

**The Passion of the Christ**  
*The Most Amazing Love Story of all Time*

**A Review from a Biomedical Engineering Perspective**

by

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Mel Gibson's movie *The Passion of the Christ* has generated more controversy in the media than any movie in recent memory. One of the main criticisms has been that the violence the movie depicts is excessive. The fact is that neither the flogging nor the crucifixion as shown was as bad or as violent as the actual event – as I will explain later.

I became interested in the medical and engineering aspects of the crucifixion when, as a relatively new believer, I attended medical school at the University of Miami in Florida in 1974-1976. I already had my engineering doctorate so my medical training made it fairly simple to work out the physiology of whole process, which was confirmed later in the JAMA paper published by W. D. Edwards, *et. al.* in 1986. The engineering load analysis, when added to the physiological information, will make it obvious why the Roman form of crucifixion is the most horrible, cruel, painful and humiliating form of execution ever devised.

I could describe it all in antiseptic impersonal terms removed from the actual event, which would make it easier for our minds to bear. Instead, I will describe it as we are going along following the events as they actually happened to our Lord and Savior as depicted in the movie by Gibson. As a physician it is easy to be impersonal and detached, but the subject matter demands that we experience it in our hearts as well as our minds - so that we can know how great a price he paid to redeem us and so that we may love him all the more. So, bear with me because this is going to be simultaneously a horrifying and wonderful experience for us all.

### **History of Crucifixion**

Crucifixion was invented by the Persians about 1000 BC. It began by tying the person by their hands over their head to a tree so that the body was suspended by the hands. If the person has his feet suspended or weighed down, the rib-cage is held in the inhaled position and breathing becomes very difficult, being only by contracting the abdominal muscles to force the diaphragm up to exhale a small amount of air. This requires a considerable amount of effort even if in the best of physical conditions. Death comes in minutes or an hour from slow suffocation. The dying process can be prolonged by providing limited support around the buttocks or for the feet to push up.

Crucifixion techniques continued to develop over the years with refinements being made by Alexander the Great, who used it in Egypt and Carthage. The Romans eventually perfected it to produce the maximum pain and suffering possible with the greatest degree of humiliation for the victim. This is why the victims were nearly always completely naked.

Because of this, Roman citizens (with the exception of Roman soldiers who deserted) were exempt from crucifixion. (This is why Paul was not crucified.) It was reserved for non-citizens and the worst criminals. There is little historical mention of it being applied to women so they were also probably exempt.

In 76 BC, when the Romans defeated the Spartacus slave uprising, they crucified 6,000 prisoners of war along the Appian Way leading to Rome as an example and deterrent to would-be rebels.

Several references are available for more details<sup>1</sup>. There is a well known analysis that was published in the *Journal of the American Medical Association*<sup>2</sup> in 1968, which provides a fine description of the medical conditions but misses the engineering loading analysis.

### **Gethsemane**

*The Passion of Christ* begins at night in the Garden of Gethsemane. Jesus is praying while his disciples are sleeping. This is where the suffering of Christ begins as he finally submits himself to the Father - “*Yet not as I will, but as you will.*”- and willingly takes on himself the sin of the whole world.

During this scene Satan, who is only visible to Jesus and the audience, is shown tempting Jesus to not go through with his atonement. Jesus is seen kneeling in prayer with sweat dropping off His face.

*“And being in anguish, he prayed more earnestly, and his sweat was like drops of blood falling to the ground.” – Luke 22:44 (NIV)*

This passage does not say that he sweat blood – only that it was like drops of blood.

The first medical symptom - Hematidrosis: This is a rare medical condition which occurs as a result of extreme stress in which the capillaries in the sweat glands break down causing bleeding so that the sweat is tinged a pink color. The sweat drops thus contain blood. The amount of bleeding is not significant. It only signifies the level of anguish Jesus was experiencing at this early stage of the Passion.

Gibson comes up with a stroke of cinematic genius in this same scene, in which we see Satan giving birth to a serpent that appears from under his/her robe and slithers over to Jesus as He is laying on the ground in anguished prayer. Just before this, a view of Satan’s face had revealed something wiggling in one of Satan’s nostrils. Some think it was a maggot, but I think it was the serpent’s tail that he/she is about to birth. Jesus gets up, oblivious to the serpent, and walking away his heel crushes the serpent’s head. Now, I would guess that only a small percentage of the Christians and none of the non-

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<sup>1</sup> Joe Zias Crucifixion in Antiquity, <http://www.centuryone.org/crucifixion2.html>

<sup>2</sup> W. D. Edwards, W. J. Gabel and F. E. Hosmer. *On the Physical Death of Jesus Christ* JAMA, 255(11): 1455-1463, March 21, 1986 For a reprint see: <http://www.frugalsites.net/jesus/>

believers watching the movie would have any idea what is going on in this scene that flashes by so quickly.

