Radiological diseases in history

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The earliest description of disease can be found in the Old Testament. In the book of Samuel for example,[1,2] the passages relating the death of King Eli describe how he *"fell off the seat backwards by the side of the gate and his neck broke and he died for he was an old man and heavy"*. Although written in biblical times these passages clearly indicate that Eli's death was due to a hyperflexion injury of the cervical spine and subsequent cord damage, a well known mechanism of injury following a backwards fall.

Biblical interpretations also offer interesting medical explanations.[1,3] In detailing the story of the punishment of King Jeroboam it is written in Kings: *"And it came to pass when King Jeroboam heard the saying of the man of God .. that he put forth his hand from the altar, saying lay hold on him. And his hand which he put forth against him dried up so that he could not pull it in again to him. And the king answered and said unto the man of God ... pray for me that my hand may be restored me again. And the man of God besought the Lord, and the king's hand was restored him again and became as it was before"*.

The above passages describe a rapid event wherein Jeroboam first loses and then regains the use of his arm. The story begins with the king raising up his arm and pointing at the man of God (saying lay hold on him). It is felt that in so doing he probably abducted and externally rotated his arm, resulting in an anterior dislocation of his humeral head. The associated muscular spasm held his elbow away from the body and prevented him from "pulling his hand in again". Other rapid events, e.g. an acute hemiparesis or fracture, seem less likely as these would have resulted in the arm hanging passively at the side of the body rather than being held away from it. Furthermore, the sudden reversal of the process favours relocation of the shoulder rather than one of these diagnoses.

By far the most interesting story from a medical/radiological viewpoint is that of David and Goliath.[1,4] Goliath is recorded as measuring 6 cubits and a span which, by modern measurements would make him 3,59m or 11 foot 9 inches*. Even allowing for some hyperbole, he was still enormous. His immense size may well have been due to acromegaly secondary to a pituitary macroadenoma. This being the case, two other facets of his disease largely contributed to his downfall. Firstly, the association between pituitary tumours and visual pathway abnormalities is well known, and Goliath, at the very least, had a bitemporal hemianopia if not a central scotoma as well, all of which made it difficult for him to even see David. The Bible describes how Goliath *"looked around and saw David"* and it was probably then, as Goliath was clumsily looking around trying to bring David into his limited field of view, that David struck.

Secondly, as a result of his acromegaly, Goliath had the typical skull features. Of particular importance was his frontal bossing, for although Goliath was covered from head to toe in protective armour, it was the frontal bossing that prevented his helmet from fully covering the vulnerable forehead region and hence David *"slung the stone and smote the Philistine in his forehead and the stone sunk into his forehead"*, the stone passing straight through the enlarged frontal sinus.

Rulers throughout the ages have also suffered from a wide variety of diseases, e.g. Maximinus I, Emperor of Rome[5] from 235-238 AD was another famous acromegalic as shown in this coin portraiture (Figure 1) and Tutankhamun, most famous of the Egyptian pharoahs, is believed to have suffered from gynaecomastia. Although these diseases probably had some influence on the lives of these individuals, they had

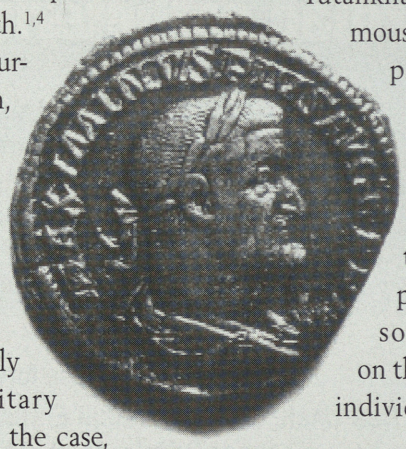

Figure 1: Coin portrait of Emperor Maximinus (reproduced from 5- permission requested).

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* A cubit being 22 inches or 56cm and a span 9 inches or 20cm.

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little effect on the history of the time. In direct contrast to this is the disease of Henry VIII which had a profound effect on himself, his wives and on the history of England.[6]

Most people retain the image of Henry VIII as a bloody tyrant. However, at the beginning of his reign, he was in fact a much loved and respected leader who showed tremendous political insight. In 1519 Erasmus wrote of him *"your king leads the rest by example. In ordinary accomplishments he is above most and inferior to none. Where will you find a man so acute, so copious, so soundly judging or so dignified in word or manner ....."*? Marked changes obviously occurred in Henry during the second half of his reign and there is considerable evidence that these changes were largely, if not solely, due to syphilis.

Firstly, despite having six wives, Henry's spouses had disastrous obstetric histories. His first wife, Catherine of Aragon, had six children - five were stillborn or died soon after birth and only one, Princess Mary, who later reigned as Bloody Mary, survived. Anne Boleyn, Henry's second wife, also had three miscarriages and, from his remaining four marriages, there was only one live birth. Furthermore his first surviving child, Mary, showed definite features of congenital syphilis.

Then in 1527 at the age of 38, Henry suffered from an ulcer on his thigh which was associated with bone pain and fever. It is generally accepted that this represented a broken down gumma and syphilitic osteomyelitis, suggesting that Henry was passing through the secondary stage of syphilis and into the tertiary stage.

The very definite changes in Henry's character during the second half of his reign are highly suggestive of neurosyphilis. From being a kind jovial king, he became suspicious, irritable and tyrannical. In a relatively short space of time he divorced Catherine of Aragon to marry Anne Boleyn, then beheaded her to marry Jane Seymour who died of puerperal sepsis. He then married Anne of Cleves and divorced her to marry Catherine Howard and beheaded her to marry Catherine Parr.

