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THE SKULL AND BONES IN EGILS SAGA: A VIKING, A GRAVE, AND PAGET'S DISEASE

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by Jesse Byock

It is often said or implied that, in our profession, a man cannot be both practical and scientific; science and practice seem to some people to be incompatible. Each man, they say, must devote himself to the one or the other. The like of this has long been said, and it is sheer nonsense.

—*Sir James Paget*¹

As suggested by Sir James Paget, breaking the narrow confines of accepted views and expanding discourse are crucial stimuli for every discipline. Saga studies might profit from Paget's observations by taking scientific analysis into account, for despite the new awakening to the socio-historical and anthropological potentials of Iceland's medieval texts, the study of individual saga characters remains largely confined to the traditional analytic tools of literature and folklore. An excellent example is the current understanding of Egill Skalla-Grímsson, one of the sagas' most colorful heroes. Egill's behavior, poetry, and the saga's descriptions of this tenth-century Viking are today interpreted solely in literary and mythic terms.

Egill, as an instance of confined analysis, is indicative of the limitations accepted by a whole study. For over a hundred years the related questions of saga veracity and the oral or written origins of Icelandic narrative texts have been continually debated. The arguments have been driven by logic and scholarly creativity, but they are based in textual interpretation without the possibility of proof. Over the years the discourse, limited by the nature of its analytic tools, has often revolved around how well or how forcefully individual scholars have presented their views. The equation would change drastically if a new source of information were found.

This article explores the possibility of a new informational source and offers an accompanying methodological approach. It proposes that medical and archeological evidence radically changes previous perceptions about Egill, altering our understanding of this warrior's character, the interpretation of his poetry, and the historical accuracy of *Egils saga*. Such a change is possible because conflicting aspects of Egill's personality, which are attributed here to the progression of an illness,² have previously been almost exclusively interpreted along traditional lines—as literary dualism,

¹Stephen Paget, *Memoirs and Letters of Sir James Paget* (London 1901) 418-419.

²This hypothesis was first raised by Þórður Harðarson, in "Sjúkdómur Egils Skallagrímssonar" *Skírnir*

the tension arising from the narrative weaving of lightness and darkness (taken both literally and psychologically), and a willful exaggeration by a thirteenth-century author of earlier, tenth-century Viking heroism.

My intent in expanding the discourse by adding epidemiological information is to add a new dimension to our understanding of both saga figure and saga. Through the combination of historical, medical, and archeological analysis, we have the tools to perceive Egill as more than just a thirteenth-century literary invention. Rather, we see Egill as both a literary "dark figure" and an individual whose remarkably disfigured bones astonished his descendant Skapti Thórarinsson in the mid-twelfth century. Skapti's observation of Egill's remains, an extraordinarily well-documented incident of medieval archeology, is explored in this article.

EGILL—A CASE STUDY

Both a literary creation and a historical figure, Egill is an intriguing character about whom to raise the long perplexing question of saga veracity. For many of us, Egill is the most memorable Viking in the sagas. Fierce, self-willed, and violent, he is also a fine poet and a man with a sense of ethics. A wanderer, Egill epitomizes the Viking urge to travel out into the unknown world seeking adventure and fortune. With a combination of courage, brawn, and intelligence, this first-generation Icelander survives war and treachery as he journeys through Scandinavia, the Baltic lands, England, Saxony, and Friesland. Egill is most menacing during middle age and, despite the threat of death around him, survives until his eighties, dying among his kinsmen in Iceland shortly after the year 990.

For all Egill's heroic stature, however, there is something deeply troubling about his character as it is portrayed in the saga.³ Egill does not quite fit in, yet he should have. Born around 910 to a prominent Norwegian/Icelandic family, he was neither a foreigner nor a political or social outsider. Egill's problem was personal. Despite his prowess and his established social status, Egill's temperament as well as his physical appearance caused alarm; he is portrayed as a dark, ugly, brooding character. In pos-

158 (1984) 245-248, in which he suggests that Paget's disease be renamed "Egill's disease." Skia, a UCLA graduate student, wrote on this idea in a short paper for a course on the sagas. Next came J. L. Byock and Skia, "Disease and Archaeology in Egil's Saga: A First Look," forthcoming in *The Haskins Society Journal: Studies in Medieval History* 4 (1993). While researching this subject, I consulted with Dr. Harðarson, currently professor and head of medicine at the National University Hospital (Landsspítali) in Reykjavík and wish to thank him for his generous help and comments. I also thank Dr. Barbara Mills, professor at the Schools of Medicine and Dentistry at the University of Southern California and at the Orthopedic Hospital, and Dr. Frederick R. Singer, professor of medicine at the University of California, Los Angeles, director of the Bone Center at Cedars-Sinai Medical Center, and chairman of the board of the Paget's Disease Foundation. These two noted authorities on Paget's read a draft of this paper and made valuable suggestions. Thanks are also due to Helgi Þorláksson, Department of History at the University of Iceland, for commenting on the drafts and reviewing with me the cartographic and archeological information about the sites at Mosfell. Gunnar Karlsson, professor of medieval history at the University of Iceland, and Hermann Pálsson, professor of Old Norse at the University of Edinburgh, also read drafts of this article, and I am grateful for their many lucid suggestions.

³ The standard edition of *Egils saga Skalla-Grimssonar* is by Sigurður Nordal, Íslenzk fornrit 2 (Reykjavík 1933). The translations in this article are sometimes my own and sometimes from *Egils Saga*, trans. Hermann Pálsson and Paul Edwards (New York 1976).

sessing these troubling characteristics Egill resembles his father and grandfather; both are remembered in the saga as physically menacing and physiologically different from their otherwise fair and handsome kinsmen. This contrast, which made a deep impression on the medieval storyteller, has long been of interest to me.⁴ It suggests that the cause for alarm in Egill's case was more than simply a small, personal peculiarity.

Egill may have suffered from a disfiguring pathology called Paget's disease. This disease, which is perhaps hereditary or of viral provenance, may cause blindness in later life as well as progressive loss of hearing and balance. Egill suffered from all of these disabilities. According to the saga, "in old age, he found difficulty in moving, and both his sight and hearing began to fail him badly" (chap. 85).⁵

SAGA INFORMATION AND ITS INTERPRETATION

Although the oral heritage of some sagas is in doubt, it may be argued with much certainty that stories about Egill circulated long before *Egils saga* was written in the thirteenth century. Indeed, the saga itself provides evidence for such a view. In its final pages it tells a curious episode about some bones, purported to have been Egill's, which were moved in the first half of the twelfth century, that is, approximately 150 years after Egill's death. These events take place in southwestern Iceland, not far from present-day Reykjavík

When Christianity was adopted by law in Iceland, Grímr of Mosfell was baptized and built a church there. People say that Thórdís had Egill's bones moved to the church, and this is the evidence. When a church was built at Mosfell, the one Grímr had built at Hrisbrú was demonished and a new graveyard was laid out. Under the altar some human bones were found, much bigger than ordinary human bones, and people are confident that these were Egill's because of the stories told by old men.

Skapti Thórarinnsson the Priest, a man of great intelligence, was there at the time. He picked up Egill's skull and placed it on the fence of the churchyard. The skull was an exceptionally large one and its weight was even more remarkable. It was ridged all over like a scallop shell, and Skapti wanted to find out just how thick it was, so he picked up a heavy axe, swung it in one hand and struck as hard as he was able with the reverse side of the axe, trying to break the skull. But the skull neither broke nor dented on impact; it simply turned white at the point of impact, and from that anybody could guess that the skull wouldn't be easily cracked by small fry while it still had skin and flesh on it. Egill's bones were re-interred on the edge of the graveyard at Mosfell (chap. 86).

⁴ The light and dark aspects of Egill's character and their social implications are discussed in Jesse L. Byock, "Egill Skalla-Grímsson: The Dark Figure as Survivor in an Icelandic Saga," in *The Dark Figure in Medieval German and Germanic Literature*, ed. E. Haymes and S. Van D'Elzen, Göppinger Arbeiten zur Germanistik 448 (Göppingen 1986) 151-163. Pálsson and Edwards discuss the light and dark aspects of characters in *Egils Saga* in the introduction to their translation (n. 3 above) 7-17. Kaaren Grimstad considers the light/dark contrast in "The Giant as a Heroic Model: The Case of Egill and Starkaðr," *Scandinavian Studies* 48.3 (1976) 284-298. Lars Lönnroth contrasts the light and dark aspects of saga figures in terms of Christian metaphor: the blond figure is seen as good and Christian, whereas the dark figure is regarded as a problem for his society. He also stresses foreign influence on the sagas. See Lönnroth, "Rhetorical Persuasion in the Sagas," *Scandinavian Studies* 42.2 (1970) 157-189, esp. 167. See also idem, "Kroppen som själens spegel-ett motiv i de isländska sagorna," *Lychnos-Bibliotek* (Stockholm 1963-1964) 24-61.

⁵ Chapter references follow the Íslenzk fornrit edition.

(Þar var þá Skapti prestur Þórarinnsson, vitr maðr; hann tók upp hausinn Egils ok setti á kirkjugarðinn; var haussinn undarliga mikill, en hitt þótti þó meir frá líkendum, hvé þungur var; haussinn var allr bæróttur útan svá sem horpuskel. Þá vildi Skapti forvitnask um þykkleik haussins; tók hann þá handoxi vel mikla ok reiddi annatti hendi sem harðast ok laust hamrinum á hausinn ok vildi brjóta, en þar sem á kom, hvítnaði hann, en ekki dalaði né sprakk, ok má of slíku marka, at hauss sá mundi ekki auðskaddr fyrir hoggum smámennis, meðan svörðr ok hold fylgði. Bein Egils váru lögð niðr í útanverðum kirkjugarði at Mosfelli.)

