented.¹ Pliny went as far as claiming that anesthesia can be induced by smelling the juice.⁷ However, it was also identified as a narcotic and necessarily a poison when taken in large amounts. Dosing was also a problem as the potency of the plant was variable based on season and geographic location. This caused it to fall out of favour.⁸

The opium poppy is the oldest, most familiar and most effective of all the ancient drugs. Opium’s use in pain control can be traced back to the Roman Empire.¹ However, its regular use for anesthesia is only observed in the Middle Ages. Opium is a well-known potent narcotic and pain reliever. Dosing was again a problem since in high doses the opium will cause central nervous system depression and death.¹ As with mandrake the variable effects of the opium poppy made it difficult to consistently use as an anesthetic.

Dwale was a liquid mixture that the patient was required to drink prior to surgery. Recipes for dwale were found dating back to the 12th century AD. Dwale was composed of bile of a boar, lettuce, vinegar, bryony root, hemlock, opium and henbane. All of these were mixed together in wine and drunk by the patient to render him asleep before surgery. To arouse the patient afterwards, vinegar was used just as it was in the case of the spongia somnifera.⁹ Bile, lettuce, vinegar and bryony root can be discarded as ineffectual ingredients in the realm of anesthesia and will not be discussed. While opium has already been dealt with, henbane and hemlock are both important plants in the history of anesthesia.

Henbane or Hyoscyamus and hemlock were not referred to nearly as much as mandrake or opium. Henbane was a lesser-known sleep inducer. It was generally used as a local anesthetic in treatment of toothache.¹ However, it too has deadly consequences if ingested in high amounts and was considered a dangerous medication. Hemlock was the poison ingested by Socrates that caused his death. It was a well-known drug and obviously quite dangerous. It was also described in the 15th century as a method of inducing sleep before surgery.¹ Both of these were strong poisons and were not frequently used.

At this stage in the discussion it is important to note that potent analgesics, sleep inducers and anesthetics were known and used by people throughout antiquity. Problems arose for several reasons including method of administration, lack of dosing control and most of all the ever-present danger of fatal overdose. These methods all fell out of favour and patients still endured pain during surgery.

The discussion must turn now to one of the oldest and most popular anesthetics, alcohol. Alcohol has always been a vital part of the struggle against pain. It was likely the spur that caused people to attempt to alleviate pain through ingestion of medicines.² Often, other
herbal remedies are mixed in with alcohol and administered for pain relief, a fact that certainly improved the potency of these ancient medicines. For example, the often used laudanum, which was very popular and was one of the only known consistent pain relievers of antiquity, was simply opium mixed with alcohol. Although alcohol alone is not sufficient to be deemed an anesthetic in the true sense it does have a valuable place in the history of medicine.

The investigation into anesthesia through antiquity shifts to a discussion of physical mechanisms. Herbal remedies were discovered to be either ineffective or too dangerous. In an attempt to control pain patients were literally clubbed on the head prior to surgery. In ancient Egypt men who dispensed this treatment became highly skilled in the technique. The blow had to be strong enough to knock the patient out but not too strong as to kill him. While this method was crude and unsatisfactory, it was used throughout history as it was better than providing nothing.

Local pressure proximal to the site of surgery was found to help control pain. By using a tourniquet that placed pressure on both the vessels and the nerves, it was found that pain could be numbed. This method was found to cause significant pain itself as well as tissue injury, which increased the risk of infection. This method can be traced back to ancient Egypt, 2500 BC, where evidence has been found in the form of pictures. These pictures show pressure being placed on the brachial plexus during surgery on the hand. This was a very crude method of anesthesia that did not provide much benefit to the patient.

The carotid artery translated from the Greek means artery of sleep. It was found that by choking both arteries, a person could be rendered unconscious. One could imagine that this was a truly ineffective method since the patient would regain consciousness soon after the pressure was removed.

The exploration thus far has discovered many options for anesthesia throughout antiquity but none of these are viable, reproducible or effective options. The attention shall now be turned to more contemporary methods with significantly more promise.

