THE AESTHETICS OF DIGITAL MONTAGE

Film Editing and Technological Change

Marc Furstenau

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Cover illustration: Elizaveta Svilova in the editing room, in a scene from *Man with a Movie Camera* (Dziga Vertov, 1929).

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Introduction

Abstract:
In this introductory chapter, I present the basic themes of the book, which is an account of the effects of technological change in the cinema, specifically the changes to the technical apparatus of editing, the advent of digital editing systems. This calls for a new aesthetics of digital montage, I argue, describing what these changes mean for editing as a technique and for the cinema as an art, based on a more careful explanation of the relation between the technical means available to the film artist and the works created through those means, a more coherent theory of the cinematic work of art.

Keywords: Film editing, digital cinema, style, aesthetics, technology, technique

Noël Burch once said, with some considerable theoretical modesty, that "editing as a plastic art is so complex a subject that those of us concerned with film probably do not yet have the means with which to undertake a serious analysis of it."[1] It has arguably become even more complex, as the basic technical apparatus for film editing has been comprehensively transformed, expanding its power as a "plastic art," with significant consequences for our understanding of it as a technique, one so integral to the cinema. What has happened can be described quite simply. The traditionally manual process of cutting and splicing film has been replaced by computerized systems for the organization and manipulation of images and sounds as digital information. While the change itself is easy to describe, the consequences are more difficult to see and understand. Any serious analysis of editing, though, will now have to take this transformation into account, to explain

1 Noël Burch, *Theory of Film Practice*, trans. Helen R. Lane (London: Secker and Warburg, 1973), 47.

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what it means for the cinema as an art that editing has been almost entirely reinvented, changed in virtually every aspect as a technical craft.

These changes are a part of the more general transformation of the cinema in the computer age, the comprehensive technological reconfiguration of the traditional apparatus of filmmaking, which has become "digital," supplanting, it is commonly said, its older, original form, which is now called "analog." The process is typically described as a kind of substitution. "The cinema screen," Anne Friedberg wrote so famously, "has been replaced by its digital other, the computer screen."[2] In the digital era, the cinema has lost what she describes as its "medium-based specificity."[3] As Friedberg says, "the chemically-based 'analog' images of photography have been displaced by computer-enhanced digital images."[4] With the loss of such "specificity," with the emergence of a new kind of image, the basic nature or identity of the cinema as an art is supposed to have been changed, paradoxically, it might seem, by expanding the creative powers of the film artist. The new "digital" medium is much more susceptible to modification and manipulation, no longer constrained by what had been understood as significant material limitations. These limitations, though, many argue, are what had importantly determined the formal and aesthetic possibilities of the cinema. They were the source of its artistic value, its identity as an art, what had made the cinema unique.

These limitations have been overcome. Cinematic representations may now be easily "enhanced" by computers, destroying their unique identity. There is an increased ability to alter the basic raw material, now digital rather than photographic. There is a greater creative power of image-making. Robert Stam, for example, has described the "dominance of digital image production," which means, as he says, that "virtually any image becomes possible."[5] The implication, of course, is that the range of possibility had been

2 Anne Friedberg, "The End of Cinema: Multimedia and Technological Change," in Christine Gledhill and Linda Williams, eds., *Reinventing Film Studies* (London: Arnold, 2000), 439. Friedberg mainly emphasizes the effects on "technologies of reception and display," but notes the important changes to "technologies of production," so that, as she says, now "film is commonly edited on video; video is transferred to film; computer graphics and computer-generated animation are used routinely in both film and television production." Ibid. I included this essay in a section on technological change in the cinema in my anthology of classic essays in film theory. See Marc Furstenau, ed., *The Film Theory Reader: Debates and Arguments* (London and New York: Routledge, 2010), 270–81.

3 Friedberg, "End of Cinema," 439.

4 Ibid., 440.

5 Robert Stam, *Film Theory: An Introduction* (Malden, MA: Blackwell, 2000), 319. This is from a section of the book entitled "Post-Cinema: Digital Theory and the New Media," with the

limited before. This limitation is widely thought to have been the source of the cinema's value as an art. Indeed, Stam suggests, like many others, that the changes, while increasing creative power, effectively amount to a kind of aesthetic loss. "The new media blur media specificity," he says. "Digital imaging," as he goes on to argue, "also leads to the de-ontologization of the Bazinian image."[6] It is the loss, that is, so prized by André Bazin, of the supposedly *photographic* identity of the cinema, derived from the raw material of the photographic image, which had been resistant to subsequent alteration. The digital image, by contrast, has a different "ontology," derived from a different material basis, susceptible to unrestrained manipulation and modification. It is merely *simulated*, so easily altered. It has what Stam describes as a "simulacral advantage," but, he adds, there "is also a disadvantage; since we know that images can be created electronically, we are more skeptical about the image's truth value."[7]

It is not clear to me what the "truth value" of an image has to do with the kind of fictional depictions that are characteristic of most film art, but it is an equation that is commonly established, as the basis for claims about the fundamental *aesthetic* transformation of the cinema. In any case, it is indisputable that much has changed *technologically* about film-making. "Digital imaging technologies," noted Stephen Prince in 1996, "are rapidly transforming nearly all phases of contemporary film production. Film-makers today storyboard, shoot, and edit their films in conjunction with the computer manipulation of images."[8] Of these, it is the changes to *editing*—the advent of digital montage, as the specific site for such "computer manipulation," the particular means of digital enhancement, providing the tools for the now virtually limitless mode of image production—that are typically emphasized, where the aesthetic consequences are manifested. It is the new editing technology that is understood, in the most direct sense, to have transformed the basic identity of the cinema. Stam notes that it is the combination of "the digital camera and digital editing (AVID)" that is significant, which will, first of all, "open up montage possibilities," but which will also, and more generally, "inevitably generate new forms of audiovisual intertextuality," an "electronic or virtual textuality," that will in turn "open up intriguing possibilities for both film and film

implication, of course, that the new technology has engendered a new form, fundamentally different from what we had known as "cinema."

6 Ibid.

7 Ibid, 319–20.

8 Stephen Prince, "True Lies: Perceptual Realism, Digital Images, and Film Theory," *Film Quarterly* 49, no. 3 (Spring, 1996): 27.

theory."[9] Nicholas Rombes has asked what it means for the cinema now that "the source material is digitised for editing and becomes part of a digital database," noting that "what the digital makes possible is the absolute disruption of moving images, the very basis of the cinema itself."[10] The disruption is thought to occur at a basic level. Aylish Wood has argued that, traditionally, "through the conventions of editing, space changes from shot to shot through a system of exchange, as one space is replaced by another, and so on."[11] New digital editing technology, though, she says, provides the means for an extensive form of what she calls "morphing," with profound consequences, so that "space can change *within* the framing of the shot."[12] Lucy Fischer, recounting the effects of the new editing technology, makes a similar point, arguing that the digital cinema can now be described as a "virtual cinema—one that questions the 'integrity' of the shot."[13] If, she argues, "film editing meant plastic relationships between shots," now, in the digital era, "editing equally implies synthetic relations *within* shots."[14] As a result, she says, "a new philosophy or ontology of the medium may be in order."[15]

It is a common claim. The new digital editing systems have altered the cinema in some basic, essential way, affecting its very "ontology." The technological changes to the basic tools of film editing are typically thought to be the most significant part of the more general transformation of the cinema in the digital era. In its original analog form, the argument goes, the cinema was "photographic." It consisted, that is, of effectively fixed, unalterable blocks of raw, photographic material, of images or *shots*, characterised by a quality that has come to be described as "indexical," by a supposedly inherent and natural link to or connection with "reality."[16] The "index" has become

9 Stam, *Film Theory*, 322, 324, 326. Stam is referring to one of the first dedicated digital editing hardware systems, created by Avid Technology, Inc., the first version of which was demonstrated in 1988, as I note later, when I trace the history of the new editing technology.

10 Nicholas Rombes, *Cinema in the Digital Age* (London: Wallflower Press, 2009), 73, 76.

11 Aylish Wood, *Digital Encounters* (Abingdon: Routledge, 2007), 50.

12 Ibid., 51.

13 Lucy Fischer, "Film Editing," in *A Companion to Film Theory*, eds. Toby Miller and Robert Stam (Malden, MA and Oxford: Blackwell, 1999), 81.