It is impossible to ensure the accuracy of this story, but we do know something about Skapti Thórarinnsson. He is mentioned in several sources as a priest, and he may also have been a *goði* (a chieftain). We cannot say with certainty where he lived,⁶ but it is possible (and some, including Sigurður Nordal, have surmised) that he was the owner of the farm at Mosfell. Skapti is remembered in *The Saga of Þorgils and Hafliði* as a man worth quoting,⁷ and, according to *Prestatal*, a twelfth-century listing of wellborn priests, he was alive in 1143.⁸ Although it is not absolutely certain that the bones described are Egill's, the probability is high that they are. At Mosfell we are not dealing with the burial yard of a town, a small village, or even a farm site with a long history of habitation, and thus a large number of bones. Rather, Skapti was present at the moving of the remains of the major members of his family, resting in a small rural church that had been in use for only a few generations before being replaced.

According to the saga, at the time of his death Egill was living with Thórdís, daughter of his brother Thórólfr, and her husband Grímr.⁹ Iceland was still pagan, and so Egill was initially buried in a grave mound within sight of the farm.¹⁰ After Iceland converted to Christianity in the year 1000, Grímr, like many other landowners, was baptized and built a church on his property.¹¹ Thórdís, who then "had Egill moved

⁶ See genealogical table 13 in *Sturlunga saga 2*, ed. Jón Jóhannesson, Magnús Finnbogason, and Kristján Eldjárn (Reykjavík 1946), which guesses that Skapti may have been the father of the priest Helgi Skaptason from Saurbær on Kjalarnes. If so, Skapti may also have lived there. In any event, Saurbær is relatively close to Mosfell.

⁷ In that saga, Skapti, presented as a man who was involved in feuds, is credited with the famous statement: "Costly would be all of Hafliði, if this should be the price of each limb" ("Dýrr myndi Hafliði allr, of svá skyldi hverr limr"). The statement refers to the large sum demanded by Hafliði as compensation to assuage his honor for the loss of a finger during a dispute (*Þorgils saga ok Hafliða*, chap. 31, in *Sturlunga saga 1*).

⁸ "Nafnaskrá íslenskra presta," in *Diplomatarium Islandicum: Íslenskt fornbréfasafn*, ed. Jón Sigurðsson, 1 (Copenhagen 1857) 186. This list has a ring of authenticity and is widely believed to have been written by Ari Thorgilsson, the author of *Landnámabók*.

⁹ Grímr Svertungsson is clearly a historical figure. He was lawspeaker from 1002 to 1003 and, according to *Íslendingabók* (ed. Jakob Benediktsson, *Íslenskt fornrit 1* [Reykjavík 1968]), he was the uncle of the law-speaker Skapti Thóroddsson (d. 1030). Considering that the name *Skapti* was rare in early Iceland, it is tempting to speculate that Skapti Thórarinnsson may have been descended from Skapti Thóroddsson.

¹⁰ Tjaldanes, the site of the mound, lies in the wide valley below Hrísbú at a distance of about 900 meters.

¹¹ In eleventh-century Iceland, the private ownership of churches, with wardship passing to descendants through inheritance, became an integral feature of the island's religious life; see Magnús Stefánsson, "Kirkjuvald eflist," especially the section "Íslenska einkakirkjan," in *Saga Islands 2*, ed. Sigurður Línald (Reykjavík 1974) 72-81; Inge Skovgaard-Petersen, "Íslensk egenkirkevæsen" *Scandia* 26 (1960) 230-296. The situation in Iceland corresponds to that which prevailed in Norway for a time after the conversion. There such property was termed *høgendis-kirkja*, "church of convenience" or private chapel. The Icelandic/Norwegian practice is similar in many ways to what Ulrich Stutz refers to as *Eigenkirche*, the phenomenon of private ownership of churches in the Germanic lands; see Stutz, *Geschichte des kirchlichen Benefizialwesens von seinen Anfängen bis auf die Zeit Alexanders III* (1895; repr. Aalen 1961).

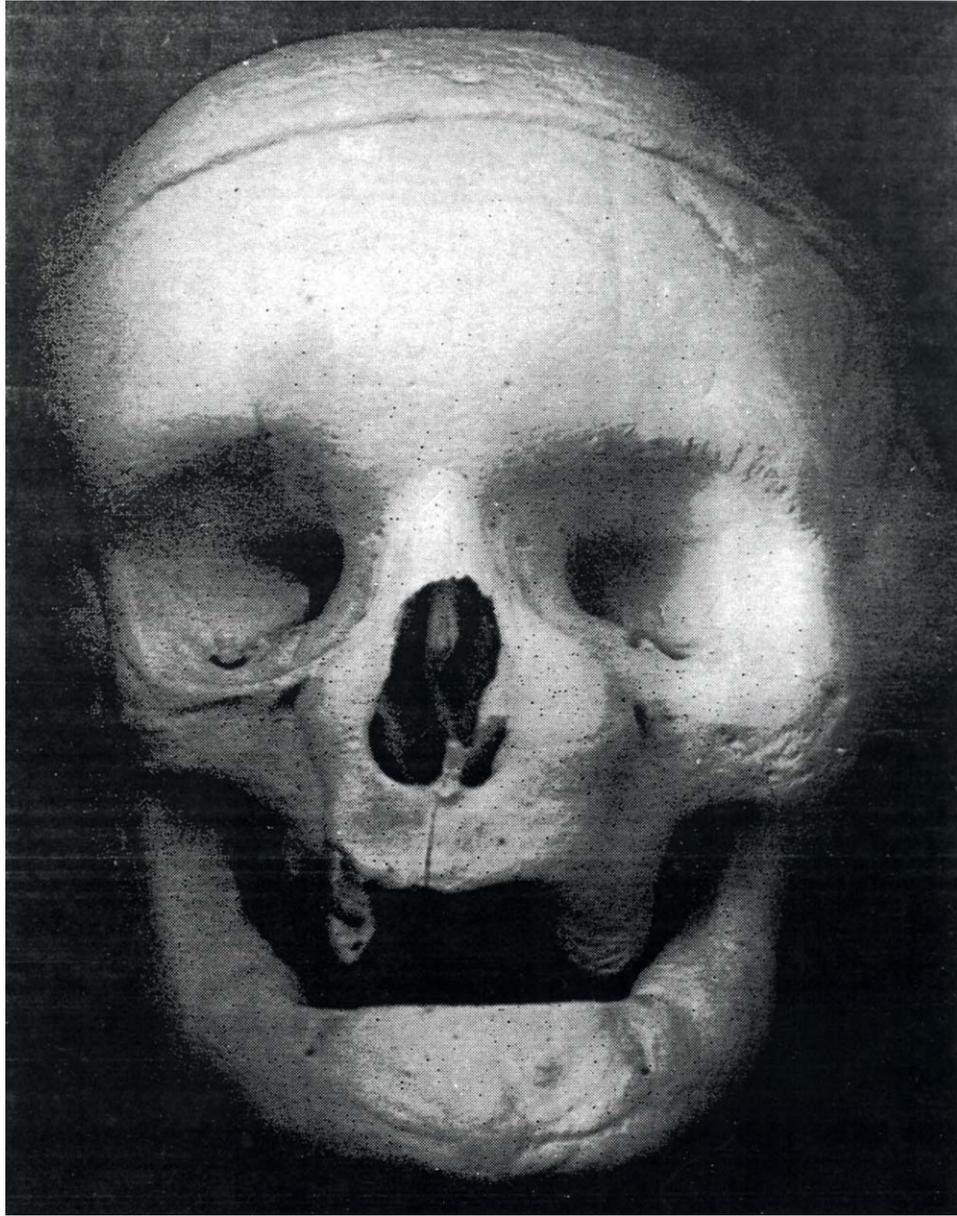


FIG. 1. Leontiasis ossea, a facial disfigurement which sometimes accompanies advanced Paget's. From Þórður Harðarson, "Sjúkdómur Egils Skallagrímssonar," *Skánnir* 158 (1984) 244. Originally printed in *Ribberts Lehrbuch der allgemeinen Pathologie und der Pathologischen Anatomie* 24/25, rev. ed. Herwig Hamperl (Berlin: Springer Verlag, 1960) 689.



FIG. 2. Skeleton of a man who had a serious case of Paget's disease involving the skull and upper and lower limbs. From Hugh C. Barry, *Paget's Disease of Bone* (London and Edinburgh: E. & S. Livingstone Ltd., 1969) 34.

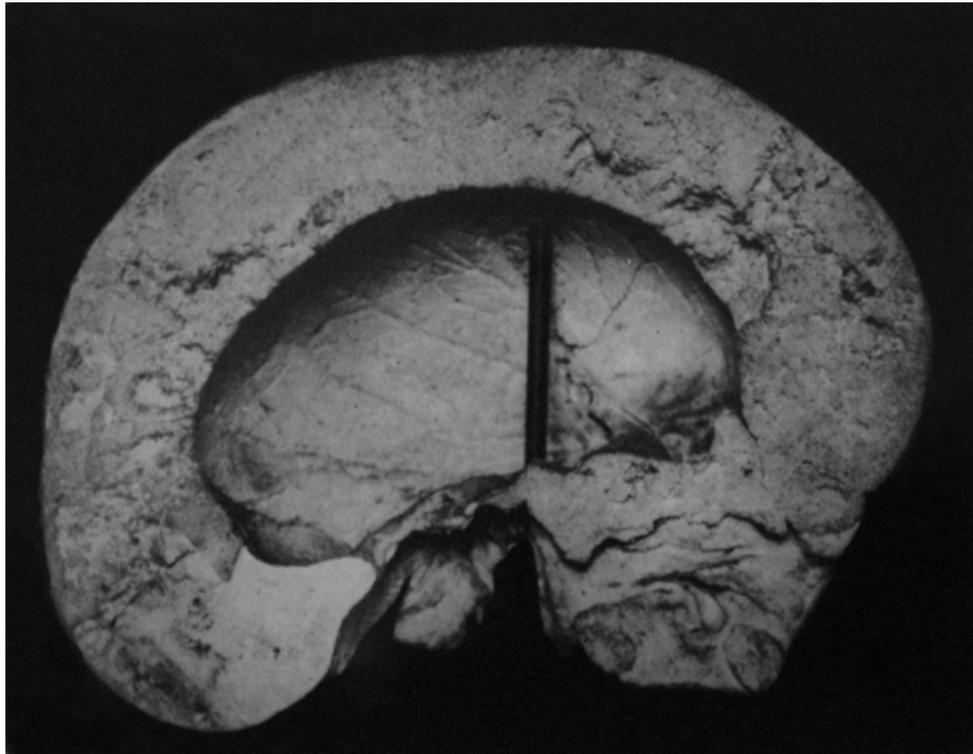


FIG. 3. Thickened Pagetic skull. From R. Lawford Knaggs, "Leontiasis Ossea," *The British Journal of Surgery* 11.42 (1923) 363.

to the church,"¹² had many reasons to desire honorable reinterment of Egill's bones. Thórdís was Egill's adopted daughter as well as his niece and Egill had raised her as his own child.¹³ Egill had married Thórólfr's widow, and thus Thórdís and he were blood kin.

