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Representing Evolution: A Case Study in Visual Narrative

The 'History of Life' genre

The mid-nineteenth century saw the emergence of the 'History of Life', a genre that situated itself tantalisingly astride a number of frontiers, combining elements of antiquarianism, the exact sciences and the fantastic journey. It was created in response to the particular characteristics and potentialities of the 'historical sciences' of geology and palaeontology, young disciplines that had struggled to find a clear-cut place amongst the established physical sciences. The main issue was a certain discontinuity between the field's ostensible methodology – which had to be strongly empirical to justify the appellation of 'science' – and the sorts of results that it promised, which were decidedly *historical* in character. In theory, the hope was that the empirical study of the earth's strata and the fossilised remains they contained would permit practitioners reliably to reconstruct the pre-human story of life on the surface of the earth. However straight-forward this programme might sound to an age accustomed to historicist thought, the fact that the achievement of the desired outcome depended upon a willingness to shift, at some stage, from an

empirical to a narrative frame of reference inevitably raised the question of the field's scientific standing.

So the characteristics of the emerging domain made it both exciting and problematic. It was exciting for its capacity to open up hitherto unguessed-at perspectives of an immense material history unarchived in human records and inhabited by creatures unexampled in human experience; and it was problematic because the very strength of its narrative potential effectively undercut the credibility of its scientific aspirations. Clearly some sort of compromise strategy of narrative management would have to be found.

In the very early days, a naturalist such as Georges Cuvier had been able to straddle the divide by producing, in separate spaces within the same work, both substantial empirical material *and* a sustained geohistorical interpretation of those findings[1]. But as the field became more specialised and professionalised, this dual function became harder to carry and practitioners were increasingly limited to one or other role. This left a space open to the popularisers, who produced the 'History of Life' genre in response to the retreat of the specialists. Writing avowedly for a generalist audience, their explicit aim was to render an important technical subject thrilling by 'translating' the scattered findings of the scientists into a unified natural narrative. Thus occupying the critical space of interaction between the scientific and the historical legs of the discipline, it was well-placed to ventilate the discipline's core debates – and to attempt to naturalise fixist or evolutionist understandings of nature's historical processes.

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[1] Cuvier's four-volume *Recherches sur les ossements fossiles* (1812), for example, was an unprecedented empirical survey of extinct vertebrate species. However, its 'Discours préliminaire' was considered such an important reflection on the nature and the import of the study of the pre-human past that it was soon published as a separate pamphlet, first in English translation as the *Essay on the Theory of the Earth* (1813), and later in French as the *Discours sur les révolutions à la surface du globe* (1825). For an account of the importance of Cuvier's text, and the inaccuracies of the initial English translation, see Martin Rudwick, *Worlds Before Adam: The Reconstruction of Geohistory in the Age of Reform*, Chicago, University of Chicago Press, 2008, pp. 20-22

The genre's benchmark was established by the French scientific populariser Louis Figuier in his 1863 publication, *La Terre avant le déluge*. He was himself responding to the somewhat whimsical – and now almost completely forgotten – *Paris avant les hommes* published by Pierre Boitard in 1861, which had used the conventions of the fantasy tale to allow the protagonist to follow, in a dream-journey, the historical stages in the development of life. Boitard had exploited implicit parallels between different continuities: the conventional continuity of narrative on the one hand – the story of the traveller passing successively from one scene to another – and the 'real' continuity of natural historical processes on the other. The plottedness of the protagonist's journey spills over into the domain of nature, transforming a space of categorial fixity into one capable of responding to a logic of change and development. Figuier's response, designed to counter this developmentalist outlook, used similar tools in a very different way, resulting in a studiedly empirical text that also followed the course of geological time, but did so in the form of a rationally distanced account mediated by a disembodied narrative voice. Figuier's 'journey through time' was virtual and rational in contrast to the materialised fantasy of his counter-model, Boitard.

In order to defend a fixist model of natural history, Figuier selected and presented his material in such a way as to suggest that the story of Life was typified by a series of distinct creations. Each stage in the story constituted a step up on the earlier one, but that sequence was *not* to be understood as resulting from a naturalistic process of development. Since developmentalism was predicated upon a process of natural and therefore *gradual* change, Figuier countered it by offering a narrative of *discontinuity*; one that sought to stress at every turn the differences between the successive 'worlds' of the geological past.