These well known upheavals in his personal life are paralleled by those in his political career in which he broke away from Rome, made the King head of the English church, granted himself new powers and became the bloodthirsty despot he is remembered to be. All in all ± 72 000 people were executed under Henry VIII, including some of his most loyal subjects such as Sir Thomas More. Lastly, towards the end of his reign, Henry became extremely overweight and in 1547 sank into a stuporous state from which he did not recover, suggesting that his ultimate demise was due to fluid overload and uraemia secondary to syphilitic nephritis.

Haemophilia has also played a major role throughout the ages. Its occurrence in the reigning houses of England, Germany and Spain had some effect on the course of events in these countries, but it was in Russia that it had its major impact on history.[7,8] Tsar Nicholas and Tsarina Alexandra, the last royal rulers, had only a single son, Alexis. In September 1912, the son, Tsarevitch Alexis developed a severe illness, later shown to be the syndrome of femoral neuropathy due to retroperitoneal bleeding as a consequence of haemophilia. Despite all the attempts of the best doctors of the day, his condition worsened and the royal family and the whole of Russia began to prepare for his death. In desperation Tsarina Alexandra sent a telegram to the monk, Gregory Rasputin, the mystical Siberian peasant rumoured to be a man of God with powers of prophecy and healing. Rasputin responded *"God has seen your tears and heard your prayers. Do not grieve. The little one will not die. Do not allow the doctors to bother him much"*. Two days later the bleeding had stopped, the pain was gone and the fever abated. As a result of this, the Tsarina became utterly captivated by Rasputin and through her he largely influenced the royal family to the extent that by 1916 he had used this influence to dictate appointments to every important government and church position in Russia. Of historical importance was his influence over the Tsar in regard to his handling of domestic unrest, and his ultimate failure to respond to the plight of the Russian people. This set the stage for the bloody revolution of 1917, an event which forever changed the history of Russia and the world.

The impact of illness on the individual can also be profound. Of particular interest is the association between disease and creativity. Many famous people's career paths have been influenced by disease. For example, it was asthma that was largely responsible for the compositions of Vivaldi. Although already ordained as a priest, his breathlessness prevented him from conducting mass. He therefore subsequently became choir master and ultimately musical director.

Matisse[9] too, had already entered the legal profession when, as a result of the complications of appendicitis, he had to refrain from work for almost a year. As a diversion he started

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to paint and became captivated by it. He himself said *"I had become possessed by painting and could not abstain"*.

Were it not for Byron's club foot he might well have become a famous soldier.[10] His outlook on life and his expression of it in his poetry certainly would have been different, as he himself wrote *"It requires great natural goodness of disposition to conquer the corroding bitterness that deformity engenders in the mind and which sours one to the world"*. Byron was quite literally twisted and bitter, and his club foot has often been blamed for the fact that he was "mad, bad and dangerous to know", though the fact that his father was known as "Mad Jack Byron" may suggest a more powerful hereditary influence.

There is no better example of the effect of deformity on a life and creativity than that of Henri de Toulouse Lautrec.[9] As a member of the nobility, he would certainly have been assigned a military career were it not for his pyknodysostosis. His gross deformity led to his self exile from the high society from which he originated, driving him to the cheap music halls, cafes and bordellos of seedy Paris nightlife. To vindicate himself, despite his deformity, he took the motto *"Paint, drink and love"* and ended up a great painter, an alcoholic and a syphilitic. His art was essentially an expression of his life (Figure 2). His painting at the Moulin Rouge is a prime example of the world in which he lived, showing Paris night life with its artificial light and assortment of garish unpleasant faces.

Figure 2: Lautrec's Moulin Rouge, showing Paris nightlife with its artificial light and assortment of garish unpleasant faces.

In contrast to Lautrec was Renoir's reaction to his disease.[9] He suffered from a crippling arthritis often rumoured to be due to poisoning from his pigments, but now generally accepted to have been rheumatoid arthritis. Despite significant disability, Renoir never allowed himself to become despondent and his love for his painting triumphed over all else. Comparing his Moulin de la Galette (Figure 3) with Lautrec's Moulin Rouge, one can immediately see the difference in the outlook of the two men - the relaxed casual atmosphere of Renoir providing a stark contrast to Lautrec's harsh realism. Even when his hands became misshapen and painful, Renoir continued to paint by taping cotton to his palms and tying the brush to his hands. So strong was his love for his art that it is rumoured that he ultimately chose painting over walking. In 1912, he had become wheelchair bound. An eminent physician was consulted, who placed him on a special diet and exercise programme to build up his strength. After four weeks he was lifted out his chair and managed to take a few painful steps, whereupon he turned to his doctor and said *"I give up - it takes all my willpower and I would have none of it left for painting"*. He then sat down and never walked again.

Figure 3: Renoir's Moulin de la Galette.

Finally, there are rare instances where disease may actually directly benefit artistic performance[11], e.g. Paganini's the "Demon of Fiddlers" probably owes much to his dexterity consequent on the hypermobility of his joints as a result of Ehlers-Danlos syndrome (though often argued to be Marfan's syndrome).

In conclusion, a few historical cases of radiological interest have briefly been discussed. Many other fascinating topics such as Jacob's lumbar disc, Charles Darwin's Chagas disease and the neurofibromatosis, fibrous dysplasia or Proteus syndrome of John Merrick, the Elephant man, could be explored. Tuberculosis has purposely not been discussed, as this would warrant a separate article in its own right. Finally, in modern times any article of this nature would be incomplete without at least mentioning the HIV virus and the consequent disease which has sometimes dramatically affected the lives of many contemporary and notable people.

Footnote: *Dr Chapeikin was invited to submit this article following a departmental presentation on the topic.*

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