Deep Time Through the Lens of the Magic Lantern: Genesis and Geology

Origins of Life

Who are we and where do we come from? The issue of origins is one of timeless inquiry. The question arises from a fundamental human desire to know and has therefore always been a matter of both science and religion. During the nineteenth century, however, a revolutionary transformation in the understanding of the earth formation and development sharpened the question in an unprecedented way. What eventually changed was the history of life itself. The Industrial Revolution and the mining industry stimulated the rapid development of geology as a science that arranged rocks according to their order of formation in time. Amateur fossil hunters, moreover, discovered the remains of dragon-like creatures walking an ancient earth. By the mid-nineteenth century, these observations and the findings were blended with theories of scholars who themselves formed new academic disciplines such as geology and palaeontology. Gradually but surely, the story of the earth started to unfold. The discovery and exploration of ‘deep time’ continued to combine the insights of those who we would now call theologians and those we call scientists. Both areas of inquiry had a considerable overlap at the time, especially when considering the twofold question of human identity and the origin of life, as many scholars had indeed long worked with competences in both domains. However, the acknowledgment that human history was dwarfed by pre-human time came down to a reshuffling of cards that were mostly new. Empirical science presented the contemporary with overwhelming evidence that mankind had been preceded not just by one week of God’s primal creative act, but

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1 The explorations eventually gave rise to ‘dinosaur’ research in 1842, when Richard Owen, a British expert in animal anatomy, described several sets of recently discovered bones, established a separate taxonomy and coined the word. For a comprehensive and exciting account of the progress of earth sciences in the nineteenth century, cf. Martin J. S. Rudwick. *Earth’s Deep History: How It was Discovered and Why It Matters* (Chicago: University Press, 2014), and Brenda Maddox. *Reading the Rocks: How Victorian Geologists Discovered the Secret of Life* (London: Bloomsbury, 2018).

by an immensely lengthy and eventful past. It reduced the whole of history, as it has been known until then, to a brief final scene in a far longer drama. The first human re-entered as a very recent actor on this vast and inhuman stage.

Integral to this scientific revolution was the contribution by the new scientific visual languages. Novel scenes of creation had to be designed, and they had to perform the impossible, making visible what is really invisible, or more precisely: they had to make the contemporary a virtual witness to a historical scene that had vanished long before there was any human being to witness it. The contemporary had to imagine deep time against recorded history. Recorded history referred to approximately the last four thousand years for which written records existed. The plot dynamic of this history was religious, based on the Bible, more specifically on the book of Genesis. Picturing an image of deep time, the millions of years preceding those written accounts, meant visualizing the invisible, picturing the unseen. From the mid-nineteenth century onwards, so-called ideal views of prehistory rose to the challenge. Science popularizers teamed up with artists to reveal the origins of life in landscape settings representing the successive geological periods. Much was at stake. This new visual language had to go beyond being an aid in the scientific description of prehistory to become central in the interpretation of the findings in relation to religion. More specifically, ideal views of deep time were to be scientific in the sense that they presented facts about long gone species and their environments, religious in the sense that biblical authority remained largely unshaken, and aesthetic in the sense that artistic imagination mediated fact and belief. Due to its imaginary power in tandem with empirical foundations, the scientific genre immediately became very popular.

The magic lantern had a crucial part in opening up the thought-provoking space of deep time. It is not by accident that the heyday of the lantern as an instrument to learn and entertain in Europe coincided with the breakthrough of the earth sciences in the 1860s. Itinerant showmen accordingly played a crucial role in the marketing of scenes of creation. Taking advantage of their contemporaries’ enthusiasm for learning, they reproduced scientific illustrations of deep time and exploited all the resources of performance, showmanship, and rhetoric.

They offered mixed attractions as part of the repertoire of family-friendly theaters, and created value and meaning while doing so. Knowledge was communicated through the spoken word in conjunction with images, and all layers of society, both literate and illiterate, could be introduced to the new earth sciences. The magic lantern performance, I want to argue, perfectly matched the demand for a new vision of prehistory. Due to the flexibility of the medium, genesis and geology could indeed harmonize with each other very well when adopted in the repertoire of the lantern. It possessed the capacity to set up the negotiation of science and religion, to effect ‘movement’ in thought and to allow new objects of knowledge to emerge. In this contribution, I will first discuss the nature

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4 In her influential book, *Performance and Evolution in the Age of Darwin: Out of the Natural* (London, New York: Routledge, 2002), Jane Goodall has exclusively focused on burlesque counter-culture, ‘[w]here museum displays concentrated on portrayals of the natural order, the entertainment side of their business began to exploit a counter-fascination with what might be “out of the natural order”: freak shows in which extreme differences of bulk and stature, form and feature were the staple ingredients’ (7). But there was more to geology shows than mockery; as I aim to demonstrate in his article, serious science shows represented a huge part of the market.
and context of a canonical slide series. I will then hold a crucial slide from this series depicting the arrival of man up to the light to gauge the relation between science and religion. Thereafter, I will discuss the medium-specific properties of the lantern in relation to the drama of deep time and the embodied performance of the slides before an audience.