Figuier's main writerly difficulty resided in the challenge of arranging his voluminous empirical material in such a way as to produce the right sort of narrative. He needed to find a way to 'place' his mass of facts within a

framework of underlying narrativity that would permit the reader to make sense of them, while avoiding the danger that the narrative might come to dominate – and so give unwanted weight to the feeling that Nature herself was characterised by an analogous narrativity. Figuier therefore sought to control and direct the narrative energy of his account by separating out the descriptive or empirical work on the one hand from the narrative work on the other. While the empirical content was carried by the main text and its accompanying specimen illustrations, the narrative was essentially carried in a separate space, embodied by a series of special illustrations that Figuier called "Ideal Scenes"[2]. These scenes appear throughout the text, one or two per chapter, and serve to encapsulate in a single living 'moment' the world as it was supposed to have been at the particular age in question. Illustrations being intrinsically *static*, in contrast to the implied *movement* of narrative, they could readily be used to give expression to the dynamic of discontinuity that was so important to Figuier.

Take for example these two 'Ideal Scenes', representing consecutive stages of the carboniferous age, appearing a mere twelve pages apart in the text (**figs 1 and 2**)[3]. It is immediately striking how radically different these scenes are from one another; despite their relative proximity in time, they seem to represent quite different worlds. Similarly, a number of subsequent scenes contain wondrously exotic beasts which appear only once and then disappear to be replaced by other equally weird beings of a completely different kind. Thus the extraordinary exoticism of these scenes, along with the immense variety of landscapes and living types represented, served at once to maintain the reader's interest *and* to naturalise a guiding narrative of discontinuity in nature's affairs.

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[2] They were executed by Edouard Riou, a successful illustrator of popular literature. He also worked with Jules Verne during this period. See Martin Rudwick, *Scenes from Deep Time: Early Pictorial Representations of the Prehistoric World*, Chicago, University of Chicago Press, 1992, pp. 173-218 for a detailed discussion of Figuier's illustrations; and the book as a whole for remarks on early pictorial representations of the geological past.
[3] These illustrations first appeared on pages 91 and 103 of the 4th edition of 1864.

Of course the story of Life could also be told in other ways, in order to suggest different dynamics. But quite significant variation could also be operated *within* the model conceived by Figuier; and in fact, his text *was* subjected to a form of manipulation by translators. Thus the English versions of *La Terre avant le déluge*, for example, were subtly realigned to suit the text to the Anglo-American ideological context: where the original French text was resolutely empirical and aggressively anti-development, the English versions soft-pedalled the empiricism to allow a greater space for providential design, and by the same token, for a dynamic of progressive change[4]. So, given the popularity and the relative adaptability of the Figuier model, there was initially no very strong impulse towards the formulation of alternative modes. It was not until the 1880s that the need to defend a form of developmentalism influenced by Darwinian evolution prompted some popularisers to attempt a novel approach to the 'history of Life' genre. An interesting example can be found in the work of the important science writer and educator, Arabella Buckley; and it is to her most significant work in this domain, *Winners in Life's Race*, that we accordingly now turn.

Buckley's narrative: a typological framework

One of the most successful producers of science for children in the late nineteenth century, Buckley came to writing relatively late in her career, after eleven years' work as Charles Lyell's personal assistant – a position she lost only after the geologist's death in 1875. Unmarried until 1884 at 44 years of age, she probably turned to writing out of economic necessity. Her first efforts were in the history of the natural sciences and – later on – in English history, but it was in the repackaging of science for children that she excelled. Perhaps her most successful title was the first, *The Fairyland of Science* (1879), a series of

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[4] Figuier's work was translated as *The World Before the Deluge*: six different editions were produced between 1865 And 1891. For a detailed discussion, see Richard Somerset, 'Textual evolution: the translation of Louis Figuier's La Terre avant le déluge', *The Translator*, Volume 17, Number 2, 2011, pp. 255-74.

