

Tree-ring chronologies present us with independent records of past natural events which, strangely, or perhaps not so strangely, seem to link with some stories from myth.

M G L Baillie

School of Archaeology and Palaeoecology, Queen's University, Belfast

I recognize that going into a field such as Celtic myth is much like going into a card game where all the other players are experts at the game. There is a good chance of the outsider, me, coming to grief. The only real defence I have for sitting down with the experts - the Celtic scholars - is the fact that I do have access to a body of precisely-dated information that never existed before; the results of several decades of tree-ring studies. This means that I come to the card game, not so much with an ace, but, at least, with a joker. I therefore feel confident that I can take at least one 'trick'.

The Background.

In the early-mid 1980s the tree-ring group in Belfast completed one of the world's longest tree-ring chronologies (Pilcher et al 1984). (At that time there were only five really long regional chronologies in the world; three for oak, namely Ireland, North Germany and South Germany, and two for bristlecone pine from the western United States.) Not long after the Irish chronology was completed back to 5289 BC it was discovered that if the chronology was interrogated for "narrowest ring" events (points in time where numbers of trees from different sites exhibited their narrowest growth rings at the same time) the dates 3195 BC, 2345 BC, 1628 BC, 1159 BC, 207 BC and AD 540 dropped out of the bog-oak chronology (Baillie and Munro 1988). The initial hypothesis was that these abrupt environmental downturns were due to the effects of explosive volcanic eruptions. This hypothesis held up fairly well until the early 1990s when it began to become clear that some of the events were complex and did not seem to conform to what one would expect from point events such as big volcanic eruptions.

Moreover, volcanologists repeatedly pointed out that the environmental effects of even a big volcano should be over in a few years because volcanoes inject material up into the atmosphere from whence it washes out in a relatively short time. So some of the tree-ring events which appeared to last for longer periods - five, ten even eighteen years - did seem to be out of step with conventional wisdom on volcanic effects (Pyle 1989). This was most apparent with the so-called AD 540 event that seemed to span 536-545. As interest developed in the environmental event, which must have been responsible for the narrow rings in the oaks, it became apparent that the event was not restricted to oaks; the rings for 536 and 541 were singled out by temperature sensitive pine chronologies from Northern Sweden and the Sierra Nevada as among the coldest in 1500 years (Baillie 1994). Subsequently the rings immediately around AD 540 indicated reduced growth in chronologies from Siberia through Europe, to North America, to Argentina. Thus dendrochronology hinted strongly at a global environmental downturn. Moreover, there appeared to be no equivalently severe and widespread event anywhere between 540 and the present. The happening at 540 therefore had to be highly unusual.

It was quickly ascertained that other scientists had noted happenings in AD 536. There were descriptions by several Mediterranean writers of a dim-sun event in 536-7 which volcanologists Stothers and Rampino (1983) had ascribed to a major volcanic eruption. For China, Weisburd (1985) had pointed out the catastrophic cold and famines in 536 and the following two years. Interestingly no one had ever previously noticed anything untoward at 540-1-2. So, by the early 1990s a combination of historical sources and dendrochronology hinted at a two-stage environmental event; could it have been a doublet - namely two large volcanic eruptions happening about four years apart with perhaps a re-enforcing effect? However, one had to ask, if that had been the case why was there no reference to the second dust veil, why were the records so quiet on what happened in the early 540s? It was also noted that the plague of Justinian, which seems to have originated in about 540, broke out with a vengeance in 542. Could there be some link between the environmental happenings around 540 and the outbreak of this severe plague?

In order to preserve the (then) current paradigm, various scenarios were envisaged wherein more than one large volcano had erupted in a short space of time, or that there existed a class of volcanoes that were more environmentally effective than those we have witnessed in recent centuries. However, by 1993, revelations about the dating of layers of volcanic acid in the Greenland ice in the vicinity of the AD 540 event - or rather the revelation that there were no acid layers dating to the years around AD 540 - meant that the volcano hypothesis was starting to look thin. This combination of factors allowed a new paradigm to be contemplated - was it possible that the serious global environmental event around AD 540 was not due to a volcano or volcanoes, but rather was due to the next most likely cause of a global environmental event i.e. some loading of the atmosphere from space? In 1994 the first tentative hint of this paradigm shift was published in the journal *The Holocene* (Baillie 1994)..