**Scenes of Creation**

The incentive to research scenes of creation came from a remarkable French collection of geology lantern slides archived in IES Bárbara de Braganza, a school in Badajoz in the Spanish Extremadura region. The set combines hand drawn images of geological time table charts which indicate the successive layers of sedimentary rock, photographs of important sites and their findings (mountains, glaciers, traces of earth quakes, volcanoes, sea shores), and undated reproductions of etchings taken from popular scientific journals such as *La Nature* (*Nature*) and *Le Magasin Pittoresque* (*The Picturesque Magazine*). Its heterogeneity makes it hard to determine the exact date of the set as a whole. Mixing and matching slides with other slides and series was common practice in the case of the lantern, as they typically travelled through time and space, appearing in a variety of contexts.

What strikes out immediately, however, are seventeen lantern slides depicting so-called *vues idéals* (‘ideal views’) of deep time. This sequence begins with the period before the origin of life itself. We see torrents of rain falling on the still hot globe and the subsequent condensation announcing the cooling and the conditions for the creation of the first organisms. What follows is earth’s history divided into a series of time intervals with exotic names that must have stirred the imagination of the audience – ‘Ideal view of the earth during the Silurian Period’ and, subsequently, the Devonian, Carboniferous, Permian, Conchyliean, Saliferan, Lias, Oolite, Cretaceous, and Eocene epochs. The narrative arc involves the depiction of the first marine organisms thrown on rocky shores, the emergence of plant and animal life, and, finally, the creation of man. Interestingly, the seventeen slides can be traced back to catalogue no. 38 by Radiguet & Massiot, successors of Molteni, that, in the 1905 edition, advertised sets for ‘Conférences Scientifiques et Mondaines’ (‘Scientific and Mundane Conferences’). They are listed in the chapter on geology, marked with the same number and title, under the heading ‘History of the Globe’. The series, however, already appeared in an earlier and more general catalogue from 1874, albeit as part of less elaborate sequences; the ideal views bore the same titles but have different numbers. It is in other words safe to assume that the slides sparked performances for over at least thirty years.

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5 The IES Bárbara de Braganza in Badajoz, Spain, is the heir of the Provincial Institute, created in 1845 at the request of the Real Sociedad Económica de Amigos del País. The archive of the school holds materials belonging to the Physics and Natural Sciences Cabinets and works from the National Museum of Painting.


The lantern slides are taken from a magnificent sequence of scenes printed in *La Terre avant le déluge* (*The World Before the Deluge*), a book published in 1863 by the French popularizer of science Louis Figuier (1819–1894). The work immediately became an international classic in popular science, opening up the new field of earth sciences to a wide audience of non-specialists. It went through nine editions, the last appearing in 1883, and was translated into various European languages, including Dutch, Spanish, and Danish. The ‘Twenty-five ideal views of landscapes of the ancient world’ included in the book most certainly played a crucial role in this unparalleled success. They were initially drawn by Édouard Riou (1833–1900), a young illustrator and former student of the French printmaker Gustave Doré, one of the most prolific and successful illustrators of the nineteenth century. The scenes are truly spectacular, especially when foregrounding monstrous animals. An ichthyosaur spouting like a whale while confronting the giant reptile-like plesiosaur (cf. Fig. 1), a gloomy pterodactyl swooping on a big dragonfly, the iguanodon biting (and being bitten by) a megalosaur (cf. Fig. 2): what invariably stands out in all the pictures are the monsters’ sharp teeth and their ferocious behaviour.

The contemporary undoubtedly viewed the first humans as the beginning of redemptive history through the lives of Adam and Eve. This was a familiar picture. But to see creation framed in a presentation that depicted an utterly uninhabitable and inhuman environment must have sent shivers down the reader’s (and spectator’s) spine. Nobody had ever seen a dinosaur, and nobody ever would, yet very soon everybody would know what they looked like. Even today, dinosaurs are so familiar that we tend to forget that they are products of creative imagination, assembled out of empiric fragments and augmented with aesthetic speculation. The realistic style invites us to imagine that we are seeing deep time with our own eyes, unproblematically, as for the first time. However, ideal views are very far from simple realism, not only because they crowd a variety of entities into one scene that would

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8 Subtitle of Figuier’s book (1863).
9 William John Thomas Mitchell documents the dino-obsession, the extraordinary pervasiveness and continuous resurrection of the dinosaur as a popular icon throughout history and until the present in *The Last Dinosaur Book: The Life and Times of a Cultural Icon* (Chicago: University Press, 1998).
be unlikely to pose in real life, they are also and above all indebted to a specific pictorial tradition. There is indeed the major influence of Doré’s dark hand, whose exuberant and bizarre fantasy created demonic scenes that made him no stranger to enthusiasts of the magic lantern (for example, his illustrations of the Bible and Dante’s *Inferno* were reproduced as lantern slides). But it was probably the work of John Martin that had a profound effect on Riou’s representation of deep past. The painter and devout Christian earned great fame with his huge Romantic scenes of doom and apocalypse, and very often biblical themes taken from the Old Testament, such as ‘The Evening of the Deluge’ (1828). Martin did not pass up on the opportunity to occasionally populate his landscapes with gigantic lizards. His ‘The country of the Iguanodon’ was even a frontispiece to Gideon Algernon Mantell’s *The Wonders of Geology* in 1838, a crucial book in geology that sparked the study of dinosaurs.

