Thought Without a Thinking Subject; or, Karl Popper as Film-Philosopher

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Abstract:

The most interesting, and problematic, claim made by (some) film-philosophy, for me, is the proposition that film thinks. This claim is interesting because it asserts that film has something philosophical to offer that philosophy itself lacks. It is problematic because we tend to think that where there is thinking, there must be a 'someone' doing that thinking. And whatever film is, it is not a 'someone'. This paper brings Karl Popper's model of objective knowledge – what he calls 'knowledge in the absence of a knowing subject' – to bear on the proposition that 'film thinks', in order to sketch out an account of film as a process of objective thinking distinct from that of philosophy or any other merely human mode of thought.

Keywords: Film philosophy, Karl Popper, Objective Knowledge

KARL POPPER AS A FILM-PHILOSOPHER

Karl Popper is a key figure in the history of the philosophy of science. But he figures not at all in film-philosophy (however one conceives of it). There are very good reasons for this, not least of which is that he shows almost no interest in the cinema, philosophical or otherwise. Other than a brief analogy he puts to use in conversation with Einstein, film doesn't come up in his work or ideas at all. And his philosophical style and subject matter are such that he shares little in common with those philosophers who do show an interest in the cinema.[1] In short, it would be quite perverse to try and put Popper to work in the service of film-philosophy. So, of course, that's what I aim to do. Specifically, I want to bring to bear his treatment of what he calls 'objective knowledge', or 'knowledge without a knowing subject' to bear on the proposition that film thinks. The latter is, for me, the most interesting and problematic claim made by (at least some) film-philosophy. It's interesting because it asserts that film has something philosophical to offer that philosophy itself lacks - a distinctively non-human mode of thought, above and beyond the thoughts in any given director's head. It is problematic precisely because it's hard to imagining a thought without

[1] Popper really dislikes Wittgenstein (so Cavell is out). He would regard most continental philosophy as fundamentally irrationalist (which Popper associates with fascism), so Bergson, Deleuze, Badiou, Ranciere and the like are also out. The nearest thing I can think of to someone who writes about film and who seems to have some Popperian sympathies is David Bordwell, whose insistence on 'small scale, piecemeal theorising' in preference to 'grand theory' in cinema studies seems to be influenced by Popper's *The Open Society and Its Enemies*, which argues for small scale social theorising in preference to prophetic or deterministic theories of society on both logical and moral grounds (Popper regards determinist social theories as totalitarian in orientation). More generally, one could argue that Bordwell's empiricist tendencies have a broadly Popperian flavour. So, I do think there's a link there, though I don't think it's enough to call Bordwell's treatment of cinema a 'Popperian' one.

someone to think it. So, if one wants to uphold this claim, one can either argue for film constituting an active subjectivity in its own right, one distinct from its all-too-human makers (and I can see no evidence that films are self-conscious entities in their own right); or one can try to offer a plausible account of what a thought without a thinking subject might look like. Popper does not provide this account, quite. But I think I can make him.

Popper is most famous for his falsificationist account of scientific knowledge, which argues that scientific theories can never be validated or confirmed, but can only be falsified, at least insofar as science is in the business of looking for universal laws or constants. But this is not the aspect of his work that interests most me here (whatever film-philosophy is, I'm pretty sure it's not science, or the philosophy of science). I'm more interested in the metaphysical commitments underpinning his work, and the philosophical consequences that follow from them.[2]

Here's the kind of world Popper thinks we live in: he is a realist and an objectivist, who believes the world exists independently of what we think or know or believe about it. He's an indeterminist, meaning he thinks that the future is not fully determined by the past. And he's an anti-essentialist – he thinks there are no such things as essential properties, only relational ones. He offers a range of arguments across his work for how these commitments might be justified, and why he thinks we too should share them. But he knows they are metaphysical, and so ultimately undecidable. He holds these philosophical commitments because he thinks that without them neither science nor the growth of scientific knowledge as we understand them would be impossible.[3]

The reason I think Popper's ideas offer a useful angle on film-philosophy is not because of his proximity to science's place of privilege in Western hierarchies of knowledge. Rather, it is because his philosophical commitments make him a process philosopher – one who posits processes as more fundamental than things, and movement as more fundamental than stasis. This is not the usual way of thinking about Popper or his work. Not only does the importance of falsification in his work seems to foreground breaks, or interruptions, or stoppages more than flows, or streams, or continuity, he is actively hostile to many of the philosophers we might usually think of as process philosophers.[4] Nevertheless, the process orientation of Popper's work is a necessary consequence of his particular form of realism, since for him, 'the reality of time and change…[is] the very crux of realism.' (2002a, p.149). In other words, he is a temporal realist, and the objective reality of the world that he is committed to is