If Thórdís, as a newly converted Christian, wanted to move her stepfather's body from his burial mound to a prominent resting place in the church, Egill himself was entitled to burial in hallowed ground.¹⁴ During his service as a mercenary for the English king Athelstan (895-933), he had been "prime signed." *Prímssigning* is a Norse term meaning "provisional baptism," adopted from the Latin *primum signum* or *prima signatio*. It consisted of making the sign of the cross over non-Christians in order to cleanse them of the evil spirit. After being "prime signed," pagans could attend mass and enter into full relationships with Christians.¹⁵ Egill remained buried in the small church on the farm at Mosfell for approximately 130 to 150 years until the new church was built about 500 meters from the old one, and the bones were exhumed by Skapti.¹⁶

Would people have forgotten the burial site of an ancestor as venerated as Egill? It seems doubtful. In the first place, it is improbable that the burial of an honored ancestor in a consecrated piece of ground such as this would have been forgotten, especially in circumstances of such short and constant habitation. The period from the early

¹² Remains of this first church and its small graveyard (11-12 faðma) could still be distinguished in the mid-nineteenth century, when the site (as well as the church at Mosfell and Tjaldanes) was described in detail by the local priest Magnús Grímsson. The turf ruins of the church at Hrísbú were in Magnús's time (as they still are today) called kirkjuhóll, "church knoll." (Magnús Grímsson, "Athugasemdir við Egils sögu Skallagrímssonar," in his *Safn til sögu Íslands og íslenskra bókmennta að forna og nýju* 2 [Copenhagen 1886] 255--256). See also P. E. Kristian Kálund, *Bidrag til en historisk-topografisk Beskrivelse of Island* 1 (Copenhagen 1877)48-51.

¹³ The saga makes much of what may have been a well-known story of deep affection between stepfather and stepdaughter: "Egill loved Thórdís as much as he loved his own children" (chap. 77); Egill "moved south to Mosfell to live with his kinsman Grímr, because more than anyone else alive, he loved his stepdaughter Thórdís" (chap. 79).

¹⁴ Jón Steffensen, who has considered the issue of the transference of Egill's remains to sanctified ground in light of later twelfth- or thirteenth-century regulations as preserved in *Grágás*, is also of the opinion that, in the early years after the conversion, Egill would have been eligible for reburial in Grímr's new church; see Steffensen, "Ákvæði kristinna laga þáttar um beinafærslu," in his *Menning og Meinsemdir: Ritgerðasafn um mótunarsögu íslenskerar fjóðar og baráttu hennar við hungur og sóttir* (Reykjavík 1975) 153. For an overview of the early post-conversion years, see Jesse L. Byock, *Medieval Iceland: Society, Sagas, and Power* (Berkeley 1988) 141-144.

¹⁵ Einar Molland, "Prímssigning," *Kulturbíóísk leksikon for nordisk middelalder* 13 (Reykjavík 1968) 439-444.

¹⁶ Scholars have been in some disagreement as to precisely what the saga passage tells us about the early placement of the church at Mosfell. Was it at Hrísbú or at Mosfell? The two sites are within 500 meters of each other. Some who have examined the sites (for instance, Kálund [n. 12 above] 50 and Grímsson [n. 12 above] 254) have argued that the description of the move should be understood to mean that the farm Mosfell was originally situated at Hrísbú. Later, according to this view, it was moved to the present location of the farm of Mosfell. Then, or sometime afterward, the farm that remained at the original location was renamed Hrísbú and became a form of rental property. Some time thereafter, in the middle of the twelfth century, the removal of the church took place. The other view, advanced by Nordal (n. 3 above) 298, is that the chief farm was always at Mosfell. Following the tradition of the pagan temples, however, the first churches after the conversion were erected at some distance from the farm buildings, in this instance at Hrísbú. Later, as a matter of convenience, a new church was built at the farm of Mosfell, and the earlier church site was converted into a tenant property with the name Hrísbú.

eleventh to the mid-twelfth century was a time of relative stability in Icelandic history, and throughout this period Egill's descendants were well aware of his resting place; further, a prominent descendant, Skapti, was present at the exhumation. In determining Skapti's relationship to Egill, we again turn to independent, corroborating sources. According to a preserved section of *Melabók*, one of the oldest and most reliable variants of *Landnámabók*,¹⁷ Skapti's parentage is traced directly through six generations to Egill: Skapti—Æsa—Helga—Geirlaug—Skúli—Thorsteinn—Egill.¹⁸

And there are other powerful reasons why the memory of Egill's life could last so long in oral tradition. First, his descendants were numerous; and second, several of them were poets. There can be little doubt that it was Egill's poetry rather than his other achievements which prevented various aspects of his life from being forgotten. Further, we should note that the description of a burial such as Egill's is not unique or even rare. There was, in fact, a well-developed tradition of remembering burials. Recollections of the burials of other members of Egill's prominent kinfolk are mentioned in several sagas. Of his grandnephew Björn Hitdælakappi we are told, "The kinsmen of Björn saw to his body, and it was buried at Vellir at that church which he had built there in honor of the Apostle Thomas."¹⁹ Of his granddaughter, Helga Thorsteinsdóttir, *Gunnlaugs saga Ormstungu* tells us, "Helga was taken to the church, but Thorkell [her husband] continued living there on the farm."²⁰ Concerning his grandson, Kjartan Ólafsson, *Laxdæla saga* says, "Kjartan's body rested for a week at Hjarðarholt. Thorsteinn Egilsson had a church built at Borg. He took Kjartan's body home with him and Kjartan was buried at Borg. The church had only recently been consecrated, and was still hung with white."²¹

Modern studies of oral narrative in rural Iceland are also useful. Jonas Kristjánsson, director of the National Manuscript Institute (Stofnun Árna Magnússonar) in Reykjavík, has written about his own family. In his typical rural family, neither wealthy nor prominent, Kristjánsson witnessed that genealogy and oral story connected with kinship are remembered with great factual accuracy for at least 120 to 150 years.²² As Kristjánsson documents, in some instances, accurate memory can easily span almost a century and a half. To do so requires only that an elderly grandparent who heard of or experienced an event in his youth transmit the information to a grandchild, who then lives to an advanced age. In Egill's case, we do not have to guess about the presence of oral tradition. To the contrary, the saga reports that precise information was available about his burial site. The text specifically tells us that the location of Egill's remains was known from the *sögn manna*, a phrase meaning "the report (or knowledge) of men." In this instance the *sögn manna* is a reference to the memory of only a few generations in a stable agricultural community.²³

¹⁷ *Landnámabók* (*The Book of Settlements*) often provides detailed information about Iceland's settlers and their descendants. The standard edition is *Landnámabók*, ed. Jakob Benediktsson, Íslenzk fornrit 1 (Reykjavík 1968).

¹⁸ Nordal (n. 3 above) Ivii, citing *Melabókarbrétt*, found in *Íslendinga sögur* 1 (Copenhagen 1843) 354-355.

¹⁹ *Bjarnar saga hitdælakappa*, in *Borgfirðinga sögur*, ed. Sigurður Nordal and Guðni Jónsson, Íslenzk fornrit 3 (Reykjavík 1938) 206-207.

²⁰ *Gunnlaugs saga Ormstungu*, in Nordal and Jónsson (n. 19 above) 107

²¹ *Laxdæla saga*, ed. Einar Ól. Sveinsson, Íslenzk fornrit 5 (Reykjavík 1934) 158.

²² Jónas Kristjánsson, "Sannfræði fornsagnanna," *Skírnir* 161 (1987) 234-269.

²³ Ólafur Lárusson, *Ætt Egils Halldórssonar og Egils saga*, *Studia Islandica* 2 (Reykjavík 1937), and Anne

The saga passage about the unearthing of Egill's remains has received considerable attention over the years. The conclusions of Jon Steffensen, former professor of medicine at the University of Iceland and an eminent commentator on diseases and health in early Iceland, summarize the reigning view as to authenticity. Steffensen, who harmonizes the saga description of Skapti's exhumation of Egill's bones with the standard interpretation that sagas are untrustworthy, fictional creations, writes: "This description has about it much of the folktale and is not very probable; ... all who have held the skull of an old man in their hands know that it could not resist the stroke of the hammer side of an axe."²⁴ In an article entitled "Hard Headbones" ("Hörð höfuðbein"), Bjarni Einarsson casts further doubt on the reliability of the passage. Building on Steffensen's conclusions, Einarsson determines that such saga descriptions are "literary invention" (*bókmenntaminni*).²⁵ For Einarsson this invention or "motif" of exhumed bones from *Egils saga* is especially enlightening and serves as an example of the overall technique of saga writing. Through it the modern critic can discern the saga author at work making his fictional story appear credible by blending fact with fantasy. In this specific instance the saga author is supposed to have joined the presence of a known priest from the century following Egill's death with an implausible description of bones.²⁶

By far the majority of commentary about this passage in recent years comes from scholars who view the description of the skull and bones in exclusively symbolic terms. For example, Laurence de Looze suggests that Egill's disinterred skull is an "icon of poetic text," and finds that the skull's "ridges and indentations parody the runes carved on horns and staves, *grammata* that resist obliteration."²⁷ Kaaren Grimstad maintains that the "story of Egill's bones is well suited to the author's magnification of the hero to giant proportions."²⁸ Margaret Clunies Ross writes that Egill's "physical appearance, as a dark, ugly, bald, and troll-like figure, signals the writer's moral disapprobation to the saga audience."²⁹ Preben Meulengracht Sorensen compares Egill to the mythical trickster Loki, a creature whose nature is both godlike and demonic, qualities that account for the evening "wolf-nature" of Egill's grandfather Kveld-Úlfr.³⁰

There is, of course, good reason for these mythopoeic interpretations. The total pic-

Holtmark, "Skallagríms heimamenn," *Mad og Minne* 3.4 (1971) 97-105, supply information about Egill's descendants and extended kinship ties.