Riou’s antediluvian world consequently retained a sense of dark romanticism (cf. Fig. 3), yet at the same time emancipates itself from the mythical through a scientific design that was first and foremost grounded in facts. The artist more specifically based his ideal views on similar scenes published in 1851 in *Die Urwelt in ihren verschiedenen Bildungsperioden* (*The Primitive World in its different periods of formation*) by Austrian botanist and palaeontologist Franz Unger. The then well-known landscape painter Karl Josef Kuwasseg had created fourteen large lithographed scenes for Franz Unger’s book. At the time, this was the most ambitious project of this kind yet undertaken to make deep time amenable to thought through visual imagery. The result was published as a beautiful folio atlas mostly focusing on plant life in geohistorical contexts. Kuwasseg’s sequence would obtain great

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12 Martin John Spencer Rudwick, *Scenes From Deep Time: Early Pictorial Representations of the Prehistoric World* (Chicago: University Press, 1992), 97–135. This book is an invaluable source for everyone wanting to research scenes of creation and early pictorial representations of prehistory, regardless of the discipline one is working in. This article most certainly could not have been written without it.
international fame through the magic lantern performances by Paul Hoffmann, who in 1858 started his geological program and toured the capitals of central Europe thereafter.\textsuperscript{13}

According to Martin Rudwick, Édouard Riou ‘established the genre of scenes from deep time throughout the Western world’, continuing their influence even during the twentieth century.\textsuperscript{14} This is worth contemplating: whenever we see a dinosaur today, we are somehow looking at Riou’s 1863 etchings. His representations implied a human perspective on a world in which there never was a human to record the scene, nor would there be in the future. There was (and is) simply no other way to show and tell about deep time. It is in this regard telling that, around the same time, Riou’s marine reptiles also appeared in Jules Gabriel Verne’s soon to be legendary \textit{Voyage au centre de la Terre} (\textit{Journey to the Centre of the Earth}, 1864), where they figured in far more fantastic scenes. The ubiquity of the scenes proves their popularity and the decisive grip they held on the imaginary. Riou’s depictions of deep time indeed sat very comfortably in the middle of the continuum between fact and fiction, science and sensation. It should not come as a surprise that, as will be demonstrated below, lanternists and showmen eagerly responded to the magnetic and performative attraction of the series.

The ideal views activated formats, modes, and ideas from the realm of aesthetics, as the scientist at least partially gave over control to a professional artist. Nevertheless, Figuier did not proceed without care when he approached the artist. In fact, the main motivation to write \textit{La Terre avant le déluge} was the author’s reluctance towards books


\textsuperscript{14} Rudwick. \textit{Scenes From Deep Time}, 219.
that wandered too far from the actual domain of science into the realms of the imaginary. The young generation was tainted by ‘the love of wonder’ and the ‘faculty of imagination’ urgently needed to be brought back into scientific service to promote ‘the naked truth’.15 Yet, as one of the greatest pioneers of his time, Figuier was also conscious that science popularization operated through an appeal to the senses and generated consent through visual imagery. He found Riou’s creations important enough in the marketing of the book to highlight the name of the artist in its subtitle. Riou’s drawings were not only meant to sharpen the appetite of the contemporary for new knowledge. The skills of the artist were above all directed at persuading the audience of the rightness of the argument. As such, the illustrations did not merely illustrate the text, it was rather the other way around with Figuier detailing prehistory on account of his describing what the reader saw when they looked at the pictures. The ideal views were in other words constitutive of the scientific argument.16 The portrayal of the first humans is a case in point. In what follows, we propose

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15 Louis Figuier. *La Terre avant le déluge*, second ed. (Paris: Hachette et Cie, 1867), iv–vi. All the more surprising is Figuier’s introduction to his book, a fiery tirade against the culture of spectacle and popular entertainment. ‘Youngsters visit the theatre only in search of the féerie, the diablerie, the phantasmagoria and the allegory’ (iv). Figuier grumbles, detailing the catalogue of damned spectacles: ‘Puppet shows’, ‘the unchanging annual procession of revues-féeries’, ‘Chinese shadow shows’, ‘escamotages’ (especially Robert Houdin), ‘table-turnings and spirits’ (iii–v) – they spoil the youth and definitely expose them to ‘the invasion of an alternatively ignorant fanaticism or a menacing socialism’ (v). Figuier’s attack on ‘the love of wonder’ may easily be interpreted as a general aversion to the appeal of the sensuous. This is not the case, as Figuier wanted instead to divert the reader’s attention from the supernatural to nature itself, while preserving ‘the faculty of imagination’ (vi). This, however, required a new genre. With his scientific edition Figuier explicitly aims to move away from the fictional dialogues between scholars and the theatrical mise-en-scène of science, that ‘obsolete form’, that ‘genre vieilli’ (ix–x). He searched for and found that new genre in the ideal views drawn by Riou. Ironically, towards the end of his life Figuier would try his hand at writing plays for the theatre with legendary scientists as protagonists: cf. Fabienne Cardot. ‘Le théâtre scientifique de Louis Figuier’, *Romantisme* 65 (1989): 59–68.

to focus on this crucial slide, because it also allows us to gauge the dynamic relationship between science and religion.