[2] Metaphysics is such a slippery term that I think it's useful to say what I mean by it, which is that a metaphysical claim is one that can neither be proved nor disproven, either by empirical investigation or logical analysis. The older style of analytic philosophy would dismiss such a claim as meaningless, but I do not, since such claims have real consequences for the kinds of knowledge, or arguments, or practices they make possible or preclude. In short, a metaphysical commitment is a fundamental claim about the kind of world we live in, one that shapes the sense it makes, and that we make of it. I'm drawing here on A. W. Moore's definition of metaphysics as 'the most general attempt to make sense of things' (Moore 2012, pp.1–7).

[3] For example, Popper is an anti-essentialist because an explanation of things by way of essences stops with the putative essence and can go no further. But this is no better than saying 'God did it', or 'it is what it is'. Any explanation worthy of science must itself be capable of being explained in turn: if we explain A by way of B, B in turn demands an explanation. And that explanation, C, must also be explained, and so on without end. So, for Popper, it's explanations all the way down.

[4] He regards Henri Bergson's work, for example, as fundamentally irrationalist, and irrationalist philosophy as playing a key part in the rise of totalitarianism in the 20th Century. The latter, larger claim is at is the core of Popper's *The Open Society and Its Enemies*. (2008a, 2008b)

one in which change is more fundamental than stasis, and process more fundamental than things.

I think this is a useful starting point for thinking about film, because if the movies are anything at all, they are movement, change, process. So, the objective reality Popper attributes to change offers us a way to start to think about the realist vocation that has so often been attributed to the cinema, in so many different ways. If time and change are the crux of realism, then cinematic realism would first of all be a question of its capacity for movement, and not for representation. And this tension and relation between real movement and the abstract representations subtracted or cut out from it seems to me fundamental to the paradoxes of the cinema, which produces movement out of still images cut out from the real movement of the world.

DETERMINISM AND THE CINEMATIC ILLUSION

Popper is an indeterminist because he thinks determinism rests in the last instance on an idealist metaphysics, one that reduces our experience of time and change to a subjective illusion. It's on this point that his one cinematic allusion is brought to bear, as part of an attempt to persuade Einstein away from the latter's determinist convictions (most famously summed up in the assertion that 'God does not play dice'). As Popper tells the story, he pointed out that a fully deterministic universe of the kind Einstein believed in would be one in which everything is given entirely in advance, since 'the future, being causally entailed by the past, could be viewed as contained in the past' (1991, p.91). Such a world would be one in which nothing new or unforeseeable would or could ever happen, a world in which movement and change would be an illusion – what Popper calls a 'Parmenidean block-universe' (2002b, p.106). Such stasis is clearly at odds with the movement and change we experience in everyday life. Determinism can only account for this disparity as an outcome of our limited perspective on the world – only able to grasp one 'time slice' of this static universe at a time, one after another, we experience movement and change where there is none. It is here that Popper's motion-picture analogy comes into play - each 'time slice' would be like the still frames of a motion picture, creating the illusion of movement as they pass successively through the projector (1991, pp.90–92). But this, he says:

> amounts to saying that the arrow of time is subjective, and that time as we experience it is an illusion – a view which forms an integral part of an idealistic or subjectivistic philosophy, and which is linked up with further idealistic and subjectivistic consequences (1991, pp.89–92).

So, if we want to be realists, and objectivists, we had better not be determinists. If we wish to assert the reality of time and change then the objective reality of the world must be such that that world is open, and not closed: its future must not be fully predictable on the basis of its past.[5]

[5] Though partial predictions are always possible, in a range of different senses of the word 'partial' For example: partially accurate (not perfectly precise); predictions of finite temporal extent (predicts only part of the future); predictions that bear on only part of the world (e.g. laws that predict specific limited features of the world, such as, say, the temperature at which water will boil as sea-pressure).