²⁴ Steffensen (n. 14 above) 152-153. The original reads: "Þessi frásögn er urn margt þjóðsagnakennd og ekki alls kostar sennileg; ... en allir, er handleikið hafa hauskúpu gamalmennis, vita, að hún stentz ekki högg axarhamars."

²⁵ Bjarni Einarsson, "Hörð höfuðbein," in *Minjar og menntir: Afmálsrit helgað Kristjáni Eldjárn 6. desember 1976* (Reykjavík 1976) 50. The summary at the end (54) of Einarsson's article adds, "The present author believes that the exhumation and removal of the bones of named persons in sagas ... is a literary motif." This view is echoed in a short article about Egill's bones by Thórir Óskarsson, "Kollgáta í Eglu," in Gísli Sigurðsson, ed., *Sólbrarfásambli: Thorleifi Hauksyni fimmtugum 21. Desember 1991* (Reykjavík 1992) 71-72.

²⁶ Einarsson 50.

²⁷ Laurence de Looze, "Poet, Poem, and Poetic Process in *Egils Saga Skalla-Grimssonar*," *Arkiv för nordisk filologi* 104 (1989) 123-142.

²⁸ Grimstad (n. 4 above) 284.

²⁹ Margaret Clunies Ross, "The Art of Poetry and the Figure of the Poet in *Egils Saga*," in *Sagas of the Icelanders*, ed. John Tucker (New York 1989) 127.

³⁰ Preben Meulengracht Sorensen, "Starkaör, Loki, and Egill Skallagrímsson," in Tucker (n. 29 above) 155.

ture of Egill Skalla-Grímsson, however, leads one to wonder if pathological and archeological explication might alter our view. The issues are these: Should we discount Skapti's observations of the enlarged bones and unusual skull features? Should we continue to treat this episode as a purely literary device—a thirteenth-century fiction invented to magnify the heroic qualities of a Viking warrior and to exaggerate the light-dark dichotomy that marked Egill's family for three generations? Modern medical knowledge—that is, information outside the normal discourse of saga studies—provides an opportunity to weigh the evidence, to look into the oral past, and to reconsider the prevailing view that *Egils saga* is a late, romantic creation.

A PATHOLOGY?

The saga is precise in describing the skull as "ridged all over on the outside like a scallop shell" ("allr báróttir titan svá sem hörpuskel"). This precision is striking since the words *hörpuskel* (scallop shell) and *báróttir* (ridged, waved, corrugated, wrinkled—a descriptive adjective derived from the Old Icelandic noun *bára*, meaning the small waves caused by the wind, which "wrinkle the surface of the sea")³¹ are by no means common usage in the sagas. A computer search of the corpus of the family sagas, including all the short stories (*þættir*), *Landnámabók*, and the Sturlunga sagas, reveals that *báróttir* and *hörpuskel* are used only in this passage from *Egils saga*.³²

If a "scalloped" bone surface has little to do with Norse heroics, it is, however, a textbook description of Paget's disease (see appendix). Consider the following portrait from the *Textbook of Pathology*, a book widely used in medical schools for diagnostic instruction: "The thickening is most strikingly seen on the cut surface of the skull cap, and a pathological diagnosis can readily be made from it alone.... The cement lines are wide, prominent and irregularly scalloped."³³ Likewise, doctors D. Resnick and G. Niwayama describe the often ruffled Pagetic skull: "Similar irregularities on the outer surface of the skull ... may be associated with striking corrugation or a wavy appearance."³⁴ An inquisitive twelfth-century Icelander, it seems, observed precisely the distinguishing "irregularly scalloped" features that a twentieth-century medical student is taught to look for. Even the saga description of the whitening of the skull (*hvítuáði hann*) when hit by Skapti's axe is a clear indication of Paget's. When subjected to a blow, the soft, pumice-like outer material of the enlarged Pagetic skull, laid on top of a now hardened and resilient core or inner table, turns white.³⁵

³¹ *An Icelandic-English Dictionary*, ed. 2 Richard Cleasby and Gudbrand Vigfusson with suppl. by William A. Craigie (Oxford 1957) 54. This entry on *bára* adds that metaphorically the word means "undulations or rough stripes on the surface of a thing, e.g the crust of a cheese." The meaning has continued into modern Icelandic where *báróttur* is translated as "corrugated; wavy, billowy, undulated"; *Íslenskt-Enska orðabók: Icelandic-English Dictionary*, ed. Arngrímur Sigurðsson (Reykjavík 1970) 61.

³² My thanks to Örnólfur Thorsson, Guðrún Ingólfssdóttir, Eiríkur Rögnvaldsson, and Bergljót Soffía Kristjánssdóttir at the University of Iceland and the Stofnun Árna Magnússonar (Icelandic National Manuscript Institute) for running computer searches through a vast corpus of Old Icelandic texts.

³³ William Boyd, *A Textbook of Pathology: Structure and Function of Diseases*, ed. 8 (Philadelphia 1970) 1242-1243.

³⁴ D. Resnick and G. Niwayama, *Diagnosis of Bone and Joint Disorders* (Philadelphia 1981) 1726. Numerous other researchers have observed the "scalloped," "ruffled," or "mosaic" Pagetic skull. See C. R. Patterson and W. J. MacLennan, *Bone Disease in the Elderly* (New York 1984) 117.

³⁵ For this observation about the whitening I am indebted to Dr. Barbara Mills and her wide experience

How common is skull corrugation? This question was the subject of a study done in a London hospital and reported in an article entitled "Corrugation of the Skull in Paget's Disease of Bone." The study found that of 5,000 hospital entries during a one-year period, 80 were diagnosed as having Paget's disease. In 16 of the Pagetic cases the skull was affected and of these 6 displayed corrugation.³⁶ The conclusion was that, among symptomatic cases, "the incidence of corrugation of the skull in Paget's disease of bone appears to be about one in fifteen."³⁷

The resiliency of Pagetic bone has long been noticed, especially because its unusual hardness hindered surgery until modern diamond-tipped instruments were developed. Dr. R. C. Hamdy, an expert on Paget's disease, writes that, in its advanced stages, "the bones become ivory-hard, very difficult to cut and heavier than normal. The amount of bone per unit volume increases and abnormal lamellar bone with irregular cement lines is now the prominent component."³⁸ Dr. Hamdy might be surprised to learn that his observations about the toughness of such irregular bone are similar to those of a twelfth-century Icelander, who tested such an enlarged skull with the blunt end of his axe.

Paget's disease was not known in the Middle Ages. In fact, its different and seemingly unrelated symptoms were understood to be a single affliction only in the late nineteenth century, when they were described by the English surgeon, Sir James Paget (1814-1899).³⁹ The disease can affect any bone or combination of bones, but it is usually restricted to one or two locations. The most commonly affected sites are the femora, spine, pelvis, sternum, and skull.⁴⁰ James Paget's clear and essentially accurate description remains a classic formulation of *osteitis deformans*. In his words, the disease "begins in the middle age or later, is very slow in progress, may continue for many years without influence on the general health, and may give no other trouble than those which are due to changes in shape, size, and direction of the diseased bones. Even when the skull is hugely thickened and all its bones exceedingly altered in structure, the mind remains unaffected."⁴¹ All these characteristics, including the clarity of thought, fit Egill, who recorded a physically troubled old age through insightful and innovative verse.

Paget's disease may also have affected Egill's facial appearance. The saga does more than simply call Egill ugly (*ljótr*), it describes his features in detail, revealing also that

with the disease. Also see Alex Norman, "The Radiology of Paget's Disease," *Paget's Disease of the Bone: Clinical Assessment, Present and Future Therapy*, ed. Frederick R. Singer and Stanley Wallach (New York 1991) 9.

³⁶ N. K. Chakravorty, S. K. Das, M. S. Kataria, "Corrugation of the Skull in Paget's Disease of Bone," *Postgraduate Medical Journal* 53 (1977) 40-46.

³⁷ *Ibid.* 44.

³⁸ R. C. Hamdy, *Paget's Disease of Bone* (New York 1981) 36.

³⁹ Paget practiced medicine at Saint Bartholomew's Hospital in London. In 1854, as part of a distinguished career, he became surgeon extraordinary to Queen Victoria and, a few years later, surgeon ordinary to the Prince of Wales. Paget's fame rests on his descriptions of several diseases, the most famous of which, *osteitis deformans*, is named for him. Paget published his findings in 1876 in a paper describing five cases of this previously unidentified malady. His primary case was a man whose condition he had observed for twenty years, beginning when the patient was forty-six years old and already suffering from the illness.

⁴⁰ L. Merkow and J. M. Lane, "Paget's Disease of Bone," *Orthopedic Clinics of North America* 21.1 (1990) 171-189. Norman (n. 35 above) 7.