**Image and Narrative: The First Humans**

The slide in question (cf. Fig. 4) depicts three men outside a cave that is overgrown with dense vegetation. They are clad in furs and hold flint axes while confronting a hostile nature across a defensive gap. It is a very dynamic scene. The hunters apparently defend the family hiding in the cave behind them against a remarkably heterogeneous horde of animals such as hyenas, bear, deer, white horse, and the more prehistoric mammoth and rhinoceros. Different times merge in this image. This depiction returns to us as a lantern slide that was to have a lasting life. However, this was not the illustration that Riou had initially drawn for the book. As Rudwick has demonstrated, Figuier had at first instructed Riou to portray the scene in a way that made no allusion whatsoever to current debates about the antiquity and evolution of human species. The result explicitly did not mix fiery animals with cave-dwellers. It instead highlighted Adam and Eve (with child) in the foreground of a peaceful Arcadian landscape (cf. Fig. 5). While woman is playing with the child, man confidently glances into the distance. He carries a staff signalling that domestication of the animals nearby, farm animals such as sheep and cows, is just a matter of time. This pastoral scene was fully in line with biblical scriptures. It picked up on a long and religious iconographic tradition.

What prompted Figuier to change the scene was the discovery of a human jaw by amateur archaeologist Jacques Boucher de Crèvecoeur de Perthes in 1863. This important finding forced the author to bow to the inevitable, alter his edition, and adapt a wilder scene. Perthes’ fossil man was proof that the first human had coexisted with species formerly believed to be extinct – hence the peculiar and somewhat awkward coexistence of cave-dwellers, mammals, and prehistoric beasts in Riou’s new version. It can be argued that the new scene marked the transgression of early man into prehuman world. Without doubt, it stirred the audience up with new ideas about evolution. It did not, however, erase the divine status of their ancestors. Nor did it impose upon the wider public the suggestion of a clear break between biblical record and scientific account. To begin with, in the two versions, the human beings were blatantly white and European in demeanor, in line with contemporary depictions of biblical figures. The contrast between the dark background and the white bodies of the protagonists is made strong enough not to unsettle or disconcert the audience. The artist’s rendering of his earliest ancestors as noble white people remained in the service of racial goals, even when they appeared in the guise of ‘savages’. As Rudwick aptly notes:

Morally, if not technologically, they were still familiar and reassuring to Figuier’s vast middle-class Western public: they were *themselves* dressed up as primitives, though hardly more convincing than Marie Antoinette as a milk-maid.17

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Moreover, Figuier did not change the text that accompanied the scene in the first editions. It consequently remained explicitly clear that, in his words:

We are [...] far from sharing the opinion of the naturalists who represent man at the beginning of the existence of his species as a sort of ape, of hideous face and with a hairy body, dwelling in caves like the bears and lions, and participating in instincts as brutal and ferocious as theirs. There is no doubt the primitive man had to pass through a period in which he had to fight for his existence with ferocious beasts, living in the wild in woods or in savannahs, where Providence had thrown him. But this period of education did not last long, and man, an eminently social being, promptly combined in groups, animated by the same interests and the same desires, to find ways to tame the animals and to triumph over the elements, to protect him from innumerable dangers that threatened him, and to subdue to his rule the other inhabitants of the earth.18

This was an ultimate effort to (re)frame the iconography of the new version in order to (re)establish a sense of proportion and not let the reader get carried away. Figuier’s disclaimer contradicted Riou’s more dramatic image, which was in itself wilder than the earlier version. But it would be exaggerated to state that the iconography sang completely separate from the text. Next to the whiteness of the first humans that made them appear as contemporaries to the nineteenth century viewers, there is the gap that dominates the picture and that separates the humans from the animals. The cave-dwellers yield their axes

Fig. 5. E. Riou’s ‘Apparition de l’homme’, in Louis Figuier, La Terre avant le Déluge, second ed. (Paris: Hachette, 1867), 363, figure 303.

18 Figuier. La Terre avant le déluge, 361–62.
but from a safe distance; they are not really endangered by the creatures on the other side of the rift. Riou’s clever compositional move mitigated the otherness of the cave-dweller by setting the earliest human apart from the inhuman scenery he inevitably inhabits. The illustrator neatly encapsulated the historical moment at which the human species was brought fully into the epistemological panorama of the history of life on earth.19 This allowed Figuier to evoke the primitive without an allusion to the evolution of man suggested by Darwinian literature since the 1860s.

The artist together with the scientist made sure not to compromise the fundamental idea that human creation is a divine mystery which is impenetrable to science. Science could only work when it remained free of ambivalent or potentially scandalous elements. A year after publication, Figuier would reiterate his move on the occasion of the discovery of fossil man, formulating his perspective on the paradigm struggle in the clearest of terms:

In fact, French science has a wise and excellent rule. Its principle is never to mix religion and science, as it is not always within man’s power match. The scientist must do science, the theologian theology, and it is never without peril for the dignity and majesty of both of these great lights that one tries to amalgamate them. Faith is faith, science is science, man’s lights are weak: this is what we must say to ourselves to avoid the temptation to merge these incompatible elements. Let us study and record scientific facts without worrying, for the moment, about their agreement or disagreement with facts of another order. It is in this spirit, in this philosophical feeling, that we are going to report the facts discovered in 1863, which, together with a mass of others previously known, have put the high antiquity of the human species beyond doubt.20

