

The 1900 Episteme¹

François Albera and Maria Tortajada

Introduction

The technical society that came into being in the 17th century and became the flourishing industrial society of the 19th century introduced a series of new conditions into the field of image and sound. These conditions influenced firstly the *effects* that were sought and produced. There was a move both to record and reproduce reality as exactly as possible and, on the contrary, to create the fantastic and embody fantasy. There was the portrayal of such phenomena as movement, succession and the flow of time. Secondly, and more significantly, the new conditions had an impact on the *means* used, in other words, the devices and machines.

The *mechanical* model, which began with Descartes and de la Mettrie, overturned Aristotle's physics and opened up a new conceptual space that gave rise to a series of propositions concerning the modes of apprehension of both objects and beings, with in particular the division into discrete units, which could then be combined. This conceptual space allowed for the body's mobilising power and dynamics to be located outside of it. The importance of the paradigm of the clock in the seventeenth century is well known – the clock with its weights and the spring-driven watch were micro-mechanisms that inaugurated a new state that combined two types of movements and stop mechanisms to achieve regularity; its effect is to transform movement into information. One might speak of a 'clock-making' *episteme* spreading implicit or stated knowledge in various ways, in various sectors of knowledge, ideas, practices and institutions, knowledge based on dissociation, assembling, articulation, automatism, etc. (the clock or watchmaker was a central character in the 18th century together with clocks and also automata, right up to Méliès's *Robert-Houdin* theatre).²

We speak here of *episteme*. The term, coined by Michel Foucault, is problematic, partly because of the way it 'competes' in this chapter with the notions of 'model' and 'paradigm' with which it is often confused. Foucault's *episteme* has a characteristic which distinguishes it from the *paradigm* (described by Thomas S. Kuhn)³ and *a fortiori* from the *model*, in that it does not define a state of knowledge – whether scientific or philosophical – at a particular moment, but that which makes a theory, practice or opinion possible.

Thus, one can say that the representation of the 'mechanical era' was 'fitted out with tools', 'engineered', and no longer used its *own* techniques (those of the painter or sculptor, their *savoir-faire*) but, instead, used instruments and techniques designed for other ends. This 'equipment' of the processes of representation represents one of the transformations of this period, which was characterised by the promotion of (existing) apparatuses from the status of *instrument* to that of *machine* (Dürer employed apparatuses, as did the *perspecteurs*, but they were controlled by their own hands).⁴ It is true that Bazin saw this move to *automatism* as the dispossession of man as creator, but he immediately brought back Providence into the liberated space: the photographic imprint is the Veil of Veronica, but there is no longer an intermediary (it is the artist's 'temperament' that is interposed as a prism in Zola's famous expression that is referred to here). Bazin, contrary to Walter Benjamin, believed that one should do *without* the apparatus because Veronica's Veil is not the screen, it receives its imprint using neither lens nor exposure time, nor development, printing, calibration, etc. (and yet when Niepce took his first photograph, he was immediately subjected to the weight of the technical dispositive of his machine with its two shadows – already the very 'first' landscape is *not* an imprint in Bazin's use of the word: it records several time-periods because of the very nature of the machine).

When Canaletto introduced his Camera Obscura in Venice's *piazze* and, as it were, 'fixed' the landscapes, he was taking part in this automatism; when he combined different images, added a *campanile* taken from elsewhere, moved a church or a palace, it was because he was able to conceive of the process of dissociating *and* reassembling a view on the basis of presuppositions that were not based on those of El Greco, who 'turned' a building around in his painting of the Toledo landscape.⁵ And *a fortiori* the photographer Gustave Le Gray, who 'mounted' his images from several negatives.

The introduction of this equipment led to a new type of relation between object, apparatus, representation and spectator, which was to take concrete form at a certain moment in the *dispositives of viewing and listening* (i.e., an organisation that assigns positions to its protagonists) – the cinematograph, photograph, television, phonograph, telephone, etc., each of which assumed various structures and shapes. By examining the conditions of possibility of these dispositives, we shall construct what we call the *1900 episteme*. Thanks to this analysis of the epistemology of dispositives, we shall be in a position to entirely restructure the field of modes of representation, including traditional media such as painting or literature.

Dispositives and machines: hypotheses

Other scholars have envisaged these dispositives and machines. From our point of view, however, none of their approaches is satisfactory. We are referring here firstly to the vision of the 1970s, when scholars such as Jean-Louis Baudry and Jean-Pierre Oudart concentrated on the cinematograph, which was only examined from the point of view of the perceiving subject with a Lacanian perspective. Secondly, there is Friedrich Kittler's transferring of the Lacanian triad (imaginary, symbolic, real) onto that of the gramophone, cinema and typewriter, and thirdly Jonathan Crary's analysis⁶ which, despite its Foucauldian premise, not only fails to address the relation between *concrete* 'machinic' dispositives and the discourses he analyses, but also changes direction by fixing on the stereoscope as the place of rupture and emergence of a phenomenological model of the subject. Crary sees the introduction of subjectivity with time and duration, and focuses on the subject rather than analysing the construction of the subject via the dispositive (for Michel Foucault, there is no (phenomenological) subject, but discursive dispositives which assign a place to the subject and constitute it as such – 'the dispositive is above all a machine which produces subjectivations').⁷

Our hypothesis is therefore that the new conditions of viewing and listening that emerged out of industrial society have redrawn the spectator-spectacle schema by introducing the question of the *dispositive*, which assigns a new position to those who view. This can be seen not only in the introduction of machines and tools that increase vision (from the telescope to the magic lantern), and recording or capturing devices (photography, the gramophone), but also in the promotion-spectacle of the manufactured object, its *exhibition* (as Philippe Hamon has shown when writing about universal exhibitions),⁸ traffic conditions (speed) and urban relations (shocks), as well as in the commentaries that highlight such phenomena.

