UNIVERSITÉ DU QUÉBEC À MONTRÉAL

ACTOR AND TECHNOLOGY:

APPROPRIATING DIGITAL MEDIA INTO THE CREATIVE PROCESS

DISSERTATION

PRESENTED

AS A PARTIAL REQUIREMENT

OF THE MASTER'S IN THEATRE

BY

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APRIL 2012

UNIVERSITÉ DU QUÉBEC À MONTRÉAL

ACTEUR ET TECHNOLOGIE :
L'APPROPRIATION DU NUMÉRIQUE DANS LE PROCESSUS DE CRÉATION

MÉMOIRE

PRÉSENTÉ

COMME EXIGENCE PARTIELLE

DE LA MAÎTRISE EN THÉÂTRE

PAR

SEBASTIAN SAMUR

AVRIL 2012

ACKNOWLEDGEMENTS

Many thanks to my supervisor, Alain Fournier, for your on-going support, openness, and availability. Your regular feedback and exchange of ideas really helped develop and refine my research, keeping it on track, yet open to outside influences. The consideration and independence you gave allowed both a structure and freedom to explore academically and creatively, and for this I am very grateful.

Thanks also to Marie-Christine Lesage for your guidance and support early on in my research. Your insightful questions kept me coming back time and time again to more thoroughly define the subject matter and place it within a contemporary context.

Thank you to Chantale Lepage and Véronique Borboen for your valued comments and interest in this dissertation and the conference-demonstration.

Thank you to Nathalie Derome, Martine Beaulne, Yves Jubinville, Geneviève Billette, Gérald Garutti, and to all my fellow classmates, for the many enriching classes and experiences at UQÀM.

A big thank you to Fiona Beckett for your collaboration. Your assistance as an outside eye, as well as with the video and photography is very much appreciated, and this project would not have been the same without you.

And lastly, thanks to my parents, sisters, and friends who have supported me in countless ways throughout my studies. My time at UQÀM, and in Montreal generally, has been both challenging and enlightening. I am eternally grateful for all your help, talks, cheers, and admonishments. It has been a blast, and an experience I will not soon forget.

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RÉSUMÉ

Réfléchissant à l'utilisation croissante de la technologie sur la scène contemporaine, ce mémoire-création a pour but d'analyser l'incorporation des technologies numériques dans le jeu de l'acteur-créateur. La recherche est divisée en trois parties examinant les aspects historiques, théoriques et pratiques, ce qui permet un regard plus global sur le sujet.

D'abord, le mémoire présente les histoires parallèles de la technologie sur scène et du jeu d'acteur au XXe siècle. Il est constaté que leurs chemins sont restés assez indépendants au début du siècle, se croisant de plus en plus lors des années 1960s et 1970s. Vers la fin du XXe siècle, par contre, les recherches sur le jeu d'acteur ont diminué, alors que l'intérêt est resté fort pour les laboratoires technologiques.

Suite à cet aperçu historique, le mémoire examine le travail d'un praticien et théoricien américain, David Saltz, qui explore l'utilisation de technologies variées sur scène. Saltz a suggéré une taxonomie de 12 rôles technologiques pour classifier les différentes utilisations des technologies au théâtre, ce qui aide à mieux cerner les recherches portant sur la technologie.

La taxonomie de ce mémoire a été utilisée pour encadrer une exploration pratique en utilisant un seul élément technologique : la projection. Adoptant une approche basée sur un théâtre corporel – notamment par les techniques du masque neutre et du mime – le laboratoire a exploré le rôle des costumes interactifs par le biais des projections. Les résultats du travail pratique ont été présentés lors d'une conférence-démonstration, dans un contexte de répétition pour mettre l'accent sur le processus de création. Les techniques présentées portèrent sur l'installation de l'équipement, sur la sélection des projections, ainsi que sur le mouvement de l'acteur.

Le mémoire-création conclut en reliant les trois parties de la recherche, suggérant d'autres possibilités d'exploration et affirmant l'intérêt de relier les recherches du jeu d'acteur avec celles de la technologie.

Mots Clés

Technologies numériques – acteur-créateur – jeu d'acteur – projections – costumes interactifs – masque neutre – mime – interdisciplinarité – intermédialité

SUMMARY

Reflecting on the growing usage of technologies in contemporary theatre, this dissertation seeks to analyze the incorporation of digital technologies in the training of an actor-creator. The research is divided into three parts, examining historical, theoretical, and practical aspects, which permits a more global examination of the subject.

First, the paper presents the parallel histories of technology in theatre and actor training in the 20th century. It is noted that their paths remained relatively independent at the beginning of the century, crossing more and more in the 1960s and 1970s. Towards the end of the 20th century, however, research into actor training diminished, while interest in technological laboratories remained strong.

