

## EARLY MENTION OF THE AURORA BOREALIS

THE explanation given by Mr. G. Henry Kinahan\* of the superstition prevalent in Ireland regarding "showers of blood" is extremely interesting, and to a great extent the true one; but any student of Irish history must feel how difficult it is to apply it to the interpretation of not a few prodigies recorded in the earliest chronicles. The word "blood" is frequently met with in accounts of wars, in such a manner as to make it quite impossible to construe it into an allusion to the Aurora; nor is it in many places capable of a dual meaning, for instance, the "Chronicum Scotorum"† under A.D. 531, says, in relating the drowning and burning of Mu rcertach Mac Erca,—

The king Mac Erca, returns  
To the side of the Uí Néill;  
Blood reaches girdles in the plain;  
Territories increase afar.

Mac Erca was killed by a fairy woman named Sín. The words "Blood reaches girdles" are not very clear, but the Aurora cannot be meant. Under an earlier date it is related (A.D. 497)—

The battle of Seghais—  
A certain woman caused it;  
Red blood was brought over lances  
By Duisech, daughter of Duach.

The further we go back, the obscurer it becomes, and the greater the difficulty in attaching a consistent meaning, especially such an one as a record of auroral appearances. In Dr. Lynch's "Cambrensis Eversus," vol. i., it says:—

"A.C. 673.—Fionachta succeeded his father in the throne. During his reign an enormous quantity of wine fell like fleeces of snow from the sky."

"A.C. 561.—Elim Ollfinachta . . . succeeded . . . He was called Ollfinachta, because snow, which fell during his reign, tasted like wine."

The first of these quotations might be explained by saying that an Aurora was visible during the falling of snow, which appeared red from reflection, but this will not do for the second. Under A.D. 604 (Chron. Scot.) occurs—

Great was the red sorrow  
Over the chieftains of Frinn all—  
Aedh n-laine, with multitudes,  
Ae Jh Roin, Aedh Euidhe, were slain.

Here *red sorrow* means a "bloody sorrow," but I cannot see in this any reference to an Aurora.

For a more direct and satisfactory record of an auroral appearance, the following are given in Chron. Scot.:—

"A.D. 659; A.D. 660—Darkness on the Kalends of May, at the ninth hour; and in the same summer the sky was seen to burn."

"A.D. 670.— . . . A thin and tremulous cloud, in the form of a rainbow, appeared at the fourth watch of the night of the fifth day before Easter Sunday, stretching from east to west in a clear sky. The moon was turned into blood."

"A.D. 680.— . . . Loch nEchach was turned into blood." Perhaps this was caused by reflecting the colour of an Aurora.

The "Anglo-Saxon Chronicle" contains the next later observation:—

"A.D. 685.—This year it rained blood in Britain, and milk and butter were turned into blood.‡ The Chron. Scot. follows with:

"A.D. 688.—The moon was turned into the colour of blood on the festival of Saint Martin (11th November)." This is singularly corroborated by the "Brut y Tywysogion" (The Chronicles of the Princes).§

"A.D. 688.— . . . it rained blood in the island of Britain, and in Ireland."

"A.D. 689.— . . . a battle against the son of Penda. Bloody rain fell in Lagenia." (Chron. Scot.)

"A.D. 690.— . . . the milk and butter turned to blood." (Brut y Tywy.)

"A.D. 692.— . . . the moon turned of a bloody colour." (Brut y Tywy.)

We now come to a most perplexing record of phenomena, which cannot, I am afraid, be explained; they occurred in

"A.D. 714.— . . . it rained a shower of honey upon Othan

Bec; a shower of silver upon Othan Mór; and a shower of blood on the Foss of Laighen." (Chron. Scot.)

If the shower of blood means an Aurora, what do the other showers mean? What is a shower of honey?

The auroral hypothesis will not satisfactorily apply to the following:—

"A.D. 734.— . . . This year the moon was as if it had been sprinkled with blood." (Anglo-Sax. Chron.)