'talks' in which aspects of the natural world as perceived by the scientist are presented in the magical terms usually associated with fantasy stories. Almost equally successful were the next two titles, *Life and her Children* (1880) and *Winners in Life's Race* (1882), respectively presentations of the invertebrate and the vertebrate classes of animals, and thus together forming a complete survey of nature and its workings. Although Darwin was barely mentioned in either text, it is clear that one of Buckley's unstated missions was to introduce her young readership to a world-view influenced by Darwinian thought; a delicate subject to bring before children so soon after the 'Monkey debate' of the 1870s! Clearly, Buckley had to be very careful about the form of Darwinism she presented, and most of all, how she presented it. It was perhaps in response to such pragmatic considerations, then, that she chose to focus on the immediate task of importing changefulness into the realm of nature, and on giving that changefulness the only form – moral and progressive – that would be acceptable to her middle-class readership. In promoting this vision, Buckley based her narrative on hierarchies of typology rather than on the chronology of descent, and then relied largely on suggestive illustrations to establish the required link between the two. Unlike Figuier's naturalistic representations, Buckley's scenes served not as 'witnesses' of the successive stages of the past world, but as abstract representations of the idea of the limits of classes of being, and especially, the meeting points between them. The key concepts in these illustrations, I would suggest, are *frames* and *limits*, *thresholds* and *points of passage*.

The best way to get a feeling for Buckley's 'typological' approach to the telling of the story of Life will be to start with the specimen diagrams which form an integral part of the text itself. These also featured heavily in Figuier's narrative, but naturally enough for him they mostly depicted either fossil remains or the reconstruction of the extinct life-forms they represented. In Buckley's work, on the other hand, only *one* specimen diagram depicts the remains of an extinct species; all the others represent the familiar beasts of the

modern world. How can this approach be made to work towards Buckley's goal of defending a developmental understanding of the story of Life? The strategy can be summed up as one that based its empirical credentials upon the participatory observation of modern nature, and then applied these findings to the past history of Life by a process of analogy. A few examples will illustrate the technique.

In presenting these specimens Buckley often inserted two illustrations, as can be seen in **figures 3 and 4**: the first depicted the animal as normally seen; and the second presented the same animal in the same posture but with the soft tissue removed to reveal the skeleton beneath. In addition, each of the skeleton illustrations featured a common pattern of labelling (compare **figs 4 and 5**) – a scheme which allowed Buckley to draw the reader's attention to the unexpected similarity of anatomical construction in these apparently very different sorts of animals. The educated gaze, she thus suggested, is able to see beyond the apparently radical differences between these classes of animals and to discern elements of structural convergence. This underlying similarity can act as the basis of an implied narrative of common descent. In the text, Buckley worked up this sense of connection by the extensive use of two related metaphors, the first centred on the notion of the *family* and family relations, and the other on the notion of the competitive *race*. These are already visible in Buckley's titles, *Life and her* **Children**, and **Winners** *in Life's* **Race**. Briefly, the first metaphor works to join different animal-types together under the auspices of a shared genealogy as the 'children' of a loving mother (Nature); while the second serves to introduce the notion of dynamic hierarchy or progress, with some 'children' becoming progressively more advanced, physically or morally, than others[5].

Buckley's implied narrative: a story of limits and thresholds

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[5] For a fuller discussion of Buckley's narrative strategies see Richard Somerset, 'Arabella Buckley and the Feminisation of Evolution as a Communication Strategy' in *Nineteenth-Century Gender Studies*, Special issue: "Women Write the Natural World", summer 2011.

We have already stated that Buckley's text focuses on the familiar animals of the modern world, while the extinct species of former times are typically mentioned only in passing. Indeed, such passages as relate directly to the geological past seem to be little more than embellishments in a text whose core structure, and overwhelming bulk, is devoted to a typological survey of modern forms. For example in the chapters on fish where the most significant foray into the past occurs, this digression occupies a mere seven pages out of a total of fifty (*WLR*, 35-42). The rest is almost exclusively occupied with a survey of *modern* fish types, designed to give body to the idea that amongst these species, there exist more or less 'modern' or 'ancient' types. The shark and the sturgeon, for example are described as "old-fashioned", while the apparently modest minnow is an exemplar of the modern bony fish, characterised by remarkable agility and a sort of incipient moral sense discernible in the care that some species devote to their young.

