

NEUROPATHOLOGY IN THE BIBLE

J. C. E. KAUFMANN, M.B., CH.B. (CAPE TOWN)

Neuropathology Department, South African Institute for Medical Research, Johannesburg

PART I

Biblical characters suffered from various diseases of the nervous system including strokes, epilepsy, heat stroke and insanity. Some of the descriptions of their illness are amazingly detailed; others are medically incomplete and conjectural. This collection is of organic diseases mainly and contains adequate quotations to spare the reader a search for the passage concerned.

INJURIES OF THE CENTRAL NERVOUS SYSTEM

No-one can doubt that Goliath sustained a head injury before being beheaded by the youthful David:

'And David put his hand in his bag, and took thence a stone, and slung it, and smote the Philistine in his forehead, that the stone sunk into his forehead; and he fell upon his face to the earth. So David prevailed over the Philistine with a sling and with a stone, and smote the Philistine, and slew him; but there was no sword in the hand of David. Therefore David ran, and stood upon the Philistine and took his sword, and drew it out of the sheath thereof, and slew him, and cut off his head therewith . . . (1 Samuel: 17, v. 49-51).

By sinking into his skull the stone caused a depressed fracture, probably compound in type (Fig. 1). Earlier, disdainful armour, David had collected five smooth stones for ammunition from a brook. Goliath was protected by a brass helmet, a coat of mail and a shield, and armed with a spear and a sword. In the narrative of the contest, David threatened that he would cast the carcass of the Philistine to the fowls of the air. The Philistine raised his eyes skywards to see whether there were any birds about. The upward motion of his head



Fig 1. David seen through the eyes of Andrea del Castagno (about 1420-1457). The stone shown with a rough instead of smooth surface is embedded in Goliath's forehead. Notice the looped end of the sling around the third finger, and the position of the other end. (By courtesy of the National Gallery of Art, Washington, DC.)

pushed his visor slightly away from his forehead and in that instant the pebble aimed by David struck him on the exposed spot.¹ David's threat also appears in the Bible. Leather slings for hurling stones were one of the earliest devices used for increasing the force and range of a missile. The slings found in a chest in the tomb of the young Pharaoh Tut-ankh-amun (1362-1343 BC) were made of plaited linen thread with a pouch in the middle and a loop at the end of one cord to be held firmly on the little finger, while the second cord was left plain for releasing between thumb and first finger when discharging the missile (Fig. 2). To acquire accuracy with a sling, a proper sized stone had to be used and the loose end of the sling had to be released at the appropriate time to ensure aim and distance.²

Sisera died of a different kind of head injury. He commanded the Canaanite army defeated by the Israelites under Barak. Sisera alighted from his chariot and fled to the tent of Jael, wife of Heber the Kenite, where he could expect shelter because the Kenites were friendly to both sides. Jael

went out to meet him, reassured him and invited him inside. Being thirsty he asked for water. She gave him a drink of milk, covered him and stood guard at the entrance to the tent:

'Then Jael Heber's wife took a nail of the tent, and took an hammer in her hand, and went softly unto him, and smote the nail into his temples, and fastened it into the ground: for he was fast asleep and weary. So he died' (Judges: 4, v. 21).

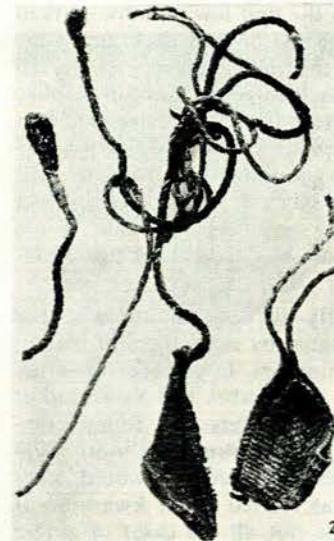


Fig. 2. Portions of the two slings belonging to King Tut-ankh-amun of the 18th Dynasty. One loop is at upper left. (By courtesy of the Griffith Institute, Ashmolean Museum, Oxford.)

be a sign of His delivering Sisera to her. Sisera did not awake. She then drove the spike into his temple and he cried out as he was expiring. 'O that I should lose my life by the hand of a woman!' (Fig. 3). Consciousness may be retained when a fixed head is injured so Sisera's lament is consistent with the story. Obviously the spike missed Broca's area.

Abimelech, King of the small city state of Shechem, also received a fatal head injury at the hands of a woman. He had seized the throne and his rise to power was disgraced by the murder of his rivals. His reign was short for the natives soon rebelled. The end of a brief civil war occurred when Abimelech captured the city of Thebez.