Within a short time it was discovered that three British astrophysicists had published a prior hypothesis, back in 1990 (Bailey, Clube and Napier 1990), in which they had proposed that the period between AD 400-600 had been a period of risk of bombardment by comet debris. It may interest readers to see exactly what the astrophysicists said. They were reviewing the hazard represented by the earth running into swarms of comet debris. They said

Overall, it seems likely that during a period of a few thousand years, there is the expectation of an impact, possibly occurring as part of a swarm of material, sufficiently powerful to plunge us into a Dark Age.

They went on to say

The occurrence of Tunguska-like swarms in recorded history is therefore expected... Thus we expect a Dark Age within the last two thousand years.

They then suggested that the incidence of meteor showers represented the best guide to when such bombardments might have taken place and they singled out two periods namely AD 400-600 and AD 800-1000. Thus these workers provided 'target' date ranges for a hazard from space and our AD 540 event fell neatly into one of them. From a scientific viewpoint this juxtaposition of a prior hypothesis and a contemplated new paradigm has a chilling resonance. In 1994 the scientific community witnessed the impact of some twenty fragments of the broken up comet Shoemaker-Levy 9 ploughing into the giant planet Jupiter with devastating effect. For those not familiar with those events back in July 1994, some of the impacts were in the 10 million megaton to 100 million megaton range - such impacts are now generally known as "dinosaur killers", i.e. they were of the same magnitude as the impact some 65 million years ago that led to the extinction of the dinosaurs after a successful evolutionary run of about 150 million years.

Hopefully it will not be lost on the audience just how bizarre a set of circumstances is being described here. After 4.6 billion years of Earth history, within 400 years of the invention of the telescope, scientists were able to watch a set of major impacts on a neighbouring planet. They do so in the year that an independent dendrochronologist asks if one of his environmental downturns about 1500 years ago could possibly have an extraterrestrial cause, and, a mere four years after it had been suggested in print that AD 400-600 was a period of risk of just such a bombardment on Earth. Is this an example of synchronicity on a grand scale? The point is that no-one knows how to handle such information, there is just an intuitive feeling that it is not "normal".

Other events

To cut a long story short, within a few years, certainly by 1997, it had become apparent that all the events from 2345 BC through to AD 540 gave a circumstantial appearance of also being comet related (Baillie 1999). However, for the purposes of this paper I am going to restrict the discussion mostly to the happenings around AD 540; an event that falls in a Dark Age and close to the date of the plague of Justinian (AD 542). Obviously, of the various events, AD 540 was chosen because for this event precisely-dated history should have been available. However, the thin nature of the historical record around AD 540 rapidly became apparent - the fifth and sixth centuries are not termed a Dark Age without reason. So, in the later 1990s I turned to mythology, for the following reason. In an article in the journal *Emania* in 1995 (Baillie 1995) I had pointed out that debates about King Arthur were like those about Saint Patrick - was he real or mythological? was there one or were there two? why was his death date not known more accurately? etc. However, with the difficulty experienced in making any sense of history

around the AD 540 event it had to be interesting that Arthur traditionally died at dates straddling the tree-ring date. In fact, if the tree-ring package is defined as AD 536-545, as it was in the original Holocene article, no less than three dates given for Arthur's death - AD 537, 539 and 542 - all occur within the tree-ring dated environmental event. So, Arthur's death coincident with a global environmental downturn caused me to ask the apparently simple question "who is Arthur?".

Who is Arthur?