What's notable here is that Popper's use of the cinema as a metaphor for an illusory grasp on the reality of change bears a striking similarity to what Henri Bergson calls the 'cinematographic illusion'.[6] Bergson argues that our natural tendency is to grasp the continuously changing reality before us by way of static points abstracted from it, just as the frames of a strip of film capture movement as a series of still images.

> We take snapshots, as it were, of the passing reality; and, as these are characteristic of the reality, we have only to string them on a becoming, abstract, uniform and invisible, situated at the back of the apparatus of knowledge in order to imitate that which is characteristic of this becoming itself (1998, p.306).

The 'apparatus of knowledge' here is analogous to the film projector at the back of the theatre, creating the illusion of movement out of still images by artificially adding its own 'abstract, uniform and invisible' movement to them. For Bergson, this illusion dominates thought, perception and language alike, for purely practical reasons – one cannot act on or master what one cannot grasp, and one cannot grasp that which is constantly changing. We abstract stasis from change because we must, if we are to live. But the consequence of this is that we lose the concrete reality of being itself.

Both Popper and Bergson use this cinematic metaphor to critique the metaphysical consequences of grasping the real movement and change of the world by way of static points. There are, of course, real differences to the ways they go about doing so. Bergson argues that we do grasp the world cinematographically, whereas Popper's argument is in the hypothetical mode – *if* determinism were complete, *then* our perception of change would be an illusion of the cinematic kind. Bergson turns cinema against the determinist metaphysics underpinning modern science, and aims to correct this metaphysical error of by way of an immediate grasp of real duration – what he calls 'intuition' – and 'so to give modern science the metaphysic which corresponds to it, which it lacks as one half lacks the other', as Deleuze puts it (1986a, p.7). Popper, on the other hand, is less interested in what science lacks (metaphysical or otherwise) than why it works – he seeks to offer an account of how and why it is that science is so successful at making (partial) sense of an indeterminist world by way of determinist principles.[7]

The account he offers is straightforward enough. Science poses general hypotheses, which make predictions, which can be tested against the specific empirical facts of the world (which is why Popperian science has to be methodologically determinist, at the same time as being ontologically indeterminist, since you can't predict an undetermined future). If the predictions don't match the facts, the theory is falsified. But if they do match the facts, that doesn't mean the theory is verified, since we can never test for all instances of a general law. If our theory is that all swans are white, it only takes one black swan to falsify it, but no matter how many white swans we see, we can never preclude the possibility of a black swan just around the corner. The most we can claim of a scientific theory is that it is 'as yet unfalsified', and never that it is 'true'.

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[6] Popper's relation to Bergson is a complex one. His few overt references to the latter are highly critical, and yet the correlations between their philosophical commitments are surprisingly striking. For anyone who's interested in exploring these, I've written about them in more in *Fascism, Irrationalism and Creative Evolution, or, Deleuze Running Away* (2005).

[7] Insofar as it works deterministically, science does indeed grasp the world cinematographically.

One of the consequences of Popper's model is that science can only deal with those parts of the world that do work deterministically, or that can be approximated in that fashion. Given his indeterminist commitments, this means that there will always be parts of the world that escape the purview of science. This sounds a bit like a Kantian noumenon, but it is not. Just because something is beyond the reach of science today, does not mean it will be out of reach tomorrow. But there will always be something at any given moment that is.[8] In other words, the reach of science is both partial and unlimited – it can never know everything, but it can always know more than it does at any given moment. This means that a 'theory of everything' of the kind some physicists set as their goal is a mirage.[9] But it also opens up the question of whether the indeterminist facet of the world can be grasped or engaged with by modes other than that of science. This is in essence the ambit of Bergsonian 'intuition'. But because intuition as Bergson defines it is necessarily beyond the cinematographic grasp of thought, perception and language, it's hard to see what one could actually do with it, or say about it, philosophically or otherwise.[10] The continuous openness to change that indeterminism requires cannot be captured as itself: whatever the means by which we grasp it, the grasping itself selects or defines just a part or a point in that process of change. We do not comprehend the world as it is, but only the abstractions we cut out of it, like so many still frames in strip of film. In his *Cinema* books, Gilles Deleuze turns to the cinema to resolve precisely this philosophical problem.[11] But in this paper I want to follow Popper instead and see where his ideas might lead us.

