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The Influence of the Medieval Encyclopedia on Snorri's Edda

> He [Pythagoras], though the gods were far away in the heavenly regions, still approached them with his thought, and what Nature denied to his mortal vision he feasted on with his mind's eye. And when he had surveyed all things by reason and wakeful diligence, he would give out to the public ear the things worthy of their learning and would teach the crowds, which listened in wondering silence to his words, the beginnings of the great universe, the causes of things and what their nature is: what God is, whence come the snows, what is the origin of lightning, whether it is Jupiter or the winds that thunder from the riven clouds, what causes the earth to quake, by what law the stars perform their courses, and whatever else is hidden from men's knowledge.
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> Ovid, Metamorphoses XV, 62-72 (Miller:1916:369)

There are a number of bodies of medieval Christian knowledge and their attendant literary genres that influenced Snorri Sturluson's Edda. The Christian view of universal history and the historical and euhemeristic interpretations of myth are Christian-Latin traditions whose influences upon the Prologue, in particular, have been thoroughly explored (Heusler:1908; Faulkes:1983). It has also been argued, with considerable conviction, that speculative theological works which concerned themselves with the question of how mankind gained knowledge of the divine creator, including perhaps those of twelfth-century Christian Platonists, may have influenced Snorri's positive, humanistic evaluation of Norse mythology (Meyer:1912;Dronke and Dronke:1977). Almost certainly a working knowledge of Christian dogma and of the Bible contributed to his coherent presentation of Norse myth, whether his intention in using it was parodic (Holtsmark:1964) or syncretic (Foote:1974:90-1). In a forthcoming study (Clunies Ross:1986) I present evidence that Snorri was very likely to have composed his analysis of skaldic diction in Skáldskaparmál in the knowledge of some of the major issues in twelfth century logic and grammar as well as with an eye to the important relationship between language and religion

which he enunciates in the Prologue. In matters of form also, all parts of the Edda, but especially Háttatal and Skáldskaparmál, reveal the influence of common Christian forms of instruction, such as the dialogue and the clavis metrica.

Even though Snorri appears to have been influenced by a diversity of Christian genres, he is his own man when it comes to the use to which he puts this material in the Edda. No single Christian tradition or body of literature offers an adequate model for all that appears in a work which is both theoretical and imaginative. Moreover, Snorri's learning is unobtrusive and does not lead us easily to named sources; instead, the ideas that came to him from Christian-Latin works are put to use in the context of explanations of Norse mythology couched in terms of indigenous modes of thought.

One genre of medieval writing which I consider to have shaped Snorri's presentation of Norse mythology and poetics was the encyclopedia, a literary form which treated the subjects that we would now call the natural sciences and astronomy. A considerable part of the conventional range of subjects treated in the medieval encyclopedia also appears in Snorri's Edda, and in several places where Snorri presents these subjects in terms of a native myth, he follows his narrative with an explanation of the phenomenon in terms of natural science. The repertoire of the encyclopedia gives us some insight into the reasons for Snorri's choice of certain subjects in the Edda, the manner of his treatment of them and, in some cases, the ordering of the material.

The encyclopedic influence is more obvious in Gylfaginning than in Skáldskaparmál; but, although parallels are more numerous in Gylfaginning, the cognitive influence of the encyclopedia is also important in the latter section. It provides a framework within which Snorri is able to interpret certain types of myth in the Old Norse corpus in a manner congenial to Christian speculation about man and his place in the universe. Two such myths, which concern the antagonistic relationships between the Norse gods and giants, are narrated at some length in Skáldskaparmál. These are the abduction of the goddess Iðunn by the giant Þjazi, the single combat between Þórr and the giant

Hrungnir, and the sequels of both. The unique versions of these two myths that Snorri presents can be most clearly understood if their subjects are seen to be influenced by the conventions of the encyclopedia. As both these myths appear early in Skáldskaparmál, they are apprehended while the cosmographic perspective of Gylfaginning is fresh in the audience's mind. This perspective is never entirely lost in Skáldskaparmál, but forms a general template for the alignment of native explanations for the phenomena of the natural world with those of Christian natural science.

Snorri's interpretations of certain significant groups of kennings in Skáldskaparmál, including those for the gods, natural phenomena and gold, depend upon his audience's knowledge of the nature of the four primary elements, air, fire, water and earth and of the relationship between the macrocosm and the microcosm, man, according to medieval Christian Platonism (Clunies Ross: 1983 and 1986). The influence of the tradition of microcosm-macrocosm speculation is anticipated for Skáldskaparmál by Snorri's presentation of the myth of the gods' dismemberment of the giant Ymir, from whose body-parts the world was made, in the early pages of Gylfaginning (Holtsmark:1964:27-32).

The encyclopedic tradition, as it was transmitted to the Middle Ages, had connections at several points with these bodies of knowledge. The four elements, for example, usually appeared in the encyclopedic repertoire. The encyclopedia, moreover, was the widest-ranging and most commonly accessible compendium within which medieval Christians encountered the corpus of natural science that the Christian West had inherited from classical writers. Furthermore, several twelfth century Latin authors had given new life to the encyclopedic tradition by incorporating its subject matter in literary interpretations of mythical cosmogony. It is tempting to believe that Snorri might have been aware of the new use to which writers such as Honorius of Autun, Adelard of Bath, William of Conches and Bernardus Silvestris had put the encyclopedic form some eighty years or so before he composed his Edda (Stock:1972:7).

The nature of the medieval encyclopedia to the mid twelfth century

The medieval encyclopedia presented a version of classical natural science acceptable to the Christian educational tradition. In the period up to the twelfth century the two most influential Christian encyclopedists were Isidore of Seville and Bede. The former attempted a reconciliation of pagan science with Christian allegory in his De natura rerum of c.613 A.D. (Fontaine:1960), while the latter, in a work with the same title (c.703), adapted classical natural science to the stringent requirements of the claustral vocation mainly by excising non-compatible material (Jones:1975). Bede's thorough and succinct codification of the opus Dei, incorporating the elements of grammar, the study of time (computus) and of music in the form of cantus, ensured that from the eighth to the twelfth centuries his works monopolized the school curriculum (Jones:1975:v-vii). He incorporated the subject of natural science into that section of the curriculum that dealt with computus, though both he and earlier masters had also incorporated it into another Christian genre, that of the exegetical commentary on the first chapters of the book of Genesis concerning the creation of the world. Hence Bede, following earlier writers such as Ambrose, wrote a Commentary on Genesis, Book I (Jones:1967) whose subject matter overlaps his youthful De natura rerum.