14 Ibid.

15 Ibid.

16 The term, which has become ubiquitous in film theory, is derived from the philosophical semiotics of Charles Peirce, as an aspect, along with the "iconic" and the "symbolic," of the process that he calls "semiosis." Peirce says, quite simply, that an "*index* represents an object by virtue of its connection with it. It makes no difference whether the connection is natural, or artificial, or merely mental." See Charles S. Peirce, *Collected Papers of Charles Sanders Peirce*, Vol. 8, ed. Arthur W. Burks (Cambridge, MA: Harvard University Press, 1958), 8.368 (n. 23). The

a shorthand term to describe the source of the cinema's artistic identity, in its original form, which is thought to have been lost in the digital era. "Cinema," as Lev Manovich so famously put it, "is the art of the index; it is an attempt to make art out of a footprint."[17] This is changed, though, he argues, by new digital technology, which "subordinates the photographic and the cinematic to the painterly and the graphic, destroying cinema's identity as a media art."[18] For Manovich, and others, this destruction is primarily the effect of new digital editing technology, the emergence of an expanded form of "spatial" montage. The new tools of editing offer an unprecedented degree of control, an increased power of alteration and manipulation. In its original, indexical form, it is claimed, the cinema established the basic limits of editing, determining its value as a technique. Shots could be arranged, placed in a linear sequence, to create all manner of relations and juxtapositions, with various and powerful aesthetic effects, but the shots themselves, the elements within the space of the shot, could not, or not easily, be modified, and therefore *should* not. This is what has changed, as the limits have been removed, precipitating what many describe as an aesthetic crisis for the cinema, as the power of editing has been enlarged and extended, so that, at any point in the filmmaking process, virtually any part of the cinematic representation can be altered—anything goes.

The technical changes to editing have certainly had significant practical effects on filmmaking, upsetting many of the most familiar patterns of working, disrupting the traditional arrangements of the various crafts, altering especially the relationship between the director and the editor, and confusing the distinction between, for example, editing and special effects. What they mean *aesthetically* is less clear, though. There is a long history of technological change in the cinema, and the changes to editing are only the latest, and it is not obvious why they, and not others, alter the cinema's artistic identity or ontology. Indeed, the question of the relation between the physical material of the arts and their value as art has been a fraught one. It

photographic image, though, has been understood by most film theorists as "indexical" just insofar as it has a "natural" connection with the object(s) represented. Peter Wollen may well have been the first to apply the term to cinematic representation specifically, limiting it to a natural connection. "An index," he says, "is a sign by virtue of an existential bond between itself and its object." See Peter Wollen, *Signs and Meaning in the Cinema*, enlarged edition (Bloomington: Indiana University Press, 1972), 122. For an early critique of Wollen's (and others') use of Peirce, see Gorham A. Kindem, "Peirce's Semiotic Phenomenalism and Film," *Quarterly Review of Film Studies* 4, no. 1 (Winter, 1979): 61–69.

17 Lev Manovich, *The Language of New Media* (Cambridge, MA: MIT Press, 2001), 295.

18 Ibid.

has always been difficult to establish any direct link between a particular technical or material change and a formal or stylistic effect, or to say just what the "medium" of the cinema is, what it consists of in any specific or fundamental sense, what material its identity is derived from, and what any technological change might mean for the cinema *as* a medium, *as* an art. Film theorists want to say that the "specificity" or the "identity" of the cinematic medium has been lost with the shift to digital technology. But this is to mistakenly conflate medium and meaning, to confuse physical material with aesthetic value, as John Dewey long ago noted, in light of debates about the then new media of photography and film. "What makes a material a medium," he said, "is that it is used to express a meaning which is other than that which it is in virtue of its bare existence: the meaning is not what it physically is, but of what it expresses."[19]

In this respect, the "expressive" use of any medium in the name of some specific art, is a historical phenomenon, the effect of the choices that artists make, in always changing circumstance, rather than a matter determined by any particular material or technological configuration, or by any particular change to it. Dewey is trying to describe what he calls the "common substance of the arts," distinct from the specific material or materials from which any individual works of art may be rendered. "Media are different in the different arts," he says. "But possession of a medium belongs to them all. Otherwise they would not be expressive, nor without this common substance could they possess form."[20] No specific substance is unique to nor definitive of any individual art, he insists. "It is possible," though, as he says, "for both perceiver and artist to carry their predilection for a particular method of attaining individualization to such a point that they confuse the method with the end, and deny the latter exists when they are repelled by the means used to achieve it."[21] There is just such a "predilection" among

19 John Dewey, *Art as Experience* (New York: Penguin, 2005 [1934]), 209.

20 Ibid.

21 Ibid., 213–14. Dewey was moved to make such an argument partly in response to those at the time who refused to see aesthetic or "expressive" value in the new medium of photography, and the new art of "the movie," which, for Dewey, share an "esthetic quality" with the traditional arts. See ibid., 4. Another American philosopher, D. W. Prall, was making a similar argument at around the same time, rejecting any *a priori* distinction between media as instruments of aesthetic expression, arguing for the artistic value of photography and film. "There is nothing intrinsically spiritual," Prall says, "in charcoal or paint-brushes, palettes and stretched canvases, red-lead and ochre and oil, to make them superior to lenses and shutters and gelatin-coated films. And there is no reason," he adds, "in the nature of things why subjects before a camera may not have expended upon them the whole power and skill of a great artist, or why, for his preservation of his vision of them, a camera of sufficient delicacy and contrivance might not

film theorists for a "particular method" in the cinema, for a specifically photographic materiality, which had initially "repelled" defenders of the traditional arts, in Dewey's time, against whom he is arguing, but which is now championed, thought to be the source of a unique aesthetic quality. There is, though, still a confusion of means and ends, and still a tendency to distinguish photography and film from the other arts, and to make the corollary claim that that distinction has been destroyed.

To acknowledge that there has been a significant technological change in the cinema, that editing especially has been thoroughly, indeed comprehensively, transformed, does not mean that the very nature of the cinema, its artistic identity or ontology, described as photographic, or "indexical," as "analog," has been changed or destroyed, replaced by a wholly new material basis or medium, which is electronic, "symbolic" or "digital," with different or even conflicting aesthetic value. There is, as Berys Gaut has argued, an important distinction to be made between the technical and the aesthetic, between a "medium" as the material substance from which a work of art may be fashioned, and the actual work of such fashioning. He insists that, "though digital cinema is a new medium, it does not follow that it is a new *artistic* medium."[22] David Davies has similarly argued that "a loss of indexicality consequent upon the use of digital technology does not in itself justify the claim that digital cinema differs fundamentally from its traditional counterpart."[23]

Both are making a principled distinction between the technical and material facts of filmmaking, on the one hand, and the cinema as an art, on the other, between the material substance of film art and the formal and artistic act of rendering that substance, of forming that material, a

be the best means." See D. W. Prall, *Aesthetic Judgment* (New York: Thomas Y. Crowell Co., 1929), 198–99. More recently, and in the same vein, Irving Singer has said that most film theorists place too much emphasis on the material aspects of the technical apparatus of photography, making the same basic error as those who had originally opposed the new instruments, assuming that the value of cinematic imagery derives directly from the material nature of the apparatus, from the technical processes of photographic creation. Singer argues, though, that cameras are effectively no different than any other device, that photography and film are not unique media, but can, like any other medium, be put to use by artists to various aesthetic ends. "By examining the technical details of film," he says, "we learn how its transformations are produced, and how they affect the audiences they can reach. The images made and organized by the camera," though, he says, significantly, "are of little interest in themselves or in their formal structure." See Irving Singer, *Reality Transformed: Film as Meaning and Technique* (Cambridge, MA: MIT Press, 1998), 11.

22 Berys Gaut, "Digital Cinema," in *The Routledge Companion to Philosophy and Film*, eds. Paisley Livingstone and Carl Plantinga (Abingdon: Routledge, 2009), 78.

23 David Davies, "Digital Technology, Indexicality, and the Cinema," *Rivista di estetica* 46 (2011): 58.

distinction that I will also try to make. No straightforward relation can be established, I will argue, between any particular technological change and the aesthetic identity of the cinema. Whatever industrial, economic, and financial disruptions might result when such changes occur, the cinema itself, the cinema as an art, as a mass medium, as a modern entertainment, generating fictions, creating imaginative representations, persists, even as significant parts of the technical apparatus of filmmaking are altered. For many film theorists, though, the most recent changes to the cinema, and especially those to the technical apparatus for editing, seem to pose a profound threat. The very identity of the cinema, its "ontology," its "indexical" identity, seems to have been seriously affected, if not in fact destroyed. A kind of category change is supposed to have occurred, with the original cinema replaced by some other kind of cinema—or by some new phenomenon that cannot even be described any longer as cinema, as it has traditionally been understood.

The supposed crisis of the cinema, though, the crisis of the digital cinema, is better understood as fundamentally a discursive crisis, as Stephen Prince in fact noted, describing the initial stages of the technological transformation of the cinema. "The rapid nature of these changes," he said, "is creating problems for film theory."[24] Given the novelty of "the digital manipulation of images," the "unprecedented" nature of the "creative possibilities it offers," he says, "its effects on cinematic representation and the viewer's response are poorly understood. Film theory has not yet come to terms with these issues."[25] It has still not fully come to terms with them, I will argue, especially with the issue of editing. A significant part of the problem is that, while the changes to editing are thought to be the primary source of the transformation of the cinema as an art, new editing systems understood as the means by which such digital manipulation is made possible, editing itself, as a technique, still largely resists easy explanation. The traditional analyses of editing, to the degree that they have been able to explain the technique (or, perhaps, as the reason they have failed to explain it, as Burch suggests), have depended on certain untenable assumptions about the cinema, about the nature of the shot, of cinematic representation or depiction, about the supposed "ontology" of the photographic image, and about the basic relation between technology and art, between the technical and the aesthetic, between the physical material used in the fabrication of a work of art and the intentional and creative activity of the film artist.