But it may to the following:—

"A.D. 744.—This year a red crucifix appeared in the heavens after sunset." (Flor. Wor. and in Anglo-Sax. Chron., under A.D. 743.)

An Aurora is undoubtedly meant in the next record:—

"A.D. 793.— . . . This year dire forewarnings came over the land of the North-humbrians, and miserably terrified the people; these were excessive whirlwinds and lightnings, and fiery dragons were seen flying in the air."\* (Anglo-Sax. Chron.)

This may be taken as the earliest direct mention of an Aurora borealis in England. "Fiery dragons" are not more inapplicable to the phenomenon than the term "merry dancers," till very lately used in the Orkneys.

The next mention of "blood," whether as a celestial phenomenon or not, I shall leave for others to say is:—

"A.D. 811.—This year was a year of prodigies. . . . It was in it, also, cakes were converted into blood, and blood used to flow from them when being cut. . . ." (Chron. Scot.)

Digressing for a moment, I am here reminded of what an Irish woman told me. She said that in Ireland a man, for masticating the sacramental wafer, had a flow of blood from his mouth until he was well-nigh drowned. This blood-tradition seems not to have entirely lost its hold on the Irish peasantry, although appearing in so many garbs.

A column of light is recorded to have appeared, but very few will accept it as an Aurora borealis:—

"A.D. 819.— . . . heaven afterwards revealed the deed by means of a column of light." (Florence of Worcester.)

"A.D. 850.— . . . a column of light shot up to heaven, and remained visible to the inhabitants of that place [Repton] for thirty days." (Flor. Wor.)

The next in chronological order is:—

"A.D. 865.—Loch Lebbinn was changed into blood, so that it became clots of gore, like the lights of animals, all round its edge." (Chron. Scot.) I may here remark how difficult it is to say what this record really means, especially when it states that the Loch became "clots of gore."

"A.D. 878.—It rained a shower of blood, which was found in lumps of gore, and blood on the plains of Ciannachta. . . ." (Chron. Scot.)

Perhaps the following may refer to an auroral appearance:—

"A.D. 890.—The heavens appeared to be on fire at night on the Kalends of January." (Chron. Scot.) But not so the next:—

"A.D. 898.—Aideidh . . . [was slain] in treachery . . . a shower of blood was shed in Ard-Ciannachta." (Chron. Scot.) This looks very much like a repetition of A.D. 878.

The next observation does not occur till

"A.D. 938.—The sun was of the colour of blood, from the beginning of one day to the middle of the day following." (Chron. Scot.) I shall not attempt to say what this was caused by, as I cannot conceive the sun being visible during the night. The Chronicles I have had access to do not mention the word "blood," nor any miracle connected with natural phenomena since this date, that would afford the least ground for surmising that an Aurora borealis was meant, till

A.D. 944.—When it records:—"Two fiery columns were seen a week before Allhallowtide, which illuminated the whole world." (Chron. Scot.) Knowing under what various forms Auroras appear, it may not be at all extravagant to suppose this "fiery column" to have been such a phenomenon; however, this is not so convincing as the next on record:—

"A.D. 979.—That same year was seen a bloody cloud, often-times in the likeness of fire; and it was mostly apparent at midnight, and so in various beams was coloured. When it began to dawn, then it glided away." (Ang.-Sax. Chron.)

\* In "The Philosophical Grammar" by Benj. Martin, 1738, there is given a list of fiery meteors, and among them are the various forms of the Aurora borealis:—"Ignis Pyramidalis, the pyramidal fire, when it resembles a pillar of fire standing upright; Draco Volans, a flying dragon, when the middle parts be thicker and broader than the ends; Capra Saltans, a skipping goat, when it appears to have a skipping motion, to be sometimes kindled and sometimes not." (Pages 204, 205.)