The early medieval encyclopedia took its subject matter and order of treatment mainly from antique treatises of meteorology as Aristotle had defined it in his Meteorologica (Lee:1952). He used this term to refer to processes of change in the four elements as they appear in the cosmos. These include phenomena of the heavens, such as the celestial bodies, seasons, winds, clouds, eclipses, thunder, lightning, rainbows, snow, rain, hail and dew, as well as phenomena of the earthly region which are related to those of the skies. Among the latter are such topics as the nature and behaviour of oceans and rivers, earthquakes and the various regions of the world. Aristotle's Meteorologica was the major model for later classical writers of treatises on natural science, like Pliny (Historia naturalis, Book 2), Lucretius (De rerum natura) and Aetius (Placita). In addition, brief catalogues of naturalia are found in classical and post-

classical Latin poetry, and these include selections from the same repertoire of themes.[1]

The ordering of subjects followed a traditional pattern, already established in Pliny's _Historia naturalis_, beginning with the world and its parts, the elements, the air, heavenly bodies and other celestial phenomena, passing then to the waters and so to the earth. Certain other subjects, such as the names of the stars, seas and rivers, were introduced into the encyclopedic repertoire in the form of schoolroom glosses (Fontaine:1959:519-20). Others, including the nature of the waters above the firmament (cf. Genesis 1,7) and the question of the animation of the heavenly bodies, were particular problems that had arisen in the tradition of hexameral exegesis following Ambrose and Augustine (Fontaine:1960:10).

During the early part of the twelfth century there arose a new interest in scientific thought, facilitated by the translation into Latin of works of Aristotelian physics and Ptolemaic astronomy which had hitherto been unavailable to the Christian West. The empirically perceptible world came to be valued both for its own sake and for the light it might be able to throw on the mysteries of the book of Genesis and the nature of the cosmos. Thus we find Thierry of Chartres, who was active from about 1121 to 1155, asserting in his exposition of the hexameron entitled _De sex dierum operibus_ (Häring:1971:184;P.Dronke:1969:138) that only a scientific interpretation of Genesis could be a truly literal one. Thierry employed the sciences of the _quadrivium_ to "demythologize" the story of Genesis and to demonstrate rationally the Creator's artifice (Stock:1972:241). At the same time, other writers used new versions of old Platonic mythological models of the universe to embrace both the inherited knowledge of natural science as it appeared in the encyclopedia, and also new information from developing fields such as medicine and botany. In Bernardus Silvestris' _Cosmographia_, (c.1147-8), for example, the allegorical figure of Natura, together with her two sisters Urania, the principle of celestial existence, and Physis, who represents material existence and the study of the physical world, embark on a collaborative venture to produce the microcosmos, man (P. Dronke:1978 and 1974:122-6). Although in the

Cosmographia Physis needs the collaboration of the other two principles of nature, her own scientific enquiries have independent value, for they record the natural properties of living beings (P. Dronke:1978:144).

One of the most striking characteristics of early twelfth century explorations of ideas that impinged on the fields of what we would now call philosophy, theology and science, was that writers often approached their subjects by means of transformations of ancient myths and images. They consciously revived the method that Plato had used in his Timaeus in order to pursue subjects of importance to the rational intellect by way of the exercise of the fictive imagination (P. Dronke:1974). However, these writers often used literary forms that were quite conventional, sometimes, no doubt, to point up the differences between their own transformations of the ancient models and the models themselves. In the field of natural science and philosophy the encyclopedia was one of the forms commonly utilized, along with the dialogue, the commentary and the prosimetrum, to explore the nexus between the old and new science. Stock (1972:7) has noted that medieval codices often include representative texts of both the old and new writers: MS Paris Bibl. Nat., lat. 11, 130, for example, contains parts of Honorius of Autun's Imago Mundi, an illustrated Philosophia Mundi by William of Conches and Bede's De natura rerum.

If, as I shall argue, Snorri Sturluson used the encyclopedic form as one of the shaping forces in his Edda, it is reasonable to suppose that he was moved to juxtapose myth and science in this work for the same purpose as Latin writers of his age and the preceding century had: to reveal the cognitive value of the myths of the pre-Christian Scandinavians by showing how the images and concepts of his systematized Old Norse mythology expressed ideas that had their parallel in the natural science inherited by the Christian West from the classical world. The encyclopedic perspective is thus one of several Snorri uses to align Old Norse thought with significant ideas in the medieval European intellectual tradition.

Icelandic knowledge of the encyclopedic tradition

Apart from Snorri's writings, most of the evidence for a knowledge of the encyclopedic tradition in early Iceland comes from two main sources: a section of Hauksbók (fols. 1-4 of AM 544, 4to) which comprises a collection of texts on chronological, geographical, scientific and theological topics and several of the manuscripts published by Kristian Kålund in his three volumes entitled Alfræði Íslenzk (1908-18). Both the material in Hauksbók and that in the Kålund collection is of varying age, and in most cases the manuscripts themselves are older than the third decade of the thirteenth century, the time when Snorri was probably composing his Edda. Nevertheless, as encyclopedic lore was part of the school curriculum, it seems probable that educated Icelanders would have been acquainted with its repertoire by Snorri's day.

Some encyclopedic information seems to have reached Iceland by way of treatises on computus with accompanying encyclopedic glosses such as are found in the oldest part of the manuscript GkS 1812 IV 4to, datable to the last decade of the twelfth century (Hreinn Benediktsson:1965:pl.4; Larsson:1883; Blaisdell: 1960). Encyclopedic glosses were widely used in the medieval West to explain to the reader of classical verse anything that was unusual or foreign to him (Wieland:1983:180-5). Some encyclopedic lore is also to be found in works such as Veraldar saga and the Old Icelandic Elucidarius, both of which are extant in manuscripts of c.1200 or a little earlier (Jakob Benediktsson: 1944; Jón Helgason:1957). Texts of classical authors which contained brief catalogues of meteorological subjects, such as Ovid's Metamorphoses (cf.XV, 67ff. quoted at the beginning of this paper), may also have familiarized Icelanders with this tradition (Holtsmark:1968:cols.63-6).