This is an absolutely brilliant depiction of the fulfillment of the curse that God placed on the serpent in Genesis 3:14-15, which is the first glimpse of God's plan of salvation.

*So the Lord God said to the serpent, "Because you have done this, cursed are you above all the livestock and all the wild animals! You will crawl on your belly and eat dust all the days of your life. And I will put enmity between you and the woman, and between your offspring (seed) and hers; he will crush your head and you will strike his heel."*

Here we see the "seed" (Jesus) of the woman (Eve) crushing the heads of the serpent. The reference to "her seed" rather than "his (Adam's) seed" in Gen. 3:15 is a foreshadowing of a virgin birth and Eve's seed (Jesus) will defeat Satan. At the cross, the fulfillment of the curse is seen where Satan's seed, through the Roman soldier, strikes the heel of Jesus as the nail is driven through the heel bone (rather than the fore-foot as shown in the movie), as I will describe later.

### **The trials**

The betrayal, arrest and trials by Caiaphas, the Sanhedrin, Pilate, Herod Antipas and back to Pilate are all well depicted in the movie. The physical beatings during these trials are consistent with Scripture. The character of Pilate is well portrayed. He obviously thinks that Jesus is completely innocent and is reluctant to condemn him. As the gospels document, Pilate declares on three occasions that Jesus is innocent.

It was the custom at the Feast of Passover to release a prisoner whom the people requested. Gibson captures the moment where Pilate brings Barabbas, a zealot who was guilty of murder<sup>3</sup>, forward to stand next to Jesus. Barabbas is depicted as every bit a mad murderer. Barabbas's name in Hebrew is *Bar* – son of, *Abba* – father, which means "son of the father." Thus when Pilate asked who should be set free, the crowd shouts "Barabbas" – "son of the father." And, thus, the real "Son-of-the-Father" who is without sin is led off to die in the place of the guilty murderer, Barabbas, who is set free and given life. A poignant reminder that we, who are deserving of death like Barabbas, have been saved by this same Son-of-the-Father Jesus, who died in our place so that we may become a "*Bar-Abba*" – sons and daughters of the Father.

Gibson deviates slightly, with good effect, from the Gospel account by having Jesus flogged before, instead of after, Barabbas is brought out before the crowd. In the movie, Pilate instructs his centurion to take Jesus to be flogged in the manner that was required preceding a crucifixion. He orders the centurion to not allow the flogging to be so severe that it kills him and orders that Jesus be brought back to him as is documented in the Gospel of John<sup>4</sup>, where he presents Jesus, wearing the crown of thorns and purple robe, to the crowd where he one last time proclaims him innocent before sending Jesus to the cross. This artistic expression by Gibson has the effect of heightening the drama when

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<sup>3</sup> Matt 27:15-18; Mark 15:6,7; Luke 23:19, 25; John 19:38-39

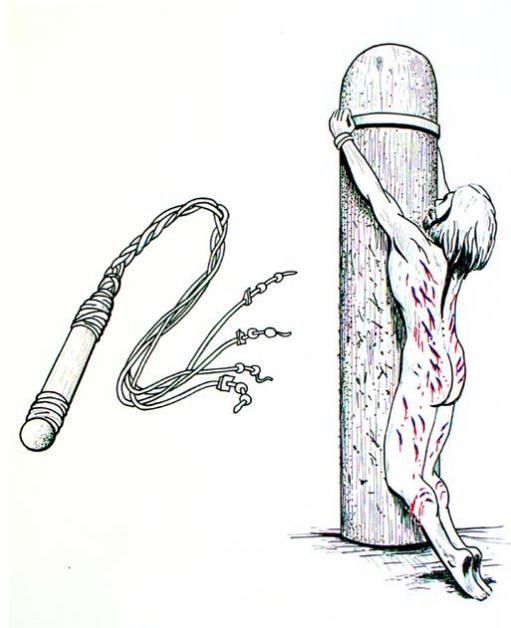
<sup>4</sup> John 19:1-16

the choice is made between crucifying Jesus or Barabbas, and it shows how Pilate was a rather sad, compromising politician.

### **The scourging**

The whip (flagrum) was like a cat-and-nine-tails made of leather strips attached to a short handle. Iron balls and shards of broken bone were tied into the leather thongs.

The bone shards had knife-like edges that slice deep into the flesh while the metal balls cause deep bruising (contusions). Each strike of the flagrum results in the bone shards slicing through the skin and muscle. When the whip is pulled off the back the bone shards slice and rip the tissue, in some places exposing the ribs and spinous processes on the back.



Jesus was taken to the Praetorium where he would have been stripped completely naked. There his hands were bound to a whipping post. The loincloth in the movie, both in the scourging scene and the crucifixion scene, probably was not present.