Buckley's core narrative is thus derived from typology not from chronology; and it uses an implied hierarchy within that typology as a way of hinting at an implied chronology of emergence that closely follows the more evident path from lower to higher types. Structural hierarchy was a far more self-evident notion to Victorians than variability in natural categories would have been! By centring her account of the history of nature around an organicised hierarchy of physical and moral status, Buckley was talking to her audience in terms that would make sense for them, as the best way to accustom them to the highly unintuitive idea that the barriers between natural categories were not in fact fixed, but might in a sense be crossed. The work of consolidating this difficult novelty would be largely carried by a distinct set of images that Buckley called her "picture headings" since they were placed at the head of each chapter, and which are of central interest to us here. The rest of our analysis will focus on their construction and their broader role in the text.

As the name Buckley gave them perhaps suggests, the 'picture headings' did not really take an active place within the text; they are in fact

rarely referred to in the text and when they are, it is to mention some specimen depicted there rather than to remark upon the significance of the scene as a whole. To the casual reader, then, they may seem to be little more than meta-textual embellishments. Their formal significance in the structure of the book becomes clear only when one notices that the table of contents includes, along with the title of each chapter, a description of the associated 'picture heading' detailing the species depicted – almost always *extinct* species – and mentioning, where appropriate, the pictorial sources used (see **fig. 6**). The descriptions also approximately situate each scene in geological time, thus asserting (in a minimalistic way) the sequential character of the series. It is also significant that the 'picture headings' are prominently mentioned in the brief preface, where Buckley calls them "geological restorations", and pointedly claims for herself the responsibility for their design, as well as asserting the originality of at least some[6].

The first chapter heading is the only one that does not participate in the chronological sequence outlined in the table of contents, also the only one to feature exclusively modern species (**fig. 7**). All the main vertebrate classes appear, readable in sequence moving more or less from bottom to top: fish, amphibians, reptiles, small and large mammals, and birds. The internal title tells us that the illustration depicts "The Great Backboned Family", while the textual heading, just below the 'picture heading' on the same page, announces the theme of the chapter as "The Threshold of Backboned Life". Nothing depicted in this scene is explicitly mentioned in the text of the ensuing chapter; yet the scene's dynamic plays an important role in giving body to the outlook that Buckley sought to promote. Clearly the point here is the establishment of the typological basis to her account.

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[6] "The geological restorations given as picture-headings (some of which are here attempted, I believe, for the first time) have been most carefully considered, though the exact forms of such strange and extinct animals must necessarily be conjectural. My thanks are due to the artist; Mr. Carrerras, jun., for the patience and care with which he has followed my instructions regarding them..." (*WLR*, vii).

Perhaps the most curious and the most striking feature of the illustration is the use of what we might call an 'internal frame' – a device that reappears in seven of the eleven remaining 'picture headings'. The central figures of the illustration are partly surrounded by an incomplete circular frame whose status as a formal division between distinct zones varies according to the elements we consider. At the top of the picture, the separation is absolute and there is no possible continuity between the landscapes represented on either side of the internal frame. But as we go down the page, the distinction dissolves, the dividing line disappears and a space of continuity emerges where the divide ceases to exist – the transition is disguised by a rock on one side, a bush on the other, and the space created is partly occupied by a sheep. The status of the frame as a conventional device is also humorously called into question by the fact that one of the birds is perched on it, and its tail even slightly obscures the other apparently conventional element, the picture's title which follows the curve of the frame. We can thus see that the illustration is designed to materialise – and to some extent even to naturalise – the concept of *the limit*, in the form of the internal frame; and also its opposite, *the threshold*, the space where the frame disappears and the passage from one space into another becomes possible.

Clearly, this scene is not intended as a naturalistic depiction of a 'slice of time', as Figuier's were. On the contrary, it translates a complex *idea*: that Nature's categories appear fixed, but when properly viewed turn out in fact to be porous. Beyond the conventions of fixed taxonomical names, we must learn to understand that nature's reality is more fluid. This picture heading is thus an attempt to represent the vital dynamic that balances stability and change in the natural economy.