I set out to find out more about Arthur who traditionally died in the vicinity of AD 540. The conventional arguments in most popular books center upon whether he was a real person or a mythical entity; where his battles were fought; where he was buried, etc. What I did glean as interesting was that Arthur and his knights were involved in a "Grail Quest", there was a concept called the "Dolorous Stroke", and another concept called "The Wasteland". Strong hints began to emerge that the Arthurian stories were based on some earlier "Celtic" stories. It wasn't long therefore before I found myself reading *Celtic Myth and Arthurian Romance* by R S Loomis (1927). In this volume you find that on the very first page, even before the title, it says 'From knights of the round table to Celtic gods'. In the Preface, despite the title, even before Arthur is referred to, Loomis makes mention of Cúchulainn the Ulster Hero. Why I asked myself is the local Irish hero so prominently to the fore in a book on Arthurian romance? Here is what the reader finds on that first page of Loomis' Preface.

'The same studies had shown me that the abduction of Guinevere (Arthur's Queen)...had its source in the Irish abduction of Blathnat by Cúroí, and in this Irish tale Cúroí seemed to be playing the part of a mythical figure, perhaps a genius of winter or death' (Loomis 1927, vii).

If you've never heard of Cúroí, you can flip over to Loomis page 55 and the chapter headed 'Cúroí, Gwri, and Gawain'. There you find the first sentence says 'Cúroí and Cúchulainn...both betray the dual nature of sun and lightning gods'. So, by opening a book relating to Arthur you find yourself reading about Cúroí and Cúchulainn, and as you read down that page you find that they 'both seem identified with Lug'. One could reasonably ask, who is Cúroí and who is Cúchulainn and, indeed, who is Lug? The answer is given partially a few sentences later.

...Cúchulainn was a rebirth of his father Lug. Likewise Cúroí is generally called the son of Daire, who in ancient tradition was equated with Lugaid...a name which MacNeill declares to be practically a variant of Lug. It would seem therefore, as if one had a right to call Cúroí, Lug son of Lug, just as Cúchulainn is also Lug son of Lug (Loomis 1927 55)

Without pausing for breath we have got from Arthurian romance to Lug. The salient point, from the perspective of looking for the cause of the AD 540 event is that Lugh is described in one story as 'coming up in the west, as bright as the sun, with a long arm'. What are the chances of asking whether the AD 540 environmental event might have an extraterrestrial cause and finding that the character Arthur has literary links to a Celtic deity whose description seems to best fit a comet. After all what else can come up in the west, be as bright as the sun and have a long 'arm'? The answer to that riddle is 'hardly anything at all can come up in the west as bright as the sun with a long arm, except a comet with its coma reflecting the sun's light to render the object almost too bright to look at. So, having found this bizarre set of links from "a possible comet around AD 540" through "Arthur" to "Cúroí", "Cúchulainn" and "Lugh, described as a comet" it became necessary to ask who all these characters are and how they are related.

T. F. O'Rahilly tells us the most important thing we need to know when handling Celtic and Arthurian mythology. It is best to quote him as he words it perfectly

...when a deity-name can be interpreted etymologically it is usually found to relate to a single aspect of the deity: but that does not mean that the deity was ever confined to that aspect....appellations denoting particular attributes of the deity were liable in the course of time to be regarded as the names of distinct deities (1946; 470;f1)

This suggests that Lugh and Cúchulainn and Finn and Fergus and Dian Cécht and Gwydion and Manannán are probably all aspects of the same deity. That is why Fergus and Finn and Mongán and Cúchulainn and Arthur and Gawain all share the same "sword" whether it is Gai

Bulga or Caladbolg or Caledvwlch or Excalibur. For example, both Cúchulainn and Arthur receive their swords from other-world maidens; both extract cauldrons from other-world adventures etc.

