

Tom McLeish, *The Poetry and Music of Science*, Oxford, Oxford University Press, 2019, 384 pp., ISBN: 9780198797999. Cloth: £25

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As Professor McLeish notes in the introduction, when one thinks of creativity, one immediately thinks of art as opposed to science: the manifest of art conjures up terms such as *creativity, inspiration, passion, form, imagination, composition, and representation*, where as that of science brings to mind more austere predicates such as *experiment, hypothesis, method, theory, and so on* (1-2). Yet it wrong to think that there is no room for creativity in science, and ultimately this a picture that McLeish sets out to correct. The goal of *The Poetry and Music of Science* is to reappraise «science through the lens of the humanities” (13), specifically by undertaking three tasks. The first is to give close attention to «stories of imagination and workmanship in the creation of art science»; the second to undertake a study of the way the creations of art and science «are received by their respective audiences», while the third compares «the human function of creative engagement with nature and, if we dare talk of it, of purpose» (ibid).

Professor McLeish is an award-winning theoretical physicist and Fellow of the Royal Society, whose work has increased our understanding of soft matter (matter that can easily be changed by stress, e.g. foam, for instance). He has also authored a well-received work entitled *Faith and Wisdom in Science*. However, his present excursion into examining the creative processes at work in art and science turns out to be somewhat less fruitful. The problems with this book are several; where to begin?

One of the first issues that crops up in the book is a lack of any kind of definition of the term ‘creativity’. Since the book is all about creativity, we would expect some kind of rudimentary characterisation of this key term. Traditionally, creativity tended to be defined as involving the production of novel ideas which were ultimately valuable in some way (see for instance, Paul and Kaufman 2014, 6). More recently, Bird and Hills have challenged the idea that creativity must involve the production of valuable objects, putting forward instead a model of creativity which retains the notion of originality, but argues that it should be the production of imagination, be many and varied, and be carried through to completion: «these four component elements work together in a creative individual...[and] creative acts and products are the manifestations of these dispositions» (Bird & Hills, 2019, 695). McLeish however, gives no kind of definition of what creativity is: presumably it is just obvious what creativity is or consists of.

The book largely proceeds by way of exemplar, being littered with examples of creative thinking from the arts and sciences. McLeish often falls into the trap on several

occasions, particularly with the historical examples, of taking a particular author's account of their creative processes at their word. With regards to art; as John Hospers (among others) has pointed out, «artists as a whole probably tend to glamourize themselves and like to leave the impression that they are solitary geniuses engaged in mysterious acts of self-expression» (Hospers, 1955, 319). Henry James – who McLeish cites at length in Chapter 5 – is a case in point. In the preface to *The Spoils of Poynton*, James gives a rather flowery account of the genesis of the story; an account flatly contradicted by what we find in his Notebooks, which gives us a more prosaic and credible history of the construction of the story (this example is highlighted in Beardsley, 1965, 292-93). Philosophers of science have similarly argued that scientists' accounts of what they *think* they are often at variance with what they were actually doing. (This isn't a charge only levelled at science of course; philosophers of history have been telling historians for years to leave the theorising to them). If such accounts are to be taken at face value, then we need to be given a rationale for doing so.

This lets us neatly segue into what is arguably the most problematic aspect of *The Poetry and Music of Science*: its failure to engage with the philosophy of science, and to a lesser extent, the philosophy of art. Two instances in particular stand out. The first is when McLeish notes that «the greatest lacuna of any theory of scientific methods is in its silence on where ideas come from in the first place...No-one has written a method for the generation of new ideas» (30), citing the work of Popper as an example of one of those who is silent on the issue. Oddly, McLeish omits to explain to the reader *why* Popper wasn't interested in developing such a method; which is ultimately because he (Popper) thought it irrelevant:

The initial state, the act of conceiving or inventing a theory, seems to me neither to call for logical analysis nor to be susceptible of it. The question how it happens that a new idea occurs to a man—whether it is a musical theme, a dramatic conflict, or a scientific theory—may be of great interest to empirical psychology; but it is irrelevant to the logical analysis of scientific knowledge (Popper, 1934, 7).

Similar claims have been in the philosophy of art; Monroe Beardsley answered the question «what difference does it make to our relationship with the arts that we understand the creative process in one way or another?» with «It makes no difference at all» (Beardsley, 1965, 301). Given the existence of arguments in both fields to the effect that to investigate the mainsprings of creativity – the context of discovery, as the logical positivists called it – is an exercise in futility, there surely needs to be a justification for the decision to investigate the mainsprings of creative in this book. But, as with the definition of creativity, no such justification is forthcoming; again, one can only assume McLeish thinks that it is just obvious that the investigation of the creative process will yield practical benefits.

Another omission vis-à-vis the philosophy of science involves McLeish's use of Thomas Kuhn. We are told that «had the impressionist movement attracted the attention of the philosopher of science Thomas Kuhn, he would have classed it

alongside his other examples of paradigm shifts» (118). I raised an eyebrow upon reading this sentence, with good reason: one doubts that Kuhn would have called it a paradigm shift, given that he was always keen to emphasise the dissimilarities between science and art. In 1969's «Comments on the Relations of Science and Art»; he noted that although there were indeed similarities between art and science, we should not lose sight of the ways in which they are very different – Kuhn wrote that E.M. Hafner's statement that «the more carefully we try to distinguish artist from scientists, the more difficult our task becomes» certainly described his own experience; but «unlike Hafner however, I find the experience disquieting and the conclusion unwelcome». (Kuhn, 1969, 341).