Although the first picture heading has a special status as the most abstract of the illustrations, the more referential ones that follow continue to deploy the same set of visual metaphors. In some cases, the limit-crossing theme appears in purely conventional terms, similar to those of the first scene.

The picture heading for chapter seven, for example, has a similar incomplete internal frame, and depicts a large bird about to land on a tree growing from the external space below into the centre of a distinct space within the internal frame (**fig. 8**). In others, such as that which introduces chapter nine, the frame is not internal to the scene, but as if to compensate, it is particularly strongly traversed and colonised by elements that would not conventionally interact with it: the palm tree overflowing on the left, and the climbing vine on the right (**fig. 9**). In addition, the scene's title now also appears in quasi-naturalistic form, as if it were an object within the scene, obscuring a part of the animal standing behind. It thus acts as another kind of 'internal framing device', not creating a threshold to traverse as before, but merely marking out a distinct space for a distinct type. In this case a small creature, the marsupial Echidna, appears alone in front of the title-block, duly separated off from the 'higher' mammals by this semi-naturalised intrusion[7].

Some apparently sober and understated picture headings reveal themselves to contain hidden narratives of frontier-crossing when read in parallel with the text of the associated chapter. This is the case of the scene heading chapter 2, which introduces the first main vertebrate type, the fish (**fig. 10**). At first the illustration seems banal enough, a straightforward depiction of a scene in an ancient sea without any flamboyant breaking of conventional frames going on. Even the title element seems more clearly demarcated as conventional and external to the scene, at least in comparison to our earlier examples. After reading the chapter, however, the significance of the two tiny crustacea appearing just below the title element becomes evident. Here are some excerpts of Buckley's comments on the species depicted in the picture heading, the crustacean Pterygotus and an early "enamel-shielded" form of fish:

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[7] Buckley's table-of-contents description calls it a "hedgehog", but a very similar specimen illustrated in the previous chapter is identified as the marsupial Echidna (*WLR*, 188, 190).

> [This was] a time when the crustaceans were the most powerful animals in the world, and the huge lobster-like Pterygotus was the monarch of the seas. It was in the midst of a scene such as this that we first find the feeble ancestors of the Sturgeon and the Shark beginning to make their way in the world. ... These fish would keep out of the way of the Pterygotus because they were small and weak and he was large and strong. ... Yet they were the beginning of a powerful race of creatures, for they had the great advantage of a growing inside skeleton, which could vary and strengthen with their bodies from generation to generation, while their rivals, the Pterygotus and his companions, had only their heavy cumbrous armour with a mass of soft flesh inside, and were but lumbering creatures at best.
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> And so we find that as thousands and thousands of years rolled by, the descendants of the enamel-shielded fishes began to improve, and grew larger and more powerful as the generations passed on, till they became master of the shallow seas, and after awhile of the rivers and lakes. ... For this was the Golden Age of fishes, just before the time when the coal-forests grew; and the clumsy crab-like animals, and the trilobites, which had had their innings when the fish were small, now began gradually to be exterminated by their powerful enemies. Little by little they gave up the battle of life, and the larger ones died out altogether, leaving only those smaller crustaceans which did not clash with the fish (*WLR*, 37-40).

This is a good example of Buckley's basic plot dynamic. Each one of "life's children" has a turn to carry the torch, until eventually a higher form emerges, not necessarily bigger or stronger, but somehow *better* nevertheless; at this point the torch must be passed on to the next type and the former monarch retire to a new position somewhere near the bottom of the emerging hierarchy. Only if they accept marginality will their continued existence be possible. Returning now to the picture heading, it is easy to see how its construction is intended to materialise Buckley's dynamic of change. The giant Pterygotus seems to dominate this world, and the small fishes in the background constitute no imaginable threat to his authority; but in fact the fish are destined to take over from the crustacean, and the giant of the centre will dwindle until it resembles the marginalised creatures at the bottom of the picture. Occupying a separate space marked off by the title-ribbon, these diminutive creatures do not participate in the principle scene; instead they constitute a sort of glimpse ahead to the future life of the Crustaceans after they have handed over power to the fish. So this apparently most naturalistic amongst Buckley's scenes is really intended as the representation of an abstract dynamic of change.