There is no shortage of examples of this 'regulation' by these apparatuses and machines, which belong to a whole series of fields to which they were previously not connected – the regulation or domination proceeding from the *Prägnanz* of their modes of functioning. Félix Fénéon wrote about the shadow theatre in 1887 as follows:

M. Henry Rivière has civilised the previously rudimentary art of the shadow theatre. Before him, the shadows filed past like characters on friezes or 'Paronies'. When he had to engineer M. Caran d'Ache's *Epopée*, he positioned them with an effect of perspective at ever-greater distances, and thought up masterly and instantaneous tricks to have the groups of characters advance and then disappear. Granted, the screen still only showed black silhouettes, but at least it was no longer a naïve surface, and

achieved depth. And now there is decisive progress with the addition of every colour – in forty minutes, forty tableaux hold their own.⁹

Emile Verhaeren commented similarly on Claude Monet's works – the pictorial reality – via Marey's chronophotographic machine. As it was the representation of a landscape, he evoked its 'successive aspects, arrested in flight by an eye of extraordinary acuity'.¹⁰ Monet's eye becomes the photographic gun, it captures objects in mid-air, including objects that are not necessarily birds. As Whistler wrote to Fantin-Latour in 1862: 'You catch it [the instant] in flight just as you kill a bird in the air'.

These are some examples of *machinic* elements that make up the dispositive before the advent of the *cinema*, and that the epistemic schema allows us to formulate, avoiding the content-based, teleological approach which would have Fénéon 'anticipate' the successive images of the cinematograph in Rivière's shadow theatre, or Verhaeren and Whistler be 'under the influence' of or inspired by chronophotography. The question is of another order, and indeed refers to that 'implicit knowledge' that makes such statements possible.

The question thus becomes: what did one call 'recreated movement' in the nineteenth century *before* the appearance of the kinoscope and the cinematograph, and *afterwards*? This may seem to be a somewhat unrefined variable, but the answer is by no means a straightforward one.

The notion of movement, or even that of breaking out of the framework of the representation, was something that could be effectively realised before the actual production of movement by the machine or the effect of movement by means of optical illusion. The enraptured critic, standing in front of one of Gustave Le Gray's photographs, 'the Great Wave' (1858), wrote that the spectator standing in front of the image was subjugated by its exactness and its rendering, 'and would be tempted to step backward in order not to be touched by its furious momentum'.¹¹ When discussing such a reaction, one can, of course, take into account the literary garrulousness of the critic. This is, after all, what he wrote after the event, and he was not actually caught in the act of backing away in the manner of the first spectators at the *Grand Café* reacting in front of the irruption of the locomotive. But the fact remains that the critic cannot describe such a reaction without a certain agreement, without it being *acceptable* to readers (irrespective of whether they have seen the photograph). It should, moreover, be noted that like Le Gray, the Lumière brothers set out to 'fix' the movement of waves which, like that of smoke, wind rustling leaves, waterfalls, etc., produces a greater effect than that of people parading past, like in the shadow theatre. The notion of *effect* is a crucial one for certain photographers and, to a large extent, addresses the relation between the representation and the spectator. Le Gray enters into some detail on the question in his treatise of 1850.¹²

Movement can be inferred from effect if the effect fixes something moving with particular force (as is the case for a wave).

This notion of *effect* also allows us to understand how black-and-white photography in 1850 could belong to the problematic of the colourist painters, who broke with the supremacy of drawing in favour of work on the 'economy of light', contours, nuances of the same colour, or mass processing which alone suited colour, as Baudelaire wrote in his *Salon* of 1846 ('III. On Colour').¹³

Such agreement in the type of reactions aroused by a representation can doubtless be explained by the change brought about by photography when compared to a pictorial representation, leading to a phenomenon of '*absorbment*' (the meaning being a little different from Michael Fried's 'absorption'), several examples of which were given by Diderot in his descriptions (he constructed a narrative which involved penetrating inside the picture and navigating within it – and even losing oneself inside it).¹⁴ The photographic paradigm thus becomes the interpretant of the different visual phenomena.

In Le Gray's work, this *effect* of breaking out produced the dissociation of the two planes (the sea and the sky), even if the dissociation is not literally enacted but 'faked'. Since the two elements are not continuous, they produce the dehiscence which sees the bottom threatening to detach itself from the top because the respective precision of their execution makes them dissociable, in a manner of speaking. The acknowledged influence of the panorama model on Le Gray can be seen here, where two or three horizontal zones were superposed – the sky, the sea and the shore, where nothing limited them on the sides. Here we are in a 'machine' (with faking by means of two juxtaposed negatives) and a dispositive (the spectator is invited to discover an effect of precision that exceeds the codes that are in force and is thus brought to a 'new vision' of a phenomenon that was nevertheless well known and represented).