'But there was a stronger tower within the city, and thither fled all the men and women, and all they of the city, and shut it to them, and gat them up to the top of the tower. And Abimelech came unto the tower, and fought against it, and went hard unto the door of the tower to burn it with fire. And a certain woman cast a piece of a millstone upon Abimelech's head, and all to break his skull. Then he called hastily unto the young man his armour bearer, and said unto him, Draw thy sword, and slay me, that men say not of me, A woman slew him. And his young man thrust him through, and he died' (Judges: 9, v. 51-54).

The passage states that the stone landed upon Abimelech's head. Although the next few words seem to imply intention rather than result, Abimelech must have been mortally wounded to have ordered his own death by the sword. The Revised Standard Version (RSV) says, 'and crushed his skull'. Because he could speak and because there is no reference to unconsciousness, it is concluded that this was also a head injury without loss of consciousness or with only a momentary loss. In the absence of information about possible fixation of the head, protection by a helmet, and the presence or absence of a penetrating wound one is puzzled about the pathogenesis of this injury.

The story of the sleepy youth Eutychus as related in the Authorized Version (AV) has been regarded as a miracle of healing.⁵⁻⁸ From the New English Bible (NEB), it appears that the youth was probably unconscious.

'On the Saturday night, in our assembly for the breaking of bread, Paul, who was to leave the next day, addressed them, and went on speaking until midnight. Now there were many lamps in the upper room where we were assembled; and the youth named Eutychus, who was sitting on the window-ledge, grew more and more sleepy as Paul went on talking. At last he was completely overcome by sleep, fell from the third floor to the ground, and was picked up for dead. Paul went down, threw himself upon him, seizing him in his arms, and said to them, "Stop this commotion: there is still life in him". He then went upstairs, broke bread and ate, and after much conversation, which lasted until dawn, he departed. And they took the boy away alive and were immensely comforted' (Acts: 20, v. 7-12).



Fig. 3. Jael drives a spike, apparently a tent-peg, through the temples of the sleeping Sisera. From drawing after the Master of Flémalle (about 1430). (By courtesy of the Herzog Anton Ulrich Museum, Braunschweig.)

Appropriately, the name Eutychus in Greek means lucky or fortunate.

In the AV the youth 'was taken up dead', and so Paul's subsequent action appeared to have resulted in a miraculous cure. The fact that the youth was taken away 'alive' as distinct from 'for dead' seems to imply that he had recovered consciousness to some extent if not completely. Concussion therefore appears to be a reasonable diagnosis.

A fatal cervical cord injury is described in the first book of Samuel. Eli, 98 years old, and with poor eyesight, was sitting on a seat by the wayside. A refugee from the defeated army of Israel arrived and brought him bad news: his two sons Hophni and Phineas were dead and the Ark of God was captured by the Philistines.

'And it came to pass, when he made mention of the Ark of God, that he fell from off the seat backward by the side of the gate, and his neck brake, and he died: for he was an old man, and heavy . . .' (I Samuel: 4, v. 18).

With such a fracture dislocation of the cervical spine one could expect a laceration or contusion of the cervical cord.

A hyperflexion injury of the neck would seem to be more probable than a hyperextension injury. The vertebrae were probably fragile as a result of senile osteoporosis.

THE EFFECTS OF HEAT

There are several pronouncements in the Bible on the danger of exposure to the sun:

'The sun shall not smite thee by day, nor the moon by night' (Psalm: 121, v. 6).

The last part of the quotation probably refers to belief in the evil power of the moon, having a lunatic influence. And Isaiah: 49, v. 10 reads:

'They shall not hunger nor thirst; neither shall the heat nor sun smite them . . .'

The death of the rich man Manasses mentioned in the Apocrypha was due to heat stroke:

'And Manasses was her husband, of her tribe and kindred, who died in the barley harvest. For as he stood overseeing them that bound sheaves in the field, the heat came upon his head, and he fell on his bed, and died in the city of Bethulia: . . . (Judith: 8, v. 2-3).

Ladell,⁹ Friedenwald,¹⁰ and Smith¹¹ are in agreement with the diagnosis of heat stroke although the latter is less explicit, discussing the case under the heading of heat sickness.

The story of Jonah when he was sitting outside the wall of Nineveh points strongly to heat syncope or heat collapse:

'And it came to pass, when the sun did rise, that God prepared a vehement east wind; and the sun beat upon the head of Jonah, that he fainted, and wished in himself to die, and said, it is better for me to die than to live' (Jonah: 4, v. 8).

Earlier Jonah had made a booth on the eastern side of the city and sat under it in the shadow to see what would become of the city. The Lord had caused a gourd or castor oil plant¹² to grow rapidly over his head to provide shade, but he also prepared a worm which attacked and withered the plant so exposing Jonah to the sun.