24 Prince, "True Lies," 27.
25 Ibid.

The advent of a digital cinema, and of new digital editing systems, the emergence of a new form of digital montage, can be understood to provide, in the simplest sense, the technical means for easily altering elements within the shot, expanding the power of editing beyond the linear arrangement of shots to include the manipulation and alteration of the content of the shot. This may be accounted for, though, according to what can be described as an intentionalist aesthetics, as proposed, for example, by Gérard Genette, who offers a "theory of the artwork," which must, he says, "take into account at the same time, as much as possible, the work as *object* and the work as *action*."[26] In much film theory, though, and especially in accounts of the digital cinema, and of digital editing, such a distinction is elided. Intentional action is typically subordinated to the material constitution of the object. Artistic creativity is understood as the less significant source of aesthetic value in the cinema, which is supposed to derive instead primarily from the "medium." Indeed, new digital editing technology is typically understood as an unwarranted and worrying *expansion* of intentional, artistic control, overcoming the kinds of physical constraints that had been (properly) imposed on the film artist by the particular nature of the filmic object, given the basic, physical resistance of the cinema's raw material, supposed to be the photographic image. It is a curious, even paradoxical, part of much of the theory of the digital cinema, that the affordances and capabilities offered by new digital technology, and especially by the new editing software, are understood to have diminished the cinema as an art, altering its original identity, even destroying what had in fact distinguished it, making it no different now than any other art. While there are, of course, effects that arise from any technological change, that can make life better or worse for an artist, that can significantly alter their working conditions, providing

26 Gérard Genette, "From Text to Work," in *Essays in Aesthetics*, trans. Dorrit Cohn (Lincoln: University of Nebraska Press, 2005), 26; emphases in original. Dewey, Prall, and Singer, are also effectively emphasising the fact of intention in art. Others have offered what can be called an intentionalist aesthetics, in several works that generally and implicitly inform my argument. Gregory Currie, for example argues that "art works are in some sense closely connected with human action," and endeavours, as he says, to make this "widely recognised" fact more theoretically precise. See Gregory Currie, *An Ontology of Art* (London: Macmillan Press, 1989), 1. Contending with the undeniable complexities of the question of intention in art, David Davies offers a theory of the work of art as "performance." See David Davies, *Art as Performance* (Malden, MA: Blackwell, 2004). Berys Gaut and Paisley Livingston have edited a collection of essays that emphasize the fact of creativity, the "creation" of art, that seek to redeem the notion of intention in analyses of art. "Works of art," they say, in their introduction, "unlike natural objects, are after all *works*, the products of makings." See Berys Gaut and Paisley Livingston, eds., *The Creation of Art: New Essays in Philosophical Aesthetics* Cambridge: Cambridge University Press, 2003), 2.

new possibilities but also imposing new kinds of constraints, there is a kind of logical error in the claim that any particular change necessarily alters the essence or identity of an art, that a new and distinct "digital" cinema has emerged, offering greater intentional power, replacing the cinema in its traditional form, which had been understood as necessarily limited in its intentionality.

There is now a vast literature on the subject of the "digital cinema," which for the most part makes this kind of claim.[27] The shift to the digital is usually presented as an essential change, in very general terms, with little attention paid to the much more specific or local changes, to particular tools, as distinct parts of the technical apparatus of filmmaking. In most accounts, the question of editing is inevitably raised, but discussion of it is necessarily subordinated to the more general claim. The changes to editing are thought to be where the formal and aesthetic effects of new digital technology are manifested most profoundly, with such enormous consequences for the cinema's very identity as an art, but editing itself in the digital era is rarely discussed in any detail. An account of the changes to editing, though, can be offered that describes the very real effects of these, but does not understand them to have altered the cinema in any essential way. Editing, in both its original form, and as it has been technologically transformed, is best understood as an aspect of the cinema as a creative art, characterized generally by intentional, imaginative manipulation, artistic transformation, by the marshalling of the various parts of the technical apparatus of filmmaking, to whatever chosen extent, to aesthetic ends. That apparatus is always subject, though, to all manner of technological change. Indeed, the history of the cinema is largely a history of technical transformation. The changes to editing, while significant, are only a particular instance of the almost constant technical remaking of the cinema, of the always changing

27 Increased intentional control is implied as the primary effect of new digital tools when, for example, Philip Hayward and Tana Wollen say that, in the digital era, "audiovisual technologies have apparently removed barriers between the real and the represented, … and have ironically rendered problematic indexical relationships" between real objects and their representation. Philip Hayward and Tana Wollen, eds., *Future Visions: New Technologies of the Screen* (London: BFI, 1993), 2. Some other notable works, making similar claims, are: Thomas Elsaesser and Kay Hoffmann, eds., *Cinema Futures: Cain, Abel, or Cable? Cinema Futures in the Digital Age* (Amsterdam: Amsterdam University press, 1998); Matt Hanson, *The End of Celluloid: Film Futures in the Digital Age* (Mies: Rotovision, 2004); Stephen Keane, *CineTech: Film, Convergence, and New Media* (Basingstoke: Palgrave Macmillan, 2007); Laura Mulvey, *Death 24x a Second* (London: Reaktion, 2006); Jeffrey Shaw and Peter Wiebel, eds., *Future Cinema: The Cinematic Imaginary After Film* (Cambridge, MA: MIT Press, 2003); Garrett Stewart, *Framed Time: Toward a Postfilmic Cinema* (Chicago: University of Chicago Press, 2007).

technological conditions in which filmmakers undertake through their actions to render objects of aesthetic interest, to create works of film art.

* * *

The change from film editing to digital montage is now a part of the history of cinematic art. The tools have changed. The technical apparatus has been thoroughly transformed. The basic scene of editing, though, as an aesthetic undertaking, as artistic action, is effectively no different. Almost a hundred years ago, Elizaveta Svilova sat in an editing room in Moscow, carefully arranging the shots in one of the most famous films about editing, *Man with a Movie Camera* (1929), directed by her husband, Dziga Vertov. It is a still image from the film, showing Svilova at work, that is on the cover of this book, and which I discuss in more detail later. In a self-reflexive gesture, the editing of the film is incorporated into the film itself, as we see Svilova cutting and splicing strips of film, to produce the avant-garde, montage effects that are on display, for which Vertov, and the early Soviet filmmakers more generally, were to become so famous. Just as important as, or even more important than, the man with the movie camera, it seems, is the woman with scissors and glue. What Svilova is doing with such simple tools, with the strips of film arranged on the light-board before her, like an illuminated screen, so similar to the computer monitors and software interfaces of modern digital editing systems, is comparable, in basic aesthetic terms, to the work of editing today. The aesthetics of digital montage, the formal and artistic possibilities that emerge from the manipulation and arrangement of the various elements of cinematic representation, made possible by the new electronic and computer technology, derive from the art of film editing as it developed through the efforts of such figures as Svilova and Vertov.

There is a story to be told that links the scene of Svilova cutting and arranging strips of film to the work of editors in digital editing suites. It is a story, as it is for any art, of the relation between the tools used by the artist, the material conditions of their artistry, and the realization of their artistic goals, the creation of a work of art—the relation, more fundamentally, between the technical and the aesthetic. This relation, as I will argue, is manifested in the familiar distinction between "editing," on the one hand, the specific physical and technical craft, and "montage," on the other, the concepts guiding such work, a theory or set of aesthetic principles, like those that were being developed in the work of Svilova and Vertov. They were part of a large and heterogenous group of filmmakers and theorists, working in the early Soviet era, from whom we inherit the idea of *montage*, an

explicitly aesthetic idea of editing. The historical and conceptual continuity that I will argue for is manifested in the phrase "digital montage." If there is an "aesthetics" of editing in the computer era, it is part of a more general cinematic aesthetics, developed historically, related to and derived from these sorts of early efforts, by these film artists, who were conceiving of editing as an artistic practice, just as *montage*.