Perhaps the most elaborately constructed picture-heading is that which marks the arrival of the mammals and which figures at the head of chapter eight (**fig. 11**). As in the other mammal scene already mentioned (**fig. 9**), this picture heading makes prominent use of a naturalised title element, a sort of carved plank which has somehow become ensconced in the scene. The element's involvement is particularly strongly marked since its presence is required to sustain a fallen trunk which runs from the bottom right-hand corner of the image across the supporting title-element and on towards the centre of the composition. Around this trunk, and running along the top of it, are samples of the main animal type featured in this composition, the primitive marsupial, Microlestes[8]. Close to the base of the fallen trunk grows a single tree fern, while in the larger more central space towards which the other end of the trunk seems to point is a group of deciduous trees. In the background a group of "large swimming reptiles" (*WLR*, x) appear in the distance in front of a setting (or perhaps a rising?) sun. The frame is not as flamboyantly traversed in this image as it is in some, but it is far more marked on the right-hand side and top than it is on the left and bottom, where it tends to disappear behind the deciduous trees and the ground upon which the marsupials play. Having already established Buckley's visual lexicon, the image is not difficult to read. The most significant 'internal framing device' is the naturalised title element, and the fallen trunk traversing it translates the idea of the limit crossed; in this case we even have some creatures obligingly doing the crossing! The space is separated into three main zones: the seascape in the background, associated here with the once-dominant reptiles, now doomed to marginality as indicated by their tiny size; and the two spaces on either side of the internal framing device, associated with the older tree fern type of vegetation in the one case, and with the more 'modern' deciduous trees in the other. In addition to the very clearly materialised frontier-crossing that dominates the action in the

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[8] Identified in the table-of-contents description of the scene.

centre of the scene, the sunset/sunrise backdrop further accentuates the theme of fundamental change.

Pictorial sources and contrasts

This series of examples has served to illustrate how Buckley developed a visual language whose task it was to reinforce and to complete the challenging core concept she wished to communicate to her young readers, the concept of categorial change in nature. We have also remarked on the author's tendency to avoid frontal engagement with this issue in her text, preferring to deal with change allusively in the relatively safe meta-textual space offered by the sequence of 'picture-headings'.

We have also seen that something similar can be said for other authors working in the 'History of Life' genre, even though their illustrations were designed to suit the particular ideology the author sought to promote. However, it is important to realise that visual models for illustrators to work with were relatively scarce, the speculative reconstruction of prehistoric beasts being an art that was still in its infancy. It is therefore not surprising that representations considered successful tended to be recycled by other authors – even when they were backing a rival outlook. Buckley was no exception in this respect, and she borrowed freely from Figuier's illustrations as well as those of other fixist authors. However, any such borrowings were always transformed, if only lightly, in order to produce a result that echoed the author's preferred visual codes and conceptual orientations. Such manipulation of borrowed material is of course interesting for what it suggests about the particularity of our author's visual and narrative strategies.

The 'picture heading' for chapter four shows a typical 'coal-forest' scene (**fig. 12**) which resembles Figuier's equivalent illustration, already reproduced (**fig. 2**). In both cases, the scene is dominated by a dark, swampy forest consisting of the same characteristic vegetation, and inhabited mainly by amphibians. Although the format of Buckley's illustration differs from

Figuier's, the setting is clearly derivative. The animals, on the other hand, come from a different – acknowledged – source. The author in question is J.W. Dawson, a Canadian naturalist and educator who produced semi-technical and popular works in the 1860s and 1870s arguing against evolutionary theory. The illustration that Buckley borrowed from had been produced by Dawson for use as the frontispiece to his *Air-Breathers of the Coal Period* (1863), and as an illustration in his popular 'History of Life', *The Story of the Earth and Man* (1872) (**fig. 13**).