Scourging was required by Roman law before crucifixion. Under Roman law the maximum number of lashes that were allowed was 39. However, the Roman lictors who did the whipping would frequently work themselves up into a cruel frenzy and exceed the 39 limit, which they may have done in the case of Christ.

There were two lictors standing on either side of Jesus. Each lictor alternately whipped Christ across his shoulders, back, buttocks and legs. Each blow of the flagrum was like the claws of a lion ripping the flesh.

These wounds caused a large amount of bleeding; with blood oozing out of every laceration. An average sized 160-pound man has about 10 pints of blood in his body<sup>5</sup>. The blood lost as a result of the scourging would have been about 4 or 5 pints. This would put Christ into hypovolemic (low blood volume) shock. In this state he would have difficulty standing upright and would tend to pass out. This is consistent with his difficulty with carrying the cross to the execution site. If the blood loss from the scourging is significantly more than this, the scourging itself would have killed him.

Gibson's depiction of this scene, gruesome as it was, was not as horrible as the reality. The cuts and marks from the whipping in the movie were not as deep nor as brutal as they actually were. The amount of blood shown covering the flagstones on the floor of the Praetorium is consistent with what happened.

*Hypovolemic shock*, also called *cardiovascular shock*, results in a low return of blood to the heart due to the volume loss. This causes the heart to pump out a less than normal amount of blood with each beat resulting in a drop in the blood pressure (*hypotension*.) Normal blood pressure is about 140/80 mmHg so, depending on the amount of blood lost, the pressure might be as low as 70/zero. To maintain the pressure the heart responds by beating as fast and as hard as it can. This is called *tachycardia*, where the heart is pumping at 140-160 beats per minute, similar to what happens at maximum aerobic exercise. In an athlete, this type of output is only sustainable for relatively short periods, even without volume loss. This continued the rest of the time that Christ was alive. The heart literally exhausts itself putting itself into *acute heart failure*.

The second physiological condition that the hypovolemic shock produces is to trigger the thirst response. The body tries to replace the loss of volume by drinking fluid. Jesus' last drink had been the wine at the last supper the night before. He was *intensely thirsty*.

The third physiological response to hypovolemic shock was that the kidneys work as hard as they can to reabsorb all the fluid being filtered through them to try to maintain the volume. The kidneys stop making urine.

The normal medical treatment for hypovolemic shock is to give the patient a blood transfusion. If blood is not available, then normal saline (water) is given intravenously. If neither of these is available drinking a large amount of water, or something like it, will work until medical help arrives. [I know of a cardiologist who broke a leg and lacerated an artery on a camping trip in the desert and was unable to move. He had his son leave a six-pack of beer with him before going to get help. He drank the lot and it saved his life.]

The Roman soldiers often taunted their condemned victims by playing the "game of the king" in which they would pretend that they were a king. They would put a makeshift crown on their head and put a robe on them while they took out their frustration against their own authorities on the victim. Archeologists have uncovered what is believed to be the first-century flagstone floor of the Praetorium in the Antonia Fortress where Jesus was beaten and scourged. One of the flagstones has a cartoon of a "king" scratched in it recording that such a game was played.

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<sup>5</sup> *World Book Encyclopedia*. Chicago: World Book, 1998: 407.  
Taggart, Starr and Cecie Starr. *Biology: The Unity and Diversity of Life*. California: Wadsworth, 1989: 398

After the scourging of Christ, the gospels record that such a cruel mocking game was played on Jesus. After all, his so-called “crime” was that he claimed to be King of the Jews. So they made a crown of thorns and put it on his head and placed a robe of purple, the royal color, on him “... *and went up to him again and again, saying, ‘Hail, king of the Jews!’ And they struck him in the face.*”<sup>6</sup> “*They spit on him, and took the staff and struck him on the head again and again. After they had mocked him, they took off the robe and put his own clothes on him. Then they led him away to crucify him.*”<sup>7</sup>

After being taken back to Pilate, as described earlier, the crowd still wanted him crucified. Still proclaiming Jesus to be an innocent man, Pilate washed his hands, and let the crowd have their way. Jesus was then led away to be crucified.

### **The Passover**

All of this was happening on the Day of Preparation, that is the day before Passover, which, in the Jewish calendar, starts at sunset, about 6 hours away. The Day of Preparation is the day on which the Passover meal is prepared. The head of each household takes the Passover lamb, which by tradition has been kept as a household pet for the preceding few months, and bleeds it to death by cutting its jugular veins in its neck. So at the same moment that the Passover lambs are dying by the thousands all over Israel, the Lamb of God – our Passover Lamb – the Lion of the Tribe of Judah – is bleeding to death for you and for me.

### **The Crucifixion**

The type of cross used in Israel at the time of Christ was a low *tau* cross like the letter “T.” The crossbeam (patibulum) had a notch over which a tongue projecting from the vertical post (stipes) was placed. The stipes was between 6 and 8 feet tall and was permanently imbedded in the ground. The condemned were required to carry their cross, the patibulum alone, from the Praetorium to the crucifixion site. This is what is shown for the two thieves who were to be crucified with Jesus. They carried the patibulum across the shoulders.

