

Head wounds and the Red Book of Hergest



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HEAD WOUNDS AND THE RED BOOK OF HERGEST¹

ABSTRACT

At the beginning of the text traditionally associated with the *Meddygon Myddfai* ('the Physicians of Myddfai') in the Red Book of Hergest (Oxford, Jesus College MS 111, c. 1400), there is a section concerning the disease and injury of the head and their treatment. Using my knowledge and experience of the medical principles in neurology, from practice as a consultant clinical neurologist and professor of clinical neurology, I will explore this passage as evidence of the treatment of head wounds and head injury in medieval Wales. The comparative texts in the two other medical manuscripts, London, BL Add. 14912 and Oxford, Bodleian Rawlinson B. 467, will be explored in parallel and differences included in the discussion. I will outline the details of trepanation, as practised by these physicians, at that time.

INTRODUCTION

FOLLOWING THE ROMAN PERIOD and until the end of the Middle Ages, there was a general belief in Britain and Europe that most afflictions affecting the mind or nerves, for example madness, epilepsy and paralysis, could be attributed to poor attention to and care of the 'soul' in religious terms. The treatment of such conditions required strict religious measures, including prayers and charms, and sometimes the removal of a demon or spirit that was causing them. There are reports of such treatments in the archives of hospitals and sanctuaries in Britain from the twelfth century onwards.² However, recent social-anthropological discussion and more rigorous studies of medieval culture and religion have cast doubt on this simple medico-religious view and have expanded horizons towards a more spiritual religious concept embedded in the social and cultural beliefs of the time.

For the early medieval period, Meg Leja has considered the limitations of human intervention for the health of the body in the ninth-century Carolingian Empire.³ Early medieval medicine had been classified as superstitious and a

¹ Acknowledgements are due to Professor Peredur Lynch, School of Welsh and Celtic Studies at Bangor University, for his learned advice on translations from Middle Welsh, and also to Professor Ann Parry Owen, Centre for Advanced Welsh and Celtic Studies at Aberystwyth University, for advice on content and presentation of this article.

² Basil Clarke, 'St. Bartholomew's, London: a twelfth-century series', in his *Mental Disorder in Earlier Britain: Exploratory Studies* (Cardiff, 1975), 143–51.

³ Meg Leja, *Embodying the Soul: Medicine and Religion in Carolingian Europe*, The Middle Ages Series (Pennsylvania, 2022).

deterioration of the more rational Greco-Roman tradition. However, Leja has argued that Carolingian scholars debated the value of Hippocratic knowledge in the context of efforts to define Christian orthodoxy led by Charlemagne and his successors. From pagan origins with links to magic, medical knowledge became classified as a sacred art. The body and soul gained virtue by working together harmoniously. For the later medieval period, Carole Rawcliffe has addressed how the 'medical profession', including physicians, surgeons and apothecaries, were able to function faced with high mortality, widespread disease and continuing difficulties with public health.⁴ The alternatives available to the patient ranged from 'society doctors' to wise women, quacks and hospitals for the sick and poor. The man on the street was often critical of, and sometimes hostile to, the medical theories and practices at that time.

Certainly, these concepts can be readily applied to the general population and social community in medieval times and to some extent they are likely to have influenced the medical profession. Here I have tried to strike a balance between the older, more rigid medical dogma and the more recent, more attractive view of concepts relating to medieval medicine raised by important social and cultural studies.⁵

Most medical concepts in medieval Britain and Europe were based on the theories of the four humours, following the Greek physicians Hippocrates (c. 460 BC–370 BC) and Galen (AD 129–216).⁶ However, it is clear that when reviewing the mental and neurological conditions of mania, melancholy, epilepsy and paralysis, the role of the four humours in these conditions and their treatment was not very rational and was inconsistent.⁷ It is apparent that traumatic head injury, which would frequently have been treated by procedures such as trepanation, was not considered to be a direct disturbance of the four humours. It is interesting that from archaeological studies of exhumed skeletal remains in late medieval Europe, the majority of identifiable death wounds were to the head rather than the torso, emphasizing the high frequency of traumatic head injury in medieval society.⁸

In this article I have focused on a dedicated translation of the Middle Welsh text on head wounds and head injury in the Red Book of Hergest from a predominantly linguistic and literary perspective, and have explored this in parallel with the comparative text in the two other medical manuscripts, London BL

⁴Carole Rawcliffe, *Medicine and Society in Later Medieval England* (Stroud, 1995).

⁵Luke Demaitre, *Medieval Medicine: The Art of Healing, from Head to Toe* (Santa Barbara, California, 2013); Larissa Tracey and Kelly DeVries (eds), *Wounds and Wound Repair in Medieval Culture* (Leiden, 2015).

⁶Demaitre, *Medieval Medicine*, 1–34 ('Learning to heal').

⁷Demaitre, *Medieval Medicine*, 111–52 ('Head problems, from hair loss to epilepsy').

⁸Robert C. Woosnam-Savage and Kelly DeVries, 'Battle trauma in medieval warfare: wounds, weapons and armor', in Tracey and DeVries, *Wounds and Wound Repair*, 27–56; M. R. Geldof, '“And to describe the shapes of the dead”: making sense of the archaeology of armed violence', in Tracey and DeVries, *Wounds and Wound Repair*, 57–80.