⁴¹ N. J. Y. Woodhouse, "Historical and Epidemiological Aspects of Paget's Disease," in *Human Calcitonin and Paget's Disease*, ed. I. MacIntyre (Bern 1977) 54.

Egill thought himself distinctively ugly. In poetry that the saga claims Egill composed, he repeatedly refers to his head, often in strange ways. For example, in one poem, composed in response to receiving a pardon from his sworn enemy, King Eiríkr Blóðox (Bloodaxe), Egill made this verse (chap. 61):

I am not opposed,
Though I may be ugly,
To accepting my helms'-rock of a head
From a ruler.

(Erumka leitt
þótt ljótr séi,
hjálma klett
of hilmi þiggja.)

Referring to one's head as a "helms' rock" may seem unusual to the modern reader, but the real question is whether this circumlocution was unusual in Old Icelandic poetic description. The answer is that the phrase *hjálma klettr* (literally, "helms' rock cliff") is an exceedingly rare way to describe a head. In all of the thirty or so family sagas, the more than sixty *þattir*, *Landnámabók*, and the Sturlunga sagas, it appears only once, that is, when Egill so describes himself.⁴² In another place, Egill, grieved by the death of his brother Thórólfr, is described as follows. Facing the man who he believed owed him compensation for Thórólfr's death, Egill

sat upright, but his head hung forward. Egill was marked by prominent features. He had a broad forehead and large brows, a nose that was not long but enormously thick, and lips that, seen through his beard, were both wide and long. He had a remarkably broad chin, and this largeness continued throughout the jawbone. He was thick-necked and broad-shouldered and, more so than other men, he was hard-looking and fierce when angry. Well built and taller than others, he had thick wolf-gray hair but was early bald. While he sat as was written above, he jerked one eyebrow down to his chin and lifted the other one up into his hairline; Egill was black-eyed with eyebrows joined. He refused to drink, although drink was brought to him, but alternately jerked his eyebrows up and down (chap. 55).

Although we may assume literary license, it is curious and unusual that the physical characteristics of a saga protagonist are portrayed in so grotesque a manner. It may be that the saga writer is not arbitrarily inventing this description but is conveying well-known information about a strange-looking man. Indeed, just such information might have made Egill exemplary as a subject for legendary traditions.

Osteitis deformans supplies a plausible explanation for Egill's facial irregularities

⁴² To my knowledge the only other use of *hjálma klettr* is in "Háttatal," a poetic composition by Snorri Sturluson, in which the learned skald shows off his knowledge of meter and earlier poetic innovations. Snorri (1179--1241) was a descendant of Egill and apparently knew the saga. Much attention has been given to the possibility that he is the saga's author. See Vésteinn Olason, "Er Snorri höfundur Egils sögu?" *Skírnir* 142 (1968) 48-67. Olason concludes that the authorship will remain an enigma. It is somewhat surprising, but perhaps indicative of the precise meaning in Egill's case, that *hjálmr klettr* is so rare, since both the words of this kenning, *hjálmr* and *klettr*, are common and found separately in a number of other combinations. For example, *hjálmrstofn*, meaning head (the trunk on which sits the helm) or "berða klettr drep ec þér hálsi af" (I strike the cliff of your shoulders from your neck), from "Locasenna" 57; *Edda: Die lieder des Codex Regius nebst verwandten Denkmälern*, ed. Gustav Neckel, ed. 4 rev. Hans Kuhn, 2 vols. (Heidelberg 1962) 108.

and a skull like a "helms' rock." Distortion and hardening of the cranium, changes which are characteristic of Paget's disease, may lead to *leontiasis ossea*, a distortion of the facial bones that gives the individual a lion-like appearance. And here the description of Egill's face fits well, because as a result of this pathology "the bones of the face are greatly thickened."⁴³ As for disfiguring the eyebrows, it is conceivable that a person as menacing as Egill learned to make the most of his ugliness and was remembered for its outrageous effect.

It is in Egill's old age that we most clearly discern the major symptoms of advanced Paget's: the loss of balance and hearing, and the phenomenon described in the *Textbook of Pathology* as a "great head hanging forward."⁴⁴ Remarkably, each of these symptoms is mentioned in verse. The saga tells us that Egill, after he came to live with Grímr at Mosfell,

was walking outside beyond the wall one day when he stumbled and fell. Some of the women saw this and laughed at him.

"You're really finished now, Egill," they said, "when you fall without being pushed."

"The women didn't laugh so much when we were younger," said Grímr. Egill made this verse (chap. 85):

My bald pate bobs and blunders, I
bang it when I fall;
My cock's gone soft and clammy
And I can't hear when they call.

(Vals hefk vófur helgis;
váfallr em ek skalla;
blautr erum bergis fótar
borr, en hlust es þorrin.)

This verse about a man with a head that "bobs"⁴⁵ is a good example of a skald's ability to turn physical disorders into memorable imagery. As the Old Icelandic original is much more graphic than the English rendition, let us consider its precise meaning. The first line carries the understanding: "I have swayings of the neck." In building the image of a neck, the poet fashioned a kenning, *helsis vair*, meaning "the horse of the necklace." More straightforwardly, the word "swayings" is constructed from the verb *váfa*, "to sway or dangle while hanging" and it conveys the same understanding that is found in the related word, *váfuðr*, the poetic name for Odin, meaning the "hanged god." Thus the line in the verse refers to a neck, bent under the weight of a head that wobbles forward and backward.

A drooping, swaying head is not a standard feature of old age; so also the graphic description, *vófur helgis valr*, is not at all a common usage in Old Icelandic poetry. Again, a computer search turned up no additional occurrences of the combination in the written texts. Likewise, the *Lexicon poeticum antiquae linguae septentrionalis*, a treasure trove of obscure usage, lists only a single occurrence—this specific line from *Egils saga* describing Egill in old age.⁴⁶

⁴³ Boyd (n. 33 above) 1242.

⁴⁴ Ibid. 1243.

⁴⁵ The translation is that of Pálsson and Edwards (n. 3 above).

⁴⁶ Sveinbjörn Egilsson, *Lexicon poeticum antiquae linguae septentrionalis*: Ordbog over det norsk-islandske skjaldesprog, ed. 2 rev. Finnur Jónsson (Copenhagen 1931) 243.

Among his afflictions, Egill suffers in old age from pain and blindness. He is humiliated for his inactivity and his craving for warmth:

Egill became totally blind (*varð með öllu sjónlaus*). One day in winter when the weather was cold, he went up to the fire to warm himself.... "On your feet!" said the woman. "Get back to your place and let us do our work."

Egill stood up, walked over to his seat and made this verse:

I flounder blind by the fireside,
Ask females for mercy,
Bitter the battle
On my brow-plains.

(Hvarfak blindr of branda,
biðk eirar Syn geira,
þann berk harm á hvarma
hnitvöllum mér, sitja [chap. 85].)

In the above verse the words *hvarma hnitvöllum* have two meanings: literally, the part of the face for the eyes; poetically, the field of the eyes. The distinction depends upon whether the words refer to the eyes themselves or to the area of the eyes, including the part behind and around the eye sockets. If the former, the words refer again to Egill's blindness. If the latter, then the phrase means that "I bear pain in the region of my eyes," with the understanding that Egill has headaches. As a kenning generally has two meanings, both were probably intended.

Egill's headaches and chilled feelings are consistent with his other symptoms. Sufferers from Paget's sometimes experience headaches caused by the pressure of an enlarged vertebra pressing on the spinal chord. They also have a high incidence of arteriosclerosis and heart damage as the heart is overtaxed and blood is diverted from the extremities in order to support the rapid process of bone remodeling. The chill that Egill endures is consistent with the attendant circulatory problems, often in the feet, which accompany such illnesses. Another lament of Egill's supplies us further information about his chill and cold feet:

My feet freeze up like
widows' beds
while these cold crones
won't give me warmth.

(Eigum ekkjur
allkaldar tvær,
en þær konur
þurfa blossa [chap. 85].)

The poet is skillfully playing on an understood double entendre. The Norse audience would know to substitute the word *hall* for the two stated words, *ekkjur*, "widows," and *konur*, "women" (here translated as "crones").⁴⁷ *Hall* carries the double meaning of widow and heel (i.e., feet). The two nouns for "feet" are connected with the plural

⁴⁷ This fine translation is from *Egils Saga*, trans. Christine Fell, with poems by John Lucas (London 1985) 169.



FIG. 4. Widespread Paget's disease in a tenth-century Anglo-Saxon skeleton, shown by the curved femur and spine. From N. J. Y. Woodhouse, "Historical and Epidemiological Aspects of Paget's Disease," in *Human Calcitonin and Paget's Disease*, ed. I. MacIntyre (Bern, Stuttgart, and Vienna: Hans Huber Publishers, 1977) 63.



FIG. 5. Bone Mosaic. From Þórður Harðarson, "Sjúkdómur Egils Skallagrímssonar," *Skírnir* 158 (1984) 244. Originally printed in William Boyd, *A Textbook of Pathology: Structure and Function in Diseases*, ed. 8 (Philadelphia: Lea & Febiger, 1970) 1316.



FIG. 6. Corrugated patterns on the skull in an advanced case of Paget's disease. From N. K. Chakravorty, S. K. Das, M. S. Kataria, "Corrugation of the Skull in Paget's Disease of Bone," *Postgraduate Medical Journal* 53 (January 1977) 40-46.

adjective *allkaldar*, "thoroughly cold." Thus, the passage carries the meanings of "cold feet" and "cold women," both of which afflicted Egill in his old age.

Is there a tradition of Icelandic warrior-poets complaining about their cold feet? The answer is hardly. There is, however, a tradition of recording struggles against one's fate, including the enfeeblement of old age.⁴⁸ These intimate verses from *Egils saga* are examples of the breadth and complexity of Old Icelandic poetry. In this instance the lines preserve the memory of a man's private battle with an exceptionally difficult and unusual old age. In Egill's struggle not to "go gentle into that good night" we have a source of detailed and unusually personal information.