Still, despite such conceptual or aesthetic continuity, there is indeed much about editing that has changed. I will be describing the changes to the tools of film editing, to the basic technology of editing, and considering the effects of these on editing as a craft. The advent of fully functional digital editing systems, as Leo Enticknap has argued, depended crucially and specifically on the development of microprocessor technology, and the increasing ability to effectively manage large amounts of audio-visual information in the form of digital files. While the microprocessor, the "integrated circuit," or the "microchip," was invented, as Enticknap notes, in 1958, it was not really until about the end of the 1990s or the early 2000s, that "video manipulation and editing would be possible using home computers of average power and memory capacity."[28] Various specific technical constraints limited the early development of digital editing. "Once microprocessors were fast enough," though, Enticknap says, "it made obvious sense for videotape recording to go digital."[29] Once video had gone digital, it was available for a new comprehensive form of editing—digital montage. This subsequent development was just as obvious. The new affordances of digital video were attractive, and they could be fully realized with the right tools. Dedicated digital editing systems were invented, first requiring specialized hardware, elaborate suites of devices, but soon just stand-alone software programs, that could be run on ordinary personal computers. The history of the cinema is now fully integrated, so to speak, with the history of computing.[30]

28 Leo Enticknap, *Moving Image Technology: From Zoetrope to Digital* (London: Wallflower Press, 2005), 206. For more details on the invention and the development of the integrated circuit, or the microprocessor, see Martin Campbell-Kelly and William Asprey, *Computer: A History of the Information Machine* (New York: Basic Books, 1996) and Paul Ceruzzi, *A History of Modern Computing* (Cambridge, MA: MIT Press, 1999).

29 Ibid., 210.

30 There is, of course, another way of thinking about this "integration," about the relation between the cinema, understood as a supposedly "photographic" medium, and the history of computing, that does not see them at odds, one replacing the other, but rather acknowledges the much more complex relations between the technologies, specifically the role of photography in the invention of the microprocessor, the microchip, itself, as Patrick Maynard has noted. "If something called photography," says Maynard, "seemed about to be transformed by fast-developing computer technologies, these technologies were themselves functions of a photographic technology and

Enticknap and others provide detailed accounts of this technical history. I am more concerned, though, with the *aesthetic* effects of new digital editing technology, with the consequences of these for our theoretical understanding of the cinema as an art. The changes are effectively forcing a conceptual reconfiguration. If the crisis of the digital cinema is, in fact, as I say, primarily a discursive crisis, what is required, to a large degree, is a new theoretical vocabulary, or, as I will be suggesting, a broadening of our vocabulary, of our conceptual framework. If, as Burch insists, we have not had the means with which to undertake a serious analysis of editing, this is partly the result, I contend, of certain persistent conceptual confusions at the heart of film theory, according to which particular technical changes, like those to editing, tend to be exaggerated in their effects on the cinema as an art. An effort to clarify our concepts, as I will try to show, will help us to understand what has indeed happened to editing, as a technology, but without positing some kind of ontological break in the history of the cinema, without assuming any particular aesthetic consequences.

This is not to diminish the scope of the change, though. The traditional tools of film editing have been replaced by an entirely new technical apparatus. No longer a physical process of cutting and splicing strips of celluloid, film editing has been transformed into an extensive process of digital montage, the manipulation and modification of practically all aspects of the image and sound. The new technology offers an unprecedented degree of fine-grained control over virtually every element of cinematic representation. This is undeniably significant. In the most important respect, though, the fundamentals of editing remain the same. With complex computer software, with the new digital editing systems, editors and filmmakers are able to arrange shots much more efficiently, but the patterns of arrangement remain, for the most part, quite familiar. The ultimate effect is still *linear*, with films consisting of a series of shots, one after the other, organized in some kind of coherent and meaningful order. The technology itself, though, the editing software, is importantly *nonlinear*, allowing for effectively random access to any part of the recorded material, rather than having to scroll through lengths of film, cutting out pieces and gluing them back

could not exist without it. The reason is simple: personal computers were made possible by the emergence in the 1970s of microprocessors, tiny solid-state structures that depend, crucially, upon the process of microfabrication of computer chips, which is itself a 'photolithographic' technology." See Patrick Maynard, *The Engine of Visualization: Thinking Through Photography* (Ithaca and London: Cornell University Press, 1997), 6.

together, as in the past.[31] This is also what extends the power of editing, though, so that it is no longer only a matter of arranging shots in order, placing relatively fixed images in a linear sequence. It is now possible to "edit" within the shot itself, after the fact of recording, to more easily manipulate and alter the content of the image, which is now rendered as electronic or digital information, allowing access to every part of the representation, at the more minute level of what is often described as the *pixel*, a neologism, a contraction of the phrase "picture-element." If it had once been the "shot" that was understood as the smallest basic element of cinematic composition and representation, the scale has been reduced, to the pixel, to an effectively atomic level, making every part of the representation subject to subsequent manipulation and alteration.

There are important consequences as a result of such changes, and film artists have taken advantage of the new technical affordances. Rather than describing these, though, as instances of artistry, understood precisely as the creative use of the various tools and materials available to a filmmaker, broad generalizations about the effects on film as an art are typically offered. A wholly new theory of the *digital* cinema is supposed to be needed, as an art now characterized by an unprecedented degree of intentional control, of imaginative power, provided in the main by the new tools of editing. A new kind of cinema seems to have emerged, which is, ironically it seems, and in this respect, now no different than any other art—as "subjective" as any other art, having lost the essentially "objective" character of the photographic cinema. Gone is what seemed to have made the cinema aesthetically distinctive, unique among the arts, namely an inherent and important material constraint on intention. The technical advances in cinematic technology are thought, in this respect, to have had a kind of retrograde or diminishing effect on film art. Given the technical transformation of editing specifically, with the new tools for manipulation and alteration available to the filmmaker, the traditional constraints in the cinema have been removed, constraints that had been understood to define the cinema as an art. There are, many claim, no longer any limits on the filmmaker's imagination, no longer any boundaries to their intentional control.

31 Nicholas Rombes considers the ambiguous relation between the ideas of the "linear" and "nonlinear" in digital film editing, as a practical craft, and in film as an art. "Symbolically," he says, "nonlinear editing corresponds to traditional film editing that took place on uprights and flatbeds: in both cases, images are managed and rearranged to tell a story. But the random access and virtually instant recall of the of the database fundamentally alters the way we perceive of the relationship between the shots in a film." Rombes, *Cinema in the Digital Age*, 73. This last claim, though, is one that I will challenge.

What characterizes the cinema as an art, though, one could argue, is not any particular technical apparatus, any specific tool, any unique material basis, but rather, indeed, the very fact of intention, the deliberate use, that is, of any technology, tool, or medium, any material or substance, put to imaginative or aesthetic ends, made to create an object, a *work of art*, that performs an aesthetic function. The history of art, of any art, is to a large and important extent a history of technological change. The cinema is no different. Many of the material aspects of art change, but what Dewey described as the "common substance" of art remains the same. The most recent changes to the cinema, in this respect, while extensive, while significant, are commensurate with an account of the cinema as an art. The changes to editing are, arguably, the most extensive, the most significant, but they can be explained without assuming that the cinema, *as an art*, has changed. Still, given the importance of editing as a technique, given that editing has long been understood as a technique unique to the cinema, and particularly important to the artistic identity of the cinema, it is worth carefully considering the change to the basic technology of editing, the transformation from film editing to digital montage.

* * *

The history of the advent of digital editing can be briefly summarized.[32] In the most basic sense, as I have said, it begins with the invention of the integrated circuit, the microchip, the power of which can only be applied, though, once the basic material of the cinema is transformed. That transformation arguably begins with the invention of the Ampex electronic video recorder in 1956, with the advent of videotape, as an alternative to film, and then with the introduction of Editec, in 1962, the first dedicated electronic editing system, with which the new video recordings could be effectively and efficiently edited. By 1970, on the basis of this initial technical development,

32 What I offer here as a summary is based primarily on Michael Rubin, *Nonlinear: A Field Guide to Digital Video and Film Editing*, 4th ed. (Gainesville, FL: Triad Publishing, 2000), the best and most detailed account of the transformation, presented as a year-by-year chronicle, with a wealth of technical and corporate detail. Rubin published the first edition of his book in 1991, revising it in 1992, and 1995, and finally in 2000, in light of the many rapid changes taking place in that decade. See also Enticknap, *Moving Image Technology*, for a good summary of the change to digital technology, including editing technology. For broader contextual accounts of the history of the transition to digital editing systems in the American cinema, see Deron Overpick, "The New Hollywood, 1981–1999: Editing," and Meraj Dhir, "The Modern Entertainment Marketplace, 2000–Present: Editing," in Charlie Keil and Kristin Whissel, eds., *Editing and Special/Visual Effects* (New Brunswick, NJ: Rutgers University Press, 2016), 129–41, 156–71.