Add. 14912 and Oxford Bodleian Rawlinson B. 467. I have previously presented and discussed in detail the wider archaeological findings on trepanation in medieval Britain and in particular Celtic Europe.⁹

MEDDYGON MYDDFAI

Medical practice in medieval Wales was very different to that of modern times. Fortunately a Welsh medical treatise, traditionally associated with the Physicians of Myddfai,¹⁰ a family of doctors from near Llandovery in Carmarthenshire, has been preserved in medieval Welsh manuscripts, which provides an important window on the medical practice of these medieval physicians.¹¹ The treatise opens with an introductory paragraph associating the physicians with Rhys Gryg, the fourth son of the Lord Rhys of Deheubarth, who died in 1234:

Ri6allawn uedic a'e ueibon, nyt amgen: Kad6ga6n a Gruffud ac Eina6n ... 6ynt a oedynt oreu a phennaf o'r meddygon yn eu hamser h6y ac yn amser Rys Gryc eu hargl6yd ac argl6yd Dinef6r.¹²

'The physician Rhiwallon and his sons, namely Cadwgan, Gruffudd and Einion ... they were the best and foremost physicians in their time and in the time of Rhys Gryg, their lord and the lord of Dinefwr'.

It seems likely, therefore, that these physicians practised in the first half of the thirteenth-century; however, the four earliest manuscripts associated with them date from the fourteenth and fifteenth centuries, namely London, BL Add. 14912 (14th/15th centuries); Cardiff 3.242 [= Hafod 16] (14th/15th centuries); Oxford, Bodleian Rawlinson B. 467 (14th/15th centuries) [henceforth, Rawl. B. 467]; and the Red Book of Hergest (1382 × c. 1405) [henceforth, the Red Book].¹³ Both the Red Book and BL Add. 14912 attribute the text to the Physicians of Myddfai.

Two important translations of the 'Meddygon Myddfai' were produced before the advent of modern Welsh linguistic scholarship and lexicography.

⁹Clive Hawkins, 'Trepanation in medieval Wales', *Carmarthenshire Antiquary* 58 (2022), 5–14.

¹⁰As Diana Luft notes in her *Medieval Welsh Medical Texts. Volume One: The Recipes* (Cardiff: University of Wales Press, 2020) [henceforth *MWMT*], 9, 'In reality, Morfydd Owen demonstrated long ago that the way the texts have been presented in these editions is misleading: there is no single text called *Meddygon Myddfai*, except insofar as the copies of RBH have become reified as such a text'; and see further *MWMT* 45, n. 26.

¹¹Morfydd E. Owen, 'The medical books of medieval Wales and the Physicians of Myddfai', *Carmarthenshire Antiquary* 31 (1995), 34–83; Morfydd E. Owen, 'The prose of the *cywydd* period', in A. O. H. Jarman and G. R. Hughes (eds), *A Guide to Welsh Literature 1282–c. 1550. Volume II*, revised by Dafydd Johnston (Cardiff, 1997), 314–50.

¹²Red Book, fol. 231r.

¹³For a comprehensive description of all four manuscripts, see Daniel Huws, *A Repertory of Welsh Manuscripts and Scribes, c.800–c.1800* (Aberystwyth: National Library of Wales and The Centre for Advanced Welsh and Celtic Studies, 2022), Vol. I, 563–4 (Cardiff 3.242); 615 (BL Add. 14912); 729 (Rawl. B. 467); and 741–2 (Jesus 111).

The first is a translation into English by the physician John Pughe, also known as ‘Ioan ab Hu Feddyg’, in his *The Physicians of Myddvai* (1861).¹⁴ The second is a translation into French by Pol Diverres, *Le Plus ançien texte de Meddygon Myddveu* (Paris, 1913), which generally accords better with my own interpretation of the text.¹⁵ More recently Diana Luft published her comprehensive volume, *Medieval Welsh Medical Texts, Volume One: The Recipes*.¹⁶ This comprises a major review of the vast number of herbal remedies for different conditions, which Luft calls ‘recipes’. A major emphasis of Luft’s work is the categorization of the different herbs, plants and other compounds used in medieval Welsh medicine. Luft collected the different recipes into ten ‘books’, mainly following the pattern of recipes in BL Add. 14912, which is also reflected in part by Rawl. B. 467, and to a lesser degree by Cardiff 3.242, but not so much by the Red Book. This pattern seems to present quite an amorphous collection of recipes, but it is thought to reflect more accurately their order in the original manuscripts, and is thought to have been written for practising physicians and added to cumulatively over time.¹⁷

The Red Book was chosen as the lead text in this article for translation and discussion of the material in the medical manuscripts addressing head wounds and head injury, because it was noted by Luft that the Red Book text had been the most frequently edited with word changes to improve accuracy by the established scribe, Hywel Fychan of Builth. Many of the recipes are presented in the Red Book in a more polished, more readable way, resulting in a version which was easier to understand, with some grouping of recipes to treat similar medical conditions, making the medical treatments more accessible.¹⁸ Luft has noted that there were corrections of mistakes in the Red Book which remain uncorrected in the other two medical manuscripts, BL Add. 14912 and Rawl B. 467, addressing the same comparable subject matter. For example, in the section on the four fevers, it was written that fever originated from the head in BL Add. 14912 and Rawl. B. 467, but generally in medieval medicine, fever was thought to come from the lungs and heart. In the Red Book this was corrected to a statement that fever comes in the summer, because generally fever was thought to be more common in the heat of the summer.¹⁹ A second example comes from the text under consideration in this article, from the section on payment to the physician for treatment of serious wounds to the head, brain and body. In the Red Book, the text on payment to the physician was corrected to refer to ‘the