THOUGHT WITHOUT A THINKING SUBJECT|

Popper argues that evolution generates knowledge in exactly the same way that science does. In this view, a biological entity is simply another kind of hypothesis, a tentative prediction about what it takes to survive. Just like the hypotheses of science, these predictions are subject to testing – if the entity does not survive, the hypothesis that it is, is falsified. As Popper puts it, this is a

> Darwinian theory of the growth of knowledge. From the amoeba to Einstein, the growth of knowledge is the same: we try to solve our problems, and to obtain, by the process of elimination something approaching adequacy in our tentative solutions.' (1979, p.261).

The only difference between science and evolution here is that where the falsification of a biological hypothesis is necessarily fatal, 'scientific criticism often makes our theories perish in our stead, eliminating our mistaken beliefs before such beliefs lead to our own elimination.' (1979, p.261)

[8] The invention of the differential calculus, for example, allowed us to deal with continuous variation in strictly static and mathematical terms, and in doing so greatly expanded the realm of phenomena available to empirical testing, with consequences that neither Newton nor Leibniz could have predicted. But the calculus can do so only by taking the movement out of movement, as Carl B. Boyer makes clear. (1959, pp.299–309)

[9] Not all physicists think a 'theory of everything' is possible, of course. See, for example, (Unger & Smolin 2015)

[10] As John Mullarkey puts it, "An immediate grasp of the temporal which is inexpressible would hardly seem to be a good place to begin one's philosophy."(1999, p.150)

[11] If you want to follow this claim in greater depth, I explore it in some detail in *Deleuze, Cinema and the Thought of the World* (Thomas 2018).

This is a strictly objective account of knowledge and of the growth of knowledge – not in the sense that the knowledge in question is objectively true, but rather that it is objectively *real*. Most theories of knowledge treat it as a certain kind of belief – traditionally a justified and true belief, but a belief nonetheless, which makes it a strictly subjective matter.[12] But Popper's is a theory of knowledge that requires no subjective element – it is, as he puts it, a 'knowledge without a knowing subject' (1979, p.109). This suggests a further possibility that Popper does not explore, but that I intend to. His evolutionary epistemology implies not only that there is objective knowledge, but also objective thought - a thought without a thinking subject.

Such a possibility seems counterintuitive, if only because we associate thought so strongly with consciousness. Indeed, the mere fact of thinking seems to imply (*pace* Descartes) that there must be someone doing that thinking. But unless one wants to posit a Platonic theory of knowledge as eternal and pre-existing (which Popper doesn't), knowledge must be something that is actively made, and at least part of that activity is one of solving problems. And evolution – the dynamic process of hypothesis formation and falsification – does exactly this: it actively solves (survival) problems, with neither agency nor subjectivity nor mystical force driving that action.[13] As Popper puts it in the title of one of his books, 'All life is problem solving' (2010). And neither the problems, the problem solving, nor the solutions have anything to do with subjective awareness or intent. I think it plausible to call this dynamic process of problem-solving thinking, whether there is someone doing that thinking or not.

RHYTHMIC PULSES IN THE MUSIC OF TIME

The relationship between objective knowledge, objective thought, and falsification turns precisely on the paradoxical relationship between continuous processes and discrete or static identity (in cinematic terms, between the moving images on screen, and the static frames projected thereon). A theory (be it one posed by science or by evolution) is a 'something' – perhaps a theory of gravity, or a species of rabbit. But the process by which that thing is produced – the thinking that produces it – is dynamic and does not stop. It is a becoming without end. So how do you get a discrete thing out of a continuous becoming? The short answer is by abstracting the former from the latter, the same way one picks out a point from the unbroken continuity of a line. This is why Popper describes science as "the art of systematic oversimplification – the art of discerning what we may with advantage omit." (1991, p.44). But the abstraction Popper attributes to science seems to reintroduce a subjective element to knowledge – the choice of abstraction, the mode of simplification, comes from the subjective interests and intentions of scientists. I see no problem with this, since scientists really are subjects. But what of evolutionary knowledge – knowledge without a knowing subject? How does a biological hypothesis become abstracted from the continuous becoming of reality?

The reasoning behind Popper's own anti-essentialist stance is helpful here. The problem with

[12] The flaws in this classical formulation of knowledge are well known – for example, 'justification' leads either to infinite regress (since every justification must be justified in turn), circularity (A justifies B, which justifies A, and so on) or authority ('it's that way because God said so'). But most alternatives still retain the subjective element of belief as a central part of what it means for something to count as knowledge – in other words, they insist that there must be a someone who knows it.