The contents of Fols. 1-14 of MS AM 544, 4to, one of the contributory manuscripts to the fourteenth century compilation Hauksbók, have been summarized by Jón Helgason in his facsimile edition (1960:xii-xiv). He notes that some of the material in these folios is also to be found in older Icelandic manuscripts, including GkS 1812, 4to (item 1, on the course of the sun), and

AM 673a, 4to, from c.1200 (k, on the rainbow) and surmises "there is no reason for thinking that any of [the material] was first translated when it was written here" (1960:xii). Indeed, the item on the course of the sun indicates that the astronomical tradition was not entirely a derivative one in Iceland but could generate original observations, for the piece gives an account of Stjǫrnu-Oddi's observations in the north of Iceland.

Although the sources for some of the texts in the encyclopedic section of Hauksbók have not yet been established, a major source appears to have been Isidore's Etymologiae. Isidore's work may have been known directly or through florilegia. Some of the material here and also in Alfræði Íslenzk seems to show knowledge of the Imago Mundi of Honorius of Autun (c.1080-c.1137). This popular work (PL 172, cols.115-188; Flint:1977) is a miscellany of encyclopedic, chronological and geographical lore overlaid with a superficial Platonism, as its introductory chapter (I,i,PL172,col.121) indicates with its allusion to the myth of the cosmic egg. This chapter, which compares parts of an egg to the various parts of the universe (P. Dronke:1974:79-99 and 154-166), appears in a fifteenth century Icelandic manuscript, AM 685 d, 4to (AÍ III, p.75), but probably goes back to an earlier translation. According to Anne Holtsmark (1958:cols. 593-5), an Icelandic translation of the Imago Mundi is likely to have been made in the twelfth century, as well as a translation of another of Honorious's works, the Elucidarius.

When considering the Hauksbók encyclopedic material in relation to Snorri's Edda, it is also of interest to note the appearance of two sermons in the collection (items e and h). These are based respectively on the Anglo-Saxon homilist Ælfric's De falsis diis and De auguriis. Both homilies, like Snorri's Edda, deal with the subject of non-Christian religious beliefs, though they adopt a view of the subject which is different from Snorri's in several respects. However, the subject of exotic religions and the world-view they entailed was one that had been drawn into the encyclopedic tradition since at least the time of Isidore. This was particularly the case with the subject of the names pagan peoples had given to the heavenly bodies, and the myths that gave rise to those names.

The encyclopedic dimension to Snorri's Edda

Snorri is most likely to have learnt about the subjects treated in the medieval encyclopedic tradition in the course of his education at Oddi. Most of the extant material translated into Icelandic from this tradition is fragmentary and consists of collections of short excerpts from larger works rather than systematic expositions of the encyclopedic repertoire. However, it is possible that Latin works such as Honorius's Imago Mundi were in use in Icelandic schools. At all events, the knowledge of natural science that appears in the text of the Edda does not exceed what one might expect of someone who had passed a little way beyond the elementary stage of a Christian education. The question of whether Snorri was aware of the use to which twelfth century writers had put scientific material in their mythological explorations of philosophical and theological problems cannot be answered with any certainty. However, the evidence of the Edda text indicates that his purpose in juxtaposing myth and science was similar to theirs.

Holtsmark (1964:51-4 and 78-81) and Faulkes (1982:xxiii) have drawn attention to Snorri's penchant for etiological interpretations of Norse myths. These often suggest that the myths explain natural phenomena like the rainbow or earthquakes. Holtsmark has also pointed out many of the learned analogues to these topics without, however, recognizing them as part of a set which forms a native Icelandic equivalent to the medieval encyclopedia. To be sure, Snorri does not force his version of Norse mythology into a rigid encyclopedic mould, for some of the standard topics are missing and there is much other material in the Edda which is not to be found in the encyclopedic repertoire. Moreover, he includes some material of a scientific kind which did not belong to the meteorological tradition, such as his observations on the relationship between dew and bees (8,24,21-25,6) or his mention of the way in which cold things "sweat" (gráta) when they come into the heat (35,67,18-20). However, on balance, the encyclopedic set is complete enough for it to be recognizable as one of the important structural and intellectual bases of the Edda, and one which links the Prologue, Gylfaginning and Skáldskaparmál.

The following table sets out the encyclopedic material in the Edda in the order in which the topics occur. These can be compared with their parallels in the De natura rerum of Isidore and Bede, and in the early twelfth century De imagine mundi (Imago Mundi) of Honorius of Autun, a work whose first book is based on the meteorological format, but which includes other materials derived from computus and biblical history. There is perhaps a closer similarity between Snorri's and Honorius's treatment of the topics they share than there is between Snorri and Bede or Isidore. As there is a distinct possibility that the Imago Mundi was known in Iceland by the early thirteenth century, Snorri may have been influenced by it. In the table, references are made to the relevant chapters in Bede (Jones:1975) and Isidore (Fontaine:1960) and to book and chapter in Honorius (PL 172:cols.115-188). Edda references are to chapter, page and line of Gylfaginning and Skáldskaparmál in Finnur Jónsson's 1931 edition and to page and line number of the Prologue in Anthony Faulkes' 1982 edition.

Although much has now been written about Snorri's Prologue, the contribution of the encyclopedia to its format has escaped notice. Most Christian encyclopedias open with a section on God's work of creation (topic a) and shortly afterwards move to a statement of the four primary elements, earth, water, fire and air (b). This transition also occurs in the Prologue, though it is complicated by other material concerning mankind's loss of knowledge of God after Noah's flood. Immediately after topic (b), Snorri sets out the division of the world into three regions (c), which leads him to the story of the Æsir's migration from Troy to Scandinavia. The concatenation of topics here is most reminiscent of Honorius 's Imago mundi, where topic (c) is not only treated shortly after (a) and (b) (in Bede and Isidore (c) occurs towards the end of the encyclopedia), but is followed by numerous chapters on various regions of the world, beginning with Asia, the location of Paradise, and including Germania, a region that embraces Scandinavia.

Encyclopedic Topics in Snorri's Edda

(Items marked * are not strictly part of the meteorological tradition but are included in some sources.)