The author casually added that ‘biblical England’ might well experience fossil man as an attack on the holy scriptures, but that things were different in France, where public opinion was not troubled by an all too literate reading of the Bible. There was margin for interpretation and commentary. This meant that it was deemed possible to integrate deep time and its geological periods in an enlarged understanding of the six days of Creation. ‘Creation leads into worship of the Creator’, Figuier maintained.21 But from another point of view the constellation of image and narrative in response to fossil man also betrayed the epistemological uncertainties of his time. After all, the new earth sciences did invite the contemporary to a journey into the unknown. The reader of books might not be adequately reassured by a strictly empirical account. He or she would want more assurances on the basis of scientific attitude and its relation to religion. In other words, contemporaries wanted to see the balance between genesis and geology kept even not only by the written results of science, but by the way its practitioners looked and talked about it while projecting the images. This was the *modus operandi* of the lantern performance and its dramatic logic.

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21 Figuier. *La Terre avant le déluge*, xvi.
Projection and Dramatic Logic

Looming in the background around the time that Figuier published his work was the theory of evolution. 1862 was indeed a notable year in science, with both a French translation of Darwin’s *The Origin of Species* and subsequent challenges to ‘creationist-fixist’ theories thanks to extensive empirical research. The impact of Charles Robert Darwin in France should, however, not be overestimated. Historians of science agree on the slowness of the French reception of Darwinism: on the one hand, nationalism held Darwin’s influence at bay, while, on the other hand, the French opinion held on to various elements of positivism, thus overvaluing scientific fact to the detriment of questioning the overall picture that connected the different stages in development of the earth and its inhabitants. Despite this unfavorable climate, a balance nonetheless had to be found between a nascent (and often pseudo-)Darwinism and older theories. As demonstrated above, a certain eclecticism helped, especially for science popularizers such as Figuier, as it allowed an approach and a depiction of science that did not hold rigidly to a single paradigm or set of assumptions, but instead drew upon multiple ideas. It is useful to remember that, after all, scientists were immersed in an adventure carried out in a context where incompleteness and reversals, misunderstandings and reinterpretations were more rule than exception. In any case, the inference of evolution that human beings were derived from animals by some kind of purely biological natural process was a bridge too far.

A case can be made for assuming that the medium of the magic lantern was thus that it kept this risk in check. I more explicitly want to suggest that the specific quality of the apparatus in regard to structure, experience, and perception helped the new knowledge to feed back into a coherent story or at least kept possibilities of different interpretations open. Indeed, while texts and images were allied in the service of facts, the performance of the images gestured beyond factuality, especially when viewed collectively and in the company of a lecturer, as they were designed to be experienced. Their effects exceeded the particulars of the lesson, calling attention to the flow and pace of the narrative. Lantern performance typically offered a continuous linear narrative, yet the different stages were disjointed due to the relative autonomy of the slides that substituted each other in the process of show and tell. This logic seems to rather perfectly align with the widespread conception in France that geological history was a progressive narrative punctuated by interruptions and, possibly, divine intervention.

Georges Cuvier was one of the first to remark upon the possibility of great catastrophes that had enveloped the planet and wiped out the successive geological periods. At the *Musée national d’Histoire naturelle (National Natural History Museum)* in Paris, where he was appointed shortly after the French Revolution, the French naturalist and zoologist developed the idea that natural catastrophes were part of the intrinsic way the earth worked. He had noticed several gaps in fossil records where all evidence of life would vanish and then abruptly reappear. Cuvier recognized these gaps as major events of mass extinction. His interpretation of natural history as a succession of ‘lost worlds’ had a huge impact on

scientific audiences worldwide. It was also widely absorbed by the broader public who heard him lecture or read his more accessible work. Cuvier did not explain what precisely happened in the intervals, and this conveniently left the possibility of divine intervention. This is probably why catastrophism also provided a template for science popularizers to organize the history of the world in an intelligible sequence of events. In his book *Die Katastrophische Feerie (The Catastrophic Féerie)*, Romanist Jörg Dünne has convincingly correlated drama and literature to Cuvier’s speculations on natural history. According to Dünne, the plot logic of *La terre avant le déluge* is indeed driven by catastrophism, as

[...] due to the choice of the means of representation itself, Figuier’s tableaux give the impression of a discontinuous succession of relatively stable sections of the earth’s history, between which discontinuous breaks have obliterated what can be seen in the tableaux and replaced it with a new appearance of life.

A more fitting device than the lantern to articulate this format can hardly be thought of. The audience witnessed each evening how a period emerged out of darkness to eventually retreat into darkness, awaiting a new epoch to arise: this is the logic of slide projection and it matched Cuvier’s theory.