Thus, we see that photography adopted something of the dispositive of the panorama, before painting borrowed it from photography in the works of Whistler, Courbet, Manet and Boudin. As Walter Benjamin wrote,¹⁵ Le Gray's wave spread in painting, where Courbet in particular won the reputation of having fixed an instantaneous snapshot.¹⁶

Research aims

We have decided neither to espouse the approaches of the 1970s, nor to follow in the footsteps of such scholars as Crary – whose example, despite our reserves, is an interesting one – but to examine the cinematographic dispositive. For the purposes of our demonstration, it has been reduced here to the 'view-

ing' dispositive alone, implying that the 'listening' dispositive still has to be constructed. Our aim is thus to describe and apprehend this dispositive:

1. as an *epistemic schema* (definition);
2. as belonging to a network, a wider epistemic configuration (that of cinematography, of Marey's physiology of movement, which breaks down both animal and human movement into different phases; or that of social practices, such as being in a train with the spectacularisation of the landscape, bringing together an immobile spectator, a mobile spectacle and a framework of vision) (inclusion);
3. as providing a model – a paradigm – not only within the restricted field of viewing dispositives, but going beyond it to the broader field of visibility (i. e., painting and literature), and even to that of thought (the 'cinema', a model of knowledge according to Bergson, a model of the psychic apparatus for some psychologists or psychoanalysts) (extension).

To develop these three points:

1. What is an epistemic schema in the context of our research? A formation or epistemic schema defines the formalisation of a series of viewing dispositives – to be understood as machines/discourses/practices – that we must construct.¹⁷
2. Once the schema is made explicit as a network of relations, that it has the status of a theoretical object, singular dispositives appear as empirical singular actualisations of this schema.
3. The schema that brings together all the elements associated with the cinematographic dispositives will be the '*cinema*' schema, it being understood that the term does not match *cinema* seen as an empirical object.

Our definition of the viewing dispositive is sufficiently broad to enable us to open up to research beyond any particular singular historical variation of the cinematographic dispositive. We consider that a viewing dispositive formalises the links between spectator, machinery and representation. By machinery we mean not only the viewing machine as a technical object (for example, the projection apparatus) but also all the elements used to show (in the wider sense of the term): for example the screen, the mirror of the phenakistoscope, photographs, the chemical process of photography.

The epistemic schema brings together two distinct levels in its definition: the specification of the *concrete* elements of the various dispositives, and the *concepts* that are linked to them – for example, the notions of the breaking down of movement, temporal immediacy or deferred broadcasting.

We believe that in order to construct such a schema, it is vital to bring together several approaches, which we can summarise as follows: a) the study of

discourses, b) the study of concrete dispositives, even if this is too simplistic a formalisation, as in both cases discourses may allow knowledge (*savoir*) to be constructed, and c) the study of institutional and social practices that are both engaged by, and that engage, these dispositives. The first two will be developed further.

Studies of discourses

An epistemological perspective will be taken to study the different discourses, and to distinguish the various spaces of enunciation:

1. the scientific discourses of inventors, engineers and popularisers;
2. the technical (prescriptive) discourses of technicians, salesmen, etc.;
3. the discourses of users (spectators, event managers) considered within their institutional framework (implying hierarchies, legitimating discourses, power relations, etc.);
4. literary discourses that produce variations of the dispositive within an imaginary world (Verne, Villiers de l'Isle Adam, Jarry, Apollinaire, Roussel);
5. discourses of the spectacular (magic and conjuring, i.e. Méliès).

We aim to identify the different viewing dispositives in these discourses, whatever their nature (and not only those dealing with cinematography in the strict sense of the term) and thus pinpoint the constituents of the epistemic schema to which cinema in its various forms contributes as a singular historical dispositive.

We shall, moreover, not only set out to identify the various constituents of the dispositive such as they are evinced in these discourses, but also pinpoint the different variations, extensions and links that are established within the different discourses between such elements of the dispositive and other fields of knowledge or practices.

Finally, we shall determine the place given to each visual dispositive in each discourse. This will, for example, entail defining the *function* given to the particular dispositive. Is it a tool, a model of thought or the actual object of study?

Various examples of this kind of investigation can be envisaged – two aspects are presented in the brief account that follows: 1) What does a particular discourse retain of the viewing dispositive that it establishes? 2) What function does it give to this/these dispositive(s) in its discourse?

Marey

Marey approached the different viewing dispositives that he used or developed (from the graphic notation method to chronophotography) by starting from his interest in *locomotion*. His aim was to note, break down and transcribe animal and human movement in discrete units. He was absolutely unconcerned with *perception*, which, in fact, he avoided because it did not capture the relevant articulations.

The zoetrope and chronophotography provided him with a means of checking and fine-tuning his notations. The increase in phases and greater fragmentation were a result of the sought-after *correspondence* between phenomena and notations.

- For him, the dispositive was defined by the cinematic traits of the observed phenomenon, and its transcription was grounded in the framework of physiology.
- The dispositive was the model of the object that he was analysing (he highlighted the relevant characteristics).

However, research into the correspondence between the phases of the phenomenon and the instants that were chosen was complicated by the quest for a scale of temporal notation based on the regularity of the intervals. When the chosen moments correspond to the intervals of the clock, what is noted is simply any – and not only remarkable – instants: ‘photograms’ break down the movement without considering the relevance of the cuts.

Moreover, this cutting up is verified by the reconstitution of the movement, which is apparent during projection and adjusted according to the perception of the spectator.

- The logic of the apparatus – i.e., its functioning – supplants the logic of the phenomenon under analysis, thus the visual dispositive is defined in other terms.

When Marey adopted a vector of regularity (i.e., equidistant intervals) that is outside the actual phenomenon, he was brought back to perception, and thus to illusion.

- It thus became necessary to develop a third phase – manipulating the projection apparatus, which can be slowed down, speeded up or stopped to come back to analysing movement in scientific terms. These characteristics of the ‘cinema’ dispositive, which Marey systematized, would in part be integrated into the cinema as entertainment (reversion, slow motion, and accelerated motion as attractions for the Lumière brothers), and then scientific cinema (the growth of flowers, etc.).