the first computer editing system was created, the CMX 600—the product of a joint venture between the American television broadcast network CBS and the magnetic recording tape company Memorex. At first, these technologies were being used only in the still very new context of television production. Some of the effects of this technological change were being felt in the film industry, but still only in stylistic terms, as filmmakers were beginning to notice the kind of editing in television programs, which they would sometimes emulate.[33] Editing in the cinema, though, was still almost exclusively *film* editing, still done manually, by cutting strips of celluloid and reassembling the pieces. That changes only in the 1980s, with such systems as the Montage Picture Processor, a nonlinear videotape editor, and the EditDroid system, developed by Lucasfilm, George Lucas' production company in San Francisco. Stanley Kubrick used the Montage system to edit his film *Full Metal Jacket* (1987), as did Alan Alda, directing his first film, *Sweet Liberty* (1986), and Sidney Lumet, on *Power* (1986). Other filmmakers begin using it, too, and, in 1987, acknowledging the significance of the new system, and its growing popularity, the inventors of the Montage Picture Processor were given a special Academy Award for technical development.[34]

By 1989, the first truly digital, nonlinear, electronic video editing systems are invented, and many more filmmakers began using them, most notably the Avid/1 system, and Lucas' redesigned (and renamed) EditDROID, first used by Oliver Stone to edit parts of *The Doors* (1991). The era of digital montage in the cinema had begun. In 1991, Apple released QuickTime, to run digital video on a personal computer, opening the door to the first digital stand-alone editing software programs like Apple's Final Cut and Adobe Premiere, which could be run on an ordinary desktop or laptop

33 The Canadian-born Hollywood director Edward Dmytryk was one of the first to notice what was happening in television, and to speculate about the possible effects on film editing as a result of such stylistic emulation of the televisual aesthetic, by the new video technology. Known for such films as *Farewell My Lovely* (1944), *Crossfire* (1947), and *The Caine Mutiny* (1954), Dmytryk began his career as a film editor in the 1920s and 1930s. At that time, he says, editing had been "severely depressed by the advent of sound, with its 'fixative' tendencies." In the early 1980s, he says, there is a similar technical crisis in editing, noting that "it is once again suffering through a period of banality, which is the inevitable result of the peculiar economic and so-called artistic demands of corporate television." While he does not mention the new video editing technology explicitly, he was keen to address what he nevertheless saw as a significant threat to the technique from the new technology of television, writing his manual in the hope, as he says, of "reawakening an interest on the part of filmmakers in the still unexplored potential of film editing." See Edward Dmytryk, *On Film Editing: An Introduction to the Art of Film Construction* (Boston: Focal Press, 1984), x.

34 Rubin, *Nonlinear*, 59.

computer. It is with the purpose-built, dedicated systems, the digital editing workstation or editing suite, though, that the revolution in film editing is initiated. Describing the changes, Stephen Prince notes that, by the end of the 1980s, "post-production practices were undergoing major redesign. The traditional approaches to film editing," he says, "vested in the physical acts of cutting, splicing, and searching through trim bins had given way to the 'cleaner' and more powerful use of electronic and then digital technology to offer quicker and more flexible approaches."[35]

By the beginning of the 1990s, the changes were being effectively consolidated, as electronic and digital systems became standard. As Michael Rubin observes, with the adoption especially of the Avid systems by many Hollywood studios, "1992 [was] a watershed year for nonlinear editing, and digital nonlinear editing in particular."[36] As Rubin notes, J&R Film, a major technical supply company in Hollywood that rented out editing machines, mainly flatbed systems like the Steenbeck and the K-E-M, began to acquire digital nonlinear systems. Very soon these were the only ones that filmmakers wanted, the Avid system being the most popular. The old devices were phased out. In an especially symbolic move, J&R stopped renting out the Moviola, an older stand-up editing device, a venerable machine, the first dedicated apparatus for editing, that had been introduced in 1924, and which many editors had continued using.[37] "It was a landmark move," Rubin

35 Stephen Prince, *A New Pot of Gold: Hollywood Under the Electronic Rainbow,1980–1989*. History of the American Cinema, edited by Charles Harpole, vol. 10 (New York: Charles Scribner's Sons, 2000), 115. Prince adds, significantly, that the changes to editing technology blurred or dissolved some of the most basic distinctions between elements of the post-production process. "Editing and special effects work," he says, "bonded intimately as related parts of a unified phase of electronic post-production" (115). Prince pursued the question of special effects in a later book. See Stephen Prince, *Digital Visual Effects in Cinema: The Seduction of Reality* (New Brunswick, NJ: Rutgers University Press, 2012). For further considerations of the relations between editing and special effects, in both the traditional cinema and the later digital era, see the essays in Martin Lefebvre and Marc Furstenau, eds., *Special Effects on the Screen: Faking the View from Méliès to Motion Capture* (Amsterdam: University of Amsterdam Press, 2022).

36 Rubin, *Nonlinear*, 64.

37 The Moviola was invented by Iwan Serrurier, and was in fact patented under that brand name in 1919 as a "Picture Presenting Apparatus," imagined initially as the means by which movies could be shown in private domestic settings, before becoming, with some slight redesigning, an exclusively technical device used for editing, as Eric Theisen explained, in an article in a trade journal in 1935, when it had become the standard device in editing rooms. "The first moviola," he says, "was a far cry from the present device; in fact it was a home movie projector in a victrola-like cabinet." See Eric Theisen, "The Story of the Moviola," *The International Photographer* 7, no. 10 (November 1935): 4; cited in Paul Monticone, "Classical Hollywood, 1928–1946: Editing," in *Editing and Special/Visual Effects*, eds. Charlie Keil and Kristin Whissel (New Brunswick, NJ: Rutgers University Press, 2016), 205, n. 9.

says, "in an industry where the Moviola had been the bedrock of traditional editing equipment for 100 years."[38] A new, digital foundation was being built, replacing the traditional material infrastructure with new kinds of systems.

This brief capsule history provides an initial account of the relatively rapid transformation of film editing to digital montage. I will provide more historical detail as I proceed, but the basic story of the change is relatively straightforward, and the effects on the practical aspects of filmmaking, and even the broader industrial and economic effects, can be easily recounted. The aesthetic consequences of these changes, though, as I say, are more difficult to describe. To do so will require revisiting the history of thinking about editing, revising some of the most basic assumptions about the technique, which have been at the core of much film theory. For many, and according to such assumptions, editing is a basic technique, defining the cinema as an art. Or, more precisely, it is *film* editing that had defined the cinema, determined by the even more basic, supposedly "ontological" fact of photography, understood as the primary source of the "raw material" of the cinema, the photographic image, in the form of the shot. A series of shots could be arranged and rearranged by editing, but they were not easily altered or modified themselves. The shot, as the solid, elemental component of the cinema, determined the very limits of editing as a technique, in turn defining the cinema as an art. Film editing has been replaced, it is argued, by a new and more comprehensive digital process extending or destroying such limits. A technique that had been defined by material limitation has given way to a new process of unlimited manipulation. Yet certain basic aesthetic assumptions must apply whether one is cutting and splicing strips of film or manipulating audio-visual data on a computer. The fact of technical change must be understood as a necessary part of the very conception of art, perhaps especially the art of the cinema. There is a basic relation between technology and art, between the technical and the aesthetic, that I will explore, and that allows for an explanation of technological change as a necessary part of the history of cinema as an art, consisting of such techniques as editing, according to which a continuity may be established between the original technical apparatus of editing and the new digital systems.

Most accounts of editing posit a basic relation between the technical and the aesthetic, but often in too simplistic, even deterministic terms. An important part of the idea of editing, as it has been developed by film theorists, is that the aesthetic effects that can be created, the most complex artistic possibilities, derive from the very basic tools and procedures of

38 Rubin, *Nonlinear*, 65.

editing as a practical craft. In strictly technical terms, editing is (or was) perhaps the simplest of all the techniques of filmmaking, and it can be described very easily. Jean Mitry, for example, has offered a basic definition. "Editing (*montage*)," he says, "technically speaking, is nothing more than the laying end to end of different shots."[39] So simple, but so significant. Indeed, its significance seems to derive just from its simplicity. Editing, this rudimentary procedure, the mere linear arrangement of shots, is of particular importance, in its simplicity, performing (at least potentially) an aesthetically constitutive function, as Mitry suggests. "This work, "he says, "strictly artisanal, is one of the most crucial operations of cinematic art."[40] Indeed, it is only with the invention (or discovery) of editing, many claim, and the aesthetic possibilities that it created, that the cinema emerged *as* an art. It was when filmmakers first had the idea to join separate shots together, as, for example, André Malraux argued, "that the cinema as an art was born."[41] For Béla Balázs, it is editing specifically that creates artistic value in the cinema. "In film," he says, "the most meaningful set-up does not suffice to give the image its full meaning. In the final analysis, meaning is determined by the position of the image between other images. The issue here is editing … this is the ultimate refinement of work on film."[42] Even André Bazin, who so famously insisted on the "limitations" of montage,

39 Jean Mitry, *The Aesthetics and Psychology of the Cinema*, trans. Christopher King (Bloomington and Indianapolis: Indiana University Press, 1997), 92. The importance of the distinction in English between the practical fact of "editing" and the artistic technique of "montage" is implied by the parenthetical inclusion here in the English translation. In French, Mitry says simply: "Le montage qui, techniquement, n'est rien de plus que la mise bout à bout des différentes prises de vues," adding that editing (*montage*) "est aussi vieux que le cinéma lui-même," that editing "is also as old as the cinema itself," implying that the technique is an original and perhaps essential aspect of film art. See Jean Mitry, *Esthétique et psychologie du cinéma I: Les Structures* (Paris: Éditions Universitaires, 1963), 271. On these grounds, as we shall see, Mitry also establishes a distinction between the practical fact of editing and an aesthetics of montage, building on and revising Soviet-era montage theory.