Gibson has said in interviews on the making of *The Passion of the Christ* that he went to great lengths to keep the images in the film consistent with those depicted in the great paintings and sculptures of the middle ages, which have formed the images in the minds of Christians for centuries. We have to admire him for this, for had he presented the scenes of Christ on a low *tau* cross it would have just “looked” wrong to us and the impact of the movie would have been reduced.

Gibson does show a scene of the two thieves on the cross where a black raven flies onto the patibulum of the unrepentant thief and plucks his eyes out. This has caused some controversy among critics, but this type of thing happened regularly at crucifixion scenes in the Roman world. Because the crosses were often only 6 to 8 feet tall, the victim’s feet would often be only one foot off the ground. Wild animals would feed on the bloody flesh, whether the person was alive or dead. Birds of prey would also take the opportunity

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<sup>6</sup> John 19:3 (NIV)

<sup>7</sup> Matthew 27:30-31 (NIV)

to feed on the ribbons of flesh from a fresh kill. Victims' families, if any were available, would stand vigil at the foot of the cross to drive away the wild animals and birds of prey.

There is no record of such an event happening in the gospels, however, it could have, and not been deemed worthy of record. Gibson takes the biblical symbolism that black birds are "the evil one."<sup>8</sup> In this scene in the film Gibson cleverly projects the idea that the evil thief is forever lost, while the repentant thief will that day be in paradise<sup>9</sup> with Christ.

We can see Gibson's traditional Roman Catholic heritage most clearly coming through in the journey from the Praetorium to "... *the place of the skull (which in Aramaic is called Golgotha).*"<sup>10</sup> The cross that Jesus is carrying is the "classic" Latin cross, with stipes and patibulum attached. All of the events in the Stations of the Cross along the *Via Dolorosa* are portrayed convincingly. Simon of Cyrene<sup>11</sup> comes off as a very real character. The necessity for him to carry the cross for Jesus is consistent with the hypovolemic state that Jesus was in as a result of the scourging. As he stumbled along with the cross on his back, the lacerations on his back, which had clotted, would have been reopened by the cross rubbing on them causing more blood loss.

Golgotha, "the place of the skull," is shown in the photo below. The "eye sockets" and "nose" are clearly seen in the hill side. This is about 100 yards from the Garden tomb. The crucifixions took place at on top of the hill (about where the trees are.) This can be seen from much of the city of Jerusalem.



"The Place of the Skull" – Golgotha – Calvary  
Photo by Alex Metherell

When Christ arrived at Golgotha, they removed his robe and the soldiers divided it among themselves but they cast lots for his tunic because it was made of a single piece of linen. At this point, Jesus would have been naked but, for obvious reasons in the movie, he is covered with a small loin cloth. The lacerations from the scourging would have caused blood clotting on his garments. When these garments were removed some of the wounds would open up and start the bleeding again causing more blood loss.

A sign (Titulus) is attached to the top of the cross of every condemned man that states the crime for which the man is being crucified. Pilate had ordered the sign on Christ's cross to read "JESUS OF NAZARETH, KING OF THE JEWS"<sup>12</sup>. It was written in Aramaic, Latin and Greek. The chief priests protested to Pilate saying "Do not write, 'The King of the Jews,'

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<sup>8</sup> Matt 13:4, 19, 32; Mark 4:1-12, 15,32

<sup>9</sup> Luke 23:42-43

<sup>10</sup> John 19:17

<sup>11</sup> Matt 27:32. Mark 15:21. Luke 23:26

<sup>12</sup> John 19:19-22

but ‘This man said, I AM KING OF THE JEWS.’”<sup>13</sup> Pilate answered, “What I have written, I have written.” Not only did Pilate confirm that Jesus is King of the Jews but, ironically, the priests unwittingly confirmed it with the addition of the “I AM” suggesting that he is God also.

The cardiovascular shock would have worsened with the journey up the hill and having to carry the cross partway. The tachycardia and induced heart failure is now beginning to take its toll. As the heart is failing under the stress, a pericardial effusion of clear straw-colored fluid begins to collect between the outside of the heart and the pericardial sac, which is a strong membrane surrounding the heart and is normally in intimate contact with it. As this pericardial effusion increases in volume it compresses the heart and further impedes the heart’s ability to function properly.

Since the scourging, Christ’s breathing has increased to try and keep up with oxygen and carbon dioxide transport. There is a probable pleural effusion of a similar clear straw-colored fluid in the pleural space between the outside of the lungs and the pleura just inside the rib cage. In the upright position, as he was when he eventually was hanging on the cross, this pleural effusion would collect in the lower part of the pleural space at the level of the heart. There are other biochemical changes going on in the blood associated with cardiovascular shock, including an increase in the acidity of the blood (acidosis), which will soon will be exacerbated further with more serious consequences.