¹⁴ John Pughe and Rev. J. Williams, *The Physicians of Myddvai* (Llandovery, 1861), available online at <http://hdl.handle.net/10107/4987119>. On John Pughe, see Idwal Lewis (1959), ‘Pughe, John Ioan ab Hu Feddyg (1814–1874), physician and littérateur’, *Dictionary of Welsh Biography*, <https://biography.wales/article/s-PUGH-JOH-1814>, accessed 5 December 2022.

¹⁵ P. Diverres, *Le Plus ançien texte de Meddygon Myddveu* (Paris, 1913). On Pol Diverres, see William Llewelyn Davies (2001), ‘Diverres, Pol (1880–1946), linguist, Celtic scholar, and sometime Keeper of manuscripts in the National Library of Wales’, *Dictionary of Welsh Biography*, <https://biography.wales/article/s2-DIVE-POL-1880>, accessed 5 December 2022.

¹⁶ *MWMT*.

¹⁷ *MWMT* 11–18.

¹⁸ *MWMT* 11–18.

¹⁹ *MWMT* 15–16.

physician's due', in other words the payment that was due to the physician for treatment, rather than the incorrect versions referring to 'the physician's honour' seen in the other two texts, which erroneously relates to the status of the physician.²⁰

In addition, there have been two previous translations of the text in the Red Book from Middle Welsh to English or French, the first by a surgeon (John Pughe) and the second by a medically trained historian and linguist (Pol Diverres), as discussed previously. Although Pughe's translation is over 150 years old and Diverres's thesis over 100 years old, as dedicated translations by medically trained professionals, there is the potential that their translations of specific medical words could help. The knowledge of the vocabulary used by past surgeons and physicians in the Victorian era or early twentieth century might shed light on points of uncertainty in translation not helped by *GPC* or the wider medieval medical literature. There have been no previous medical translations from Middle Welsh to English or French of the comparative text in BL Add. 14912 or Rawl B. 467, to allow a direct comparison. However, it could be equally argued that the possibly more rudimentary, less edited versions in BL Add. 14912 and Rawl. B. 467 could include material at times more relevant to the physicians' practice, on the assumption that these texts were the work of physicians themselves imparting knowledge to each other in a more direct, less edited form. Thus, it was of utmost importance that the comparative text in BL Add. 14912 should be explored in detail in parallel with the Red Book. This comparative text in BL Add. 14912 has been presented and annotated in detail by Luft,²¹ and thus I have studied this in detail and Luft's translation has been compared to the Red Book. In addition, the comparative text of Rawl. B. 467, although very similar to BL Add. 14912, has been studied and compared to the Red Book. There were two instances in the text presented in this article where an additional phrase in BL Add. 14912 contributed to the further understanding of the text in the Red Book, and one instance where a key word in Rawl. B. 467 potentially made a major difference to our understanding. This related to the medieval physician's perception of the underlying disease process resulting from head trauma and requiring trepanation. These are discussed in detail in the section following the edition below.

THE TEXT: *CLEFYDAU'R PEN* ('HEAD WOUNDS')

The Red Book of Hergest version of the *Meddygon Myddfai* text, found on fols 231r–238v (cols 928–59), was written around the turn of the fifteenth century by the professional scribe Hywel Fychan of Builth, who contributed the manuscript's main hand.²² Hywel Fychan was working under commission for his

²⁰*MWMT* 16.

²¹*MWMT* 82–7.

²²Oxford, Jesus College MS 111 [= RBH], can be accessed online at <https://digital.bodleian.ox.ac.uk/objects/9bf187bf-f862-4453-bc4f-851f6d3948af/>.

patron Hopcyn ap Tomas of Ynysforgan, near Swansea, and the Red Book is a huge compendium of a variety of prose and poetry texts in Middle Welsh.²³

In his introduction to the text, the author of the treatise states that the physicians had their knowledge (*kywreïnryd*) written down so as to ensure that there would not be any physician that did not have the same understanding as themselves (*rac na bei a wpei gystal ac a wydynt h6y g6edy 6y*).²⁴ Then, giving the principal place to the head where the five senses are located, the treatise begins with a short section discussing head wounds and their treatment.

I have divided the text into numbered sections, which are translated into modern English and then discussed below. The manuscript's original orthography has been retained, and punctuation and capital letters have been added as necessary, and words that were written together in the manuscript have been separated when necessary. I have also transliterated the original Middle Welsh into modern Welsh orthography (shown in italics).