40 Mitry, *Esthétique et psychologie du cinéma I*, 354; my translation. "Ce travail, strictement artisanal, est l'une des opérations capitales de l'art cinématographique." In the published English translation, this passage is rendered, rather less literally, as: "This purely technical stage in the filmmaking process is of the utmost importance." Mitry, *Aesthetics and Psychology*, 127.

41 Quoted in Mitry, *Aesthetics and Psychology*, 67. From André Malraux, "Esquisse d'une psychologie du cinéma," *Verve* 2, no. 8 (June 1, 1940): 69–73. Translated as André Malraux, "Sketch for a Psychology of the Moving Pictures," in *Reflections on Art: A Source Book of Writings by Artists, Critics, and Philosophers*, ed. Suzanne K. Langer (Baltimore: The Johns Hopkins Press, 1958), 317–27.

42 Béla Balázs, *Béla Balázs: Early Film Theory*, Visible Man *and* The Spirit of Film, ed. Erica Carter, trans. Rodney Livingstone (New York and Oxford: Berghahn Books, 2010), 122. This is a single-volume English translation of Balázs' two books on film. The quotations here are from

was also willing to accept its very real "virtues." While he advocated for a restricted use of editing, he understood and acknowledged its fundamental necessity. It was, for him, "in no sense a question of being obliged to revert to a single-shot sequence or of giving up resourceful ways of expressing things or convenient ways of varying the shots."[43] Siegfried Kracauer, too, similarly ill-disposed to "formalistic" manipulations of the original photographic camera recording, admits to the power and necessity of the subsequent ordering of the shots. "Of all the technical properties of film," he says, "the most general and indispensable is editing."[44]

It was, of course, the early Soviet-era theorists and filmmakers who argued most explicitly and passionately for the values of editing, which they thought performed an elemental and definitive role. "The foundation of film art," declared Vsevolod Pudovkin, "is *editing*."[45] They established a basic distinction, now a familiar one, between "editing," the word that Pudovkin uses here, understood as the necessary practical and technical procedure of arranging shots, and "montage," imported from French, rendered in Russian as *montazh*, which they defined as the artistic or aesthetically constitutive use of editing. Editing, of course, quite simply and practically, is little more than the physical connection of one shot to another, creating a linear chain or sequence of shots. One needs, though, they argued, a theory of connection, guiding the process, proposing the concept of "montage," understood as the deliberate *assembly* of the finished film from a raw material, or the ultimate *arrangement* of basic elements, which is then conceived of as the fundamental source of meaning or significance in film. "Montage," as Lev Kuleshov insisted, is "the very basis of cinematography."[46] The most

The Spirit of Film, published originally in German as *Der Geist des Films* (Frankfurt: Suhrkamp Verlag, 1930).

43 André Bazin, "The Virtues and Limitations of Montage," *What Is Cinema?*, trans. Hugh Gray (Berkeley: University of California Press, 1971), 50.

44 Siegfried Kracauer, *Theory of Film: The Redemption of Physical Reality* (Princeton: Princeton University Press, 1960), 29. Kracauer distinguishes between such "technical properties," which include the techniques of cinematography, the various "special effects," and so on, editing being the most important of these, and the "basic properties," which are, he argues, "identical with the properties of photography." According to this distinction, he presents his basic thesis: "Film, in other words, is uniquely equipped to record and reveal physical reality and, hence, gravitates toward it." Ibid, 28.

45 V. I. Pudovkin, *Film Technique and Film Acting*, trans. Ivor Montagu (London: Vision Press, 1954), xiii; emphasis in original.

46 Lev Kuleshov, *Kuleshov on Film: Writings of Lev Kuleshov*, trans. and ed. Ronald Levaco (Berkeley, Los Angeles: University of California Press, 1974), 48; emphasis in original. Kuleshov is describing the work that he undertook with his students in Moscow in the 1920s, experimenting with the possibilities of editing, on the basis of which, he says, "we came to understand that the

basic principle of montage theory, as Kuleshov argued, is that editing is to be distinguished from the substance that was being edited. "Separate shots of film," as Kuleshov says, "constitute cinematic material."[47] They await expressive fulfilment, so to speak, through subsequent manipulation. Aesthetic value in the cinema does not reside in the shots, that is, but is derived specifically from their ordering. It is Sergei Eisenstein who develops this claim in its most famous and influential form, producing the most elaborate and intricate theory of editing as montage. "Shot and montage," he says, "are the basic elements of cinema. Montage," he adds, with a telling metaphor, "has been established by the Soviet film as the nerve of cinema."[48] Indeed, the cinema as an art, he insists, is effectively reducible to the fact of editing, to montage. "To determine the nature of montage," he says, "is to solve the specific problem of cinema."[49] Of course, the "essence" of montage cannot be reduced to the basic technical procedure of editing, as he admits. "The mechanical process of splicing

basic strength of cinema lies in montage, because with montage it becomes possible both to break down and to reconstruct, and ultimately to remake the material." Ibid., 52. In the English translation of Kuleshov, the term "montage" is used consistently. A distinction is maintained in the translation of Pudovkin, though, between "editing," used in the passage I quote above, and "montage," which is presented as a distinct term, which he uses later in the book. It was from Kuleshov, Pudovkin says, "that I first learned the meaning of the word '*montage*,' a word that played such an important part in the development of our film-art." Pudovkin, *Film Technique*, 166. Imported from French, as it was being used by filmmakers and critics like Abel Gance and Jean Epstein, to describe the specific artistic possibilities of the technique, the term was very quickly and widely adopted, used in the most general sense to designate editing in an explicitly artistic mode. Balázs, for instance, in *The Spirit of Film*, published in German in 1930, describes editing as "a process for which it is significantly a French term, 'montage,' that has come to be accepted in the technical vocabulary of film." Balázs, *Early Film Theory*, 122. Yuri Tsivian considers the emergence of "montage theory," distinguishing between the terms "cutting," "editing," as more practical applications, and "montage," which is, as he says, "the practice of editing in the mirror of theory," noting that "the term itself came from the French word *montage* via Russian *montazh* and settled in English in or soon after the 1920s." See Yuri Tsivian, "Montage Theory I (Hollywood Continuity)," in *The Routledge Encyclopedia of Film Theory*, eds. Edward Branigan and Warren Buckland (London and New York: Routledge, 2015), 306.

47 Kuleshov, *Kuleshov on Film*, 50.

48 Sergei Eisenstein, "A Dialectic Approach to Film Form," *Film Form: Essays in Film Theory*, ed. and trans. Jay Leyda (New York: Harcourt Brace Jovanovich, 1949), 48.

49 Ibid. The essay has been published in a different translation, with subtle alterations in emphasis, so that the passage reads, "shot and montage are the basic elements of film. MONTAGE. Soviet film has established this as the nerve of film. To determine the essence of montage is to solve the problem of film as such." See Sergei Eisenstein, "The Dramaturgy of Film Form," in *Selected Works, Volume I: Writings, 1922-34*, ed. and trans. Richard Taylor (Bloomington and Indianapolis: Indiana University Press, 1988), 163; capitalization in original.

would," in that respect, he says, "be made a principle."[50] The true principles of montage are theoretical, conceptual, not material or physical. Still, it is precisely by first of all cutting strips of film into pieces, and simply sticking them together, that the aesthetic possibility of montage emerges. It is the nature of such possibility that must be explained, he argues, by a theory of editing as montage.[51]

Montage theory is perhaps the most significant account of editing, and continues to influence most subsequent accounts, which tend to trace the origins of film art to the basic procedures of cutting and joining, to the material and physical facts of editing, establishing a relation between technical simplicity and aesthetic significance, between the rudimentary arrangement of shots and the expressive power and potential of the cinema. "Editing," as Valerie Orpen says, in her recent book on the technique, "straddles the line between art and craft."[52] It can be easily dismissed as a mere technical necessity, though, given its simplicity. Editing was derided famously by Claude Chabrol, she notes, as the "washing up," coming at the end of the truly creative processes of scriptwriting and filming. For Orpen, though, editing is essential. It is, she argues, the "art of the expressive," the primary source of the communicative and representational power of the cinema, the importance of which can nevertheless be too easily overlooked. As a technique, she says, editing is often effectively *invisible*, functioning at what she calls a "subliminal" level. While less easy to see, less obvious, arguably, than the other basic techniques of filmmaking, Orpen argues that it is nevertheless the most important, explaining cinema itself, insisting that "a discussion of editing is not only possible but also essential to a greater understanding of the ways in which films make meaning."[53] This was appreciated most acutely, she says, by the Soviet montage filmmakers and theorists. "As Eisenstein, Pudovkin, and Kuleshov claimed," she observes in