[13] Unlike Bergson, Popper is no vitalist.

essentialism, for Popper, is that it 'amounts to the view that science must seek ultimate explanations in terms of essences…that a satisfactory explanation must be in terms of inherent properties (as opposed to relational properties).' (1979, pp.194–195). It is a view he finds quite unacceptable: 'I reject [he says] all *what-is questions*: questions asking what a thing is, what is its essence, or its true nature.' (1979, p.195. Emphasis his.) His reference to 'relational properties' is the key to understanding this rejection. Any property a thing possesses by virtue of its relations with some other thing cannot be essential to it, since those relations are external to it. But by the same token, any property which does not enter into relations with anything other than itself cannot have any bearing *on* other things. In other words, an essence could neither explain nor relate to anything outside of itself. Should such essences exist, they would by their nature be causally inert, utterly unknowable, internal, impassive and closed, cut off from all other things and with no possible impact on them. Their existence would make no difference whatsoever to the world, to anything in it, so the most parsimonious assumption is that they don't exist at all. And this means that there are (or may as well be) no distinct, self-identical things, only a mutable network of constantly varying relations. There is no there there.

This leads us to a problem that Popper doesn't unpack, but I think we must. When we think of relational properties, we tend to think of them as something that exists between things, without belonging to them. For example, I am taller than my daughter, but 'taller than' isn't a property of me, or of my daughter. It only exists 'between' us - but it still seems to rely on there being a 'me' and a 'my daughter' for it to be between. But if all there are relational properties, then 'things' are just bundles of relations that in the ultimate instance are fully defined only by the whole of relations – the open and thus continuously varying whole of being itself. And that means that there are no things for relations to relate to each other – all there is are relations, and relations between relations, and all that is solid melts into air.

But if there are no things, how can anything be falsified? This problem becomes even more acute when we realise it applies to any philosophy that prioritises processes over things. If the fundamental reality of the world is changing (as Popper thinks), then how do distinct things become differentiated from the continuous, and therefore unbroken, variation of relations between relations that reality is made of? When a species goes extinct – when its survival hypothesis is falsified – then its evolutionary variation, its movement, its change stops. But how can anything stop when all there really is, is process, flow, movement? A rabbit is most certainly a rabbit, and moreover it is *this* rabbit, rather than *that* rabbit. It is where it is and is not where it is not. It was born and will die. So, this rabbit certainly seems like a distinct spatially and temporally bounded thing, not a continuous process. But it only looks like this at a particular temporal scale – more or less the one that we ourselves live at. Slow things down and *this* rabbit dissolves into a mobile section of the continuous variation of genetic material that makes up the species 'rabbit'. Slower still, and we find ourselves following the cycling of organic molecules in and out of the biosphere, all the way to the production of their atomic constituents in the furnace of the stars. Or speed things up, and we see that the rabbit-thing is itself made up of innumerable faster process-things – the trillions of cells that it's made of each have a life span distinct from the organism they make up, being turned over many times before the creature itself dies. Processes of digestion, hormonal fluxes, cellular respiration, protein transcription, and so on all have their own time scales. A mountain seems the most stable and definite of things, but at the right time scale it is fluid, mutable and continuously in flux. In other words, thinghood is always strictly relative, not absolute –

relative to the relations of speeds and slowness of the processes that they exist in relation to. Things *are* just bundles of processes, of relations between relations, rhythmic pulses in the music of time.[14] And since individuation – thinghood – is relative to relations between temporal relations, this means that falsification is also relative to a given time scale, a given rhythm. A fox may eat a rabbit, and so put paid to that individual rabbit's survival hypothesis ('run or hide?'), but this does not falsify the evolutionary hypothesis *Oryctolagus cuniculus*.[15] If European rabbits go extinct, this does not falsify the whole mammalian lineage. I don't die if one of my blood cells does. And so on, up and down the scales of time.

So, I would characterise objective knowledge like this: it is a more or less condensed spatio-temporal point of view on the whole of relations, of being, posed in the form of hypothetical solutions to the problems that impinge on the time scales most relevant to that point of view.[16] And objective *thinking* – the growth, change and variation of objective knowledge – would be the variation of that point of view, its movement with respect to the whole. The objective knowledge manifest in the dinosaurs was very successful solution to the problems posed by their environmental niche - but when something from outside the temporal rhythms of that niche intervened (in the intersection of the aeons long passage of a giant asteroid with the cyclic rhythms of the Earth's orbit), their hypothesis, their local point of view, was falsified. The variation in relations so imposed constitute the conditions of and for the new, for the thinking of new forms of objective knowledge – such as that expressed in the rapid post-dinosaur, post-asteroid expansion of the mammalian lineage, all the way to those of us here now, writing and reading this paper.