Bergson

Marey's chronophotography was a viewing dispositive that played a key role for Bergson, as the dispositive *determined* the viewpoint he was to develop: he aimed to go beyond it in the name of higher knowledge. In the context of philosophical discourse, Bergson referred to a variety of viewing dispositives – for example, the photograph, 'already taken, already developed', that he used to model 'pure perception, and the 'discernment' that it implies; or the process of photographic focusing, which refers to the activity of the memory.¹⁸

He used the reference to cinema by considering certain of its aspects – the mechanical element, the photogrammatic, the phenomenon of the breaking down of movement and its recomposition. He was thus particularly interested in the machinery, rather than the representational side. It was a dispositive that was part of the project that Bergson developed, his aim being to criticise the analytical process of science – and it gave him a model of the functioning of scientific thought. It was thus a central pillar of Bergson's discourse, and became not only the illustration of a historical phenomenon, but also a model, in essence a concrete epistemic schema that was proper to the complex philosophical system that he elaborated. That, of course, does not mean that this model of the cinema corresponds to the epistemic schema that we wish to construct, but it is interesting to note that in the historical context of 1900, the viewing dispositive in question acquired this status. The epistemic schema to be constructed will have to take this aspect into account.

Jarry

Alfred Jarry takes us into the world of literary discourse which in no way claims to constitute a type of knowledge (*connaissance*), and yet which invents a type of knowledge (*savoir*) via the imaginary world that it develops. Thus, through Jarry's various fictions, we can construct a criticism of Bergson's theory on the experience of movement as continuity, thanks, in particular, to reference to the cinematographic dispositive.

The cinematographic dispositive is formulated in a variety of ways in Jarry's work, which distance it from the historical model that spectators at the turn of the century were familiar with. He exploited the machine, the series of photographs, the projector's and cine-camera's rotating movements, and the impact of speed.

Above all, Jarry breaks up the different fields of knowledge and experience by pitting them against each other, mixing them together and playing with paradox. He exploits the various machines of the modern world – trains, automobiles and cycles of all types are present, whether in his plays, novels or news-

paper articles. The imaginary variations on the cinematographic dispositive come face to face with other viewing dispositives, such as photography, as is the case in some of the texts in *la Chandelle verte*. But there are also other scientific fields – in *le Surmâle (The Supermale)*, Jarry stages a combat between two giants, one embodying kinematics via the cinematograph, the other electricity via the dynamo. Between the lines, one can spot the traces of the conceptual battle being fought out between the two key domains of physics – mechanics and electromagnetism – which went through a serious crisis at the end of the 19th century, that would ultimately be resolved by Einstein's discoveries of restricted relativity.

Jarry tested both philosophical and scientific concepts in his literary writings and by means of inventing machines – 'his' cinematograph being one of the most important ones. His proposals concerning viewing dispositives enter into the extended epistemic schema that we seek to construct, and allow us to gauge his capacity of defining a certain 'modernity'.

Apollinaire

Apollinaire's interest in the cinema is regularly evoked by scholars who mention the column about films that he started writing in the 1910s in *les Soirées de Paris*, and the rolls of film that are kept at the *Bibliothèque Nationale*. They also note that he composed a script – *la Bréhatine* – that was 'not meant for filming' – as Benjamin Fondane later pointed out in defining a 'genre' that was popular with the Dadaists and Surrealists. Like his contemporary, the humorist Cami, Apollinaire parodied cinema's action-packed stories. Scholars also mention the interview he gave to *SIC* in 1916 and his lecture at the *Theatre du Vieux Colombier* in 1917, where he extolled the virtues of 'art nouveau', 'popular art par excellence'. But nowhere is mention made of the story entitled 'le Roi-Lune' (the 'Moon King'), which was published at the same time in the *Mercure de France*.¹⁹ He used machines that combined some of the characteristics of the cinematograph and the phonograph. These included recording and the ability to reproduce a sound or image taken, and thus furnished the possibility of re-living a past event, creating the illusion of reality, etc. He thus developed two aspects which anticipated the future to come: virtuality and simultaneity. Firstly, the filming of improbable images of people living in the past (i.e., great innamorata) caught in improbable situations (sexual pleasure, for example) produces a simulated activity that is really experienced (moving from simulacra to simulation). Secondly, communication via a microphone with the whole of the planet from a centre point (thanks to the telegraphic wire, which takes the place of the radio waves that will come later) brings about the generalised intercommunication within the 'global village'. Apollinaire thus conceived of operations that one

would now usually relate to the advent of 'new technologies' by using 'old new technologies'. His narrator describes a box, a kind of apparatus that enables one to interact with virtual images ('I could look at, touch, in a word I could pleasure ... the body within my reach, whereas the body had no idea that I was there, as it had no *present* reality'). Moreover, the organ belonging to the Moon King (Louis II of Bavaria), which is connected by 'sophisticated microphones ... so as to bring into this underground place the noises coming from the furthest outposts of terrestrial life', brings him directly up to date with the murmurs, fracas, and words from the rest of the world: 'Now it was the murmurs of a Japanese landscape ... Then ... we were transported ... Then ... we found ourselves at Papeete market, ... now we are in America ... It is four o'clock. In Rio de Janeiro a carnival-like cavalcade goes past ... It is six o'clock on Saint-Pierre-de-la-Martinique ... Seven o'clock, Paris', etc. In other words, we are presented with an auricular, immobile tour of the world.