50 Eisenstein, "A Dialectic Approach," 48.

51 It is on this point that the differences between montage theorists emerge, and it is in this essay that Eisenstein famously distinguishes his theory from others. It is clearer and more explicit in the Taylor translation. For Eisenstein, montage is "collision," as opposed to Pudovkin's idea of montage, to what Eisenstein calls the "'epic' principle," the "*unrolling* of an idea through single shots." He also dismisses the arguments of "the theoretically outmoded Lev Kuleshov," as Eisenstein describes him, "[who] regarded montage as a means for producing something by describing it, adding individual shots to another like building blocks." For Eisenstein, by contrast, "*montage is not an idea composed of successive shots but an idea that DERIVES from the collision between two shots that are independent of one another* (the 'dramatic' principle)." Eisenstein, "The Dramaturgy of Film Form," 163; emphases in original.

52 Valerie Orpen, *Film Editing: The Art of the Expressive* (London: Wallflower Press, 2003), 1.

53 Ibid., 119.

her conclusion, endorsing this basic claim, "editing is indeed the foundation of film art."[54]

Sam Rohdie has similarly argued that editing, or montage, is foundational. It is, he says, perhaps the most significant of what he describes as the "artifices of cinema," allowing it to *represent* reality, and not just mechanically record it, transcending mere imitation or mimesis.[55] Like Orpen, he credits the Soviet-era filmmakers with the initial and most important and enduring insights about editing. Kuleshov, he says, recognized montage as "the essence of cinema. … The only reality for Kuleshov was that created by the editing."[56] It was Eisenstein, though, Rohdie suggests, who was arguably the first to fully grasp the essential nature of editing, and to put his theoretical insights into practice in his filmmaking. "Fragments (shots)," in Eisenstein's films, Rohdie says, "are not joined to create a continuity nor do they refer to an interior unity of which the fragment is an essential part, but rather correspond to a need to demonstrate a relation or to organise a significance."[57] Rohdie insists that he is not offering a theory of editing, or montage, admitting that it is "difficult to generalise or extrapolate,"[58] that he will only, and more modestly, offer a series of short critical essays on the particular editing patterns in the films of some of the most significant directors in film history, who, he argues, recognized the elementary power of the technique.

There is a clear theoretical implication here, though, the assumption that editing is an essential, foundational part of the cinema, and that editing derives its value from some more fundamental material base, which provides some basic link to "the real." Rohdie offers a kind of generalization, derived from his particular examples, that suggests a theory of editing, that posits at the very least that its conceptual and aesthetic complexity derive from a technical simplicity. "Montage," he says, "simply is the joining together of different elements of a film in a variety of ways, between shots, within them, between sequences, within these."[59] From such a basic material fact comes the range of complex expressive effects characteristic of the most accomplished filmmakers, whose editing he analyzes. In the end, Rohdie's critical essays amount to an effective endorsement of the claim that editing is fundamental or foundational, and he seeks to reconcile Soviet montage theory with its supposed theoretical opposite, the cinematic realism of

54 Ibid.
55 Sam Rohdie, *Montage* (Manchester and New York: Manchester University Press, 2006), 137.
56 Ibid., 27.
57 Ibid., 33.
58 Ibid., 1.
59 Ibid.

André Bazin. He concludes with an explicit rejoinder to (or theoretical rehabilitation of) Bazin, famous, of course, like Kracauer, for his supposed resistance to a montage aesthetics. Rohdie argues, though, that the "ambiguity that Bazin valued as inherent to the real can only be found and revealed (as he recognized) by the artifices of the cinema"[60]—the most significant being editing, conceived of as montage. "All films, perhaps" Rohdie says, effectively offering a generalization, "and the best ones especially, are a response to the questions: what is the cinema? What is its essence? What can it do best?"[61] As he implies in his analyses, it is editing that is arguably the essential part of the cinema. The cinema is the art of editing. It is at its best in the form of montage.

These are, I would suggest, theoretical claims, but they are only implicit in Rohdie's argument, manifested, for instance, in his attempt to reconcile Eisenstein and Bazin. As I will try to show, such reconciliation is indeed possible, but only insofar as they both in fact reduce the cinema either to the fact of editing or to the fact of photography. Both, that is, are equally flawed, establishing a normative, deterministic relation between a specific technical or material aspect of the cinema, presumed to be the source of the cinema's identity as an art. Indeed, despite the apparent fundamental differences, they in fact share a more basic assumption about the nature of the photographic image, as the fixed, immutable raw material of the cinema, differing only in their response to it—as what the filmmaker should ideally try to overcome or to which the filmmaker should submit. For both Eisenstein and for Bazin, the question of the cinema is reducible to the question of editing, which is to be either fully exploited as a technique, in the face of a recalcitrant raw material, which must be forced into desired aesthetic form, or it is to be subordinated to the more aesthetically significant fact of such material recalcitrance. A common assumption unites these two supposedly contradictory theories.

Indeed, it is this assumption, and these two basic responses, that have structured most accounts of digital editing, understood as the specific site of the recent technological transformation of the cinema. The crisis of the cinema in the digital era is typically reduced to a crisis of editing, understood either as a moment of aesthetic opportunity and possibility, fulfilling the formalist promise of film art, or as the end of an aesthetic era, dashing the realist hopes for the cinema. From a formalist perspective, Lev Manovich argues that the effects of new digital technology on editing can be traced

60 Ibid., 137.
61 Ibid., 85.

back to Eisenstein and Soviet montage theory, noting the limitations of the theory, though, insisting that Eisenstein "ultimately focused on one dimension—time."[62] Digital editing, Manovich argues, by contrast, offers new possibilities, by allowing for the control of other dimensions. "By establishing a logic that controls the changes and the correlations of values on these dimensions, digital filmmakers can create what I call *spatial montage*."[63] Sean Cubitt adopts an essentially Eisensteinian principle, arguing that there is "an internal logic at work in the genesis of cutting as the basis of film form."[64] That logic, discovered originally by Georges Méliès, Cubitt says, with his stop-motion effect, achieved through rudimentary editing, was pursued in most theoretical and practical detail by Eisenstein and the Soviet montagists, leading ultimately, he argues, to the comprehensive formal and manipulative powers of digital montage.

There is, on the other hand, the realist response to digital editing. D. N. Rodowick argues that the new digital editing systems, what he calls digital compositing, or the "digital event," provides an unprecedented degree of control, fundamentally transforming the film as a work of art, which now, he says, "is a fully imaginative and intentional object."[65] Film had always allowed for some degree of artistic freedom or latitude, Rodowick admits, but it was necessarily constrained. "Though subject to all manner of manipulation and transformation," he says, film has its origins in what he describes as "analogical automatic causation," which "serve as limits to subjective decisions and acts—they lend an objective, or as Bazin would have it, inhuman quality to the production of image."[66] This is what has been overcome, though, he says, primarily with the advent of digital editing systems. Like Rodowick, Dudley Andrew has argued that the new digital editing technology threatens what had been unique about the cinema as an art, by overcoming all (or most) constraints on intentional, imaginative control. "Films," he says, in their original form, actually made out of *film*, "exhibit tension between the human (imagination, intention) and the recalcitrant chunks of recorded reality."[67] He champions the film theory of Bazin, what he describes as his "theory of 'impure cinema,'" which, Andrew says,

62 Manovich, *Language of New Media*, 156.

63 Ibid., 158.

64 Sean Cubitt, *The Cinema Effect* (Cambridge, MA: MIT Press, 2004), 43.

65 D. N. Rodowick, *The Virtual Life of Film* (Cambridge, MA: Harvard University Press, 2007), 169.

66 Ibid., 49.

67 Dudley Andrew, *What Cinema Is! Bazin's* Quest *and its Charge* (Malden, MA: Wiley–Blackwell, 2010), 30.

"negotiates between man and nature, the imagination and the real."[68] This has been replaced, though, he argues by a "pure" cinema, fully imaginative, fully intentional, limited by nothing other than artistic will, no longer the site of such metaphysical or ontological negotiation.