CINEMATIC THOUGHT

How does all this bear on the cinema, and on the question of whether and in what sense it might be said to think? In keeping with Popper's anti-essentialist stance, I don't think 'the cinema' is just one thing: it is a bundle of relations between relations, of temporal registers that can be related to each other in various ways in order to bring out certain perspectives on or aspects of it. The cinema can be grasped in terms of film form, of industrial practices, genre divisions, national cinemas, historical trends, and yes, philosophical or theoretical frameworks, and in many other ways again.[17] But some of these bundles do bear on the question of 'film thought'.

First possibility: does hypothesis formation and falsification play some part in 'the cinema'? Does 'objective knowledge' in Popper's sense play any part in it? David Bordwell's cognitivist-inferential model of film spectatorship does turn on the viewer making hypotheses about what will happen next in a film and revising those hypotheses when they turn out to be wrong.[18] But these are the viewer's hypotheses (or at least those of their cognitive apparatus), not the film's – and so subjective thought generated in relation to a given film, not thought

[14] It seems worth noting that the variable relations of speeds and slownesses is also a key Deleuzian theme.
[15] aka the European rabbit.
[16] This is quite close to Deleuze's Bergsonian characterisation of a 'brain' as a centred point of view on the acentred universal variation of the whole. For a more detailed analysis of the latter, see (Thomas 2018, pp.119–132)
[17] This is more or less the argument John Mullarkey makes about the troubled relationship of film and philosophy in *Refractions of Reality: Philosophy and the Moving Image.* (2014).
[18] Neither the hypothesis formation or the revision of those hypotheses is necessarily a conscious or self-conscious process.

attributable to that film as such.

It's also possible to argue that there is a process of hypothesis falsification at work in the cinema at an industrial level. If we take a given film to represent a hypothesis (by the producers, say) about what audiences will pay to see, then a genuine flop at the box office serves quite well as a falsification of that hypothesis. Box office success even offers a loose analogy with the reproductive accomplishments of 'as yet unfalsified' biological entities – a profitable film often leads producers to try and emulate it by making new film with similar themes, genres, or even casting – giving us films 'descended' from the original success, but not identical to it.[19] It may even be possible to extend this logic to the ebbs and flows of a range of historical trends in different aspects of the cinema, although I'm dubious about how informative these sorts of explanations might be at the level of particular films, or features thereof.[20]

So, although there may be some aspects of objective knowledge produced by the cinema, I don't know how far this gets us. What about objective thought? Is there some sense in which film – more specifically, the bundle of relations surrounding the dynamic process of the projection of *a* film - can be said to think, without that thought belonging to or coming from some thinking subject (whether that be a director, or writer, or anyone else 'behind the scenes')? In particular, does it, or can it, constitute a mode of thought distinct from philosophy, or at least distinct enough to differentiate it from philosophy (given that anti-essentialist relationalism allows for no absolutely distinct 'things')? If objective thought is, as I've argued, characterised by the variation of a more or less condensed spatio-temporal point of view on the world, then I think the answer is yes.

First of all, a film camera is indeed a point of view on the ceaseless variation of the world. On its own this is not so different from a human point of view, either in its potential mobility or even its recreation of motion by way of static points.[21] But the showing of a film requires more than just a camera to record the images; it also requires a projector and a screen. The projector has its own point of view – a fixed, immobile one located in the projection booth behind the viewers' heads.[22] This means that the images that appear on screen do so from two disjunct points of view *at the same time*: the static one of the projector and the mobile one of the camera. In other words, the motion – the variation – we see on screen is not is not just that of the images of things moving (people, or cars, or whatever you will), or of moving images, but also of the image as a whole. And it is not just camera movement that creates this double movement. In films that have cuts in them (which is most of them), each edit marks a

[19] Darwinian evolution doesn't require genes, or any other specific infrastructure. All it requires is repetition with variation and selection – or more aptly, the deselection or falsification of variants that prove to be flawed 'survival hypotheses.