\* See NATURE, December 8, 1870.

† Published under the direction of the Master of the Rolls. Translated by W. M. Hennessy, M.R.I.A., 1866.

‡ Showers of blood are mentioned as having taken place in Tit. Liv. Book 42, Sect. 20. It says: "There was a report of it; having rained blood for three days at a town in Italy." And in Pliny, Book 2, Chap. 55, "It rained blood when M. Acilius and C. Perius were Consuls."

§ Published under the direction of the Master of the Rolls. Translated by the Rev. John Williams Ab Ithel, M.A., 1866.

Florence of Worcester mentions it as having been seen in "A.D. 978.—At midnight [the 18th of the Kalends of May (14th April)], there was seen throughout all England a cloud, which was sometimes of a blood-colour, and sometimes fiery; it afterwards broke out into rays of different colours, and disappeared about daybreak." (Chron. Flor. Worc.)

Gaimar, in his "History of the English," repeats this in the following manner:—

"A.D. 978.—At night, as he [the murdered King Edward] lay in the moat, a heavenly light spread itself there; the light was bright (no wonder!) it very much resembled the sun. This ray came over the holy body—the top of it was in heaven."

Putting down 978 as the correct date, and which is confirmed by William of Malmesbury (so far as the death of King Edward is concerned), this year may be accepted as the one in which an Aurora was seen.

From the last date till the year 1052, I cannot find any mention of "blood"-phenomena, or direct references to auroral appearance, and again in this year the evidence is very vague; it says:—

A.D. 1052.—A tower of fire was seen at Ross-Deala, on the festival of St. George, during the space of five hours, blackbirds innumerable going into and out of it, and one large bird in the middle of it." (Chron. Scot.)

The next, still more puzzling, will be my last:—

"A.D. 1103.—In the province called Berkshire, in a place called Heamstede, blood was seen by many to flow out of the ground." (Chron. Flor. Worc.)

I think that it will now appear from this account that any attempt to lay down *one* meaning for the whole of the numerous mentions of blood-appearances must fail, although it is, in a few instances, very clear that an Aurora is meant; but it seems as if a distinctive interpretation must be applied to the entries above given. On the whole, it is quite certain that this phenomenon has been seen at very remote dates by the inhabitants of Britain and Ireland; also that the enigmatical "blood"-miracles were not confined solely to Ireland, but seem to have been revealed alike to the *Keltic* inhabitants of England and Wales. I say *Keltic*, because I find the majority of records among the Chronicles to relate more especially to the *Ancient Britons* and *Irish*, and in many cases I believe (as one may judge from the above chronology) the style of poetical descriptions and form of mythical allusions are *Keltic*. The well-known Druidical Hymns, which appear in old Irish literature, are fair specimens of what I mean. One in particular concludes a mythical story with, "and the third (brother), guided by the lightning from his brother's fingers, shoots an arrow at the swimming hag, who immediately disappears in a *pool of blood*."\*

There are two vague poetical descriptions which I imagine to have been suggested by the Northern Lights, in Hesiod's "Theogony," where he describes the war between the Gods and the Giants in the West. (Elton's Translation.)

He says:—

The gods from Saturn sprung, and those whom Jove  
From subterraneous gloom releas'd to light,  
Terrible, strong, of force enormous, burst  
A hundred arms from all their shoulders huge.

(Lines 884—887.)

Of Erebus, the preternatural glare  
Spread, mingling fire with darkness.

(Lines 924—926.)