Red Book of Hergest, fol. 231r (col. 928, l. 23–929, l. 11)

- | | |
|---|--|
| <p>§1 Ac o'r peth pennaf a chyntaf o'r a
ffurueid6ys Du6 o gorff dyn: y penn
y6 h6nn6, kany's ynda6 y mae y
pump synn6yr corff.
<i>'Ac o'r peth pennaf a chyntaf ar a
ffurfeiddwys Duw o gorff dyn: y pen
yw hwnnw, canys ynddaw y mae y
pump synnwyr corff.'</i></p> | <p>And [starting] from the principal
and first thing that God formed of
man's body: that is the head,
because in it are the five corporeal
senses.</p> |
| <p>§2 Tri lle yn y penn y megir
cleuydeu: un y6 y tonn; eil y6 y
acreuan; trydyd y6 y greadur.
<i>'Tri lle yn y pen y megir clefydiau:
un yw y ton; ail yw y greuan;
trydydd yw y greadur.'</i></p> | <p>Three places in the head where
diseases are nurtured: one is the
scalp; the second is the skull; the
third is the meninges.</p> |
| <p>§3 O agori ar y penn hyt y creuan a
goll6ng y g6en6yn, y g6aredir y
greuan. O waet a llosceu y g6aredir
y tonn.
<i>'O agori ar y pen hyd y greuan a
gollwng y gwenwyn, y gwaredir y
greuan. O waed a llogau y
gwaredir y ton.'</i></p> | <p>By cutting open the head through to
the skull and releasing the poison,
the skull is healed. It is by means of
blood and cauterizations that the
scalp is healed.</p> |

²³For a comprehensive study of the Red Book of Hergest, see Daniel Huws, *Llyfr Coch Hergest*, in Iestyn Daniel, Marged Haycock, Dafydd Johnston and Jenny Rowland (eds), *Cyfoeth y Testun: Ysgrifau ar Lenyddiaeth Gymraeg yr Oesoedd Canol* (Caerdydd: Gwasg Prifysgol Cymru, 2003), 1–30. On Hywel Fychan as the scribe in the Red Book, see 12–18.

²⁴Red Book fol. 231r.

- §4 O agori ar [*ben hyd*] y greadur ac yna kymryt y deuparth o'r danhogen a'r trayan o'r violet, ac emenyn hallt ac eu maedu ygyt, a'e dodi 6rtha6; a hynny a diwenn6yna y greadur o'r kyuyt llit a g6en6yn yndi.
'O agori ar y greadur ac yna cymryd y deuparth o'r ddanhogen a'r traean o'r fioled, ac ymenyn hallt, ac eu maeddu ynghyd, a'u dodi wrthaw, a hynny a ddiwenwynna y greadur o'r cyfyd llid a gwenwyn ynddi.'
- By cutting open [the head to] the dura mater and then taking two thirds of betony and the third of violet, and salted butter and pounding them together and applying them onto it; and that will remove the poison from the dura mater if inflammation and poison arise in it.
- §5 O'r pan agorer ar y tonn hyt ympenn y na6uet dyd y byd y 6isc ar y asc6rn; sef y g6neir hynny o hen gleuyt penn.
'O'r pan agorir ar y ton hyd ym mhen y nawfed dydd y bydd y wisg ar y asgwrn; sef y gwneir hynny o hen glefyd pen.'
- From when the scalp is opened until the end of the ninth day, the dressing will remain on the bone; namely, this is done for longstanding disease of the head.
- §6 O dyrna6t newyd neu urath newyd ar y penn, goreu y6 bo kyntaf y diotter, rac dyg6yda6 g6aet ar y greadur a'e uer6i yno.
'O ddyrnawd newydd neu frath newydd ar y pen, gorau yw bo cyntaf y'i dioter, rhag dygwyddaw gwaed ar y greadur, a'i ferwi yno.'
- For a new blow or new wound on the head, the sooner it is removed the better, lest blood fall onto the dura mater and it congeals there.

- §7 O'r pann diotter yr ascôrn y ar y
greadur, kymryt y uiolet ac emenyn
gôryr a'e maedu ygyt, ac ony
cheffir y uiolet, kymryt gôynn ôy a
llin ac eu maedu ygyt, neu emenyn
gôryr a llin ac eu dodî ôrthaô yn y
donneuher; ac yna gôneuthur eli ô
lysseu ac emenyn a gôer, ac eu dodî
ôrthaô yny ôô iach.
*'O'r pan dioter yr asgwrn i ar y
greadur, cymryd y fioled ac ymenyn
gwyrî a'u maeddu ynghyd, ac onî
cheffir y fioled cymryd gwyn wy a
llin, ac eu maeddu ynghyd, neu
ymenyn gwyrî a llin, ac eu dodî
wrthaw yni deneuer; ac yna
gwneuthur eli ô lysiau ac ymenyn a
gwêr, ac eu dodî wrthaw yni fo
iach.'*
- §8 Punt yw dylyet y medic ô'r gôeith
hônno yn y trugared heb y ymborth
neu naô ugeint a'e ymborth.
*'Punt yw dylyed y meddyg ô'r
gwaith hwnnw yn ei drugaredd heb
ei ymborth, neu naw ugaint â'i
ymborth.'*
- From when the bone is removed
from over the dura mater, take
violet and unsalted butter and
pound them together, and if violet is
not obtained, take egg white and
linseed and pound them together, or
unsalted butter and linseed and
apply them on it until it becomes a
thin layer; and then make an
ointment of herbs and butter and
tallow, and apply them to it until it
is healed.
- The physician's due is a pound for
that work in mercy, excluding food,
or nine score including food.