Heat exhaustion is suggested by the following extract in which heat, muscular exercise, weakness and failure to drink water are all mentioned:

'The smith with the tongs both worketh in the coals, and fashioneth it with hammers, and worketh it with the strength of his arms: yea, he is hungry, and his strength faileth: he drinketh no water, and is faint' (Isaiah: 44, v. 12).

POSSIBLE INFECTIONS

'And Jonathan, Saul's son, had a son that was lame of his feet. He was five years old when the tidings came of Saul and Jonathan out of Jezreel, and his nurse took him up, and fled: and it came to pass, as she made haste to flee, that he fell, and became lame. And his name was Mephibosheth' (II Samuel: 4, v. 4).

In II Samuel: 9, v. 13 it is specifically stated that Mephibosheth was lame 'on both his feet'.

Sir William Osler¹³ wrote of poliomyelitis 'Since the days of Mephibosheth, parents have been induced to attribute this form of paralysis to the carelessness of nurses in letting the children fall, but very rarely is the disease induced by traumatism . . .' While other authors have drawn the same conclusions about the cause of Mephibosheth's lameness,¹⁴⁻¹⁶ a few favour a bony lesion.¹⁷⁻¹⁹ Levin claims that the English rendering is faulty in that only one term 'lame' is employed for two distinct Hebrew terms and that the translation would be better written

'And Jonathan . . . had a son that was lame of his feet . . . and . . . he fell and became crippled.'

This means that he was lame before the injury and as a result of his fall he suffered a further injury — presumed to be one or more fractures. Levin agrees that the original lameness was poliomyelitis. Evidence for the occurrence of the latter disease in Biblical times is found on an Egyptian stele (Fig. 4).

Another puzzling illness which may possibly have been due to malaria is that of the Shunamite boy. Elisha prophesied that a wealthy hospitable woman of Shunem, married to an old man, would have a son. This happened and when the child was grown he went out to his father with the reapers one day,

'And he said unto his father, My head, my head. And he said to a lad, Carry him to his mother. And when he had taken him, and brought him to his mother, he sat on her knees till noon, and then died' (II Kings: 4, v. 19-20).

Friedenwald¹⁰ suggests that the boy was 3 years old, and Short,²⁰ between 4 and 10 years. The event occurred in the summer or early autumn and although the sun or heat are not mentioned it would be reasonable to assume that it was hot. Hence many authors^{10, 18, 20, 21} have diagnosed sunstroke or

some heat disorder. However, if that were so, one would have expected the ancients to have noticed a relationship between the illness and the heat, and they did not. Also we know that the boy became ill some time before noon, certainly well

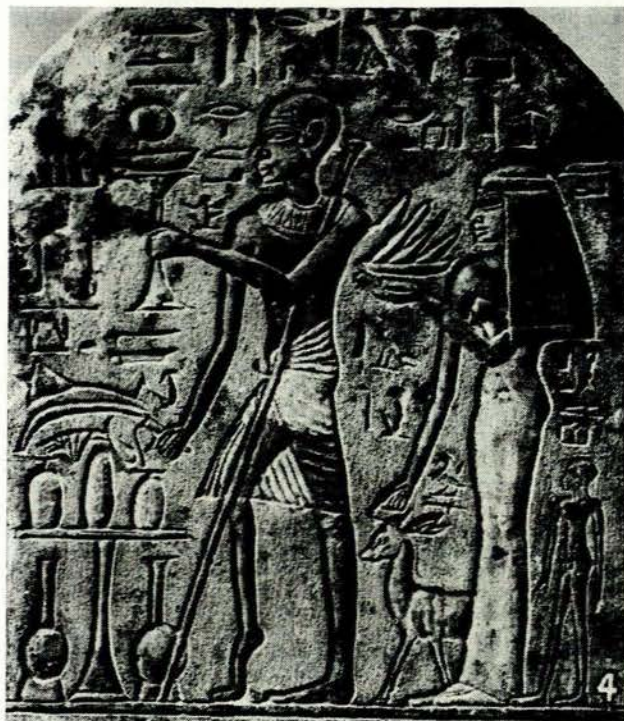


Fig. 4. A man, Ruma, and his wife bring offerings to Astarte the Goddess of Healing. His thin short right leg suggests old poliomyelitis. 19th Dynasty Stele (about 1200 BC). (By courtesy of Ny Carlsberg Glyptotek, Copenhagen.)

