

‘THOUGHTS ON TIME IN DIFFERENT COSMOSES’

Here are some thoughts which rose from a moment of deeper understanding one summer evening:

As the sun fades below the horizon a stillness falls over the fields, and from within the wood the twitterings and rustlings of small animals and bird-life come to a standstill. The faint daytime breeze drops as the air cools, so that even the leaves are silent. Everything is still, hushed, waiting – and then slowly, almost imperceptibly, like the turn of the tide, Nature begins to let out her breath.

This we can feel and understand, being ourselves part of Nature. Our day and night of twenty-four hours is the breath of Nature. Sometimes her breath comes deep, in the long summer days, and there seems hardly time to let it out before she inhales deeply again; and later, in the short dark days, her intake of breath is shallow – while she rests, so it would seem – preparing for a new surge of life in the spring.

But what of the Earth? The time of a breath for Nature can only be the blink of an eye for the Earth, for in twenty-four hours the Earth’s surface receives one pulsation of the life-giving rays of the Sun – the shortest flash of a seemingly endless pulsation of radiant energy playing on the whole surface of the Earth’s sphere. And yet in one of these brief cycles the greatest intensity of sunlight strikes only at one band on the rotating surface of the Earth – now at the equator, now above or below it, according to the angle of the Earth’s axis and her position in the annual path round the Sun. At one point on her orbit the North Pole will be in continual darkness while the South Pole is in continuous day; while at the opposite point on the orbit the South Pole will be dark while the North Pole is in constant light for a season. It is not until a year has flashed by that the whole of the Earth’s surface has received its complete benediction of light and power from the Sun. It is as if, in that one year, some equivalent of a life-giving breath has been taken by the Earth – one completed cycle of energy in that one journey round the Sun.

Suppose, then, that we can take the breath cycle of the Earth to be one year, what is the meaning of its day and night, which would be of the order of 30,000 years? What permutations and combinations take place in the whole planetary world in that time? How far does the Sun travel through the Milky Way in that time?

Let us try to see such questions on the scale of cycles of Nature, based on the supposition that its Day and Night is one year. Certainly Nature goes through an important regular cycle of the four seasons each year, lying asleep during the winter and waking up in the spring. Nature’s life, then, would be of the order of 30,000 years, bringing it into relation with the estimation of glacial periods. For instance, it has been calculated (Le Gros Clark, *History of the Primates*, British Museum) that during the last 600,000 years there have been at least four large glacial periods. (The last glaciation is said to have ended 25,000 years ago; its duration was 100,000 years, and it was separated from the previous one by 50,000 years, and that glaciation itself lasted 75,000 years.) Another authority (*Encyclopaedia Britannica*) traces five large glacial periods and other minor ones during an epoch dating back from 30,000 to 1 million years ago. In this case the five large periods would average something between 6,000 and 200,000 years each, which tallies with an average figure of 30,000 years for the life-cycle of Nature, or organic life on earth.

What are the implications, on the scale of the Earth and the Sun, when we take 30,000 years as Day and Night for the Earth? Multiplying this figure by 30,000 we obtain a figure of about 10^9 years for the Day and Night of the Sun.

The Sun's path around the Galaxy is estimated by Hoyle to take 2×10^8 years, and is in some way connected with an intake of interstellar hydrogen gas which acts as its fuel. Thus it would seem that this movement of the Sun in one arm of the revolving nebulae of our Milky Way would be a food cycle of some kind – Day and Night for the Sun.

Perhaps some hint can be gleaned from all this as to the intrinsic meaning of the units on which the time of a cosmos is based: what (apart from its relation to time) actually *is* an impression, a breath, a cycle of day and night? Is it something to do with the intake or circulation of the three kinds of food on which any cosmos depends? In man, certainly, they are connected with the intake of *impressions*, of *air*, and *solid food*. If then, the earth can be said to 'breathe' each year, can we infer from this that 'breath' for the earth is related to the intake of certain solar radiations? What are its other foods – one denser, one more rarefied than this?

H.W.

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