Commentary

§2. There are three places in the head from which disease can originate: *tonn*, *acreuan* and *creadur*. *Tonn* is translated by John Pughe as 'pericranium',²⁵ which in modern medical terminology refers to the periosteum, the outer fibrous membrane of the bone, i.e. the outer membrane of the skull in this case, comprising vascular and connective tissue. *Geiriadur Prifysgol Cymru* [henceforth *GPC*] lists this instance under *ton*² 'skin, rind, crust', &c., a meaning that is now obsolete in Modern Welsh. The text is describing the scalp and subcutaneous tissue. *Acreuan* seems to be a variant on, or a mistake for *creuan*, *GPC* 'skull, cranium'. *Creadur* refers to the meninges, and could refer to the outer covering of the brain, the dura mater; the middle layer, arachnoid mater; or the inner covering, pia mater (*GPC* *crefadur*, *creadur*³). It probably refers to the outer meningeal covering, dura mater, here, as Pughe suggested,²⁶ or to a combination of the three layers of the meninges.

²⁵Pughe and Williams, *Physicians of Myddvai*, 37.

²⁶Pughe and Williams, *Physicians of Myddvai*, 38.

The Irish translation of Guy de Chauliac's (c. 1295–1368) treatise on anatomy is of interest for comparison. *Anathomia Gydo*, translated by Cormac Mac Duinnshléibhe (fl. c. 1459) and completed by the middle of the fifteenth century, represents an early Modern Irish version of the first two doctrines from Guy de Chauliac's *De anathomia*, which is the opening treatise of *Inventarium sive Chirurgia Magna*. Guy de Chauliac was from southern France and studied at three of the most prestigious medical institutes in Europe – Toulouse, Montpellier and Bologna. His *Chirurgia Magna* is one of the most regarded surgical documents from the fourteenth century.²⁷ The anatomy of the inner membranes of the head is described. The first to be encountered are the dura mater and pia mater. It was considered that these were two venous panicles – one towards the head ('my personal interpretation is that this is referring to the dura mater') and the other towards the brain surrounding and covering it ('my personal interpretation is that this is referring to the pia mater'). It was considered that from the dura mater through the sutures of the head ('the sutures refer to joins in the skull bones'), the membrane originated that covered the skull externally, which was named the pericranium. It was from the pia mater that nourishment of the brain was distributed.²⁸

§§3–4. To preserve the skull, an incision is made in the scalp extending to the cranium (*creuan*), to allow the poison or venom (*gwenwyn*) to exit. The healing of the *tonn* is promoted *O waet a llosceu* 'by means of blood and burns'. *O waet* could refer to phlebotomy, the taking of blood or bloodletting, but is more likely to refer to the blood from the wound providing clotting factors to help stop bleeding; blood can also provide white cells and antibodies to help control infection. *Llosceu* 'burns' is likely to refer to a form of cauterization by heat and burning of tissue to stop blood vessels bleeding.²⁹ For the use of the verb *gwaredu* (here in the present tense impersonal *gwaredir*) in the sense of 'to better, mend, cure', &c., see *GPC gwaredaf*: *gwaredu*.

In the BL Add. 14912 version of this text there is an additional sentence referring to the dura mater here, which is not included in the Red Book text: *O agori ar ben hyd gryadur y gwaredir y gryadur*. In Luft's edition of the text, this is translated as 'The dura mater is treated by cutting the head down to the dura mater', and it explains that 'The scribe of RBH made an eye-jump between two instances of the word *greadur* and wrongly left out the end of the passage.'³⁰ This makes interpretation of the Red Book text more rational, and thus *O agori ar y greadur* has been amended to *O agori ar ben hyd y greadur* and translated as 'By cutting open the head to the dura mater' by inserting the

²⁷Eithne Ní Ghallchobhair (ed.), *Anathomia Gydo*, ITS 66 (2014), 1–2.

²⁸Ní Ghallchobhair, *Anathomia Gydo*, 67.

²⁹Cauterization was used in ancient times: in Egypt as witnessed by the 'Edwin Smith papyrus'; in Greece from the Hippocratic Corpus; and in China, advised by the 'Su Wen'. Ancient implements ranged from metal lancets to cauterizing knives, heated over fire to apply extreme temperatures to the wound, at the expense of the tissue. See Madeleine Perner Cosman and Linda Gale Jones, 'Cauterization, medicine in Europe', in their *Handbook to Life in the Medieval World*, 3 vols (New York, 2008), ii, 497. It is likely that similar methods were used in medieval Wales.

³⁰*MWMT* 85, n. ix.

missing '*ben hyd*' in square brackets in the Red Book text, as seen in BL Add. 14912. This makes the phrase more appropriate as a preface to the subsequent section referring solely to the *dura mater*. This comprises cutting open to the *dura mater*, instructions on the application of betony, violet and salted butter to it, and how this removes poison from it. It is of interest that from Luft's comprehensive review, in further notes on the Recipes, betony was thought to be good for all wounds. Betony was thought to draw bones from a wound, and violet was recommended to treat inflammation due to its cold and wet nature.³¹ However, there is no evidence to support this usefulness from modern medical science.