Kuhn's paper raises a salient point about a key strategy adopted in *Poetry and Music of Science*: the decision by McLeish to straightforwardly equate the creativity needed in art with that needed in science. McLeish is quite correct to say that the prevailing idea that there is no role for creativity in science is one that needs badly correcting; and no doubt there are some parallels between the artistic enterprise and that of science. But as Bishop Butler famously put it, «one thing is what it is and not another thing»: science is science and art is art. To demonstrate that science involves creativity is one thing; to portray the creative process as analogous with that of the artist is quite another.¹

Indeed, in the final chapter McLeish states that «the primary intention of scientists and artists [is] that their readers should behold their work, contemplate it, think on it, be moved by it» (302). This, quite frankly, is an extraordinary statement: not least for the fact that it ignores the fundamental distinction between the two, which is that science is ultimately a means to an end, whereas the production of art is an end *in itself*. The *sine non qua* of any scientific theory is: 'does this theory help us accurately gauge what some portion of the world is really like?' We may debate what the virtues of a good scientific theory should be; but aesthetic virtues are rarely to be found on a list of said virtues and with good reason. There is a world of difference between what is expected of a paper contributed to (say) the *Journal of High Energy Physics* and a painting to be displayed in the Tate.

To return to the issue of creativity; one of the arguments that Bird and Hill make in their recent paper is creativity isn't *necessarily* a good thing; moreover, creativity is just one element needed to produce successful science. Bird and Hill cite Aristotle, Ptolemy, and Galen as all being highly creative individuals: but much of their scientific work:

¹ In the conclusion, McLeish tells us that science and art share the same «three springs of imagination» – «the visual image offers perspective, insight, and illumination. The written and spoken word bring the possibility of mimesis through the textual, the experimental, and the narrative form for the story of creativity itself. The wordless depths of number, the musical and mathematical draw on the ancient insights of the liberal arts at the limits of comprehension» (339). This is surely so vague and jejune as to be almost worthless.

was not only mistaken but deeply anchored in false assumptions (e.g. the circular, geocentric model of planetary orbits and the humoral theory of physiology). These individuals and their contemporaries were often highly creative, but their creativity was not itself conducive towards the truth, knowledge, understanding, or anything else of scientific value. Instead, it tended to lead them to novel but false hypotheses which creatively reconciled their false assumptions with their (more accurate) observations (Bird & Hills, 2019, 707).

To this list one might add Priestley, who (as Kuhn pointed out in *Structure*) was extremely creative in terms of trying to save the phlogiston theory in the face of Lavoisier's work on oxygen. However much creativity these old theories involved, they were ultimately wrong.

Moreover, sometimes novel scientific achievements can be the result of processes that are in some respects the antithesis of creative. The discovery of Arsphenamine (the first effective treatment for syphilis) by Paul Ehrlich and Sahachiro Hata came not via an act of creative inspiration, but via «the systematic synthesis and testing of organic arsenic compounds» (Bird & Hills, 2019, 708).

At its heart, *The Poetry & Music of Science* seems to be pursuing two necessarily incompatible aims. As we have seen, McLeish wants to make the point that the scientific enterprise can involve just as much capacity for creativity as the arts – and there is nothing wrong with this. But the book also seems to want to emphasise the beauty of science, as the title would suggest – and this seems to suggest that there is a *necessary* link between creativity and the production of beautiful objects, which is a severely question-begging assumption.

In attempting to uncover something akin to a mechanism of creativity, one quite frankly wonders if McLeish is rushing in where angels fear to tread. One of the reasons that there is a lack of a general method for generating new ideas is that accounting for creative inspiration in either art or science is an extremely tricky task, and as we saw, many have considered it to be a somewhat unprofitable enterprise. Whewell argued that «an Art of Discovery is not possible...we may hope in vain, as Bacon hoped, for an organ which shall enable all men to construct scientific truths, as a pair of compasses enables all men to construct exact circles» (Whewell, 1847/1967, viii). McLeish seems to admit as much on a couple of occasions; for instance, emphasising the role that the unconscious plays in scientific inspiration, yet «when we turn to stare at it [unconscious thought] full on, the experience of unconscious ideation is apparently nowhere to be seen» (37). Given the slipperiness of the mainsprings of scientific creativity, we should perhaps not be surprised that philosophers of science have been able to come up with a boilerplate which one can follow in order to produce creativity.

There is undoubtedly a very interesting book to be written comparing and contrasting the creative processes in art and science; and McLeish undoubtedly is able to draw upon a wealth of knowledge in order to do so at some point. But the present tome

misses its target by some considerable distance. It shows a considerable amount of learning, but simply is not analytical enough in how it marshals it, exhibiting no clear philosophy of science or art behind it. Additionally, a failure to draw out some of the key differences between art and science means that ultimately, the reader is only getting half of the picture. The main flaw of the book is arguably its confused purpose: one can show the science contains as much beauty as art, or one can show that the mainsprings of creativity are similar in both science and art. *The Poetry of Music and Science* though, tries to do both, and falls between two stools as a result.

References

- Beardsley, M., «On the Creation of Art», *The Journal of Aesthetics and Art Criticism*, 23 (1965), pp. 29-304.
- Bird, A. and Hills, A., «Against Creativity», *Philosophy & Phenomenological Research*, 99 (2019), pp. 694-713.
- Hospers, J., «The Concept of Artistic Expression», *Proceedings of the Aristotelian Society*, 55 (1955), pp. 313-344.
- Kuhn, T., «Comment on the Relations of Science and Art», *Comparative Studies in Social History*, 11 (1969), pp. 403-412.
- Paul, E.S. and Kaufman, S.B., «Introduction» in E.S Paul and S.B. Kaufman (eds.), *The Philosophy of Creativity: New Essays*, Oxford, Oxford University Press, 2014, pp. 3-14.
- Whewell, W., *The Philosophy of the Inductive Sciences*, London, John W. Parker, 1847.