Snorri Sturluson, Edda	Bede, De natura rerum	Isidore, De natura rerum	Honorius, De imagine mundi
Prologue			
a) God's creation of the world, 1, 1-3	a) I; De quadrifario Dei opere	a) ---	a) I, ii, De creatione mundi – Quinque modi creationis mundi
b) Argument from design for divine Controller of heavenly bodies and the four elements which constitute the world, 4, 1-9	b) IIII, De Elementis	b) XI, De partibus mundi	b) I, iii De quatuor elementis
c) Division of the world into three regions, Africa, Europe, and Asia, 4, 16-26	c) LI, Diuisio Terrae	c) LVIII, De partibus terrae	c) I, vii, De tribus partibus orbis habitabilis
Gylfaginning			
d) Establishment of fixed and moving heavenly bodies (stars and planets), 5,15, 8-14	d) XI, De Stellis (cf. V; De Firmamento)	d) XXII; De cursu stellarum	d) cf. I, lxxxix, De stellis
e) The circular world, surrounded by ocean, 6,15, 21-3	e) cf. XLVI, Terram Globo Similem	e) cf. XLV, De positione terrae	e) I, v, De forma terrae
f)* Day and night and their courses, 6,17, 8-20	f) Bede removed hemerological material to his De Temporibus	f) I, De diebus and II, De nocte	f) II, xii, De die and xxix, De nocte
g) Sun and moon and their courses, 6,17,20-18,13	g) XVIIII, De cursu et magnitudine solis and XX, De natura et situ lunae	g) XV, De natura solis; XVII, De solis cursu and XIX, De lunae cursu	g) I, lxix, De luna and I, lxxii, Quartus planeta, Sol
h) Cause of eclipses of the sun and moon (wolves swallow sun and moon), 6, 18,13-19,12; cf. also 37, 70,20-22 (Ragnarøkr)	h) XXII, De eclipsi solis et lunae	h) XX, De eclipsin solis and XXI, De eclipsin lunae	h) II, xxxi, De eclipsi
i) The rainbow and its properties (the bridge Bifrǫst, built by the Æsir), 6,19,13-20,2 and 8, 23, 8-9 (red colour of rainbow from flaming fire)	i) XXXI, De arcu	i) XXXI, De arcu	i) I, lviii, De iride

Snorri Sturluson, Edda	Bede, De natura rerum	Isidore, De natura rerum	Honorius, De imagine mundi
j) The origin of dew *and bees (from white mud that laves the World Ash), 8, 24, 21-25, 6 and 6, 17, 17-19 (drops of foam from Hrímfaxi's bit)	j) ---	j) ---	j) I, lxi, Quid [sit] ros et pruina
k) The origin of wind (from the flapping of the wings of the giant Hræsvelgr in eagle form), 9, 26, 14-23	k) XXXVI, De uentis	k) XXXVI, De uentis	k) I, liv, De ventis, and I, lv, De cardinalibus ventis
l)* Qualities of summer and winter, 9, 26, 24-10, 27, 9	l) ---	l) ---	l) II, lii, De vicissitudine anni; liv, De aetate and lvi, De hieme
m) Origin of certain rivers (a stream from the horns of the hart Eikþyrnir, falling into Hvergelmir, and thence to earth), 25, 43, 20-44, 3	m) cf. XLIII, De Nilo	m) cf. XLIII, De Nilo flumine and XLIV, De nominibus maris et fluminum	m) ---
n) Origin of ebb-tides (they derive from Þórr's draught of the sea in his drinking contest at Útgarðaloki's hall) 31, 59, 23-60, 5	n) XXXVIIII, De aestu oceani	n) XL, De oceani aestu	n) I, xl, De aestu maris
o) Origin of earthquakes (they occur whenever a drop of poison falls on Loki's face, as his wife Sigyn goes to empty the basin in which she has been catching the drops. He convulses and the earth shakes), 36, 69, 23-70, 5	o) XLVIIII, De terrae motu	o) XLVI, De terrae motu	o) I, xlii, De terrae motu
p) Origin of tidal wave (World Serpent in a frenzy at Ragnarøkr), 37, 71, 2-8	This subject is not represented separately in medieval encyclopedias, but is often alluded to under the topic of earthquakes.		

Snorri Sturluson, Edda	Bede, De natura rerum	Isidore, De natura rerum	Honorius, De imagine mundi
Skáldskaparmál			
q) Stars named after mythological beings i) Óðinn transforms the giant Þjazi's eyes into two stars as recompense to giant's daughter, 4, 81, 13-15 ii) Þórr throws the frozen toe of Aurvandill, husband of Gróa, up into the sky where it becomes a star. His purpose is to recompense her for removing a whetstone from his forehead, 26, 104, 4-10	q) cf. XI, De Stellis	q) XXVI, De nominibus astrorum and cf. Etymologiae III, lxxi, De nominibus stellarum	a) I, lxxxix, De stellis - cxxxv, Canopus (includes chapters on the origin of names for signs of the zodiac and various stars and planets)
r) Chapters 32-39 on poetic names for sky, earth, sea, sun, wind, fire, winter and summer relate to items b, f, g, l. They also contain different etiologies from those in Gylfaginning.			
s) Why the sea is salt. (The viking Mýsing orders Fenja and Menja to grind salt, but the ship on which they are grinding sinks and so the sea becomes salt), 53, 136, 1-7	s) XLI, Cur mare sit amarum	s) XLII, Cur mare amaras habeat aquas	s) I, xlv, De acquis dulcibus et salsis

The largest number of meteorological topics in the Edda occurs in Gylfaginning. In many cases, the transition from one topic to the next is prompted by a direct question or provocative observation from Gangleri-Gylfi (e,g,h,i,k,l); in other instances the High One elaborates on his own response to one topic by passing to another (f,j,m,n,o,p) or the matter is taken up by another member of the trinity of Æsir (d). Topic (d) makes the same distinction between the fixed (fixae) and wandering (errantes) heavenly bodies as we find in the Latin encyclopedias' treatment of this topic, though it is couched in terms compatible with Norse mythology: "They gave places (staðar) to all fiery bodies, some on the [vault of] heaven, some travelled uncontrolled (lausar) beneath the heaven..." (5, 15, 11-12). The Third, who presents this topic, then adds that it is said in ancient sources of knowledge (í fornum vísindum) that the gods' establishment of positions and courses of the heavenly bodies led to the capacity to distinguish days and years, and quotes Vǫluspá 5 in support of his assertion. Faulkes (1982:59) has noted that the juxtaposition of the eddic strophe and the reference to ancient sources of knowledge allows one to infer that these might be eddic poems or learned works on computus or both.[2] Indeed, several medieval encyclopedias included topics that strictly speaking belonged to the subject of hemerology, and Snorri follows them in including discussion of day and night (f) and winter and summer (l) in Gylfaginning. Bede removed such material from the De natura rerum to his De temporibus, but it is present in Isidore and in Honorius, though only the latter discusses the seasons of the year. Honorius deals with topics (f) and (l) in his second, non-meteorological book of the Imago Mundi.