§5. Once the application had been placed on the wound, it should be left in place for nine days. Following *ascórn*, the BL Add. 14912 version of the text has an additional phrase which reads *ac o pen y pymhettyd y gilidd y nedir yr ascwrn hyny diotter oll*, which Luft translates as 'and from the end of the same time on the fifteenth day, the bone will be shaped until it is all removed'.³² If this clause were to be included in the Red Book text, then the last phrase, *sef y gvneir hynny o hen gleuyd penn* ('namely, that is done for longstanding disease of the head') would make better medical sense, referring to the shaping and removal of the skull bone as late as the fifteenth day.

The author is here describing the practice of 'trepanation', which is the making of a hole in the skull, usually following head trauma, to prevent the pressure effect of blood under the skull compressing the brain. Presumably, the phrase quoted above from BL Add. 14912 suggests that the hole made in the skull as part of trepanation is revised to make sure that any bone fragments from the procedure are removed and the edges of the hole are clean, in order to prevent closure of the hole by rapid healing. This is because maintenance of an escape hole for potential development of haematoma, which may compress the brain and cause death, is vitally important to allow the release of blood through the hole. If the skull heals too rapidly and becomes sealed, the trepanation has failed.

§6. The sooner the mixture is applied to the wound the better the outcome following a blow or wound to the head, in case there should be *dyg6yda6 g6aet* (literally the 'falling of blood', sensibly translated as 'extravasated blood upon the *dura mater*' by Pughe)³³ and *a'e uer6i*. The verb *uer6i* here could be the lenited form of either 1. *berwi* 'boil, seethe', 'to become hot' (? through inflammation); or 2. *merwi*, a variant form of the verbal noun *marw* 'to die'.³⁴ Pughe translates *a'e uer6i yno* as 'that it should become concocted there' and thus it is uncertain which of the two, *berwi* or *merwi*, he is favouring by using the term 'concocted'.³⁵ However, it seems reasonably clear that he was referring to *berwi*

³¹ *MWMT* 349, 350 3/3.

³² *MWMT* 84–5.

³³ Pughe and Williams, *Physicians of Myddvai*, 38.

³⁴ See *GPC* s.v. *berwaf*: *berwi* and *marwaf*: *marw*², *merwi*.

³⁵ Pughe and Williams, *Physicians of Myddvai*, 2, 38.

because the root of the word concoct is the latin word *coquo* meaning cook or boil, and so concoct has the meaning of cooking or boiling together. Luft favours the former, *berwi*, as shown in the corresponding phrase in BL Add. 14912, which she translates as ‘in case ... inflammation should occur there’.³⁶ It is quite possible, however, in this context, to suggest that the verb *merwi* ‘to die’ could give better sense: the blood has extravasated from the circulation, is no longer oxygenated, and is therefore ‘dying’ or ‘dead’, in other words it is ‘congealed’, ‘coagulated’ or ‘clotted’ in situ. This is also the sense understood by Pol Diverres who translates *a’e uervi yno* as ‘et ... s’y coagule’ meaning ‘clotted’ (although it is unclear whether he takes *uerwi* as the lenited form of *berwi* or *merwi*).³⁷ Diverres also explains the reference in the next sentence to the procedure of removing the bone to expose the dura mater (*O’r pan diotter yr ascorn y ar y greadur*) as an ‘Allusion à la Trépanation’.³⁸ It may seem quite a jump in translation from the linguistic point of view to relate ‘dying or dead’ to ‘coagulation or clotting’, but from medical understanding the relationship between death and blood clotting is a close link. Clotting of blood is an immediate consequence of death. It is of interest that from the medieval poetry of Wirnt von Grafenberg’s popular Arthurian romance, ‘Wigalois’ (c. 1210), ‘bleeding’ was related to ‘dying’ and the internal blood of the body was compared to life, whereas the shed or external blood outside the body was considered dying or dead, equating loss of blood to death.³⁹ This may explain the concept of extravasating blood as dying or dead. In medieval medical literature from Britain and Europe, the term ‘frenesis’ referred to brain infection which was thought to be caused by vapours rising from the diaphragm, causing a hot abscess in the brain membrane due to putrefied yellow bile or boiling blood. Thus, ‘boiling blood’ was recognized in the context of brain infection but not when referring to bleeding outside the brain, with extravasated blood.⁴⁰

The BL Add. 14912 version of this section, as used by Luft,⁴¹ differs slightly from the Red Book version. There the sentence corresponding to §6 reads: *dyrnawt newyd neu vrath newyd, goreu bo gyntafy diotter rac dygyddaw gwaet ac yssic a berwi yno*, which Luft translates as ‘for a fresh cut or a fresh wound, the sooner it is removed the better, in case blood and bruising and inflammation should occur there’. For *a berwi*, the manuscript reading in BL Add. 14921 is *ab erwi*, with an obvious misdivision of the elements; Rawl. B. 467, fol. 17v has *y hwerwi*, which Luft translates as ‘to become inflamed’, taking *hwerwi* to be a southern variant of the more usual *chwerwi*.⁴² Should the initial *h-* have been dropped, as can occur, to give *werwi*, that form, perhaps written as *berwi*, could have been confused with *uerwi* ‘ferwi’. Although *GPC* does not include

³⁶MWMT 84.