Now it is not just Loomis or O'Rahilly who link Arthur with these Celtic deities, numerous scholars who have studied the stories come to the same conclusion. For example, Squire in his *Celtic Myth and Legend* says

Singularly enough, too, the same stories that were once told of Gwydion are now attached to the name of Arthur. So that we may assume, with Professor Rhys, that Arthur, the prominent god of the new Pantheon, has taken the place of Gwydion in the old. A comparison of Gwydion-myths and Arthur-myths shows an almost exact correspondence in everything but name (1912; 316)

Or again, Joseph Campbell in *Occidental Mythology* gives us another link when he says, referring to the Grail quest

The background to the legend lay in the pagan, specifically Celtic myth. Its heroes were the old champions, Cúchulainn and the rest, returned in knightly armour as Gawain, Perceval, or Galahad, to engage, as ever, in marvellous adventure.....By various schools of modern scholarship the Grail has been identified with the Dagda's cauldron of plenty, the begging bowl of the Buddha...the Kaaba of the Great Mosque of Mecca... (1965; 508)

This latter link is interesting in itself. Campbell links the Grail with the Kaaba, well known for its association with a black meteoritic stone. So AD 540 links through Arthurian and Grail legend to a black meteorite. But it just so happens that the 207 BC event links through the falling of stones from the sky, to the goddess Cybele manifested as a black meteoritic stone (Forsyth 1990). Why should this be, unless of course both events are somehow linked with material from space. Hopefully there is enough here to justify looking, on the strength of the dates of Arthur, in more detail at these Celtic deities to see what hints they may contain.

If we go to Loomis again he notes that Rhys had pointed out passages descriptive of Lugh in the *Fate of the Children of Turenn* as follows

The shining of his face and of his brow was like the setting sun: it was impossible to look upon his visage, so great was his brilliance...The aspect of his visage and of his brow was as bright as the sun on a summer's day (1927; 46)

It is this bright splendour which Bres sees coming from the west. Loomis then draws attention to the gloss that says "a red colour used to be on him from sunset to morning". Loomis then goes on to adopt the (then) conventional link of the solar deity to the sun - the red colour is explained because the sun can be red at evening and morning. Yet it is obvious from the westerly approach that it cannot be the sun. In some ways it is a puzzle why people like Loomis seemed to ignore this very basic point. But, credit where it is due, did he really ignore it? On the same page Loomis says, in attributing the stories to the sun-god "It is highly unlikely that the red colour that was on Lugh from sunset to morning has any other explanation". Well, here we have an interesting point. Loomis doesn't say it is impossible that there might be another explanation, he says it is "highly unlikely". Thus he left open the door just a fraction for some other explanation; that other explanation is, I am virtually certain, that Lugh was a red comet. The reason I am virtually certain is that the entire package of information regarding Lugh, including the westerly approach, can be explained by a red comet whereas the Sun fails totally on this count. Moreover, Lugh's other attributes lamhfada lionnbheimionach "of the long arm and the mighty blows" are both consistent with a comet and inconsistent with the Sun. So, Lugh is not just a solar deity, he would seem to also be a comet deity.

What the descriptions may mean.

If, for the sake of argument, we take it that Lugh is a comet-god (irrespective of whether he was also a solar deity) then it seems very likely that Cúchulainn should also be a comet-god. After all, Cúchulainn is not just the son of Lugh, he is the re-birth of Lugh, i.e. Lugh back again. In the light of a comet scenario even this expression, "rebirth...back again" takes on a new significance. However, there are things about Cúchulainn that are independently suggestive of some comet links. In the story of his paroxysm (widely known and only paraphrased here) Cúchulainn has three layers of hair, brown, crimson and like a gold diadem.

Then he has the following decoration

“For like the shining of yellow gold was each glittering, curling beauty-coloured thread as free and loose it fell down and hung between his shoulders”.