Apollinaire thus used some of the characteristics of the cinematographic and phonographic dispositives and their variables related to viewing or listening apparatuses that preceded or are contemporary to the cinema. He produced novel combinations that convey how the imaginary world of the 'cinema' includes functions and faculties that would later be distributed differently (by specifying that a particular machine would deal with a particular task) according to industrial or commercial determinations.

The proposed model for studying concrete dispositives

Apart from these discourses, it is necessary to study not only the concrete functioning of the various viewing dispositives, but also the machines themselves as material objects, together with the specific dispositives in their historical and structural dimensions, and finally the social dimension of spectators.

In order to ensure optimum comprehension and description of the different dispositives, a model has been developed that allows fine distinctions to be made between the possible visual dispositives. The model is founded on the three terms that themselves constitute the defining constants of viewing and listening dispositives – the *spectator*, the *machinery* and the *representation*. It is important to stress firstly that 'machinery' does not simply boil down to the machine, secondly that the problematics of the theory of representation are included in 'representation', and thirdly that 'spectator' includes the various psychological, sociological and cognitive approaches to the notion. Moreover, the three levels have to be redefined each time.

It is a useful model in that it clearly distinguishes between the three levels and highlights data that are used to develop problematics that could not take shape if they were simply addressed from the viewpoint of current approaches. Many authors who have approached these questions anew insert the dispositive into pre-existing theories, which, more often than not, ends up simply by checking that the theories function properly rather than actually exploring the characteristics of the dispositive.²⁰ The model should, for example, allow one to leave behind some of the classic oppositions such as the alternative between the spectator's activity and passivity, or between transparency and mediation, i.e., hidden and displayed mediation, and those endless debates around the notion of realism. These issues arise and begin to dominate because the angle from which they are approached is a representational one. Without denying the pertinence of such an angle, we believe that it is not always primordial in the understanding of viewing and listening dispositives. It is thus possible to envisage describing some aspects of dispositives by only dealing with the relation between spectator and machinery. This is the case, for example, when one isolates a criterion such as spectator movement or immobility in reception mode. Hence the usefulness of the model, which ideally evinces the maximum number of the diverse aspects that define the dispositives.

One may study the dispositive as a means of determining each relevant level. One example is machinery, where one will examine the specification of the machine (if it exists, of course), describe how it works and functions; the type of support used for the representation must be defined – whether on paper, by projection, by means of the actor's body in the theatre, for instance, or by means of an effigy such as a wax or stone statue or a mannequin. At the spectator level, the definition of the spectators' institutional and social position can be examined – whether they are scientists, game operators or technicians; or their characteristics, in terms of identity, gender or cultural traits. Ultimately, the representation will be defined according to its intrinsic functioning and formal traits, together with their possible combinations.

It should, however, be pointed out that what defines the dispositive is not only what characterises each of the three levels as such, but the *relations* that the dispositive leads to within the three levels it is comprised of. Theoretically, one can produce the following combinations:

- The relation between the spectator and the machinery;
- The relation between the spectator and the representation;
- The relation between the representation and the machinery;
- The relation between the spectator and the whole – (the machinery and the representation).

The idea here is not to present a simple combination of elements of an equivalent type – spectator, representation and machine – but to link together these three terms in their diverse variations while bearing in mind the purpose of the viewing and listening dispositives and thus the function that each of the three terms has in relation to the others:

- The spectators are the element that makes the dispositive function or for whom the dispositive functions; they are the ones for whom the representation is given.
- The representation is what the dispositive produces or shows.
- The machinery gives access to the representation and makes possible the showing (in the widest sense of the term).

Our model analysis of the viewing and listening dispositives is based on these criteria (highlighting especially the viewing dimension).

Some examples follow below.

I The relation between the spectators and the machinery

1.1 The relation between spectators' bodies and the machinery – the question of places.

- a. A lone spectator or group of spectators (magic lantern spectator vs. the stereoscope).
- b. Mobile or immobile spectators (zoetrope, where movement is possible vs. the dominant model of cinema).
- c. Spectators who move.

1.2 The relation between the spectator's body and the machinery – the question of size and presentation of the machinery.

- a. Spectators included in large-scale machinery (magic lantern, cinema, diorama, panorama).
- b. Spectators handling an apparatus, a kind of visual prosthesis (kaleidoscope, some stereoscopes).
- c. The spectator faced with an effect of the mechanism – hidden in a 'box' (kinetoscope) vs. the spectator faced with a machine in the proper sense of the word, with a visible mechanism (for example, the praxinoscope).

2 The relation between, on the one hand, the spectators and, on the other, the machinery and the representation

2.1 What the spectators see of the representation and/or the machinery.

- a. They see both levels at once (zoetrope).

- b. They only see the representation (the illusion of transparency, if the techniques of the representation tend to efface the techniques).
 - c. A borderline case is when they only see the machinery (as in experimental cinema). This also covers the exhibitions of apparatuses outside their function as viewing and listening dispositives. They are then integrated into another type of dispositive – that of the exhibition itself, with its multiple modalities. The demonstration of these apparatuses also belongs here.
- 2.2 The spectators' mode of access to what is seen. The aim here is to define the point from which one considers that the spectators 'try out' the dispositive.
- a. Spectators see the two levels successively (one being substituted for the other) (stereoscope, cinema).
 - b. Spectators are faced with a progressive *process* of accommodation: they eventually see what is represented after having looked for the point from where it can indeed be seen (examples include anamorphosis, trompe l'œil, and the stereoscope).
 - c. The machinery and what is represented are immediately visible (zoetrope, phenakistoscope).
- 2.3 Spectators taking action or remaining inactive in relation to the machinery.
- a. Action taken on the machinery to produce the image.
 - b. 'Action' in the form of a simple movement in, or in relation to, the machinery and representation.
 - c. No action is taken other than perception.