In either case, for the formalist and the realist, there is an acknowledgement that the full realization of electronic video editing, in the form of digital systems, computer programs, has comprehensively transformed the methods of film editing, altering the cinema, both argue, at a more basic, more profound level, transforming the essential raw material of filmmaking, that had necessarily constrained the work of editing. It was this basic, raw material, the filmstrip, with the photographic imagery printed on it, and the sound recordings affixed to it, that was thought to have established the possibility of editing as a technique, and which was the basis for the very idea of montage, as a theoretical concept. Lucy Fischer argues that the effects on editing of the incorporation of the "high-tech methods" of digital technology are at least comparable to but likely greater than the effects of any of the other major technological disruptions in the cinema. "While in the 1920s and 1930s the coming of sound created one kind of crisis in editing," she says, "the advent of new, high-tech methods precipitates another."[69] It is in this respect, Fischer argues, that the advent of digital editing, an aesthetics of digital montage, has created a crisis of unprecedented consequence for the cinema itself, altering its very "ontology," so that a new theory or "philosophy" of the cinema is needed.

* * *

While a new philosophy of the cinema may indeed be warranted, it is not, I will argue, because of any change to its ontology. It is just this sort of confusion on the matter that I will seek to address. To that end, I will be tracing the critical and theoretical discourse about the aesthetics of editing, in both its original and digital forms, considering the debates about the relation between editing as a specific technique, or set of techniques, and the art of filmmaking more generally. One of the most significant issues has been the very distinction between the cinema and the other arts, the assumption that the cinema was unique, a kind of aesthetic exception, and that the incorporation of digital technologies have effectively destroyed what had fundamentally distinguished cinema from other arts, specifically from

68 Ibid., 30–31.
69 Fischer, "Film Editing," 81.

the "visual" arts, like painting and drawing and sculpture, and from theater, but from the traditional arts more generally. Emphasis has been placed inevitably on that technique that seemed unique to the cinema, namely editing. No other art possessed a comparable ability to effect such sudden transformations, shifting from one shot to the next, through the simplest of means, with nothing more than a cut, the effects of which seemed at once so fundamental and yet so variable.

The same technique, reducible to the basic gesture of the cut, was the foundation for the coherent elaborations of spatial and temporal unity of the so-called "continuity style" of editing, as well as the formal and compositional disjunctions of avant-garde and experimental filmmaking, of "montage" cinema. Editing has been understood as the basis of the cinema in its "classical," realist form, but also the primary means for the creation of a formalist avant-garde alternative. In both cases, though, the aesthetic possibilities of the cinema were reducible to the specific capacities of editing. In whatever form the cinema took, the fact of editing was always understood as the most definitive technique, understood, though, in relation to a yet more basic assumption about the origins of cinematic representation, of filmic depiction or composition, which have for so long been thought of as essentially photographic. The photograph, the causally generated or "indexical" image, was what had determined the basic limits of editing, constraining editing as a technique, restricting the imaginative intentions of the filmmaker, while simultaneously imbuing it with aesthetic value. Indeed, its value seemed to be derived just from the limits on intention and imagination. While such imagery could be arranged in whatever order a filmmaker desired, through the very simple procedures of film editing, the image itself was thought to be immune to any more fundamental editing process. To edit was to arrange in a linear sequence or series an essentially stable element, the *shot*, or the basic photographic component, which itself could not, or not easily, be changed in any fundamental way.

This, of course, is what has changed. The concept of editing, as a craft, as a technique, and as an aesthetic idea, has been transformed by new digital technology for the alteration and manipulation of the image itself, the shot itself, with significant consequences for the cinema as an art. Yet this sense of profound change is based on assumptions that are largely unexamined, within the usual precincts of film theory, and which can be called into question. These are some of the most basic and long-established assumptions of the theory of film as an art, which need to be reconsidered, in order to more effectively account for the recent technological changes to the cinema, and specifically to editing. The first question that I will consider

is the supposed fate of film editing, which is thought to be determined by particular technological changes, according to certain basic understandings about the relation between art and technology, some quite fixed assumptions in much film theory. I will then consider each of these in turn.

The first and most important of such assumptions is about *intention* in art, which, in most accounts of the cinema, of film art, is reduced to the fact of editing, understood as the manifestation of a properly limited form of artistic intention, characteristic of the cinema, necessarily constrained by the causally fixed nature of the photographic image. This is primarily what is supposed to have distinguished the cinema from the other arts, which are characterized by an unfettered intentionality, making those arts entirely subordinate to the artist's will and whims, the products of an all-encompassing artistic subjectivity. The cinema, by contrast, before the digital era, was thought to be characterized by a general objectivity, derived from an inherent, *non*-intentional basis. It necessarily had a more intimate and objective relation to "reality," which the artist could not easily overcome, except, of course, by simply abandoning the basic process of photography, in favor of some form of "animation," or a too flagrant use of special effects, and so on. In the most basic sense, the cinema's aesthetic value was supposed to have derived, to a very significant degree, from the intrinsic, material limitations on intention, overcome only, or most properly, and in importantly restricted fashion, through editing. Yet, as I will try to show, to argue that the cinema derives its uniqueness as an art from a basically non-intentional process is to misunderstand the very concept of art, of the artwork, or to misconstrue it, to fail to understand the necessary relation between the fact of intention and the formation of works of art. It is intention, as I will argue, that defines any object *as* a work of art, undertaken through the use of specific tools, a particular technical apparatus, with which any work of art is realized or formed.

The second complex of problems, then, that I think is raised by the changes to film editing, are those encompassed by the word *technology*, the question of the relations between the tools used by artists to create works of art, the specific forms of which are always changing, the choice of which to use or which to eschew always potentially open. Such choices manifest in the form of specific techniques, which seem, on the one hand, to be irreducibly specific and individual, but which also apparently derive from the material facts of any particular technology, providing the basic formal means for the fabrication of works of art, which can be recognized as particular instances of general kinds of art, but which are thought to possess a specific or even unique identity. The relation between technology and technique, though,

and the question of artistic identity, as I will try to show, is much more complex than often thought.

How and whether any particular filmmaking apparatus determines or contributes to the realization of the identity of the cinema as an art opens on to broader issues. From the specific questions of intention and technology, then, we are led to the more general concept of *ontology*, the question, that is, of the very status of the work of art as a particular kind of object. As I will try to show, a theory of the work of art, of the ontology of the art object, must be general enough to encompass any particular form of artmaking, including the cinema, which cannot be understood as aesthetically distinct or unique, to be contrasted with the so-called "traditional" arts, at least not in the terms that have so often been proposed by so many film theorists. At the heart of a viable concept of the work of art is an understanding of the relations between the aesthetic and the technical, an understanding of the inevitable variety of means for the creation of works of art as, precisely, technological means, put to artistic or aesthetic ends. Whether such means are as simple as those used for traditional film editing, scissors and glue, a blade and some tape, or as complex as new digital editing computer workstations, aesthetically they are the same.

It is these three basic concepts, then—these conceptual groupings, or clusters of questions—around which this book is organized, namely *intention*, *technology*, and *ontology*, as aspects of a more general aesthetics. It is my contention that, in order to understand the kinds of technical changes to the cinema, and specifically the changes to the tools of film editing, given its particular significance as a technique in so much film theory, these conceptual categories require some considerable clarification. To that end, I will be surveying some of the main currents in film theory, and some of the most significant accounts of the effects of digital technology on the cinema, in light of the broader and more general work in philosophical aesthetics, which, as I will try to show, can be brought to bear on some of the enduring conceptual problems of film theory, specifically the problem of editing, offering the means for understanding and explaining the kinds of changes that have taken place recently in the cinema.

An aesthetics of digital montage, in this respect, is an account of the cinema as an art, understood, in the most basic sense, just as the site of the complex relations between intention and technology, between the aesthetic and the technical, as manifested in the undeniably significant effects that may be created through the specific and, arguably, unique technique of film editing. The ontology of a work of art must be understood to derive just from such relations, as the products of artistic effort with the means that

are available, with tools and technology that are always changing, within conditions that are, inevitably, historically variable. In this respect, then, the cinema, as an art, as the art of filmmaking, cannot be reduced to any particular technology, to any specific material basis, or even any particular technique, but must, like any art, be understood as an artistic activity, as a kind of artistic making, undertaken with various and variable technical means, used in many different ways, to create what can be understood precisely as *works* of cinematic art, the products of such activity.

To say that this has not been appreciated by film theorists is not right. As a particular branch of the philosophical inquiry into the arts, as a part of the broader endeavor of the field of aesthetics, as I think it must be understood, film theory has in fact been especially sensitive to the particular problem of the relations between intention, technology, and ontology in art. Yet, and as I will try to argue, certain assumptions, long established within film theory, on these very issues, have become rather sclerotic, hardened into the form of accepted and often unquestioned truisms, rather than illuminating and explanatory concepts. Especially fixed are some of the most basic assumptions about editing, the art of film editing, which are being upset by the undeniably dramatic changes to the tools of the editor, and which invite, I think, a reassessment, a rethinking, which I will try to offer here, as I endeavor to describe those changes, and to propose an aesthetics of digital montage.