Since Egill's symptoms, as recorded in the poetry and in the descriptions of the bones, provide a full picture of Paget's, we might ask whether the unearthing of the bones in the mid-twelfth century could be the source for the poetry? Such a sequence of events, however, is scarcely possible. Before the identification of the disease in the late nineteenth century, its various aspects had not been coordinated. With understandable logic the saga treats Egill's difficulties not as indications of a disease but as the indiscriminate ravages of old age. If a creative medieval author had wished to present Egill as a hypochondriac, complaining of the hardships of old age, he could have chosen many other symptoms which would have ruled out Paget's.

It is at least possible that a twelfth- or thirteenth-century poet, having learned about the condition of Egill's bones, might have been inspired to write verses about the hardness of Egill's head, using a kenning such as *hjálma klettr*. Would such a poet, however, know the particulars of Paget's disease well enough to construct an in-depth portrait of a man with cold feet, chills, headaches, a swaying, hanging head, inconsistent bouts of lethargy, and loss of balance, hearing, and sight? The answer is even clearer when we remember that the saga makes no connection whatsoever between the bones and disease. In fact the medieval text draws quite the opposite conclusion. It points out how useful such a tough head would be for a warrior, noting that "anybody could guess that the skull wouldn't be easily cracked by small fry while it still had skin and flesh on it." Even if a thirteenth-century author had observed a person with the symptoms of Paget's and modeled his character of Egill after that person, he could not have known the specific attributes of Paget's bone and skull—the thickened, resilient, ruffled surface structure that whitens upon impact.

The crucial factor is that the poetry independently corroborates, by giving different details, the specifics of the bone find. Here we come to the question of scholarly focus. Modern scholarship dealing with Egill's verse has concentrated on his earlier poems, particularly those concerned with war, enmities, and the loss of a son. A medieval audience may have viewed the poetry somewhat differently, and perceived heroism in Egill's ability to describe the panorama of a whole life, including his final struggles with infirmity and approaching death.

⁴⁸ This tradition is discussed, for example, in Bjarni Einarsson, *Litterære forudsætninger for Egils saga* (Reykjavík 1975) 211-218, where Egill's symptoms are categorized as falling within the context of "alderdommens tragedie." Scholars have tended to generalize about the various descriptions of aging in the sagas in order to form an overall literary theme. In so doing, they frequently ignore differences. Highly individualistic examples such as Egill's are often lumped together with saga descriptions displaying widely different details.

PATHOLOGY AND THE TEXT

Awareness of the presence of a pathology clears up the well-known problem of inconsistency in the text. Despite the description of Egill in his old age as doddering, the saga also reports that Egill in his eighties was at times an active man. For example, at the very end of his life, he plotted to ride to the Althing, where he intended to toss his silver into the air in order to promote dissension among the men. Thwarted in this scheme to attend the assembly and to participate in one last good fight, Egill nevertheless succeeds, shortly thereafter, in leaving the farm to hide his silver.⁴⁹ In the process of burying the treasure, he kills the two slaves who did the work and thus know the location of the silver. Such a feat would seem beyond the reach of a decrepit old man who had to be chased from the fire.

The obvious inconsistency of Egill's unexplained surge of vitality must have been as apparent to the medieval storyteller and audience as it is to the modern reader. This matter is especially interesting to our inquiry since the contradictory elements could have been easily harmonized by an author writing fiction. For example, a somewhat similar occurrence in *Njáls saga* is explained in terms of a divine intervention. There a blind man suddenly regains his sight just long enough to take blood vengeance. But Egill's blindness has nothing to do with supernatural intervention, and he does not regain his sight. Although such a change in the story would have made killing the slaves more logical and surely much easier, it would also have ruled out Paget's. In those cases where Paget's compresses the optic nerve the damage is irreversible. In Egill's case, the unexpected resurgence of vigor is not explained away, but treated as a matter of course in the hero's long life, as if the saga author was simply telling everything he knew about Egill.

If the medieval text's inconsistency in its portrayal of Egill's uneven decline in old age is difficult to explain as a fictional invention, it is easily understood in terms of Pagetic symptoms. This affliction manifests itself in frequent bouts with apathy and intermittent lack of energy.⁵⁰ The cause of such bouts is physical. In the active or mixed phase, when the disease is in full progress, the affected bone can be absorbed and renewed as quickly as twenty times the normal rate. Significant amounts of blood are diverted from other parts of the body, for instance, the hands and feet, to the affected bones to support this metabolism. The overall result is diminished cardiac reserve, since the heart is forced to increase its output in order to cope with the excessive demands of the Pagetic bones. As part of this process blood is also diverted from the brain to the affected areas. This is known as "Pagetic Steal" and victims, in such cases, "are frequently withdrawn, apathetic, and drowsy. They lack energy and become easily fatigued."⁵¹ However, the overactive process of bone remodeling does not last indefinitely. In the final inactive or *sclerotic phase* of the disease metabolism slows down, with a resultant lessening of the need for blood.

Knowledge of the symptoms of this pathology may perhaps shed light on other areas of the text. Bone pain or headache may be the first signs of Paget's disease. These

⁴⁹ This was the treasure that Athelstan had originally sent to Skalla-Grímr as compensation for the loss of his son Thórólf. Egill, however, kept the silver for himself

⁵⁰ Hamdy (n. 38 above) 37.

⁵¹ Ibid.

symptoms, which continue for years, tend to become worse in the evening.⁵² In middle age, Egill's father, Skalla-Grímr, and grandfather, Úlfr, are described as showing signs of evening irritability. A passage of the saga (chap. 1) records that Úlfr, once his youthful Viking days were over, settled down on his estate in Norway. But "each day as night fell, he [Úlfr] became so ill-tempered that few men were able to speak with him. In the evenings he was drowsy. Men said that he was a shape-changer, and he was called Kveld-Úlfr [Night-Wolf]." Similarly Egill's father, Skalla-Grímr, after he began to age, was menacing in the evening. According to the saga, Skalla-Grímr's evening irritability brought death to Thórðr, a local man, when a ball game continued on into the evening: "When evening came, and once the sun went down, ... Skalla-Grímr grew so powerful that he picked Thórðr up bodily and dashed him down so hard that every bone in his body was broken, and he died on the spot" (chap. 40).

Although it is possible that it might have been Paget's disease that caused the evening madness reputed to have afflicted several generations of Egill's family, the evidence is insufficient to make a categorical statement. It is known, however, that the pains of Paget's increase at night. This is particularly true, if, as is often the case, arthritis in the joints is produced by Paget's. It is easy to imagine frightening stories circulating about a big, dangerous man, like Úlfr, who, racked by pains and unable to sleep, wandered the forests and fields at night earning himself the nickname "Night-Wolf."

But could Paget's run in a family such as Egill's? It is as yet undetermined whether Paget's disease is attributable to an inherited weakness of the immune system or to a mutant incubating virus. Although significant evidence seems to support the theory that a virus is an important etiological factor,⁵³ numerous specialists remain unconvinced.⁵⁴ This is largely because current understanding of the pathophysiology of Paget's disease is not based on clearly distinguishable viral effects. Rather, contemporary knowledge is founded mostly on the response of the disorder to unspecific interventions such as calcitonin, diphosphonates, aspirin, nonsteroidal anti-inflammatory agents, and so on.⁵⁵ Indeed, the hereditary and viral explanations are not mutually exclusive. One researcher has noted, "It seems possible that we will eventually discover that some people are born with the genetic tendency to develop Paget's disease if they are exposed to an environmental factor such as a virus.... Exposure could occur in a household where a parent and child live together and both later develop Paget's disease."⁵⁶

Either theory would explain Egill's case, with a virus present on the family farm or a susceptibility within his kinsmen's genetic makeup. Whatever the cause, the familial tendency of Paget's has been well-documented in modern studies. In one particular

⁵² Editorial, "Paget's Disease and Calcitonin," *British Medical Journal* 263 (1975) 505; Paterson and MacLennan (n. 34 above) 43.

⁵³ Merkow and Lane (n. 40 above) 171-189; L. Harvey, "Viral Aetiology of Paget's Disease of Bone: A Review," *Journal of the Royal Society of Medicine* 11.77 (1984) 943-948.

⁵⁴ John A. Kanis, *Pathophysiology and Treatment of Paget's Disease of Bone* (Durham, N.C. 1991).

⁵⁵ My thanks to Marshall R. Urist, M.D., at the Bone Laboratory, School of Medicine, University of California, Los Angeles, for discussing this point with me and for sharing his then-unpublished review of John A. Kanis's book. Prof. Urist's review of *Pathophysiology* appeared in the *New England Journal of Medicine* 326 (1992) 1574.

⁵⁶ Ethel Skis, "Paget's Disease in Families," *Update* (newsletter of the Paget's Disease Foundation) 11.2 (1989) 4-5.

family, Paget's was traceable through four generations: the patient and his brother, their mother and a maternal aunt, the maternal grandmother, and the great grandmother.⁵⁷ A familial tendency is found, according to one authority, in the family histories of sixteen percent of Pagetic patients,⁵⁸ and similar statistics are provided by a study conducted at Columbia University Medical School. Of the 900 participants, it was found that eighteen percent of the patients had at least one other family member with the disorder.⁵⁹ Such statistics may give us insight into what is otherwise a very unusual saga description of a family that for generations produced both normal and abnormal-looking individuals. The latter were also remembered for unusual irascibility in middle age.