[20] Evolutionary explanations are potentially relevant to *any* historical process including repetition with variation plus selection – so evolutionary explanations don't need to map onto the 'DNA replication + mutation' specification of the modern evolutionary synthesis - see (Jablonka & Zeligowski 2014, pp.9–40). But this also means that any evolutionary account of some feature of the world only takes on genuine explanatory force to the extent that it specifies the particular modes of repetition, variation and selection at work in the phenomena to be explained – which is why I'm dubious of their value in the study of the cinema, unless there is a genuine attempt to get into the fine details of how the features characterising Darwinian evolution are realised in cinema.

[21] According to Oliver Sacks, there's good empirical evidence to suggest that Bergson was right about human perception operating cinematographically (2004).

[22] Otherwise the image it projects would fly all over the walls, which might be fine for some forms of experimental installation art, but doesn't work very well for most other forms of cinema.

leap in space or size or time (or all three) mapped on to the immobility of the projector. Add to this the fluidity of cinematic time (via the speeding up of the frame rate of the camera to slow down the movement of the image, or vice versa), the differences between screen time and story time, and the endless possibilities afforded by the tensions between framing, composition and the manipulation of on and off screen space, and you have a highly complex mode of multiple modes of manipulation and composition of mobile points of view on the processes of the world.

The aspect of this that stands out for me is the complex of possibilities afforded by both the interweaving of both continuous variation and stasis. The movement from still frames to mobile image on screen is only the first layer of this; the stillness of the rectangular screen/projector's point of view in relation to the mobile point of view of the camera is another; the tension between discrete shots cut together into a seamless continuity (that of the film-strip, but also that of the constructed spatio-temporal world) another. As Jean Epstein argues in *The Intelligence of a Machine* (2014)[23], the condition of cinematic thought is neither static frames nor mobile continuity, but rather the unceasing transformation of one into the other, and back again. In other words, the cinema's objective thought is not just given in the variation of its point of view on the unceasing change of the real, it is the capacity of that variation to move from continuous to discrete, from process to 'thing' and back again.

It is always possible to say philosophical things about the cinema, but this is true of anything at all (philosophy has no 'proper' subject matter). The philosophical appeal of the cinema's particular form of objective thought lies rather in its capacity to offer a thinking of the process reality of the world that bears on the human in ways that go beyond the human, and beyond any merely human philosophy. In other words, the cinema thinks more, or other, than philosophy can say.[24] Anyone who has read a film review, or tried to recount a film experience to someone outside the cinema knows that what we can say of a film can never do justice to what it means to be exposed to it (just film is exposed to and by the light of the world, so we are exposed to and by the light of the cinema). For the disjunction of the projector and camera is imposed upon us by the conditions of theatrical exhibition: the projector replaces our view of the world with its own images, replaces our head and eyes with its own, which are in turn doubled and disjunct with and by the mobile view of the camera. In this way the objective thinking of the cinema exposes us to its mobile view of the mobility of the real, a thinking that is neither philosophy's nor our own. It is, rather, a thought of the world that belongs to the cinema before it belongs to us, and whose capacity for the composition of disjunct bundles of relations is other than that of philosophy (or indeed of science, or any other humanly centred perspective on the world).

The reciprocal genesis of stasis and movement, the discrete and the continuous, that we find in the cinema cannot be reduced to, or fully subsumed by, philosophy. If it could, film-philosophy would be pointless, since philosophy would thereby contain the cinema in itself, making the cinema as such unnecessary for philosophy. By the same token, although the cinema's capacity for thought bears on and perhaps transforms philosophy, it does not and cannot replace philosophy, or even reproduce what philosophy already has or thinks. Philosophy is not cinema, and cinema is not philosophy. But neither are they fully or entirely

[23] A book that deserves to be better known, and which should be regarded as one of the founding texts of film-philosophy.

[24] This is the core logic Deleuze's *Cinema* books are built around. (Deleuze 1986a, 1986b)

themselves. This is a simple consequence of Popper's relational objectivism: no entity is ever fully closed on itself (there are no essences), and to the extent that they open onto relations with other process-things, other temporal rhythms, every entity is changed. The difference between cinema and philosophy lies not in the comparison of what they are (their non-existent essences), but in the relation between their processes, between their respective material and formal articulations of time. It is time that brings cinema and philosophy to bear on each other, and in that relation has the capacity to transform both, to process their processes, and so to think what neither can alone.

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