He is laid down on the cross to be nailed. The two thieves are shown being crucified historically accurately because they had only carried their patibulum (cross beam) and the stipes was already permanently in the ground. The mechanics of what happens next is the same for all three victims. Christ’s cross is lying on the ground and he is thrown down onto the ground with his arms outstretched along the Patibulum. The dirt and gravel grind in to his wounds and the bleeding increases.

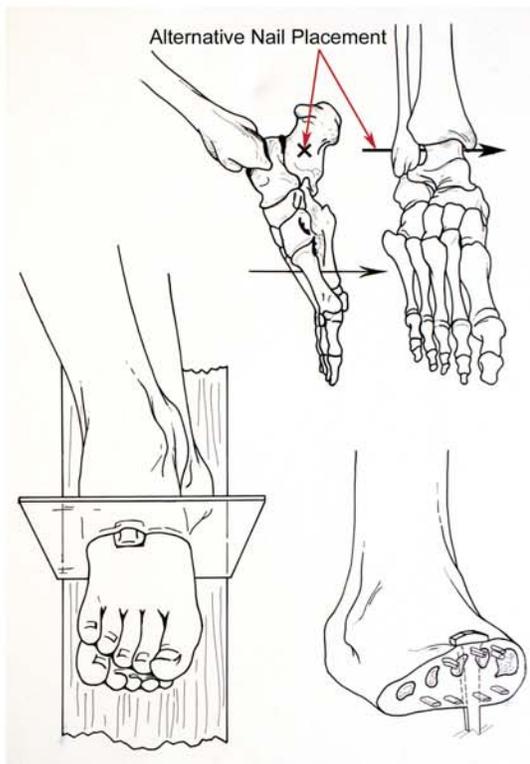
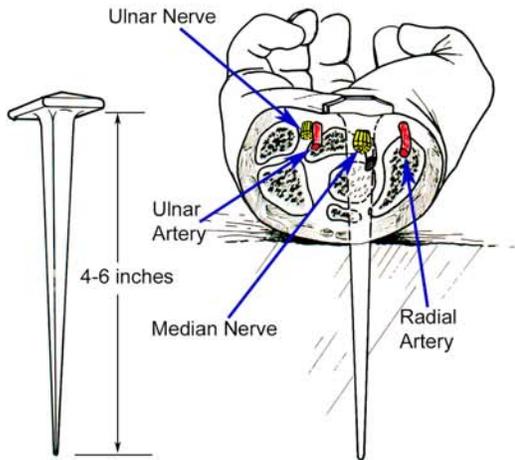
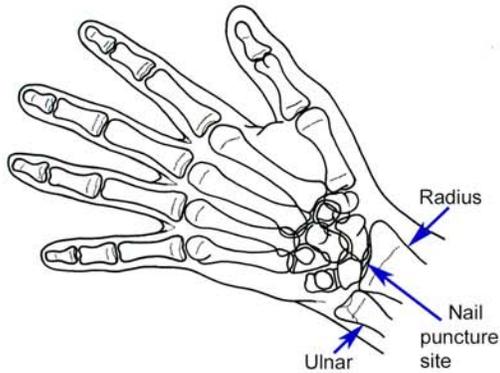
### **The Nailing**

In a very dramatic and gruesome close-up, Gibson shows the first nail being driven through the palm of Christ’s hand. This is where centuries of artists have shown the position of the nail so it is quite justified that Gibson shows it that way. The nail, however, was not placed there – if it had been, the load pulling on the nail by the weight of the body when it is hanging on the cross would tear through the flesh of the palm towards the fingers until it tore out of the hand entirely. The body would fall off the cross.

The only strong anchor point in the hand is through the crease in the wrist on the palm side of the hand. (See diagram) This is immediately at the end of the radius and ulnar (the bones of the forearm.) The nail is driven through the carpal tunnel. The bones of the forearm and the carpal bones of the wrist are bound by strong ligaments that make this a solid anchor point. As the nail is driven through the carpal tunnel, it crushes the median nerve, which is the largest nerve going to the hand. The other smaller nerve is the ulnar nerve.

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<sup>13</sup> John 19:21 NRSV



This ulnar nerve, as it passes down the arm through the elbow, goes through the groove on the inside of the elbow. We all know this as the “funny bone.” It isn’t funny and it isn’t a bone. It is the ulnar nerve, which, at one time or another, we have all had the painful experience of banging on the corner of a table. Imagine, if you will, taking a pair of pliers and crushing that ulnar nerve! The pain would be unbearable.