The subject of topic (e) is raised by means of a direct question from Gangleri and is closest both in formulation and positioning to Honorius's paragraph on the nature of the earth (cf. Holtsmark:1964:32fn.1). In the classical and early medieval encyclopedias, the topics of the shape of the earth and its regions occur towards the end of the set rather than near the beginning. Topics (f), (g) and (l) are expressed in terms of native myths which are closely related to Snorri's treatment of

kenning-types for natural phenomena in Skáldskaparmál (Clunies Ross:1986). I have observed both the correspondences and also the disparities between the handling of these topics in Gylfaginning and in Skáldskaparmál. Topic (h), the cause of eclipses, follows topic (g) in both Bede and Isidore and also in Snorri, and the matter is reiterated when he deals with the subject of Ragnarøkr. There is a clear difference also between the conceptualization of the wind as deriving from the flapping wings of the giant Hræsvelgr in eagle form (topic k) and its representation as one of the three sons of Fornjótr in Skáldskaparmál (Clunies Ross:1983). Holtsmark (1964:81) has drawn attention to the learned occurrence of the image of the wind's wings. To this one might add that both Bede's and Isidore's chapters on the winds in their De natura rerum make comparison between the currents of air that produce winds and the action of a fan (flabellum).

Two of the most interesting topics in the meteorological repertoire established by Aristotle and passed down in the medieval encyclopedic tradition were the subjects of the rainbow (i) and the origin of dew (j). Although the origin of dew happens to be missing from both Bede's and Isidore's De natura rerum, it was part of the repertoire and appears in Honorius's Imago Mundi shortly after his discussion of the rainbow. Holtsmark (1964:52-3) has cited a number of learned Latin discussions of the rainbow and the significance of the varying number of colours ascribed to it by medieval writers. Most of the authorities she adduces are commentators on Genesis. While it is quite possible that hexameral commentaries contributed to Snorri's awareness of the Christian resonance of this topic, the way in which it is presented in Gylfaginning suggests the closer relevance of the major medieval vehicle for natural science, the encyclopedia. The High One, after reproaching Gangleri for his ignorance about the gods' path, Bifrǫst, suggests that even such an obtuse man as he might have observed it in its more mundane form: "You will have seen it, maybe you call it 'rainbow'" (6,19,16-17). Just so, those with earthly understanding and reasonable powers of perception can discover the rainbow's natural properties though they may be ignorant of its mythic significance.

There is a similarly scientific cast to Snorri's presentation of the origin of dew, though one would not want to quarrel with Holtsmark's interpretation of the image of the World Ash laved by white muddy liquid (aurr) from which the honey-dew (hunangfall) drips, as paradisal. As she points out (1964:46-7), both honey and dew are associated with the concept of paradise in classical and Christian literature, and there is a strong possibility that the comparison the High One draws between the holy, white waters of Urðarbrunnr and the membrane on the inside of an eggshell is meant to remind us of the Platonic analogy between parts of the cosmos and parts of an egg. As Holtsmark observed (1964:48), the Icelandic translation of Honorius's Imago Mundi (AÍ III:75) equates the egg-shell with fire, the membrane with air, the egg-white with water and the yolk with earth, though in fact the standard Latin text of Honorius does not mention the membrane[3].

In several cases within Gylfaginning where the trinity of the Æsir align mythical and scientific explanations they do so in a form of words which clearly indicates that the scientific explanation is one current in the world of men that Gangleri inhabits. This is the case with the High One's gloss on the white substance that the Norns draw from Urðarbrunnr with which to lave the World Ash: "that dew (dǫgg) which falls from there to the earth, men call 'honey-dew' (hunangfall), and bees feed from there." (8,25,5-6). Clearly the belief in the origin of honey-dew and the genesis of bees are ascribed to human observation and not to the faith of the Æsir, who have a mythological explanation for the origin of dew. Snorri seems to be alluding here to an ancient belief, found in classical authors, that honey fell as dew from heaven because bees could be observed feeding on the sweet, sticky substance found on some leaves[4].

The same kind of distancing phraseology, whose purpose is to differentiate the beliefs of the Trojan Æsir from the scientific explanations of natural phenomena current in Gangleri's world, can be found in Gylfaginning's treatment of topics (n) and (o) and, by implication, topic (p). Towards the end of the trinity's lengthy narration of Þórr's encounter with Útgarðaloki, the latter explains to Þórr why he was unable to carry out the three

trials of strength he had set him. After revealing that the end of the drinking-horn he tried to drain was in the sea, Útgarðaloki tells Þórr: "and now, when you come to the ocean, you will see how great a lessening you have drunk in the sea" (31,60,3-5). Immediately following this passage of direct speech comes the statement "That is now called ebb-tides" (Þat eru nu fjǫrur kallaðar). This is followed by a continuation of Útgarðaloki's remarks to Þórr, introduced by the clause, "And he went on ..." (Ok enn mælti hann ...). It seems most natural that the remark about the origin of ebb-tides should be attributed not to Útgarðaloki (as is implied by Finnur Jónsson's (1931) punctuation), but to the narrator of the story, who is the Third. He is directing this remark to Gangleri, indicating that nowadays people observe and give the name of 'ebb-tide' to the phenomenon which the Æsir ascribe to an act of the god Þórr[5].

There is no doubt, in respect of topic (o), the origin of earthquakes, that the High One means to differentiate his belief in Loki's world-shaking convulsions from the human name 'earthquake' for commotions of the earth when he says: "then he (i.e. Loki) convulses so strongly that the whole earth shakes. You call that 'earthquake'" (36,70,3-4). It is not clear, though, that the account of the World Serpent's production of a surge of the sea (sævargangr))37,71,8) is meant to be aligned with human explanations of tidal waves. The explicit phrasing characteristic of many other encyclopedic topics is missing, and tidal waves were not given separate treatment in most medieval encyclopedias, even though they were part of the Aristotelian repertoire (Lee:1952:218-9). They were, however, closely associated with earthquakes and one can only note the closeness of topics (o) and (p) in Gylfaginning.