Moreover, Cuvier never really explained any force that could have caused the occasional cataclysms that had revolutionized the history of nature. Because he never identified these forces, many indeed believed that the extinctions were the result of divine intervention. Cuvier, at one point in time, even identified the most recent ‘revolution’ as the flood in Genesis. The handling of the flood was a delicate passage in geo-history, because it marked a symbolic boundary between the human world and the deep past. It was important that this central biblical event retained a place in scientific understanding, and it did, as testified by the many variations of the traditional term ‘antediluvian’ in titles of the lantern shows to come to terms with a scientific understanding of the primitive world. But, at the same time, only empirical findings would give the deluge a legitimate basis for inclusion in the historical account. The question whether the historical reality of massive inundations had also been the biblical flood recorded in Genesis, runs throughout the nineteenth century, dynamizing the territories of science and religion, and challenging their borders. As a result, Genesis and geology merged into a dual plot. It was quite possible to foreground the progressive dynamic of nature while maintaining that the orientation of that dynamic remained positively guaranteed by God’s all-pervasive presence.

Unfortunately, the slide depicting the flood was not part of the Braganza archive, but it is mentioned in the Molteni catalogues and hence was undoubtedly once part of the lantern sequence of ideal views. In a way, the common image of a globe periodically wrecked by cataclysms survives in all depictions of violent epochs and their monstrous inhabitants. Against the backdrop of catastrophism, a sequence of lantern scenes could be interpreted in either of two ways. It could, on the one hand, be regarded as a series of independent epochs

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with intervals of darkness, each time an individual glass slide plucked from the shelf, held before a light source, and projected in front of an audience: the paratactic logic of breaks and (probably divine) changes of scene. On the other hand, the format of a sequence at least allowed for the possibility of a more evolutionary approach, as together, the separate slides evoked the continuous panorama of prehistory; it set up the captivating illusion of scenes converging into one sequence. This dual plot structure was easily reunited into a single strand through the use of the lantern. The technology itself in a way lent itself well to showmen who wanted to treat geology as compatible with Genesis while simultaneously adopting new geological findings.

In order to further investigate this hypothesis, we have to actively broaden our perspective of the lantern and not view it as only an apparatus. We should not forget that the lantern functioned as a mode of display shaped, marked, and circulated by live performance – even if the ephemeral meeting between performer and audience is notably difficult to reconstruct. By definition, a performance does not only represent given facts, it produces them by engendering a situation that inscribes the spectator in certain assumptions, values, and imaginaries. This especially holds true, as Aileen Fyfe and Bernd Lightman have demonstrated in *Science in the Marketplace*, for ‘a period when people differing in gender, rank and depth of experience not only talked about science but in doing so contributed directly to its making’.

The meaning of the slides was, then, defined from the user’s end as much as from the scientific end in a period when an eager audience not only talked about science, but contributed to its development in doing so. Looking back at the golden age of science popularization, Robert Fox noticed particularly in France a distinctive sense of freedom after 1860; a trend among lecturers ‘to become more opiniated’ alongside ‘a move toward a greater degree of audience participation’. Public involvement was fostered by invoking a communal purpose among audiences, and discussion through direct address of the audience was a common tactic. In order to better understand the multiple ways science and religion overlapped we have to gain insight into this interaction.

**Performer and Audience**

One of the showmen who promoted the strange otherness of deep time to the full and put it on display over a long period of time was Henri Robin, a French magician who turned science into entertainment in the 1850s after having extensively toured Europe as a magician. Newspapers for the first time advertised his ‘Histoire de la création de la terre’ (‘History of Earth’s Creation’) in Brussels in October 1860. Robin’s ‘geological

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30 *Journal de Bruxelles* (18 October 1860, 23 October 1860, 3 November 1860, 15 November 1860, and 28 November 1860).
demonstration in two parts and 38 tableaux’ was the apex of his program in Gymnase Polytechnique (The Polytechnic Gymnasium), the theater that he had opened in the Belgian capital the year before, a stone’s throw from the opera house La Monnaie. Newspapers announced the shows of the ‘skilled physicist’ on a daily basis in what must have been a magnificent theater venue that included several exhibition rooms, where machines and a gallery of Cosmoramas could be visited before and after the performances. The lantern show on creation presented the grand finale of Robin’s stay in Brussels. But it was not the end of the story. Two years later, Robin would emerge in the London Egyptian Hall with ‘for the first time, the History of the Creation of the World, geological illustrations by the agioscope, Showing the different changes our Planet has undergone from its origin to the present day.’ The geology program was mounted together with a demonstration of electricity and astronomy. In 1863, ‘Creation’ resurfaced in Paris (cf. Fig. 6), where the new and permanent Théâtre Robin on the legendary Boulevard du Temple advertised a forty-five minute magic lantern performance depicting earth’s evolution, from a boiling ball of gas to a world covered with vegetation and populated by dinosaurs and, finally, Adam and Eve. There, the science program would successfully be combined with ghost apparitions and other illusionistic tricks. All in all, the geology program in particular seemed to have settled the reputation of Henri Robin as one of the greatest.

Remarkably, the first mention of Robin’s interest in geology is not a performance but a ‘scientific and artistic exposition’ of his minerals, fossils, and shells. This collection was already on exhibition in his Brussels theater the year before he actually brought ‘Creation’ as a performance to the stage. The collection of objects remained key in the putting together of the show before the audience. Robin rather proudly reproduced the following laudation by a journalist in his professional biography:

Mr Robin, who has traveled extensively and must have learned a great deal from his travels, possesses himself a very remarkable collection of antediluvian fossils, which would be the envy of the best-composed museums, and we can personally state that the paintings he shows have been drawn from the originals in his hands, so they cannot fail to be true and resembling.