3 The relation between the spectators and the representation

This part includes questions of cognition – deciphering and decoding visual signs – and the specification of the spectators' various systems of beliefs in relation to the aesthetic choices implied by the 'techniques' of the representation. Theories of representation, which turn representation itself into a 'proxy' of reality – or to be more precise, a 'represented' and a referent – are relevant here.

4 The relation between the machinery and the representation

- 4.1 The materialisation of the representation.
- a. What is shown (or represented) has no material support in the dispositive (telescope, microscope).
 - b. The representation is materialised in one way or another on a support.

c. The representation relies on a multiple and combined support: it is produced by elements (actors, objects, painted or photographed elements, etc.) that are themselves seen via a certain dispositive (theatre, stereoscope).

4.2 The temporal relation of the showing is implied by the dispositive: simultaneity/’*différance*’.

a. Immediate transmission (immediacy: camera obscura, television, microscope).

b. Deferred broadcasting (time gap: photography, cinema).

5 The overall qualification of the dispositive

5.1 The ‘nature’ of the dispositive producing relations between the three levels:

a. mechanical

b. computer-based

c. theatre production

d. exhibition

– hanging (on a wall)

– ‘installation’.

This model is merely a tool that needs to be rethought, completed or reorganised during the research stage in accordance with each dispositive examined. The aim is not to build up an exhaustive descriptive model, but to have an adequate tool for each specific set of questions. The outline that we are presenting here underlines the relations by mainly adopting the spectators as a point of reference. They may be defined empirically by confronting each dispositive with the distinctive criteria of the model. In parallel to any theoretical or abstract discourse, one can understand the very concrete role of the different elements involved – for example, spectators can be seen as spatial bodies occupying a specific place in relation to the machine or the whole dispositive. Such spectator characterisation should allow one to reflect on the subject, the receiver of the representation. It might even uphold Crary’s original theory, when he saw in the optical instruments of the first half of the nineteenth century the sign of a new conception of the subject, a new mode of viewing, ‘a subjective vision’ grounded in the ‘observer’s’ own body – she or he is defined as being mobile, not just having one viewpoint, experimenting with an apprehension of things that is opposed to the mode of contemplation, as Benjamin put it. This idea goes hand in hand with the notion of the decentring of the spectator, which Crary also envisages in relation to these optical instruments (starting from the analysis of the stereoscope). An essential aspect must be added to this definition: the classifying of these dispositives within all of the coercive modes of viewing, im-

plying submission to the machinery that is comparable to the *panopticon* analysed by Michel Foucault.

However, a concrete approach to dispositives – when one tries to characterise them in finer detail by combining several descriptive criteria – leads to questions about how in tune they are with the definition that Crary borrows from Foucault and above all Benjamin. The zoetrope, phenakistoscope, thaumatrope, diorama, stereoscope, and kaleidoscope are examined to show how they contribute to the changing of the mode of viewing. Some of these apparatuses share the characteristic of making spectators an element of the machine,²¹ which submits their bodies to a practice of viewing, but also of constructing a new model of the spectator as someone who is mobile, decentred, etc. However, if one re-examines the criterion of mobility, it is clear that the spectator's experience in relation to these different dispositives is not the same: while the phenakistoscope requires the spectator not to move, as Crary points out – as does the stereoscope – the zoetrope allows her or him to move around the rotating mechanism at the very moment when it is producing the animated representation. While retinal persistence is the model that explains the represented movement – a model that was used in the nineteenth century in connection with Plateau's experiments for several of these viewing dispositives – it cannot hide the fundamental difference that sets them apart.²² The fact that some are based on mobility and others on fixedness is all the more significant as the essential criterion of modernity is precisely the mobility of the point of view. The spectator's experience is shaped in a significantly more meaningful way by the concrete movement imposed on the body by one or other dispositive than by the perceptive (and not immediately analysed) 'movement' that is attributed to retinal persistence. When one wishes to define the subject in relation to her or his experience, the analysis of scientific discourses and theories is no substitute for the concrete phenomenon imposed by the dispositive in its materiality.

A further point should also be added, which our model incorporates: freedom of movement is not the same in the zoetrope, thaumatrope and diorama, and this is the result of a significant difference. In some cases, the apparatus is a tool that remains outside the spectators' bodies – at best it is a prosthesis that is applied to the eyes (like the kaleidoscope or some 'stereoscope-glasses'), which they can thus handle at will; in other cases, spectators are included in a dispositive that incorporates them – that is, when one refers to spectators as 'elements of a machine'. The nature of the movement and the physical and phenomenological relation of the spectator to the dispositive are very different each time, and one may well ask if this does not completely change the ascendancy of the dispositive, its supposed coercion. To put it very bluntly: in order to introduce the model that Foucault bases on the *panopticon*, is it sufficient to retain the fact that the subjects are manipulated by a certain politics of the body? Is it not necessary

to envisage the very structure of the dispositive in order to postulate the effect of control produced by machineries that are simply not defined institutionally as instruments intended for such a function?

It is hard systematically to pinpoint the known and already established criteria of modernity in dispositives, given that one might refute such criteria after examining the dispositives closely.