It is now possible to understand the purpose of the encyclopedic dimension to Gylfaginning. The Trojan Æsir, by their own admission, accounted for the nature of the cosmos in terms of the acts and natures of the deities they claimed to believe in. The Scandinavian people they subdued, of whom Gangleri-Gylfi was a representative, had evolved a set of names for meteorological phenomena based on their mundane observations of the world. The two views were complementary, though they represent distinct

modes of thought, the one religious, the other scientific, for both the Æsir and their Scandinavian subjects lacked direct knowledge of God and based their theories on their 'earthly understanding'. Yet both sought to explain the same set of phenomena, and this set, furthermore, is the same as that of the Christian encyclopedia whose purpose was to reconcile natural science with Christian dogma. The relationship between myth and science is thus a collaborative one and implicitly similar to that explicitly enunciated by Bernardus Silvestris as between Physis, Urania and Natura in the *Cosmographia*.

The encyclopedic dimension to Skáldskaparmál and Snorri's account of the metamorphoses of giants

The encyclopedic material in *Skáldskaparmál* is of a somewhat different order from that in the Prologue and *Gylfaginning* and serves a somewhat different purpose. Topic (r) takes up subjects that have already been treated in *Gylfaginning*; topic (s) introduces the standard meteorological subject of why the sea is salt by way of the myth of the grinding of salt by the giantesses Fenja and Menja. Topic (q) is of considerable importance to the furtherance of two of the longer narratives of *Skáldskaparmál*, and deals with the naming of certain stars after mythological beings. Topics (q), (r) and (s) all utilize the framework of the encyclopedia to present an important subject in Norse mythology which might otherwise have been difficult for Snorri to have fitted into his general interpretation of the old religion of the Scandinavians as an anticipation of Christian thought; this was the subject of giants and poetic terms for them.

In an earlier article and in my forthcoming book on *Skáldskaparmál* (Clunies Ross:1983 and 1986), I have observed that Snorri's omission of sets of kennings and *heiti* for giants and other supernatural beings such as dwarves and elves is the most significant gap in his representation of the Old Norse kenning system. His refusal to be prescriptive about how to refer to giants in poetry stands in marked contrast to his evident willingness to narrate lengthy stories of dealings between giants and other beings. Such narratives are to be found in both *Gylfaginning* and *Skáldskaparmál*. I have also shown how Snorri systematically represents three of the four primary elements,

water, air and fire, as the sons of a giant named Fornjótr in his treatment of kennings for natural phenomena (topic (r)).

In my discussion of Snorri's presentation of giants as embodiments of the workings of nature (Clunies Ross:1983), I indicated that both he and other, near-contemporary Norse writers favoured the interpretation of giants ad naturam, where a connection is made between pagan supernatural beings and natural phenomena. We find influential medieval Latin writers such as Isidore of Seville advocating such a view: "some myths are to be interpreted according to the nature of things, some according to the customs of men ... Formulations like 'lame Vulcan' refer to the nature of things, since fire is never straight by nature" (Etymologiae I,xl,3-4).

However, the fourth primary element, earth, is not interpreted in Skáldskaparmál in the same way as the other three, even though there was ample evidence in Norse mythology for earth's representation as the animate Jǫrð, mother of Þórr. It was simply not possible to connect the body of myths associating Jǫrð, Óðinn and Þórr with those Snorri and others used to connect air, fire and water with the sons of Fornjótr. His choice of the latter model in Skáldskaparmál also meant that he was unable to utilize the common medieval connection of giants with the earth by way of the etymology proposed for the Greek and Latin word for giant as meaning "produced from the earth" (terrigena)[6]. This notion would have been quite compatible with a majority of giant-kennings in skaldic verse which refer to giants as the inhabitants of rocks or mountains; but so strong is Snorri's allegiance to the dual principles of family relationship and animate, named referent in his interpretation of kennings, that he neglects what he must have known as the dominant type of giant-kenning, even though he narrates several giant-stories in Skáldskaparmál which depend directly on his knowledge of skaldic poems such as Haustlǫng and Þórsdrápa in which giant-kennings of the dominant type appear.

Instead, he turned in several significant instances in Skáldskaparmál to a combination of two models from Christian-Latin literature to enable him to present the acts of giants in Norse myth as in some sense compatible with the way such beings were accommodated to Christian views that were concerned to interpret

giants as creatures of dignity, as they also appear in skaldic mythological poetry (Clunies Ross:1981), rather than as the product of the giants of Genesis and the race of Cain or as emissaries of the devil (Clunies Ross:1983:62-3). The two models that provided this perspective were the encyclopedic topic of the names pagan peoples had given to the heavenly bodies and the Ovidian theme of metamorphosis of gods or men into celestial phenomena as either a reward or punishment for their deeds. Snorri put these models to work in the context of an extended narrative based on traditional myth, which often takes the form of the European wondertale as analysed by Vladimir Propp (Clunies Ross and Martin:1985).

We have already seen that the topic of the names pagan peoples had given to the heavenly bodies was an important Christian addition to the classical meteorological repertoire and necessarily entailed some account of the pagan myths that had given rise to those names. Isidore gave special prominence to these subjects in his De natura rerum and the Etymologiae (III, lxxi), perhaps because, as his editor Fontaine (1960:10) surmised, the memory of pagan beliefs was still strong in Visigothic Spain. We find the late Anglo-Saxon writer Ælfric using Isidore's writings on this subject as the basis for a chapter on various stars in his De Temporibus Anni (Henel:1942:68-71) and including the Anglo-Saxon names Carles wǣn, "Charles's wain" and scipsteorra, "ship star" for the seven bright stars in the Great Bear and the Pole Star respectively. In his homily De falsis diis (Pope:1968: 687, lines 181-9) he takes up the reason why pagans gave names to the heavenly bodies; it was to honour their gods by dedicating stars to them. Ælfric presents an euhemeristic view of these gods, according to which Saturn and his colleagues were once men, who were not even born until after the Flood: "but nevertheless the stars shone in the heavens at the beginning of the world, before the wicked gods were born or chosen as gods" (lines 187-9).[7]

Isidore saw the value of pagan star lore as lying in its wide dissemination of knowledge accessible to the human senses which could be used as the basis for the spiritual understanding of the world that holy scripture made possible (Fontaine:1960:264:lines 12-17). Bernardus Silvestris makes a similar point about the lasting value of classical star-names, presumably by comparison

with the varying names of European vernaculars: "The stars, which the present age calls by this name or that, existed at the birth of time as heavenly fire. Lest he should stumble in seeking to express this universal theme in common speech, man created those names which even now denote the stars" (Wetherbee: 1973:78)[8]. Snorri used this topic (q) in combination with the theme of the transformation of the body-parts of giants into stars as a reward or as compensation to the giant's kin for a service done or an act of vengeance carried out. This theme is almost certainly a borrowing from a non-native tradition in its linking of metamorphosis and reward or punishment.