Increasingly, statistics show that *osteitis deformans* is not especially rare. It is estimated that between three and five percent of all adult males in the United Kingdom above the age of forty have Paget's disease in some form, and the frequency may go as high as ten percent after the age of seventy.⁶⁰ It is believed that three million people past the age of forty in the United States have Paget's disease. Of these, perhaps twenty-five percent or fewer show distressing symptoms.⁶¹ Besides its tendency to run in families, the disease is known to cluster in specific geographic areas, mostly in Europe and especially in England and France. Even among populations not prone to Paget's the disease may exist. In such cases it is frequently isolated in relatively small sites, such as the town of Avellino in Italy. An extensive cluster of cases was found within an extended family that had emigrated from Avellino to the United States.⁶²

Is there a strong possibility that Paget's could have existed in medieval Norway and Iceland? The answer is a probable yes. *Osteitis deformans* is an extremely old disease, and its epidemiology is very stable. The first recorded evidence of Paget's was found in a grossly thickened ancient Egyptian skull, dating from about 1000 B.C. Closer to the subject of our inquiry, archeological findings from Anglo-Saxon England include Pagetic skeletons showing loss of vertical height, elongation of bone, and the characteristic thickening of the skulls. These findings from a Christian settlement in Jarrow (northeast England) date from the year 950.⁶³ With such clear evidence of the disease from these excavations, the possibility that the disease also existed in medieval Scandinavia is strong. In modern Scandinavia, Paget's disease is not unknown, but it is uncommon.⁶⁴ If this were the case in medieval Scandinavia as well, then an individual suffering from Paget's, as Egill might have, would have been distinctive.

⁵⁷ D. D. Dickson, J. D. Camp, and R. K. Ghormley, "Osteitis Deformans: Paget's Disease of the Bone," *Radiology* 44 (1945) 451.

⁵⁸ F. Singer and S. Krane, "Paget's Disease of Bone," in *Metabolic Bone Disease*, ed. L. Avioli and S. Krane (Philadelphia 1990) 548.

⁵⁹ Siris (n. 56 above) 4-5.

⁶⁰ D. J. P. Barker, A. T. Chamberlain, P. B. Guyer, and M. J. Gardner, "Paget's Disease of Bone: The Lancashire Focus," *British Medical Journal* 280 (1980) 1105. D. J. P. Barker, P. W. L. Clough, P. B. Guyer, and M. J. Gardner, "Paget's Disease of the Bone in 14 British Towns," *British Medical Journal* 269 (1977) 1181-1183.

⁶¹ Information supplied by the Paget's Disease Foundation, P.O. Box 2772, Brooklyn, New York 11202.

⁶² T. P. Jacobs, J. Michelsen, J. S. Polay, A. C. D'Adamo, R. E. Canfield, "Giant Cell Tumor in Paget's Disease of Bone," *Cancer* 44.2 (1979) 744-747.

⁶³ Woodhouse (n. 41 above) 60-62.

⁶⁴ Very little has been written about the disease in Scandinavia. A search of the database, *Index Medicus*, from 1966 (the beginning of the database) through September 1991 for the general terms *Scandina-*

If Paget's disease is not frequent in Scandinavia, it was until quite recently thought not to exist at all in modern Iceland. But it does exist. In 1981 Dr. Gunnar Sigurðsson published an article⁶⁵ describing a patient who showed the classic symptoms of Paget's: increased head size, loss of balance, bone pains, progressive loss of hearing, and osteosclerosis. Aware of the traditional view that Paget's did not exist in Iceland, Dr. Sigurðsson points out the Icelandic heritage of the patient who had experienced these symptoms over a twenty-year period: "The patient is a man in his fifties. Both his parents were Icelandic and he has never lived abroad." Careful X-ray examination and lab tests confirmed the diagnosis.

Dr. Sigurðsson notes the difficulty of determining the frequency of Paget's in Iceland because, then as now, X-ray departments in Reykjavík hospitals did not list Paget's as a disease for which they made routine investigation.⁶⁶ Nevertheless, some estimates can be made on the basis of corroborating information, particularly that concerning the presence of osteosclerosis and other bone abnormalities. Using such information, Sigurðsson estimated that, in the 1970s, ten well-developed cases of Paget's could be diagnosed from the records alone. When I interviewed Dr. Sigurðsson in July 1991, he was treating ten clear cases of Paget's disease.⁶⁷ No statistics, however, exist to indicate whether the disease is centered in certain localities, such as Borgarfjörður, where Egill's family farm was located. Indeed, to my knowledge, beyond the information presented in this article, little if anything additional has been written about Paget's in Iceland, whether in English or Icelandic.⁶⁸

Pia, Norway, Sweden, Finland, and Paget's found no matches, despite the fact that such a search picks up the key words anywhere in the entry and not only from the title or in the abstract. In fact, only one match was found between the terms *Denmark* and *Paget's*, in an article on the correlation between ocular damage and Paget's in Danish patients; J. Dabbs, "Prevalence of Angioid Streaks and Other Ocular Complications in Paget's Disease of the Bone," *British Journal of Ophthalmology* 74 (1990) 579-582. My thanks also to Mats Hemlin at Göteborgs Universitet, whose further search in Scandinavian language journals for information on Paget's yielded similar results.

⁶⁵ Gunnar Sigurðsson, "Morbus Paget: Íslenskt sjúkratilfelli og meðferð," *Læknablaðið* 67 (1981) 106-110. This article, whose subtitle means, "An Icelandic Example of the Disease and its Treatment," has never been translated into English, and its observations about the presence of Paget's in Iceland are little known.

⁶⁶ Because many symptoms of Paget's disease are confused with the effects of aging, routine X-ray investigation has traditionally been essential for the establishment of reliable statistics. DNA analysis may soon change the procedure. If Paget's is not diagnosed in Iceland as frequently as it exists, the same may be true of Norway. This position is advanced by Dr. J. A. Falch, who in a 1979 letter to *Lancet* (J. A. Falch, "Paget's Disease in Norway," *Lancet* 2 [1979] 1022) observes that "Paget's disease of the bone is said to be rare in Scandinavia ... but there is no epidemiological support for this statement." Falch points out that many cases of Paget are asymptomatic; only when the disease becomes symptomatic is an afflicted individual in Norway referred to a hospital and recorded as a Pagetic patient. He concludes, however, that symptomatic Paget's is very rare in southeastern Norway.

⁶⁷ Dr. Sigurðsson is currently head of medicine at the City Hospital (Borgarspítali) in Reykjavík. His recent observations about the disease correspond closely with those of Dr. Harðarson, Dr. Harðarson had observed from 1980 to 1985 the treatment in Reykjavík of an obvious case of Paget's in a policeman from eastern Iceland. The initial symptom was progressively increasing cranial size, requiring ever larger hats. The patient discovered his affliction only because he had to wear a hat for his work, an observation closely corresponding to Dr. Paget's a century earlier. The Icelandic patient also experienced progressive loss of hearing, bone pains, difficulty in moving, and deteriorating vision.

⁶⁸ A search of *Index Medicus* from 1966 through May 1991 for the terms *Iceland* and *Paget's*, and *Iceland* and *osteitis deformans* found no matches. No results were found by taking the inquiry a step further and searching the entire database for *Iceland* and *history* to discover any items on the history of medicine in Ice-

While I was led to the issue by research intended to explain passages in a medieval saga, it is now clear to me that accepted, present-day statistics about Paget's in Iceland, Norway, and possibly all of Scandinavia, are surely inaccurate. This situation exists because so little attention has been directed to effectively diagnosing the presence of this disease.⁶⁹ For example, an extensive 1982 study to determine the European distribution of Paget's, using the replies to 4,755 questionnaires from radiologists, found that the disease was more prevalent in Britain than in any other western European country. Characteristically, the study did not include Norway, Iceland, Sweden, or Finland "because there was already clear evidence of very low prevalences."⁷⁰ As we now know that Paget's is sometimes found in modern Iceland—a fact that is for the most part buried in an obscure Icelandic medical journal—the possibility that a saga Iclander, and perhaps even a medieval family, could have been afflicted provides potentially useful epidemiological background.

Could any other disease cause Egill's symptoms? *Osteitis fibrosa* may cause thickened and deformed bones, but it makes them soft and porous, a condition not consistent with Egill's size and strength. Acromegaly, or gigantism, is a disease that causes enlargement of the bones, but it would not seem to be the cause of Egill's problems. Among other reasons, the length of Egill's life and those of his forefathers far exceed the relatively short life spans that are generally allowed by this affliction. Acromegaly is caused by overproduction of growth hormones as a result of a tumor or some other abnormality of the pituitary gland. Although the affected bones are unusually heavy and large, their surfaces are not irregular; furthermore, this malady does not damage the cranial nerves. Thus it does not engender the other problems that afflicted Egill: loss of hearing, sight, and balance. *Hyperostosis frontalis interna* may also be ruled out, as it is found principally in women and, more important, it does not increase skull size.

Fibrous dysplasia causes uncontrolled and abnormal bone growth, but this disease does not thicken the skull and affects primarily children and young adults. Another bone affliction, *osteopetrosis*, could possibly be the diagnosis in Egill's case. The symptoms of this rare genetic disease closely resemble those of Paget's; it causes an abnormal density of the bones and, in children, compression of the cranial nerves, which leads to deafness and blindness. The bones, however, are not enlarged or very deformed, and, as its name implies, this disease is characterized by brittle, easily broken bones, a symptom that is not present in Egill's case. The brittleness associated with *osteopetrosis* is generally different from the structural characteristics of Pagetic bone. The latter fractures easily,⁷¹ but chiefly along the surface. In James Paget's classic for-

land which might be relevant to Paget's. My thanks to Jeffrey Mazo for his generous help in this aspect of the research. Thanks also to Karen Oslund for her help.

⁶⁹ For similar reasons, statistics are probably inaccurate for other regions as well. For instance, Paget's has long been considered almost non-existent in Asia as well as Scandinavia. Yet Dr. Barbara Mills, in recent discussions with surgeons in Japan, was informed that Paget's has now been identified in Japanese patients. No reliable statistics for Japan currently exist, principally because doctors there have not been trained to diagnose the disease and hospitals do not routinely test for it.