³⁷Diverres, *Le Plus ancien texte de Meddygon Myddveu*, 10, 11.

³⁸Diverres, *Le Plus ancien texte de Meddygon Myddveu*, 10 and 11, n. 1.

³⁹Bettina Bildhauer, *Medieval Blood* (Cardiff, 2006), 68.

⁴⁰Demaitre, *Medieval Medicine*, 133–4.

⁴¹MWMT 85.

⁴²For *chwerwi* ‘be inflamed’, see *GPC* s.v. *chwerwaf*: *chwerwi*; D. Simon Evans, ‘The Consonants’ in *A Grammar of Middle Welsh* (Dublin, 1964), 11.

the sense ‘to inflame’ for *berwi*, some of the examples quoted there do suggest that the verb could be used for blood, or for parts of the body that become hot, and presumably the heat might be caused by inflammation.⁴³ Alternatively, ‘boiling’ or heat in this context could lead to or relate to ‘congealed’ or ‘coagulated’ blood rather than the need to invoke ‘inflammation’. Luft gives the Red Book reading (*rac dygwydaw gwaet ar y greadur a’e uerwi yno*) as a variant of her BL Add. 14912 version, and translates it as ‘in case blood should fall onto the dura mater and inflame it there’.⁴⁴ The lenited verb (*uerwi*) suggests that the preceding infixed pronoun ‘*e*’ refers to the masculine noun *gwaet* rather than to *y greadur*, which is feminine. Thus, if Luft is correct about the sense ‘inflame’, the Red Book phrase would appear to mean ‘to inflame the blood’ or ‘inflamed blood’ rather than ‘in case the blood might fall on the dura mater and inflame it’. The concept of ‘to inflame blood’ or ‘inflamed blood’, having extravasated from the circulation and thus deoxygenated and dying or dead upon the dura mater, does not, however, readily make sense in medical context from our understanding of the known pathophysiology of blood. The alternative would be that *berwi* is acting as an intransitive verb in this sentence, which it can do, and the pronoun is acting as its subject. However, whichever is the case, in the context of trepanation, the major concern after head injury, with or without skull fracture, would be falling or extravasated blood on the dura mater which would become congealed or coagulated as a clot under the skull. This could then compress the brain beneath the intact skull, and the primary purpose of opening the skull and exposing the dura mater would be to prevent the blood clot compressing the brain and causing death. Thus, on balance, it seems that the Red Book’s *uerwi* as a lenited form of *merwi* makes better sense, implying congealed or clotted blood as a result of ‘blood dying’ on the dura mater following deoxygenation, having extravasated from injured or ruptured blood vessels following trauma. I would interpret this section as meaning that by making a hole in the skull, exposing the dura mater and applying the mixture to the dura mater, this may prevent the possibility of haematoma (coagulated or congealed ‘blood clot’) developing.

§7. In this section on making a paste, *yn y donneuher* has been translated as ‘becoming a thin layer’, on the basis of the verb *teneuo*, but this does not explain the ‘*o*’ or the ‘*nn*’ of *donneuher* in the Red Book text or in BL Add. 14912. Luft has considered *tonneuher* as a verb based on the noun *ton*, meaning skin, and thus she has translated *tonneuher* as ‘to form a skin’. This followed discussion with Dafydd Johnston.⁴⁵ John Pughe translated *yn y donneuher* as ‘until [the

⁴³Examples such as *gwaed yn berwi* tend to be figurative, referring to an emotional state; but *Mae ’nhraed i’n berwi* (section c), refer to feet that have become hot, and presumably the heat might be caused by inflammation.

⁴⁴*MWMT* 85, n. xvii.

⁴⁵*MWMT* 87 and 318, n. 77.

pain is] assuaged'.⁴⁶ Pol Diverres considered that *yn y donneuher* would translate as '*jusqu'à ce qu'elle se cicatrise*',⁴⁷ which translates into English as 'until it forms a scab'.

§8. The Demetian Code (Blegywryd) of the Welsh Laws states that for the treatment of three types of serious wounds, all with poor prognosis, namely 'a stroke to the head unto the brain; a stroke to the body unto the bowel; the breaking of one of the four limbs of a man's body' (*torri penn dyn hyt yr emenyd, neu vrathu dyn yn y arch hyt y keu, neu torri vn o'r petuar post corff dyn*), the court physician could claim 'one pound without victuals, or nine score pence with victuals' (*y keiff ef punt heb y vuyt, neu naw vgeint a'e ymborth*) as well as his 'bloody clothes' (*y dillat creulyt*).⁴⁸ The court physician had to treat other officers of the court for free except that he received any bloody clothes they were wearing. The exception to this was for the three deadly wounds, for which he received wages.