He is capable of going into his “riastradh”, his “battle rage”, in which he undergoes horrendous contortions wherein he becomes “a fearsome and multiform and wondrous and hitherto unknown being”. We hear of “flakes of fire” and “Among the aerial clouds over his head were visible the virulent pouring showers and sparks of ruddy fire.” Why might these descriptive elements of the hero Cúchulainn link to a comet? From a scientific viewpoint, the surprising thing is that his behaviour in his battle rage may be consistent with the auroral display that would accompany a comet passing so close to the earth as to pass through the magnetosphere. Here is what an atmospheric physicist suggests might happen in the case of a very close comet approach to the earth (based on a suggestion from Professor Gerry McCormac):

If it came within the earth’s magnetosphere it would probably be spectacular...the sky would go purple or green, particles from the comet would spiral down the lines of force and it is likely that you would have amazing auroral displays and coloured streamers (Baillie 1999).

For comparison, here is an abstract from the description of Cúchulainn’s “riastradh”: His limbs shift unnaturally.

Every limb and joint and point and articulation of him quivered...his feet, his shins, and his knees shifted themselves and were behind him: his heels and calves and hams were displaced to the front of his leg bones...taller, thicker, more rigid, longer than mast of a great ship was the perpendicular jet of dusky blood which out of his scalp’s very central point shot upwards and then was scattered to the four cardinal points; thereby was formed a magic mist of gloom...(Loomis 1927; 46)

Basically it is suggested that a comet entering the earth’s magnetosphere might trigger a massive auroral display with “charged particles spiralling down the lines of force”. If we add that detail, which could refer to “each glittering, curling, beauty-coloured thread as free and loose it fell down”, to the known published representations of 19th century comets with three distinctive layers of coma looking exactly like hair, with an inner bright forehead (Sagan and Druryan 1985; 149-153), we have a pretty good picture of what the ancient observers may have been trying to convey. Again the aurora would be well described by the “jet of dusky blood...scattering to the four cardinal points“. So several elements of Cúchulainn’s description are consistent with what might happen if a comet passed frighteningly close to the earth. What may, or may not, be missing is the loading of the atmosphere with comet derived material and megaton class airbursts caused by associated fragments of the comet exploding in the atmosphere. However these elements might well be encapsulated in one description of Lug’s approach;

They saw a great mist all round, so that they knew not where they went because of the greatness of the darkness; and they heard the noise of a horseman approaching. the horseman (Lug) let fly three throws of a spear at them (Loomis 1927; 47)

Loomis’ tells us what some scholarly opinion tried to make of this. “It has been suggested that this extraordinary performance has, as its foundation, the epileptic fits of a historical brave”. I think we can discount this on the basis that no warrior can jet blood from the top of his head to order, still less to the four corners of the heavens. Loomis gets a little closer with his attempt. “Is it not far more plausible to see in it the transformation of the sun-god into the fire-shooting thunder cloud“. It is as if for the lack of an appropriate model - the comet model - Loomis was having to do the best he could with the then available paradigm - the solar deity. Again I would suggest that the close-pass comet model makes for a more likely scenario.

I can imagine that much of the above sounds fanciful. However, to temper that thought with some scientific rational let me quote from Sagan and Druryan again.

From the observed frequency with which new comets arrive in the inner solar system, it is possible to calculate how long we have to wait before a comet comes as close as the Moon. The answer is a few thousand years at most. If you’re prepared to wait four or five thousand years, a cometary nucleus should pass you by at considerably closer range. Imagine the sky dominated for months by a dull, red, irregular object, spitting out white canopies, its shimmering, curved fountains flowing into space, and all the material

eventually swept back into a vast tail that extends from horizon to horizon (1985; 154) The reader should probably note at this stage that combining the quotes from Bailey, Clube and Napier (1990) and Sagan and Druyan (1985), a very hazardous near-Earth environment is being casually discussed by highly qualified space scientists. In particular they are all saying that we should have had close brushes with one or more comets in recent millennia; I suspect this is news to people in other disciplines. What is perhaps most interesting is the close relationship between their descriptions and those in the mythological stories. Again to demonstrate the strangeness of this issue, in 1999 I published an early version of this comet story in which I had noted that Cúchulainn seemed to be a close-pass comet and his paroxysm was probably the associated auroral display. Imagine my surprise when following publication I was sent a copy of an article by Dorothea Kenny (1987) entitled *Cúchulainn - Comet or Meteor?* She had found it impossible to get it published in mainstream literature, as a result she had published it in a catastrophist journal. The article was based on a textual analysis of the most famous Cúchulainn story - *Táin Bó Cúailnge* - The Cattle-raid of Cooley. Here was an independent scholar who had deduced that underlying the descriptive elements of Cúchulainn was the image of an extraterrestrial body.