The median nerve in the carpal tunnel is larger than the ulnar so imagine it being crushed by the nail as shown in the illustration. This is where the Romans took the art of torture to its highest point by causing a maximum level of pain experienced on the cross for the whole duration of time it takes to die. So horrible is this pain that they coined a new Latin word to describe it – *ex, crux* – out of, the cross – the English word we use today – *excruciating*.

Gibson correctly shows how the other hand is nailed by stretching the arms out in a straight line along the patibulum. When the other hand is nailed in place the hands are as far apart as possible.

The cross Jesus is shown being put on is the Latin cross where the stipes and patibulum are already assembled. His back is on the Stipes and the soldier positions a foot rest (sedile) which is fastened to the stipes with a nail such that his knees are bent in a half-knee bend position. His feet are then nailed to the sedile.

It is possible that the nail in the feet did not go through the forefoot as shown in the illustration. In 1968, an ossuary was found in Jerusalem that had an inscription

on the outside which read “Jehohanan the son of HGQWL.” This ossuary, dating to the time of Christ, contained the only archeological evidence in Israel of a man who had been crucified. The right calcaneus (heel bone) had an iron nail piercing it from the lateral to the medial side (outside to inside.) There was still a small amount of wood from the crucifix attached to the nail. The nail was 11.5 centimeters (4.5 inches) in length, which meant that it could only attach one heel to the stipes. Each foot was probably nailed on either side of the post, rather than to the front of the post.



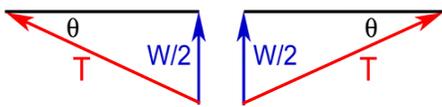
Right Calcaneus (Heel Bone) with nail from  
1<sup>st</sup> Century Crucifixion still in Place  
Photo © Israel Museum – Israel Antiquities Authority

Just because this one archeological find has been made does not mean that this is how it was done in the case of the crucifixion of Jesus. There was a lot of variation in how crucifixions were performed. The nail could well have been driven through the forefoot as shown in the illustration and the traditional paintings of the church and it would have accomplished the same result.

Now comes the gruesome part – getting Christ and the two thieves upright and the stipes anchored in the ground. The legs in a half-knee bend position cannot sustain the body weight for more than a minute or two, even when in the best of condition. For nearly all of the time while hanging on the cross, the weight of the body must be supported by the arms. Each arm has to produce an upward (vertical) component of force to carry the weight of the body.

The tension force in the arm is along the direction in which the arm is pointing. The tension in the arm produces both a vertical and horizontal component that can be calculated by the “triangle of forces” using simple vector analysis. The triangle is made up of a vertical side, a side parallel to the arm and a horizontal side that makes up the triangle. The lengths of the sides of the triangle are proportional to the vertical component of force, the horizontal component of force and the hypotenuse that represents the force in the arm.

## Tension Force Pulling Arms



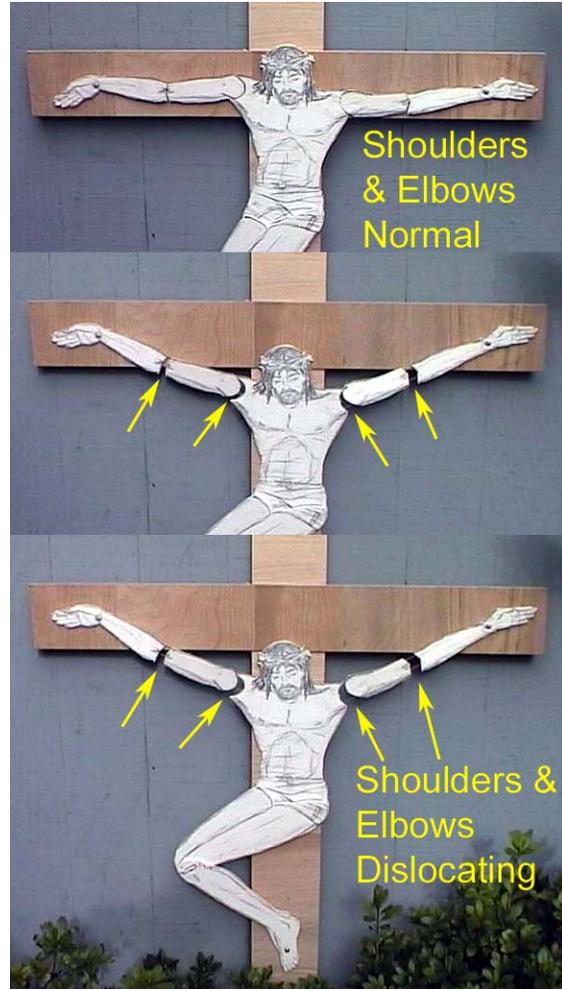
If we assume the weight  $W$  of Jesus was 180-lb then the vertical component of force on each arm must be 90-lb.