Although themes of vengeance and compensation are of central importance to several Icelandic literary genres including the family saga, they only appear in combination with the idea of metamorphosis in Snorri's Edda. Furthermore, the motif of metamorphosis as compensation or reward does not belong to the repertoire of the wondertale which otherwise provides the basic narrative syntagm of giant stories such as Snorri's tale of Þjazi's abduction of the goddess Iðunn (Clunies Ross and Martin: 1985:000). It is found many times over in Ovid's Metamorphoses, however, and this work may have provided Snorri with a mythological model for dealing with indigenous stories of the dealings of gods and giants. Although there is no clear indication of the direct influence of Ovid upon the Edda, it is not implausible to suggest that the Metamorphoses may have exerted a direct or indirect influence upon Snorri. As Anne Holtsmark observed (1968:col.65), the Edda has many points in common with Ovid's work; both function as keys to a body of myth and mythological texts of an earlier age; their opening accounts of creation are very similar and Snorri's Christian interpretation of Norse myths reminds one of various medieval Christian interpretations of Ovid.

Two of Snorri's giant narratives culminate in the metamorphosis of the body-parts of two supernatural beings into stars. In the first instance, the giant Þjazi, father of Skaði, is killed by the Æsir as a consequence of his abduction of the goddess Iðunn, and the transformation of his eyes into two stars is a form of compensation (yfirbœtr) to Skaði for her father's death (4,81, 13-15). The second case occurs in a sequel to the single combat

between Þórr and the giant Hrungnir. Although Þórr kills Hrungnir, the giant's whetstone lodges in his skull. Þórr engages the services of a sorceress named Gróa to loosen and remove the whetstone by the use of her magic incantations. Wishing to please her and reward her for her services, Þórr begins to tell her how he brought her husband Aurvandill back from giantland in the north, carrying him on his back in a basket from which one of his toes protruded. The toe froze and Þórr broke it off, threw it up into the sky and made of it a star called Aurvandill's toe (26,104,1-10). Snorri adds that Gróa was so delighted at this news that she forgot her incantations and so the whetstone still lodges in Þórr's head.

The status of Aurvandill is unclear in Snorri's narrative, though, as he needs to be rescued from giantland by Þórr, one might infer that he is not himself a giant. On the other hand, his wife, Gróa, is a practitioner of incantations (galdrar), a sorceress (vǫlva) who knows how to counter the power of giants. The various possible transformations and euhemerizations of the protagonists of this narrative have been analysed by Dumézil (1970). It is also generally assumed that a traditional explanation of how the star known as Aurvandill's toe got its name underlies Snorri's tale. The fact that the cognate Old English word earendel (or eorendel) appears in several early glosses as a name for the morning star (Venezky and Healey:1980; Gneuss:1968: 175) suggests that this star name was known among several of the Germanic peoples. Yet there is no extant poetic analogue for Snorri's account, as there is in the case of the transformation of Þjazi's eyes. Snorri quotes a half-strophe by Bragi Boddason on the subject among his illustrations of heaven-kennings (32,144, 6-8) and in the Eddic Hárbarðsljóð 19 Þórr boasts that he hurled Þjazi's eyes into the sky where they shine as a mark of his achievements (Neckel-Kuhn:1962:81). Snorri, by contrast, attributes this feat to Óðinn.

Although some parts of both the tales considered here had native analogues, whether in poetic form or otherwise, their combination in the Edda stories comprises a secondary mythic narrative of a fanciful kind by means of which Snorri was able to suggest certain Christian-Latin resonances to native giant tales. The implicit etiological question of how some stars got their

Icelandic names is answered within the encyclopedic framework established in the Prologue and Gylfaginning. Thus Icelandic star names can be understood within the mainstream of classical astronomical lore which had been accommodated to Christian doctrine and the myths that gave rise to them could be similarly dignified. The motif of metamorphosis also serves to dignify the personae of Norse myth by suggesting that the early Scandinavians, like the Greeks and Romans, sought to express the theme of the universal presence of the stars in their own language and were able to identify individual heavenly bodies by calling them after the supernatural beings they themselves believed in.

Moreover, the final book of Ovid's Metamorphoses showed how the motif of transformation could be instrumental in allowing the author of a mythological handbook to bring old myths up to date by imbuing them with contemporary political allusions. Ovid rounds off the Metamorphoses by referring to the transformation of Julius Caesar into a flaming star (stellam comantem XV,749 and 843-51) in order to compliment his adoptive son, the emperor Augustus. There is probably a political dimension also to Snorri's Þjazi myth, which occupies an important place near the beginning of Skáldskaparmál. The political nature of this fiction is made explicit in Snorri's Ynglinga saga (Bjarni Aðalbjarnarson:1941-51:I,21), where he tells how Þjazi's daughter Skaði left her husband Njǫrðr, who was married to her by the Æsir in part compensation for their killing of her father, and subsequently married Óðinn, by whom she had many sons. One of these was named Sæmundr and he was the ancestor of the earls of Hlaðir. The poets Kormakr (Sigurðardrápa 6/4, Skjald B,I,69) and Eyvindr (Háleygjatal 3-4, Skjald B,I,60) both allude to the connection between stories of the mythical Þjazi and Skaði and the descendants of the Hlaðir earls. It seems likely that Snorri intended at least a muted allusion to this connection in Skáldskaparmál, which, while being primarily a treatise on poetry, was not entirely free from political overtones and genealogical fictions, such as we also find in chapter 81, in his presentation of the patriarchal Hálfdan gamli as ancestor of important Norwegian royal and noble families (J. Turville-Petre:1978-9:12-13).