I have already noted that the ideal views were new and of speculative nature. In order to fully appreciate the veracity of the lantern scenes, the visitor apparently wanted proof. Material objects, presumably assembled from authoritative scientific sites outside the theater and now there to be touched, matched the performance to the expectations of the visitor. The audience could see with their own eyes the fossils that were part of the

31 ‘Henri Robin’s appearance at the Egyptian Hall, 1862’, Evanion Catalog number 1392 of the British Library, [accessed 3 September 2020].
33 The same newspaper advertises on 9 January 1861 the sale of Robin’s collection including the fossils and minerals.
34 Robin. L’Almanach illustré ‘Le Cagliostro’, 32.
drawn landscapes projected on screen, which in turn attested the truthfulness of these landscapes and the animals dwelling there.

Scientific realism was indeed an important element of the performance. It is significant that none other than contemporary Abbot Moigno mentioned Robin's geological shows to promote the magic lantern as an instrument of truth. François Napoléon Marie Moigno was a French Catholic priest and Jesuit who devoted his life to science communication for the masses. He belonged to the progressive clergy and was a supporter of ‘concordism’, the principle of exegesis consisting in interpreting the sacred texts in such a way that they do not contradict scientific knowledge. Already during his life, Moigno became known as ‘the apostle of projection’.35 He clearly admired Robin for his shows, merely suggesting a technical update to enhance scientific accuracy:

Mr Robin, in these last evenings, has taken up his geological tableaux again [...]; but these tableaux, like almost all the views projected by the skilful physicist, are paintings that leave much to be desired from the point of view of design and truth; when he has photography at his disposal, he will show us many other wonders!16

Moigno’s remark underscores once again that ideal views were a tight balancing act and that the ‘faculty of imagination’ (Figuier) had to be restricted when it came to science. Representation of new knowledge should not venture off too far into aesthetics.

Truth depended on correspondence with facts. But what mattered as much as anything for the audience’s understanding of earth’s history was the relationship of evidence to belief. When visitors saw geology on show they were not only taught how to interpret the history of the world but also to situate divine providence in it. A large picture reproduced by Robin as an illustration to his lantern show drove the point home.37 A composite image reassembles the protagonists of deep time in a typical prehistoric landscape. Remarkably enough, in the middle of the scene there is an emblematic earth globe. The great iguanodon, the mammoth, pterodactyl, and other animals that roamed the earth raise their head to gaze with awe and reverence at this globe beyond which God appears in full, with a white beard and rays emanating, to leave no doubt that creation could only have come from His hand. The picture blends together in one image the reconstructions by sculptor and natural history artist Benjamin Hawkins of some of the most spectacular fossil animals that geological research had revealed. When the Great Exhibition of 1851 in London finally closed, Hawkins created life-sized sculptures of dinosaurs for the permanent arts and science exhibition in the Crystal Palace, the steel and glass building that held the heritage of the mass event of 1851.38 Robin was in London around the same time, where he opened his ‘Salle Robin’ in 1850, and there is no doubt that the avid showman had picked up the popular display of monsters and copied the scientific illustrations that went along with it.39 Robin recombined them into a tableaux which succinctly set the scene for the reconciliation of science and religion.

It is moreover striking that commentaries on Robin’s geology shows invariably stress the breaks between the epochs. In what must be the longest and most poetic evocation of Robin’s geology performance, the author and critic Paul de Saint-Victor recounts the evening in detail, focusing on the interruptions in the progressive plot towards the appearance of man. After each epoch, ‘creation gets back to work; it sees that what it has done is not good’ by way of an ‘unknown and purifying cataclysm’.40 God in other words simply did away with an epoch because he wanted to abolish barbaric nature or punish

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the cruel creatures roaming his earth. The geologic periods were, so to speak, chapters in His work in progress, leading up to the creation of man. This picturing of deep time as a gradual story punctuated by occasional ruptures corresponds to the theory of catastrophism developed by Georges Cuvier as discussed above.

All the while, any incompatibilities between geology and Genesis that might have profoundly unsettled the audience of science performance seemed to ebb away. When, as an example, M. Fossier brought his ‘The Earth Before Man’s Creation’ to the Brussels Alhambra in 1874, he could freely address ‘[…] The morals and customs of antediluvian man according to the facts acquired by science’. Fossier, director of the ‘amusing physics matinee’ of the famous Théâtre de Folies-Dramatiques, toured France, the Netherlands, and Belgium between 1870 and 1892 with a performance that was reportedly ‘half science, half magic lantern’. He used between thirty and forty lantern slides that, judging by the titles of his shows, he recuperated from different source books, from Figuier to Flammarion. The appearance of the first human was invariably the culminating point in the concept of prehistory, in which the deep past found its fulfillment in the human world. We saw how it had prompted Figuier and Riou to alter the scene in the middle of a successful edition. But to address the issue like Fossier did, as a social situation with a certain continuity (‘morals and customs’), and not as a *deus ex machina* with an encapsulated – Caucasian – couple fallen from the heavens, seems to suggest a context that was less tense. It appears that the awareness of current ideas in the earth sciences increased in the wider world.