⁷⁰ F. M. Detheridge, P. B. Guyer, and D. J. P. Barker, "European Distribution of Paget's Disease of Bone," *British Medical Journal* 285 (1982) 1006.

⁷¹ Pathologic fractures occur most frequently in the weight-bearing bones of the lower extremities, such as the femoral, subtrochanteric, and tibial regions; Merkow and Lane (n. 40 above) 174.

mutation, Pagetic bone strength is described in this way: "The limbs, however misshapen, remain strong and fit to support the trunk."⁷²

In the face of this medical information about bones, we might well refocus on a crucial factor: the saga author in recounting the episodes of the bones did not intend the reader to conclude that Egill suffered from an illness, nor does he draw any connection with the disorders described in Egill's poetry. Rather, he was simply commenting on the impressive appearance and characteristics of the skeletal remains. The bones are just one more aspect in a tale which concentrates upon the hero's unusual dark-sided heritage. Yet here too the medieval text provides additional evidence to our inquiry since this dark heritage was remembered as being remarkable, spanning three generations. Egill's grandparents, Kveld-Úlfr and Salbjörg, we are told, had two sons, one of whom possessed a foreboding appearance and a gloomy temperament:

Kveld-Úlfr and his wife had two sons. The older was called Thórólfr and the younger Grímr.... Thórólfr was the most handsome and accomplished of men. He resembled his mother's people and was cheerful, openhanded, ambitious, and full of energy. He was liked by everyone. Grímr was dark and ugly, like his father, both in outward appearance and in temperament (chap. 1).

A somewhat similar story is told of Egill's parents, Skalla-Grímr and his wife Bera, and their two sons:

Skalla-Grímr and Bera... had a son who was sprinkled with water and named Thórólfr. And when he grew up he was soon tall of stature and of the handsomest features. Everyone said that he would be a man just like Thórólfr Kveld-Úlfsson, after whom he was named. Thórólfr was far beyond those of his own age in strength, and as he grew up he became adept at most feats and skills then the vogue with men of ability. Thórólfr was a happy-natured man

Once again Skalla-Grímr and his wife had a son. He too was sprinkled with water and he had a name given to him. He was called Egill. But as he grew up it could soon be seen that he would prove a rare one for ugliness. Egill was black-haired like his father (chap. 31).

After Egill's generation, the sons born to his family no longer exhibit such a dichotomy of light and dark, and the hint of supernatural attributes disappears. A decided physical contrast, however, remained part of the family heritage, as the saga makes clear: "Because to this line were born those who were the most handsome of Icelanders ... but the majority of the Mýra family were the ugliest of men" (chap. 87).

DIAGNOSIS OF PATHOLOGIES FROM LITERARY SOURCES

Somewhat similar to our inquiry about Egill and his bones is a striking, though little noticed, correlation of saga accuracy and archeological investigation. The textual information comes from *Morkinskinna*, one of the oldest manuscripts containing saga histories of the kings of Norway.⁷³ *Morkinskinna* tells the story of the eleventh-century Danish king Sveinn Úlfsson (Ástríðsson) (1047-1074), whose bones were later

⁷² Woodhouse (n. 41 above) 54.

⁷³ *Morkinskinna*, ed. Finnur Jónsson (Copenhagen 1928) 214.

exhumed.⁷⁴ Sveinn is constantly at war with the Norwegian king Haraldr Harðráði (1047-1066), and is repeatedly defeated. After a great sea battle in 1062 at the mouth of the river Nissa,⁷⁵ Sveinn, badly beaten, barely makes it ashore ahead of the Norwegians searching for him. Coming to the home of a local farmer, Sveinn hides his identity as he seeks a way to escape. The saga author relates how the farmer's shrewish wife insults the disguised king, complaining that Sveinn is an unworthy ruler, being "both lame and cowardly" (*hvarveggja halltan oc ragan*).⁷⁶ Despite the wife's animosity, Sveinn escapes.

This episode is more than a good example of storytelling in the sagas. It is also one in which bio-archeological evidence supports a story that had previously been considered fictional. In 1911 Sveinn's bones were exhumed from their resting place in Roskilde Cathedral and subjected to a careful anatomical examination. To their surprise, the investigators discovered that both of Sveinn's hips were deformed.⁷⁷ In all probability, the wife's remark was literally correct: King Sveinn was almost certainly lame.⁷⁸ So too, we do not have to discount *Egils saga* in order to explain the enlarged and misshapen skull and bones unearthed by Skapti Thórarinnsson in the twelfth century. In the words of a modern expert on Paget's, "The surface of the skull may appear irregular and corrugated,"⁷⁹ a description that tallies with a medieval Icelander's characterization of his ancestor's skull as "ridged all over like a scallop shell."

CONCLUSIONS

Together, Egill's poetry, Skapti's archeological observation of the bones, and modern medical knowledge provide a detained picture of a Pagetic affliction. Armed with this insight we can see that *Egils saga*, long presumed fictional, may well contain a good deal of accurate information. Is there more work to be done here? Yes, perhaps, since the bones are possibly still in the ground at the old church yard at Mosfell waiting to be unearthed for the third time in 1000 years.⁸⁰

⁷⁴ The story, which seems to have been well known, is also to be found in an essentially similar form in *Haralds saga Sigurðarsonar* in Snorri Sturluson, *Heimskringla*, ed. Bjarni Aðalbjarnarson, Íslenzk fornrit 28 (Reykjavík 1951) 153.

⁷⁵ The river Nissa is today in western Sweden, close to the Norwegian border.

⁷⁶ The full *Morkinskinna* text (n. 73 above) 214 reads "Vesol erom vet k. oc ç vei verþi os. ver eigvm k. hvarveggja halltan oc ragan." *Haralds saga Sigurðarson* (n. 74 above) reads "bæði haltr og ragr."

⁷⁷ "Ganske Overraskende kommer imidlertid det positive Fund, at der har været noget abnormalt i begge hans Hoftled"; Fr. C. C. Hansen, *De ældste Kongegrave og bispegrave i Roskilde Domkirke: Anthropologisk-Historiske Undersøgelser* (Copenhagen 1914) 61; see also 18-19.

⁷⁸ Whether or not he was a coward is a matter of opinion. However, it may be stated that King Sveinn had more experience than most rulers in fleeing from lost battles

⁷⁹ Hamdy (n. 38 above), caption of plate 4.

⁸⁰ This is a project which I am considering.

APPENDIX: PAGET'S DISEASE

Paget's disease or *osteitis deformans* affects slightly more men than women, and usually occurs after the age of forty. Normal human bones, which are constantly being renewed, are usually rebuilt every eight years. Paget's quickens the pace of bone breakdown and reformation, with the result that the layers of new bone are structurally disorganized, misshapen, and considerably larger than the original bone. As one researcher has put it, "Paget's disease is a paradigm of bone modeling gone awry."⁸¹

Paget's progresses through several phases. The disease begins in an osteolytic or *resorptive stage*, when bone starts to be resorbed⁸² and renewed at an unusually rapid pace. The osteoclasts, cells which resorb bone, begin to function too quickly.⁸³ Too much bone is resorbed, and the rapidly rebuilt bone becomes structurally unable to withstand bio-mechanical stresses. The "lamellar" pattern of normal bones, in which "bundles" of bone collagen (proteins) are of uniform size and arranged in a parallel fashion, is replaced by irregular deposits. The newly-formed irregular bone is structurally inferior to its normal counterpart. In this stage of the disease, bones deform easily under their own weight.⁸⁴ In subsequent stages—the intermediate or *mixed phase*, and finally the inactive or *sclerotic phase*—*Pagetic* bone hardens and may develop a mosaic or ruffled surface pattern.

The base of the skull and the vault are both vulnerable to deformation from the disease. The pressure on the spine may deform the weakened base of the skull, which causes pressure on the brain and the nerves in the upper spine. Patients may have difficulty walking, and may shuffle or fall backwards as a result of *Pagetic* nerve compression. Egill's stumbling walk, his falling and swaying may have been caused by pressure on the spine or skull base.

Patients do not usually die of Paget's but of some related disorder, such as cancer or heart failure.⁸⁵ In the final stage of Paget's disease the bones and skull may become considerably enlarged. In some cases bones become even four times as thick as normal and new bone steadily covers the entire area previously invaded by the resorptive process.

Patients suffering from Paget's may become blind as a result of compression of the optic nerve. More frequently, the disease causes hearing loss. "Deafness may be due to compression of the eighth nerve of the auditory canal ... or through direct invasion of the cochlea (the middle ear) by *pagetic* bone."⁸⁶ Between twelve and forty-seven percent of individuals with Paget's have some form of hearing deficiency.⁸⁷ These and

⁸¹ Steven L. Teitelbaum, "The Pathology of Paget's Disease," in Singer and Wallach (n. 35 above) 32.

⁸² Resorbed is a term widely employed in discussions of Paget's, although "reabsorbed" is also used.

⁸³ Such osteoclasts may become huge, containing a hundred times the nuclei of normal cells; Teitelbaum (n. 81 above) 32.

⁸⁴ *Ibid.* 37.

⁸⁵ Daniel Wilner, *Radiology of Bone Tumors and Allied Disorders* (Philadelphia 1982) 586.

⁸⁶ Hamdy (n. 38 above) 58.

⁸⁷ In a review of 111 cases of Paget's disease it was found that fourteen percent had defective hearing; J. A. Rosenkrantz, J. Wolf, and J. J. Katcher, "Paget's Disease (*Osteitis Deformans*)," *Archives of Internal Medicine* 90 (1952) 610-633. In another study, which examined 30 patients, forty-six percent were found to have hearing loss; N. L. Sparrow and A. J. Duvall, "Hearing Loss and Paget's Disease," *Journal of Laryngology and Otology* 81 (1967) 601-611.

other alterations to the surface of the braincase rarely affect the brain itself. If the victim were an elderly poet, the mind would be free to use the artistic skills acquired during a lifetime to record the distress caused by the disease.

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