A good example is the stereoscope, an apparatus that imposes fixedness. Here the new subject of viewing is constructed thanks to the decentring of the spectator, which can be demonstrated via an analysis of the representation that the stereoscope offers. But as we are speaking of the spectator's 'experience', should one not also take into account *all* the dispositive, the very condition of the spectator's perception, even before one addresses the issue of representation? For when it comes to perception, the stereoscope imposes the centring of the spectator, on the one hand with regard to the fixedness of her or his place in front of the lenses, without moving, and on the other hand in the need to accommodate her or his viewing to the only point where it will be possible to see the 'depth' of the objects presented. This type of experience requires a certain type of centring, even if this is not defined according to the codes of perspective.

The analysis of the discourses on which an epistemological approach is based must proceed by gauging the theoretical development against the concrete dimension of the object of these discourses, specifically when the aim is to develop an understanding of the subject that has been constructed as a body submitted to an experience. One cannot turn a blind eye to the actual conditions of this experience and their plural nature, in order to weigh them against the theoretical discourses that surround them in a particular context.

The model represents a means to avoid an apprehension of a dispositive that would be too rapid, too partial and not sufficiently concrete in the design of a theoretical, epistemological and thus *a fortiori* conceptual discourse. It is thus a kind of safeguard. But, more positively speaking, it should provide a means of displacing and renewing the problematics that question the viewing and listening dispositives, while exploiting the largest number of terms that can be used to set up the epistemic schema of the 'cinema' in c. 1900.

Notes

1. This article is a rewritten, developed and modified version of the paper presented at the Domitor Symposium (Montreal), with a number of corrections and additions. Some of the publications that present these ideas can be found in the bibliography.
2. The French etymology of 'montage' comes from the clock whose weights must be wound up (*monter*), is said to be wound up (*montée*), and metaphorically speaking,

- in French one uses the verb *remonter* when one speaks of winding (up) the clock's successor – the watch. François Dagognet has addressed the place of the 'clock model' in the history of techniques, in his *L'Essor technologique et l'idée de progrès*, Paris: Armand Colin, 1997, pp. 46-50. Regarding the extension of automata, see Jean-Claude Beaune, *L'Automate et ses mobiles*, Paris: Flammarion, 1981.
3. Thomas S. Kuhn, *The Structure of Scientific Revolutions*, Chicago: University of Chicago Press, 1962.
 4. Pierre Francastel has underlined Brunelleschi's use of an optical instrument several times as 'a kind of little box' with a hole for the eye and a mirror reflecting a view of Florence, or Poussin's manipulation of a scenographic box which he used to study the effects of light on the people he painted (see 'Destruction d'un espace plastique', in *Etudes de sociologie de l'art*, Paris: Denoël/Gonthier, 'Médiations', 1970).
 5. Regarding the multiplication of viewpoints and their montage in El Greco's work, see S. Eisenstein, 'El Greco y el cine', in *Cinématisme*, Dijon: Les Presses du Réel, 2009 [1980], *passim*. On Canaletto and his 'montaged' Venice, see André Corboz, *Venezia immaginaria*, Milan: Electa, 1985, 2 volumes.
 6. See Friedrich A. Kittler, *Gramophone, Film, Typewriter*, Palo Alto: Stanford University Press, 1999 [1986] and Jonathan Crary, *L'Art de l'observateur*, Nîmes: Jacqueline Chambon, 1994 [1990].
 7. Giorgio Agamben, *Qu'est-ce qu'un dispositif?*, Paris: Rivages-Poche, 2007, p. 42. One could add that, more recently, we have not been convinced by the 'philosophy' of the apparatus as espoused by Jean-Louis Déotte, where perspective with a unique vanishing point is considered to be 'apparatus' that forms 'the base of modernity'. He also speculates on the move from the technical apparatus to the aesthetic and then the cultural apparatus (see in particular: J.-L. Déotte, *L'Epoque des appareils*, Paris: Lignes & Manifestes, 2004).
 8. Philippe Hamon, *Expositions, littérature et architecture au XIXe siècle*, Paris: José Corti, 1989.
 9. F. Fénéon, "'Calendrier de décembre 1887'", *Cirques, Théâtres, Politiques*, *Œuvres plus que complètes*, Geneva: Droz, Tome II, p. 720-1.
 10. P. Verhaeren, *Mercur de France*, October 1902, reprinted in *Sensations d'art*, Paris: Séguier, 1989, p. 208. The relation between impressionist painting and photography is thus very different from what Bazin describes in his 'Ontologie de l'image photographique', where photography 'delivers' painting and allows it to gain its 'aesthetic autonomy' (*Qu'est-ce que le cinéma ?*, Paris: Cerf, 1985, pp. 16-17) – a position that was popularised by Malraux in his writings on art in the 1940s.
 11. Henry d'Audigier, *la Patrie*, 25 July 1858 (quoted in Sylvie Aubenas (ed.), *Gustave Le Gray (1820-1884)*, Paris: BNF-Gallimard, 2002, pp. 366-7). Cézanne's comments, as noted by Joachim Gasquet in front of one of Courbet's 'Waves', are similar in their intention.
 12. Gustave Le Gray, *Traité pratique de photographie sur papier et sur verre*, Paris: Baillière, 1850 (at: gallica.bnf.fr).
 13. Regarding several of the points briefly raised here about Le Gray, see Sylvie Aubenas (ed.), *op. cit.* This 'colourism' of the photograph stands in opposition to the photography criticism of such scholars as Rodolphe Töpffer, who contrasts it with the greater efficiency of drawing.