More of the same.

To show how these associations work, let us look at another story involving a “frenzy” in this case Mongán’s frenzy. Mongán is an aspect of the Celtic god who manifests himself as Lugh, Cúchulainn, Manannán, Cúroí etc. It is stated that Mongán is the son of Manannán and the rebirth of Finn. Even his name, Mongán Ir. mong (head of long and abundant hair) is not inconsistent with the description of a comet. Here is how Mongán got into the story.

Reading H. D’arbois de Jubainville *The Irish Mythological Cycle* (1903; 191) Mongán the son of Fiachna was “slain with a stone in 625 by Arthur son of Bicur (Bicior), a Briton”. However, in a footnote we find that in another source “Mongán living with his wife in the year Ciaran mac int Shair and Tuathal Mael-Garb died, that is to say, 544”. So a rebirth of Finn turns out to be linked, however loosely, to the 540s AD. In James Stephens’ *Irish Fairy Tales* (1923) where he details Mongán’s Frenzy, the date of the gathering at the Navel of Ireland is given as 538. So Mongán’s Frenzy which involves a shower of hail-stones so anomalous that to escape from it Mongán has to enter the other-world comes at a date which is highly consistent with Arthur’s death. Given that Arthur is taken to the other-world at his death the linkage here is interesting in itself as both stories provide essentially the same date. In fact put at its simplest two aspects of the same deity both go to the other-world in the same 536-545 time window

It turns out that Mongán is even more interesting. He is the son of Manannán, however it turns out that in Welsh legend Manannán is also known as Barinthus, who just happens to be the boatman who guided the barge taking Arthur to the other-world. As if this is not bad enough, there is an interesting refinement of the story. Barinthus, who is credited with knowing the stars, is guiding the barge containing Arthur to the Isle of the blest, or Avallon, or the glass castle. But the glass castle is the sky, so, the missing element of the story is that Arthur went away into the sky just like a comet that has skipped close past the earth should do, presumably leaving a wasteland in its wake. It should be no surprise that the glass castle is described as ‘where the sun likes to travel’.

I feel that R S Loomis got very close to the right answer but simply lacked the comet paradigm. If anyone is interested in following this up I suggest they turn to his page 318 and read about Cúchulainn’s association with a “wheel”. Loomis, like many before and since, thought of the wheel as a solar symbol. But the wheel can be associated with a swastika e.g. as Loomis says “At Caerleon on Usk there is a monument of a man carrying a wheel in both hands, a wheel at his left foot, and the swastika, another solar symbol (sic), at his right foot”. Amazingly he also says on the same page “...in certain runic calendars the 25th of December, the day of the winter solstice, is represented by a wheel”. This clue should have told him that the wheel was a comet, not the Sun.

This is probably a good place to introduce a little more science. The Isle of Man (Manannán’s isle) has a three-legged swastika as a symbol and it is no surprise in this story to find Sagan and Druyan (1985) suggesting that the swastika, whether three or four legged, is a comet symbol. It is interesting to see the context of their tentative suggestion. They note

Pliny's description of a comet

too brilliant to be looked at directly; it was white with silver hair and resembled a god in human form...Pliny described another kind of comet in these words 'Like a horse's mane, it has a very rapid motion, like a circle revolving on itself'...We therefore ask if there is some widespread ancient symbol, associated with the sky, that indicates rotation. Very tentatively, we suggest that there is one such symbol - the swastika (1985; 156).