Footnotes

1. Fontaine:1960:9 has a table of correspondence between the major classical treatises and Isidore's De natura rerum. On page 10, fn.1 he lists the major Latin poets to treat the subject. These include Virgil, Georgics 1,5 and 2,475-490; Ovid, Metamorphoses XV,67ff. and Boethius, Consolation of Philosophy 1, metr.2.

2. The quotation of Vǫluspá 5 is followed by the rather cryptic statement, "Svá var áðr en þetta væri of jǫrð" (5,15,18). Only the Codex Regius has the final phrase of jǫrð. Faulkes (1982: 59) offers two possible interpretations of this line, "It was the same with the earth before this took place" and "thus it was above the earth (i.e. in the sky) before this took place". It seems to me that the second interpretation is to be preferred and that the statement probably refers to the notion that, according to Christian writers, God ordained at the beginning of the world that the stars should shine in the heavens and determine times and seasons, even though pagans (like Gangleri's informants) attributed these acts to supernatural beings who lived after the Flood. Statements from Ælfric, Isidore and Bernardus Silvestris in support of this line of thought are cited later in the present paper and in footnote 7.

3. De imagine mundi I, i (Pl 172, col.121) equates the egg-shell with heaven, the white with aether, the yolk with air and the drop of fat inside the egg with the earth. Other medieval commentators on the cosmic egg mention the membrane; for details, see P. Dronke: 1974:154-66.

4. Cf. Virgil, Georgics IV, 1 (Mynors:1969:83) and Pliny, Hist. nat XI, xii, 30-31 (Rackham:1956:450). The clause "ok þar af foeðask býflugur" is susceptible of two interpretations, as Faulkes (1982:98) notes. It means either that bees are born from honey-dew or that they feed on it. The former interpretation was also known to the classical world: Aristotle, Historia Animalium 5,21 advances the idea, repeated by Virgil in Georgics IV, 197-202, that bees gather their offspring from flowers. Holtsmark (1964: 47) cites yet another notion (Pliny, Historia naturalis XI, iv,

14-15) that connects some products of bees with the droppings of gum-producing trees, but this does not seem especially relevant to the passage in question.

5. Faulkes (1982:43:15-16) indicates by his punctuation that the observation about ebb-tides is not part of Útgarðaloki's speech, as do Holtsmark and Helgason (1976:59:5-6). The phrasing of the Uppsala manuscript, while not clearly removing the observation from Útgarðaloki's speech, clarifies its etiological nature: "However, that was the greatest marvel when you drank from the horn, one of whose ends was in the ocean. As a result of that, ebb-tides have come into being" (þat var þo mest vndr er þv drakt af hornino er annarr endir var iægi. Þvi ero orþnar fiorvnar.) (Grape et al.:1977:29:12-13).

6. Cf. Isidore, Etymologiae XI iii, 13 (Lindsay:1911) and Bede, In Genesim II, vi, 3-4 (Jones:1967:100).

7. Cf. Isidore, Etymologiae, III, lxxi, 37, "Sed quolibet modo superstitionis haec ab hominibus nuncupentur, sunt tamen sidera quae Deus in mundi principio condidit, ac certo motu distinguere tempora ordinavit."

8. Sidera, que presens sic vel sic nominat etas,
Temporis ex ortu celicus ignis erant.
Comuni ne voce rei generalis oberret,
Que modo sunt stellis nomina fecit homo.

Cosmographia, Megacosmos, iii, 133-6 (P. Dronke:1978:107). Apart from these encyclopedic works, a basis also existed in school glosses for the equation of vernacular European star names and classical ones. Part of the late twelfth century manuscript GkS 1812 IV 4to contains a collection of glosses of star names (Larsson:1883:43-4; Gering:1878:390-1), and includes, for example, the information that the Icelandic equivalent of the classical constellation named Orion was fjósakarl, "cow-shed labourer".

Quotations

Ovid, Metamorphoses XV, 62-72 (Miller:1916:368) 1

... licet caeli regione remotus,
mente deos adiit et, quae natura negabat
visibus humanis, oculis ea pectoris hausit,
cumque animo et vigili perspexerat omnia cura,
in medium discenda dabat coetusque silentum
dictaque mirantum magni primordia mundi
et rerum causas et, quid natura, docebat,
quid deus, unde nives, quae fulminis esset origo,
Iuppiter an venti discussa nube tonarent,
quid quateret terras, qua sidera lege mearent,
et quodcumque latet ...

Edda Snorra Sturlusonar, Gylfaginning, p.15, lines 11-12 14

Þeir gafv staþar a|llvm elldingvm, svmvm ahimni, svmar forv lavsar vndir himne, ok settv þo þeim stað ok skavpvðv gavngv þeim. Sva er sagt ifornvm visindvm, at þaþan af vorv dægr greind ok ara tal.

Edda Snorra Sturlusonar, Gylfaginning, p.19, lines 16-17 15

hana mvntv set hafa; kann vera, at kallið er (var. þat kallir þv) regnboga.

Edda Snorra Sturlusonar, Gylfaginning, p.25, lines 5-6 16

Sv davgg, er þaþan af fellr aiorþina, þat kalla menn hvnang fall, ok þar af fæþaz byflvgvr.

Edda Snorra Sturlusonar, Gylfaginning, p.60, lines 3-5 17

... en nv, er þv kemr til siavarins, þa mvntv sia mega, hvern þvrð þv hefir drvckit a sænvm; þat erv nv fiorvr kallaðar «.

Edda Snorra Sturlusonar, Gylfaginning, p.70, lines 3-4 17

Þa kippiz hann sva hart við, at iorð a|ll skelfr, þat kallið þer landskialpta, þar liggr hann ibavndvm til ragna ra|krs.

Isidore of Seville, Etymologiae I, XL, 3-4 (Lindsay:1911) 19

Fabulas poetae quasdam delectandi causa finxerunt, quasdam ad naturam rerum, nonnullas ad mores hominum interpretati sunt. ... Ad naturam rerum fabulas fingunt, ut 'Vulcanus claudus', quia per naturam numquam rectus est ignis ...

Ælfric, De falsis diis, lines 187-9 (Pope:1968:687) 20

Ac þa steorran swaþeah scinon on heofonum
on frymþe middaneardes, ær þa mánfullan godas
wurdon acennede, oððe gecorene to godum.

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PL = Patrologia Latina

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