Roughly speaking, Buckley's 'picture heading' was constructed by the simple expedient of transposing Dawson's creatures into Figuier's very different landscape. Even the attitudes of Dawson's animals are replicated, along with the footprints made by the largest lizard-like beast. However, the interaction of the beasts with their environment has a significant impact. In Dawson's scene that interaction is minimal, and even the creature standing on its hind legs to grab at an insect seems frozen in an attitude calculated to display its anatomy. When placed by Buckley in the setting inspired by Figuier, however, the arrangement of the beasts is more apt to hint at an implied narrative. The receding waterway in the centre of the composition, already present in Figuier, becomes a sort of pathway for this narrative. In the distant background a small head is just visible in the water; nearer-by a larger head emerges more distinctly, and in the foreground two lizard-like creatures have emerged from the water to walk on the land, which is duly marked with their imprint. Finally, Dawson's upright insect-chasing reptile is placed in a 'frame-breaking' position sitting on the ostensibly conventional title element, and propped up on a tree which he seems to be preparing to climb. If there were any doubt as to the general tendency of the implied narrative in this illustration, the point is immediately clarified by the textual heading appearing immediately below: "How the back-boned animals pass from water-breathing to air-breathing, and find their way out upon the land." Taking material used by two authors working to tell a story of life marked by periodic

discontinuities, Buckley was able to rearrange that material to make it do just the opposite: to hint at a story of gradual progress leading to frontier-breaking innovations. As for the text of the accompanying chapter, it does not explicitly build on these themes; instead it concentrates on the description of *modern* amphibians, paying particular attention to the metamorphosis of tadpoles.

Another case of potential borrowing by Buckley from Dawson is worth mentioning but this time we are interested in their marked *difference*. This concerns the 'picture heading' for chapter two which deals with the fish as a class, already reproduced as **figure 10**, which we will compare to the equivalent depiction of the age of the fish in Dawson's *Story of the Earth and Man* (**fig. 14**). The one obvious shared feature of the two illustrations is the prominent positioning of the giant crustacean Pterygotus, again in a similar attitude. But other than this one central element, everything else is different. Most importantly, Dawson does not show just one crustacean and one type of fish; on the contrary, his scene is positively crammed with a huge variety of fish and crustacean species, as well as corals and plants. Despite the presence of certain naturalising elements such as the volcano in eruption and the confrontation between the two largest beasts, the cramming of the frame is such that the scene looks more like a frozen display of specimens.

Empirically speaking, Dawson's is the more complete picture: his picture captures more fully the range of species that existed in the Devonian seas. But Buckley's illustrations were designed for narrative not empirical purposes. She got rid of all the 'excess' creatures in order to facilitate the construction of a clear narrative about the passage of 'Life' from its crustacean to its piscine age. Her illustration was designed to dramatise this 'frontier-breaking moment'. Dawson's illustration, by contrast, did just the opposite. As an opponent of developmentalism, his preoccupation was to exclude any hint that the animal economy might be formed in response to a process of naturalistic change. So the cramming of the frame works as a way of stifling and preventing any such narrative from taking shape. The central

confrontation between the Pterygotus and an equally virile fish has just the same impact. What we see here is a world already complete and adequate in itself, not a transitory state of affairs out of which some other and more adequate state is anticipated to emerge. Dawson crammed his frame with species to stifle the temptation to discern in specific differences an implied narrative of emergence; Buckley, for her part, freed up the frame and reduced the protagonists to two in pursuit of just the opposite effect.

This brief survey has given us the occasion to compare three distinct strategies of narrative-management by visual means in the genre of the popular or educational 'History of Life'. We have seen how Figuier used contrasted naturalistic scenes from deep time in order to create the impression of narrative discontinuity; and, briefly, how Dawson filled at least one of his scenes with a plethora of species in order to stifle the possibility that the confrontation of crustacean and fishes might be interpreted as implying a narrative of progress through competition. In contrast to these two fixist authors, we have seen how Buckley the evolutionist worked out a markedly different strategy based not on naturalistic representations of the past but on a stylised attempt to address the theme of categorial change in nature. The fixists used naturalistic representation to build a plot-free natural narrative; the evolutionist used stylised representation to assert against that familiar orthodoxy the inherent plottedness of nature and its operations. For all of them, illustrations played a critical role in constructing the natural narratives that their conceptual outlooks required since they offered the most effective space within which to naturalise those concepts. We therefore cannot properly read these Histories of Life if we do not read the pictures as well as the text.

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