before the hottest time of the day. For these reasons and because the only symptom was the dramatic words 'my head', repeated once, a cerebral vascular accident seems to be probable as suggested by Wassermann and Brink²² (subarachnoid haemorrhage) and Smith²¹ (cerebral haemorrhage). A vascular malformation is a not uncommon cause of intracranial haemorrhage in children. On the other hand malaria was probably prevalent in Biblical times in Mesopotamia²³ and Alexander the Great is believed to have died of malaria in Babylon in 323 BC.²⁴ Further to the East the disease was recognized by the 5th century in India and was known to be associated with mosquitoes.²⁵ Herodotus²⁶ mentioned that in Egypt the natives living about the marshes slept under their fishing nets at night to escape the 'gnats', and Rufer²⁷ deduced the presence of malaria from splenomegaly in Coptic mummies several hundred years later. There is thus reason to believe that malaria occurred in the Middle East in Biblical times, providing grounds for the suggestion that the Shunamite boy could have suffered from malaria.²⁸ His illness is remarkable for being the first recorded instance of resuscitation by mouth-to-mouth breathing. Elisha went to the house where the boy lay apparently dead

'And he went up, and lay upon the child, and put his mouth upon his mouth, and his eyes upon his eyes, and his hands upon his hands: and he stretched himself upon the child; and the flesh of the child waxed warm. Then he returned, and walked in the house to and fro; and went up, and stretched himself upon him: and the child sneezed seven times, and the child opened his eyes' (*II Kings*: 4, v. 34-35). (Fig. 5.)

This story has many parallels with another in *I Kings*: 17, v. 17, but unfortunately no more light is thrown upon the nature of the illness which is described as follows: '... and his sickness was so sore that there was no breath left in him.' The sneezing is puzzling. Levin²⁹ believes that coughing is implied, which would make better sense. Another point in favour of a vascular accident is that complicating neurogenic

pulmonary oedema could cause respiratory obstruction, cleared by sneezing or coughing.

Tsetse flies may be the ones mentioned in *Isaiah*: 7, v. 18, according to Thomson.³⁰

'And it shall come to pass in that day, that the Lord shall hiss for the fly that is in the uttermost part of the rivers of Egypt . . .'

and the last part of the passage can hardly mean anything else than the headwaters of the Nile, viz. the Victoria Nyanza itself.³¹ Laveran and Mesnil³² quote Westwood as being of the opinion that the tsetse, extending beyond its ordinary limits, gave rise to the fourth plague of the Egyptians:

'... and there came a grievous swarm of flies into the house of Pharaoh, and into his servant's houses, and into all the land of Egypt: the land was corrupted by reason of the swarm of flies' (*Exodus*, 8, v. 24).

The fifth plague, the murrain of animals, would thus have been the result of the fourth:

'Behold, the hand of the Lord is upon thy cattle which is in the field, upon the horses, upon the asses, upon the camels, upon the oxen, and upon the sheep: there shall be a very grievous murrain' (*Exodus*: 9, v. 3).



Fig. 5. Elisha and the Shunamite's son by Lord Leighton. The boy is 'dead' probably as a result of cerebral vascular accident (see text) and Elisha is engaged in mouth-to-mouth resuscitation. (By courtesy of the Kensington Borough Council, London.)

This was the threat issued to the Pharaoh concerning what would happen if the Hebrews were not released from bondage. They were not released and 'all the cattle of Egypt died' while, as had been foretold, those belonging to the Hebrews were spared. Thomson says it is significant that all the animals mentioned here are susceptible to trypanosomiasis, while rinderpest for example would not have affected horses or asses and is a relatively mild disease in sheep, goats and camels. Smith³³ supposes that the murrain was due to anthrax. Ginsberg³⁴ relates that the fifth plague was a grievous pestilence which destroyed the cattle and beast chiefly, yet did not spare the man altogether: many Egyptians died.

The unusual combination of paralysis with pain points to tetanus as the illness of the servant of a centurion at Capernaum. Unfortunately this cannot be confirmed because of the paucity of detail:

'When he had entered Capernaum a centurion came up to ask his help. "Sir," he said, "a boy of mine lies at home, paralysed and racked with pain." Jesus said, "I will come and cure him." But the centurion replied, "Sir, who am I to have you under my roof? You need only say the word and the boy will be cured" . . .' (*Matthew*: 8, v. 5-8, NEB).

The AV says 'sick of the palsy, grievously tormented'. There is even less about the illness in the NEB in *Luke*: 7, v. 2-10 where the servant is merely described as 'ill and near to death'. Taking these accounts together the paralyzed patient, gravely ill and racked with pain, could have been a case of tetanus. If not, rabies and strychnine poisoning are alternative diagnoses. Tetanus and rabies occurred in those times; the former was described by Hippocrates and the latter was mentioned by Homer and Aristotle ('canine madness') and by Galen and Celsus (human rabies). Strychnine poisoning has to be rejected because there is no evidence that it was known or used before the 9th century when the name *nux vomica* appeared in a Latin translation of the work of an Arabian physician, Serapion.³⁵

(To be continued)