They then proceed to document why a spinning comet nucleus, close to the Earth, with four outgassing jets would manifest as a swastika and conclude by mentioning that in a Chinese atlas of cometary forms unearthed from a Han tomb, the twenty-ninth form is an indisputable four-legged swastika. So, their "tentative suggestion" is backed up by a definitive document from a nation widely credited as the "culture with the longest tradition of careful observations of comets" (1985; 161)

The Wheel symbol.

It is impossible to read Sagan and Druryan on the issue of revolving sky symbols without being struck by their comments connecting bright sky apparitions, comets, swastikas and wheels.

They say

Another dilemma running through scholarly writings on the swastika is that, on the one hand, it appears to be connected with something brilliant in the sky, and on the other hand it is clearly something separate from the Sun...Sometimes, the swastika alternates with representations of the Sun. From this Count D'Alella deduces that the swastika means the Sun...But, critics argue, there is no need for an additional symbol for the Sun, and the swastika in no way resembles the Sun...All of these difficulties could be resolved if there had once been a bright swastika rotating in the skies of Earth... (1985; 159)

It is interesting to see that while Sagan and Druryan were writing in 1985, in 1986 Green was debating the issue of the wheel and the swastika in a narrower Celtic context. According to Green the Celtic peoples' celestial symbolism had its most important feature in the sun-disc ...the sun-disc, usually portrayed as a spoked wheel...This feature ...combines both of the motion through the sky and physical similarity - the nave and hub representing the sun itself, the spokes the sun's rays and the rim or felloe the surrounding nimbus of light (1986; 39).

She goes on to say that by later 1st millennium BC these wheel motifs "may fairly be interpreted as solar signs" and

It is important to remember that on stone depictions not only is the wheel itself used as a solar image, but derivative symbols also occur - the most important of these being the swastika, but including the rosette and concentric circle. The swastika merits special investigation (sic). It is widely considered that the swastika, like the wheel, represents rotary movement. While the wheel appears to depict the sun by means of its physical similarity, the significance of the swastika must lie in the suggestion of movement given by its form. There are sufficient occurrences of wheels, swastikas and dedications to a sky-god in association for us to assume a genuine link between the two symbols (1986; 55).

Interestingly the dedication to a sky god and the swastika are apparently interchangeable, and an additional feature of these small alters (with the alternative dedication and swastika) is the presence on them of a palm branch or conifer-image, which could be a fertility symbol, or may...reflect links between sky and underworld (1986; 56).

I suspect that in this case the palm branch or conifer-image is also a realistic depiction of a comet (see for example Sagan and Druryan 1985; 137). Imagine, for sake of argument, that we did now know that the swastika was a comet symbol and probably the wheel as well. We can ask, "did the Irish have the concept of a wheel/swastika and if so in what context"? Rhys makes some interesting points.

The observation made in reference to the term Fál as a name of the god would be incomplete without some allusion to the mythical creation known as *Roth Fáil*, or Fál's Wheel, and *Roth Rámach*, or the Wheel with Paddles (Rhys 1888; 210-211)

Now a wheel with paddles is an interesting concept. We know what it looks like from the wheels of horizontal mills with their scooped paddles protruding from a central hub. This is very reminiscent of a swastika. The story goes that the

Wheel was to enable Simon Magus to sail in the air; but it met with an accident, and Mog Ruith's daughter brought certain fragments of it to Ireland (Rhys 1888; 211). She set up as a pillar stone that was believed to produce blindness of looked at and death if touched. More interestingly Rhys points out that there are other versions of the story which "...made the coming of the Wheel a great calamity, not only in Ireland, but to a great portion of the west of Europe". In one prophecy "called the ecstasy of St Moling, the Wheel is represented as destined to come followed by a dreadful scourge which was to destroy three fourths of the people as far as the Tyrrhene Sea" (1888; 211).