Thus, the tension load  $T$  in each arm will be:

$$T = 90 \div \sin \theta \text{ lb.}$$

As the angle  $\theta$  varies from 0 to 30 degrees the force pulling the arms starts at an infinite load and decreases to 180-lb in each arm at 30 degrees. In so doing the arms have to lengthen since the wrists are anchored at their maximum distance apart. At the 30-degree angle each arm is stretched by about 3.4 inches. Thus the shoulders and elbows joints are pulled apart.

Angle of Arm to Horizontal	Force in Arm (lb)	Lengthening of Arm (in.)
0 degrees	infinite	0
1 degrees	5,143	0.004
5 degrees	1,032	0.08
10 degrees	518	0.34
15 degrees	348	0.79
20 degrees	263	1.41
25 degrees	213	2.27
30 degrees	180	3.40



Only by exerting extreme effort to push up on the legs can the force on the arms be relieved. Doing this transfers the weight of the body to the nails in the feet, which grind against the periosteum of the bone causing great pain. This is necessary to breathe. In doing so the arms will tend to rotate at the wrist, where the square cross-section of the nail will grind on the crushed median nerve. The pain in both the wrist and feet becomes *excruciating* with every breath taken.

The process of dying by crucifixion is primarily that of slow suffocation. With the arms outstretched upwards and the shoulders dislocated, the muscles and tendons of the upper arm and shoulder attach to the front, side and back rib cage as well as the collarbone. The ribs articulate (hinge) where they connect to the transverse processes of the spinal column. This pulls the ribcage up into a fully inspired position. The diaphragm, which also plays an important part in breathing, is a dome-shaped muscle between the lungs and abdomen. The diaphragm contracts and flattens when we breathe in deeply. With the weight of the body hanging on the arms and the inability to support the weight on the legs for more than a few seconds, the weight of the abdominal contents keeps the diaphragms down. Christ was in a fully inspired position.

The difficulty, therefore, is breathing out. Since the arms are fully stretched out, they cannot bend at the shoulder to pull the elbows down to allow some exhalation of air from the lungs. Without the ability to push up on the legs, death from complete suffocation comes in a matter of minutes. This is why, after Jesus had died, the soldiers used the handle of their iron spears to smash the lower legs of the thieves to prevent them from pushing up, resulting in their rapid death. (The leg bones in the ossuary of Jehohanan, described above, were broken in this manner.)

The medical condition of Jesus by the time he is placed on the cross is as follows:

- Loss of 5 to 6 pints of blood (half of the total blood in his body) leading to:
- Cardiovascular (hypovolemic, hemorrhagic) shock, leading to:
- Raging thirst with drying of the mouth and tongue.
- Tachycardia leading to heart failure (exhaustion):
- Pulmonary distress and pleural effusion:
- Probable pericardial effusion:
- Electrolyte imbalance:
- Extreme weakness.

Now that he is up on the cross and hypoventilating, the new problem becomes one of oxygen and carbon dioxide exchange. The breathing response is driven more by the level of carbon dioxide in the blood than it is by lack of oxygen. Carbon dioxide is transported in the blood plasma as carbonic acid. Thus a major detrimental effect of inadequate breathing is that the blood acidity increases. Some acidosis has already occurred because with less blood to participate in the oxygen and CO<sub>2</sub> exchange means that more CO<sub>2</sub> is carried per unit volume of blood. The respiratory acidosis is now accelerating.

Every time Jesus pushes up on his feet to breathe, his back slides up and down the vertical post which reopens the lacerations and more bleeding occurs.

Near the end, Jesus utters<sup>14</sup> the first verse of Psalm 22. “*Eloi, Eloi, lama sabachthani*” – which means, “*My God, my God, why have you forsaken me?*” It is as if he is telling the Pharisees and people who could hear him to look at Psalm 22 that was written by King David about 1,000 years earlier – before crucifixion was known in Israel. This Psalm is a graphic description of the crucifixion that Jesus was now undergoing.

*“<sup>1</sup>My God, my God, why have you forsaken me?” ... “<sup>6</sup>But I am a worm and not a man, scorned by men and despised by the people. <sup>7</sup>All who see me mock me; they hurl insults, shaking their heads<sup>15</sup>; <sup>8</sup>He trusts in the Lord; let the Lord rescue him. Let him deliver him, since he delights in him.<sup>16</sup>” ... “<sup>13</sup>Roaring lions tearing their prey open their mouths against me. [The bone shards of the whip tearing at his flesh like the claws of a lion.] <sup>14</sup>I am poured out like water, [half his blood has been drained from him] and all my bones are out of joint. [Both shoulder joints and elbows have been ripped apart] My heart is turned to wax; it has melted away within me. [Heart is in terminal failure] <sup>15</sup>My*