Joseph Priestly is credited with the invention of the first modern anesthetic, nitrous oxide or laughing gas, in 1773. This gas is still used in the modern day as an anesthetic. Unfortunately, during Priestly’s era doctors were not courageous enough to make use of the new discovery for fear of its potential danger and despite the positive outcomes of his experiments. It took another pioneer in the form of Sir Humphry Davy to bring nitrous oxide into popular use. Davy showed that nitrous oxide was a safe and breathable gas. He further went on to show that nitrous oxide could render a person unconscious and went as far as to write that it was capable of removing physical pain, even during surgery. No surgeon made use of the newfound anesthetic and so nitrous oxide was destined for rediscovery at a later date.

Henry Hill Hickman was another man who came close to a breakthrough discovery. His idea of suspended animation involved introducing sufficient inhalant so that painless sleep could be induced. His initial experiment in the 1820s involved depriving an animal subject of air and providing carbon dioxide alone, essentially anesthesia by asphyxiation. He noted that without oxygen an animal would soon be unconscious and would remain so throughout the surgery. As a further benefit the subject did not bleed as much and healed much faster. In retrospect this was not much different from the carotid artery compression discussed previously. This discovery truly provided an alternative to pain during surgery. Hickman attempted to present his results with the animal subjects in the hopes of gaining recognition and eventually attempting the procedure on humans. However, his theory on suspended animation was ignored completely and this promising discovery died with him.

It is commonly accepted that 1846 was truly the birth of modern anesthesia with the use of ether in surgery. However, ether was discovered in the 14th century by Raymond Lully, who synthesized it from sulfuric acid and alcohol. He named it sweet vitriol. The power of his
discovery eluded him and the discovery remained dormant until the 16th century when Valerius Cordus rediscovered it. Cordus recorded the method of synthesis and his contemporary, Paracelsus, documented its analgesic effects on chickens. Paracelsus determined that it quieted all suffering and relieved all pain. At this point in history, approximately three hundred years before Morton’s landmark discovery the effects of ether were recorded for all to appreciate. As with Day and Hickman, this discovery too was buried and ether was forced to wait for its famous unveiling.  

Mechanisms of pain control found their way into the culture of their time. Their existence was common knowledge and they provided plot mechanisms to both Marlowe and Shakespeare. However, these plants did not provide adequate anesthesia. The practice of surgery was continuing to flourish and the need for pain control was great.

It is worthwhile here to discuss what is truly meant by anesthesia. The exploration of the history of this science unveiled the possibility of providing some pain relief and methods of rendering a person unconscious but it cannot truly be declared that the ancients were in fact practicing anesthesia. A general anesthetic not only puts a patient to sleep but also keeps him asleep throughout the operation. The medicinal herbs discussed in this paper had the capacity of causing some degree of unconsciousness yet these did not replace the physical means of clubbing and physically restraining a patient. One must ask the question, how effective could the spongia somnifera or dwale be if a patient can be roused by simply inhaling vinegar. Furthermore, a utilizable drug must be reproducible and consistent in its effects. Since the potency of the plants was variable with the season and geographic area, it was impossible to establish a single effective and reliable method of providing anesthetic coverage during surgery.

The discovery of anesthesia by inhalation, nitrous oxide, carbon dioxide and ether, provided a great benefit and it is only at this stage in history that people truly began practicing anesthesia. A gas can be administered until the patient is unconscious. No longer were people tied to the variable potency of the ingredients or to the innate variability of the patient’s metabolism and overall health. It is at this stage in history that the foundation for modern anesthesia is built.

It has been over 150 years since the Velpeau’s chimera has been abolished. The ability to remove pain from surgery is one of the great marvels of modern medicine. By investigating the history leading up to this great discovery one may gain an appreciation of the great trouble that pain has caused humanity. Those whose experiments whether they were successes or failures deserve praise since they furthered humanities understanding of the science of anesthesiology and in doing so helped solve the problem of pain during surgery.

References