Genesis and geology usually stayed on the same page, even when science progressed and knowledge increased. This is made explicit by a commentator who reassured the audience on occasion of Fossier’s passage through Belgium. He wrote in 1870:

> Don’t cry heresy, M. Fossier’s paintings, and the explanations which accompany his views of the primitive world, of races, of extinct animals, of the appearance of man […] have precisely brought back our memories of […] lectures given at Notre Dame by R. P. Félix on mystery and science, on the days, or rather on the epochs of creation.

The journalist’s somewhat enigmatic reference was to the then famous Jesuit priest and rhetorician Joseph Félix, whose conferences in the Parisian cathedral had a great impact on public opinion. Félix safeguarded the thesis of divine intervention. ‘Not only is geological science not against us, it is for us, it speaks like us’, the sermon straightforwardly noted, ‘these two books answer each other page by page with an accuracy that we could not even have imagined’.

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41 L’Écho du parlement (10 May 1874).
42 Ibid.
43 ‘La Terre avant le déluge’, ‘La Terre avant la création de l’homme ou le Berceau de l’univers’. The latter seems a contraction of the titles of books by Figuier (La Terre …) and Flammarion (Berceau …). There are slides from Flammarion in the Braganza archive, and they are also enlisted in the aforementioned Molteni and Massiot & Radiguet catalogues. So, it is safe to assume that showmen like Figuier combined both sources.
44 *Courrier de l’Escaut* (24 June 1870).
Conclusion

The magic lantern positively facilitated the transfer of new ways of thinking into the popularization of the earth sciences. The mission required the capacity to reassure the audience that the new knowledge was not harmful, that it was in fact edifying, because its findings were compatible with the core religious teachings. This is where lantern projection as a performative experience actualized its full potential. Scenes of creation continued to attract large audiences well into the twentieth century. Showmen picked up on the mediating efforts of the authors and illustrators who produced the new scientific source books. Riou’s canonical sequence of scenes in particular was designed to bring home the scientific argument in a time when orthodox religious belief had to be reconciled with new empiric findings. I have shown that the imaginative repertoire more specifically brought into conjunction three pictorial traditions: natural history illustration based on the reconstruction of fossils and skeletons, historical, biblical illustration based on the interpretation of Genesis, and, of equal importance, aesthetic pictorial traditions. There was a sensuous aesthetic at play that can be followed through the most crucial twists and turns in Figuier’s narrative. Even the plainest of facts could apparently be combined with images culled from the narratives of creation in the early chapters of Genesis. Likewise, standing before the audience, the lecturer served as a mediator, guiding viewers through the slides and dictating the narrative in which these slides found their place. He controlled the presentation syntax and the discursive context. References to divine stewardship of the overall plot of deep time were crucial for their capacity to reassure the audience. Popularizers actively sought signs of divine imprints in the empirically-traced patterns of science, or, like Robin, they simply added them.

Ideal views of deep time were hybrid pictures. They were firmly rooted in new scientific evidence, yet they slotted the empirics, with artistic brilliance, into older and more familiar frames of reference that were biblical. As such, they were able to confirm religious metaphysics in the intellectual space of secular science. An important reason why lanternists chose to use the same tableaux for over more than fifty years, was indeed the comfort of familiarity and the ability to harmonize the new and the old. The ultimate meaning of the slide was moreover not necessarily in keeping with its predefined function and intention. Slides could easily be re-arranged and reordered for different purposes and audiences. Generating awe and wonder was as much part of the process as was the inquiry into nature. Interrogating prehistory and turning prehistory into a spectacle were the same thing. It of course manifested itself in spicier and more exciting offerings, but the shows also in a profound way mediated scientific realism and religious belief.

For a long time, catastrophism seemed able to balance scientific and religious concerns. The theory that sudden events of great intensity gradually wiped out the successive geological periods was widespread. Its basics aligned with the projection logic of the lantern, which in turn implied a progressive narrative of history punctuated by divine interruption. Gradually, bolder scientific statements heightened the tension and the empirical grounds of Cuvier’s theory were eventually disproved. Theories that did not comply with hard evidence were becoming harder to accept. Moreover, by the early twentieth century, the use of other technologies (such as radiometric dating) lay claim to the truth. Also, the staging context and its technologies drastically changed. Remarkably enough, there are
clues that geological shows were still being performed by Jesuits in Antwerp until well into the 1960s, but these seem to be rare exceptions. By that time, the magic lantern as a major instrument of geological knowledge had largely retreated from the scene.

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46 The archive of the Letterenhuis in Antwerp (Belgium) contains posters advertising Albert Raignier or Florent C. Bertiau and the Eckerlyc Genootschap with shows entitled ‘Ontstaan van het heelal’ (‘Creation of the Universe’) and ‘Ontstaan van de mens’ (‘Creation of Humankind’) as a ‘voordracht met lichtbeelden’ (‘demonstration with slides’).

47 The article was written within the framework of the B-magic. *The Magic Lantern and its Cultural Impact as Visual Mass Medium in Belgium* (1810–1940), a project funded by FWO and FNRS under the Excellence of Science (EOS) project number 30802346. B-magic will write the as yet unwritten history of the magic lantern as a mass medium in Belgium. In doing so, it will provide an essential contribution to the study of the country’s cultural history as well as to international media historiography.


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