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<sup>14</sup> Matt 27:46

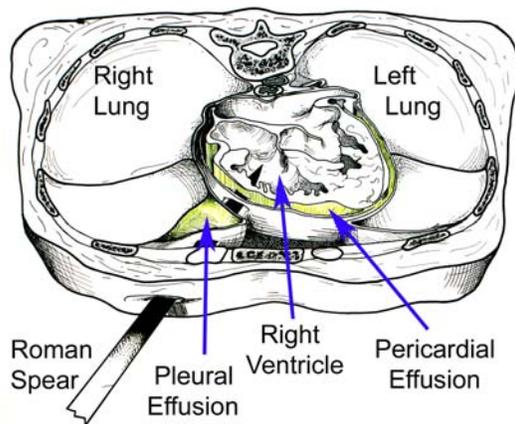
<sup>15</sup> Matt 27:39-40

<sup>16</sup> Matt 27:41-44

*strength is dried up like a potsherd*, [Weak and near collapse from hypotension, hypovolemic shock and respiratory acidosis] *and my tongue sticks to the roof of my mouth*; [Raging thirst] *you lay me in the dust of death.* <sup>16</sup>*Dogs* [Gentiles (Romans)] *have surrounded me; and a band of evil men* [those who were plotting against him.] *has encircled me, they have pierced my hands and my feet.* [with nails] <sup>17</sup>*I can count all my bones; people stare and gloat over me.* <sup>18</sup>*They divide my garments among them and cast lots for my clothing.* [The Roman soldiers divided his cloak and cast lots for his tunic.]”  
 The [ ] marks indicate the medical/physiological/engineering correlation with this prophetic Psalm.

The respiratory acidosis from the hypoventilation has been increasing and is now at the point where cardiac arrhythmias are starting to occur. Jesus could feel the irregular heart beat of cardiac fibrillation in his chest warning him that the terminal event was about to take place. He made one last monumental effort to push up on his feet so he could take his last breath and say “*Father, into your hands I commit my spirit.*” He slumped back down and went into full cardiac arrest.

Gibson, in another glimpse of cinematic genius, pulls the camera back up in the sky looking down at this terrible scene. There is this view of the sky with a cloud formation resembling a giant eye in heaven – the eye of God – from which a single large drop of water falls like a giant tear. The drop of water is followed down to the ground where it strikes a rock next to the crucifix holding the dead body of Christ. As the drop strikes the rock, there is a great earthquake that shakes the city and Temple in which we see the veil – the heavy tapestry separating the Holy of Holies from the Holy Place – being torn in two by the earthquake. Thus, the separation between God the Father and man is taken away.



Axial View of Chest through the Heart showing Path of the Spear penetrating the Pleura, Pericardium and Right Ventricle of the Heart

Back at Calvary (Golgotha) sunset is nearing which marks the beginning of the High Sabbath of Passover. There is an urgency to get the executions of all three men over so that they will not be left on the crosses at sundown. The soldiers then break the lower legs of the two thieves who had not yet died. They are now dead in minutes. But when they came to Jesus they saw that he was already dead. If a condemned man lived, the soldiers would themselves have to die under Roman law, so to confirm that Jesus was dead a soldier took his spear (which was only about 4 to 5 feet long) and thrust it into

his side. The spear probably went in through the right frontal part of the chest as shown in the diagram above.

The spear would penetrate the chest wall, then go through the pleural space of the right lung, then the pericardial space and into the right ventricle of the heart. The pleural and pericardial spaces contained the clear, slightly straw-colored fluid that looks like water.

When the spear is withdrawn, the clear watery fluid would come out first followed by the blood from the right ventricle. In the Greek, in which the New Testament was written, the order mention is reversed as “blood and water.” In Greek, this is used to indicate that there was more blood than water. It does not indicate the timing in which they came out.

Jesus, the Passover Lamb – the Lamb of God – is taken down from the cross by Mary, the mother of Jesus, the other Mary and John. There is beautiful brief scene of the dead Jesus resting in Mary’s arms in a pose reflective of Michelangelo’s famous Pietà marble sculpture in the Vatican.

We do not see anything of Nicodemus or Joseph of Arimathea, who buried Jesus. Nicodemus was a member of the Sanhedrin who had come to Jesus secretly at night. It is clear that he was a believer. Joseph of Arimathea was a wealthy Jew who gave his valuable tomb to bury Jesus. Had there been time in the movie to include them and develop their characters, this may have quelled some of the criticism of anti-Semitism (which I did not detect anywhere.)

The final brief scene is inside the dark tomb on Easter Sunday morning. As the stone rolls away letting in the early morning light, the risen Christ is sitting on the stone shelf next to his burial cloth. As he gets up and walks out, you get a brief close-up view through the hole in his hand where the nail went. That is how it ends – with the Resurrection.

Gibson has without question, produced a cinematic masterpiece. It conveys the Passion of the Christ like no other movie has ever done. It is literally stunning.

There will always be some who do not like the movie – but they probably didn’t like The Book either.

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Drawing used to make the model showing dislocations of Christ’s elbows and shoulders on the cross are by Don Winton