From astronomical calculations this war is stated to have taken place at the autumnal equinox in the year 756 B.C., and to have terminated at the era of Nabonassar; so that such an appearance may possibly have assisted Hesiod in composing this poem. The Hindu astronomers also seem to have heard of, or seen a heavenly phenomenon, which I imagine to have been something like an Aurora, if the hypothesis be true, that with the ancient natural phenomena were invariably made the themes of their verse, and were shrouded in allegorical descriptions. The most remarkable passage I have met with occurs in the Mahābhārata, Book i. chap. 15 (Wilkins's Translation):—

"They now pull forth the serpent's head repeatedly, and as often let it go; whilst there issued from his mouth, thus violently drawing to and fro by the Suras and Asuras, a continual stream of fire, and smoke, and wind, which, ascending in thick clouds replete with lightning, it began to rain down upon the heavenly bands, who were already fatigued with their labour."

\* See Thierry, "Hist. de Gaull.," and Pritchard's "Eastern Origin of Celtic Nations."

The date of this supposed war is placed at 945 B.C.

If the foregoing passages be compared with what the "Prose Edda" \* says, the hypothesis will not appear unreasonable. In the chapter on "The Twilight of the Gods, and the Conflagration of the Universe," it says:—

Midgard's protecting wall  
Bravely fights and slays  
The serpent monster,  
Then shall all mankind  
The earth abandon.

Dimm'd's now the sun,  
In ocean earth sinks;  
From the skies are cast  
The sparkling stars;  
The fire-reek rageth  
Around Time's nurse,  
And flickering flames  
With heaven itself playeth.

The idea of "flickering flames" is original, or, at least, not borrowed from the Eastern poets, and, in my judgment, could only apply to the Aurora, it may be an extraordinary appearance of it; and as the Aurora, which has been seen in England this year, was also visible in India, I think it not at all unlikely that "a continual stream of fire," which "began to rain down," is a record of a similar extensive phenomenon.

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## BALLOON ASCENTS FOR MILITARY PURPOSES

### III.

THE laws of the motion of a balloon, dependent on the change of level, appear to have been hitherto very little discussed from a scientific point of view. It is, however, a motion which can be procured very easily by throwing out a small quantity of sand, or of gas, if the balloon is properly constructed, and which is of great importance for any expedition in time of war, more perhaps than even the attempt at guiding its direction. The number of minutes required for descending from a great altitude as well as for ascending to a certain level, being the most important consideration for the aeronaut endangered by the vicinity of some foreign force, this was analytically examined by M. Dupuy de Lôme. It is the first instance that I know of such a disquisition since Euler worked his equations relating to the elevation of an aerostatic sphere supposed to be inextensible, and to be carried away in the atmosphere with a certain amount of motive power due to the small specific gravity of the included gas. That beautiful analytical disquisition is the last ever written by the old philosopher, who was totally blind at the time. It was found written by him on the *tableau noir* where he was making his calculations on the very day before he died. He had received the intelligence of the great experiment tried by Mongolfier, and his excited brain had produced during the night that masterly piece of mathematical skill which was unhappily his last! This contribution to scientific ballooning is to be found in the "Mémoires de l'Académie des Sciences de Paris" for 1781, a date anterior to the experiment of Mongolfier, which is accounted for by the issue of the volumes being always later than the date inscribed on them. Another singularity is that Euler speaks of gas for filling the balloon, while Mongolfier's was merely heated air. We must not, however, give Euler the merit of having been the real inventor of *Charlières* or gas balloon, as Mongolfier believed that he prepared gas by burning damp corn-straw! Before returning to the questions considered by Dupuy de Lôme, we may be allowed to mention that the use of gas enclosed in a gasholder of any description, was suggested by Blake in his lectures at Edinburgh, and by an Italian philosopher transacting business in London. Carvalho tried to give to the idea of Blake the shape of an experiment, but uselessly, for the want of a proper varnish, which was invented by Charles a few months only after Mongolfier's great experiment.

The principal difficulty for strangers to the scientific working of an aerostat, appears to be to draw a broad line between the *motive power* or *force ascensionnelle*, and the *space* offered for free dilatation without any gas being lost in the air, which space I will call the *dilatation chamber*, although generally there is no

\* Mallett's "Northern Antiquities" (Bohn's Edition, 1847, p. 455).