14. See his *Salons*, which were compared to paintings in the exhibition entitled 'Diderot et l'Art, de Boucher à David. Les Salons 1759-1781' (*Hôtel de la Monnaie* (Paris), October 1984-January 1985).
15. This is an important question and should stimulate anew the question of the effect 'breaking out' has on the spectators of the La Ciotat train in the Lumière brothers' film. Yuri Tsivian, when distinguishing between *reception* and *perception*, thought that the reception of *The Arrival of a Train at La Ciotat* in Russia was, as it were, 'over-determined' for cultivated spectators by the description of Anna Karenina's suicide in Tolstoy's novel. (See the fourth chapter of his *Istoriceskaja recepcija kino. Kinematograf v Rossii 1896-1930* [Riga, 1991], and the sixth chapter of the English translation, *Early Cinema and its Cultural Reception*, translated by Alan Bodger, London and New York: Routledge, 1994, 'The Reception of the Moving Image'). It could also be said that the Parisian or French spectators received the same film via a passage from Maupassant's novel *Une Vie* (*A Woman's Life*), or, in any case, *patterns* of comprehension that are common to the text and the film. One can clearly see that Maupassant's description recounts all the phases of the film, and one can thus conjecture that the effect of surprise, or even of panic, that often allegedly took place when the train left the foreground of the screen encountered conceptual frameworks in the spectators' brains that were perfectly well established, and was thus received and understood without surprise: 'Nothing was visible on the track. Suddenly she saw a cloud of white smoke, then under it a black spot, which grew larger as it approached at full speed. At last the huge engine, slowing up, roared past Jeanne; she kept her eyes on the carriage doors. Several of them opened and passengers got out, peasants in their blouses, farmers' wives with baskets, small shopkeepers in soft felt hats.' (Guy de Maupassant, *Une Vie*, Paris, Le Livre de Poche no. 478, 1962; *A Woman's Life*, translated, with an introduction by H.N.P. Sloman, Harmondsworth, Penguin Books, 1965, p. 201).

However, the 'same' movement from the rear to the front against a black background – as Méliès portrays in his *Man with a Rubber Head* – takes on a different meaning: if the train gets larger as it approaches, the spatial distance represented (set up by expectation, *a fortiori*, if one begins by projecting the stationary image of the perspective of the rails disappearing into the distance) allows one to assume a permanence in the size of the moving object and to be assured of its movement right up to the moment when it leaves the frame. On the contrary, Méliès's movement on a bench facing a camera loses its characteristics of movement, since there are no points of spatial reference, and simply appears to change size. In this case, the magnifying effect borders on the monstrous or on anomaly, and may give rise to fear (fear of the head bursting, which then actually happens). The bursting takes place inside the frame, whereas the arrival 'in the hall' that the train is supposed to accomplish has to happen off-camera. Tsivian, following Arnheim on this point, notes that as the figure approaches, it *spreads* across the surface of the screen. And this is what happens to Méliès in excess. Similarly, the wave – if indeed one can compare it to the train – clearly gets its force and the effect of reality from the dual presence of the two aspects of the landscape. And it is the fact of its breaking *away* that produces the effect of breaking *out*.

16. One of his 'Waves' is special, in that there is an extremely sharp horizon line, against which three elements are juxtaposed: 1) the sky unfolding with very de-

- tailed clouds; 2) a rough sea with high, foamy waves; and 3) a strip of land with two moored boats, creating an effect of verticalization of two-thirds of the painting (the sky and the sea), which the perception of the land redistributes in depth because of its initiating place in the foreground and its brownish tonality, which stands out against the whiteness of the foam.
17. Our starting point is Michel Foucault's definition in *l'Archéologie du savoir* (Paris: Gallimard, 1976; *Archeology of Knowledge*, English translation by Alan M. Sheridan Smith, London and New York: Routledge, 2002, p. 211): 'By *episteme*, we mean, in fact, the total set of relations that unite, at a given period, the discursive practices that give rise to epistemological figures, sciences, and possibly formalized systems ... The episteme is not a form of knowledge (*connaissance*) or type of rationality which, crossing the boundaries of the most varied sciences, manifest the sovereign unity of a subject, a spirit, or a period; it is the totality of relations that can be discovered, for a given period, between the sciences when one analyses them at the level of discursive regularities.'
 18. Henri Bergson, *Matière et mémoire*, 1896, p. 35, p. 148; *Matter and Memory*, translated by Nancy Margaret Paul and W. Scott Palmer, London: George Allen and Unwin, 1911, p. 31, p. 78.
 19. Guillaume Apollinaire, 'le Roi-Lune', *Mercur de France*, no. 440, 16 October 1916, pp. 609-624.
 20. We are thinking here of scholars such as Crary (who, without warning, presents representational criteria while giving them a meaning that needs to be debated – his use of the notion of 'referent' in particular) or Kittler, who assumes the Lacanian approach – but one could also mention Deleuze's Bergsonism (only Alain Badiou has espoused the idea that *Cinema 1* and *2* were in no way books 'on' the cinema – or, as Deleuze said, 'of' the cinema – but a reading of Bergson that was intended to bring him up to date and find a way round the prodigious phenomenologist obstacle – See his *Deleuze*, Paris: Hachette, 1997).
 21. The diorama, phenakistoscope and zoetrope are specifically cited (*op. cit.*, p.163).
 22. Leaving aside the fact that, for several decades, its importance has been relativised on the basis of the experimental research of psychologists (including those working at the *Institut de Filmologie* [1947-1961]).