So asking if the Irish had the concept of a wheel/swastika reveals that not only did they have a Wheel of Paddles which might as well be a wheel/swastika, but it must at some stage have been involved in a calamity involving the whole of western Europe. This sounds remarkably like a comet.

Conclusion

The stories of the knights of Arthur, and Arthur himself, and Merlin, bear remarkable similarities to stories associated with the pantheon of Celtic Gods such as Manannán, Finn, Cúchulainn, Lugh, Mongán etc. Underlying all of these is comet symbolism which culminates in something very unpleasant happening in the immediate vicinity of the global environmental downturn centered on AD 540. It just remains to repeat that a comet can fulfil all of the details cited in the stories above. It can come up in the west; it can be as bright as the sun, it can be red from evening to morning; it can have a long mane of hair; it can appear to have three layers of hair; it can give rise to an auroral display; it can spin and look like a swastika, it can give rise to terrible showers of hail-stones; it can deliver terrible blows (if large bits of it impact the atmosphere); it can cause the Sun (and Moon) to go dim (if dust from it intervenes between the Earth and the Sun, or loads the Earth's atmosphere); if it is involved in a close brush with the Earth it can give rise to a "wasteland" and, if it misses us it will sail away into the glass castle which is the sky. In fact, the above does not include the recurring motif of "far traveler". In one story Lug's father is Cian which probably means "far, distant, remote" (Rhys 1888; 390). Cian's possible father is Dian Cécht and "*Dian* means 'swift'; also 'quickly revolving (like a wheel)' "(O'Rahilly 1946; 472). According to Rhys (1888; 454) Lug "arrives from a distance" and O'Rahilly (1946; 473) adds that this may mean "rolls quickly forward" and is "expert in travelling long roads". While all these were previously attributed to the Sun, they all make more sense applied to comets that are, by definition, fast, far travelers that can rotate.

The essential point is this. In any conundrum, once one has the right answer, that answer will explain all of the details no matter how obtuse they may initially appear. I suggest that the insertion of a "comet" into these early stories explains so many of the previously inexplicable points that it pretty well has to be the right answer. If this is the case, then we are confronted with the fact that the people who encoded these stories did so with some purpose. There is no time here to develop the links that exist between the myths associated with the various other tree-ring events. Suffice to say that there is an ancient Chinese story wherein, in the year 2346 "BC", the first emperor Yao meets the Divine Archer Shên I (clearly a version of Apollo). At the time there are terrible catastrophes including ten suns in the sky, famines, floods etc. The Divine Archer sets out to seek the cause of these catastrophic events and finds that they are due to the activities of one Fei Lien (a wind spirit) (Werner 1995). Now, remembering the list of tree-ring dates, let us look at the associations of this story. In the Chinese stories Fei Lien, who was responsible for the calamities in the 24th century "BC" was also a minister of King Chńu. King Chńu is the last emperor of the Shang dynasty which ends traditionally in the 12th century "BC". Hence, preserved in a Chinese story is a link from the 24th to the 12th century BC. But the Greek Apollo shoots arrows at the time of Troy (traditionally 12th century "BC") while in China at the time of Chńu (traditionally 12th century "BC") one No-cha finds a wonderful *bow* and three *magic arrows*...he shoots an arrow towards the south-west 'a red trail indicated the path of the arrow, which hissed as it flew' (a bolide description?) (Werner 1995). Subsequently it is observed that the arrow bears the description 'Arrow which shakes the heavens'. So, close to two of the tree-ring events we have Apollo associations. At 2345 BC we have the Divine Archer - Apollo. At the Fall of Troy, traditionally 12th century BC we have Apollo bringing plague. Perhaps with Arthur and Mongán and plague around AD 540 we have aspects of Lugh the Celtic Apollo.

The logic of this story is that the last time the Celtic Apollo made a close approach to the Earth the event was encoded, perhaps re-encoded given prior appearances, by locating the death of one of his aspects – Arthur – close to AD 540. The logic also is that he probably is, as was always suggested, not dead, but will return.

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