TREPANATION

Trepanation, in the form of making a hole in a person's skull, has been a relatively frequent practice as identified from available skulls in prehistoric times to modern day, in Britain and Europe, and similarly in relatively diverse civilizations across the world.⁴⁹ For example, in nearly all the regions of the Peruvian Andes, dating from 400 BC to the Late Horizon AD 1470–1532, it is estimated that there were signs of healing with survival following trepanation in the later period of the Inca civilization in over 70 per cent of cases.⁵⁰ It seems that in different civilizations from prehistory to post-medieval that there was frequently an association between head trauma, skull fracture and the site of trepanation.⁵¹

Of the trepanations in medieval Britain, Roberts and Cox reported that in the early medieval period (AD 410–1050), twenty three of the trepanations were recorded in England, the majority from East Anglia, and one was from Fife, Scotland; nineteen were male skulls, nineteen were healed, meaning that the person survived the procedure, and eighteen were performed by the scraping method.⁵² This method, which was the most commonly performed method at

⁴⁶Pughe and Williams, *Physicians of Myddvai*, 2 and 38.

⁴⁷Diverres, *Le Plus ancien texte de Meddygon Myddveu*, 10–11.

⁴⁸Stephen J. Williams and J. Enoch Powell, *Llyfr Blegywryd* (Caerdydd, 1961), 26. See further, Meinir Harris, 'Compensation for injury: a point of contact between early Welsh and Germanic law?', in T. G. Watkin (ed.), *The Trial of Dic Penderyn and Other Essays* (Cardiff, 2003), 39–76.

⁴⁹Charlotte Roberts and Margaret Cox, *Health and Disease in Britain: From Prehistory to the Present Day* (Stroud, Gloucestershire: Sutton Publishing Ltd., 2003), 59, 252.

⁵⁰John W. Verano, 'Trepanation in prehistoric South America: geographic and temporal trends over 2,000 years', in R. Arnott, S. Finger and C. U. M. Smith (eds), *Trepanation: History, Discovery, Theory* (Lisse, 2003), 223–36.

⁵¹Hawkins, 'Trepanation in medieval Wales', 7.

⁵²Charlotte Roberts and Margaret Cox, 'Health and disease in the early medieval period (c. 410–c. 1050AD)', in their *Health and Disease in Britain: From Prehistory to the Present Day* (Stroud, 2003), 164–220.

this time, involved scraping the skull down to the dura mater, the outer covering of the brain, probably with flint tools, and had a high survival rate.⁵³ Six further trepanations have been found from the late medieval period (AD 1050–1550), four from England and two from Dublin.⁵⁴ Four of these show evidence of healing, and thus the patients survived the procedure. In a detailed review of trepanation in Ireland, of 18 trepanations reported in the archaeological literature, all confirmed cases were described from the Historic period (from the early medieval period, beginning around AD 400, to the early modern period beginning in the first half of the sixteenth century). The most common site was the anterior part of the left parietal bone. The most common method of trepanation appeared to be the scraping method, with high rates of survival. In 12 cases, sufficient information was available to assess the extent of healing, and in 8 of these cases remodelling of skull bone was seen indicating that the individuals survived the procedure, although in at least one of these cases, it was thought that survival was only for a short period of time.⁵⁵

Besides the scraping method, drill-type devices have also been used, although with increased risk of damaging the brain, and possibly some were made of metal, such as iron, similar to those used by Hippocrates and Galen and their followers in ancient Greece and the Roman Empire.⁵⁶ As well as head trauma, it has been suggested that trepanation was performed in medieval Europe for other conditions, particularly epilepsy, mania and melancholy.⁵⁷ The *Meddygon Myddfai*, however, only describe head trauma as an indication for trepanation.

Before the advent of CT (Computed Tomography) scanning of the head in the 1980s, trepanation, or ‘burr hole’ surgery, was used routinely in modern times in the United Kingdom and other Western countries following severe head injury, with or without skull fracture. The purpose was to exclude or drain an extradural haematoma as a result of injury to blood vessels with bleeding under the skull, which could cause rapid compression of the brain from the haematoma and subsequent death. With the advent of CT scanning of the head, the presence or absence of extradural haematoma could be visualised on scan, reducing the need for emergency surgery.⁵⁸

CONCLUSION

The *Meddygon Myddfai* considered the head and related disorders of paramount importance, and their practice of trepanation to treat head injury was

⁵³Hawkins, ‘Trepanation in medieval Wales’, 7–9.

⁵⁴Roberts and Cox, ‘Health and disease’, 221–86.

⁵⁵Barra O Donnabhain, ‘Trepanations and pseudotrepanations: evidence of cranial surgery from prehistoric and early historic Ireland’, in R. Arnott, S. Finger and C. U. M. Smith (eds), *Trepanation: History, Discovery, Theory* (Lisse, 2003), 79–94.

⁵⁶Hawkins, ‘Trepanation in medieval Wales’, 7–9.

⁵⁷Charles G. Gross, ‘A hole in the head’, *Neuroscientist* 5 (1999), 263–9.

⁵⁸Hawkins, ‘Trepanation in medieval Wales’, 10–12.

given priority in the text associated with them in the Red Book of Hergest. Trepanation has been practised since prehistoric times in diverse populations for head trauma and skull fracture, to prevent or decompress extradural haematoma following damage to blood vessels causing haemorrhage under the skull. The technique, akin to ‘burr hole’ surgery in modern practice, has been described in detail in the Red Book, as it was applied in the practice of physicians in medieval Wales.

CLIVE HAWKINS

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