Following this historical overview, the dissertation examines the work of the American practitioner and theoretician, David Saltz, who explores the uses of various technologies on stage. Saltz suggested a taxonomy of 12 technological roles to classify different uses of technology in theatre, which helps to better define research around technology.

The taxonomy, in this paper, has been used to frame a practical exploration using a single technological element: projection. Adopting an approach based in corporeal theatre – notably in neutral mask and mime techniques – the workshop explored the role of interactive costumes through the use of projections. The results of the practical work were presented in a conference-demonstration, in a rehearsal context, so as to emphasize the creative process. The techniques presented related to the installation of the equipment, the selection of the projections, as well as on the actor's movement.

The dissertation concludes by linking the three parts of the research, suggesting other areas for exploration, and affirming the interest in combining research on actor training with that on technology.

Keywords

Digital Technologies – Actor-Creator – Acting – Projections – Interactive Costumes – Neutral Mask – Mime – Interdisciplinarity – Intermediality

INTRODUCTION

Throughout the 20th century until the present day, technology and theatre have often been characterized in oppositional relationship: a division between technophiles and technophobes, according to Chris Salter (2010, p. xiii); between those who demonize and those who romanticize technology, according to Steve Dixon (2007, p. 6); or "theatre and media: rivals or partners?" as Philip Auslander writes (2008, p. 1). Today, this dualism is observable in the works of artists such as Denis Marleau, 4D Art, or Heiner Goebbels, on the one hand; and Pol Pelletier, Eugenio Barba, and Anne Bogart, on the other. The former favour the use of technology in theatre (such as microphones, cameras, projections, holograms, motion capture, etc.), while the latter prefer the actor's work to be independent of technology, harking back to Grotowski's poor theatre. For the 'technophobes', the use of technology on stage is sometimes viewed as a threat to the actor's presence. Technological elements compete with the actor or remove something from him (his aura, his energy). In contrast, the 'technophiles' view technology as an indispensable tool, one which integrates itself quite naturally into theatre. In this camp, there are certainly those who do not see the actor as absolutely necessary on the stage.

These are the two extremes of a wide spectrum of positions, in a debate that is becoming increasingly nuanced. Particularly influential and outspoken are theatre directors, and progressively some technicians (including video artists and sound designers), who are pushing the limits of what it means to create theatre. Increasingly absent, on the other hand, are those practitioners who prefer to focus on the actor's craft, human possibilities, and what it means to "act". Lengthy laboratory research has ceased or has become technology-centered. This research paper attempts to add a voice to the debate, with the hope of bridging the gap between the two, by exploring technology from an actor's perspective. By exploring the actor-technology relationship, it should become clear that there are innumerable

paths for exploration and plenty of need for a continued study of the actor's craft in a digital age.

In order to present a thorough examination of the subject, this paper looks at historical, theoretical, and practical aspects of acting with technology. It begins with a brief historical overview that parallels the use of technology in theatre with major developments in actor training throughout the 20th century. It then analyzes the work of David Saltz and the taxonomy of 12 technological roles he proposes. Finally, the design and results of a practical exploration of acting with one technological medium – projection - are presented. Saltz's taxonomy was used to define the workshop's content, which explored projections as interactive costumes. The workshop adopted a corporeal theatre approach, based in neutral mask and mime technique. As the research centers on actor training, it is the creative process (the work in rehearsal or training) that is the focus of this work, rather than the final result presented to an audience.

Before continuing, it is important to define some of the concepts that will be addressed, which have taken on multiple and increasingly general definitions over time. They are all basic concepts, at once instantly recognizable and utterly confusing.

Theatre: Traditional notions of theatre, which may conjure images of Greek, Shakespearean or Broadway stages, are adequate when discussing theatre prior to the 1960s. However, after the Second World War, ideas about theatre were challenged and upturned, and soon "theatre" came to include a wide range of forms, from mime and improvisation to the Living Theatre and the Theatre of the Oppressed. This era also gave rise to Richard Schechner's vague school of performance studies, which opened up to include any kind of *doing*. It is not the purpose of this paper to pin down any one definition of theatre, a rather futile semantic exercise. Nonetheless, for the purposes of clarity, "theatre" will generally be used to denote more traditional stage-based notions of the art form, while performance will be used to encompass the performing arts more generally, be they

theatre, dance, performance art or otherwise. Much of the research discussed in this paper is applicable to numerous art forms, regardless of the label one attributes.

Discipline: As with theatre, the words discipline and interdisciplinary are confusing designations. They reference both larger categories – what could be termed "super-disciplines" - including theatre, dance, music, and visual arts; as well as the "sub-disciplines" within each. In theatre, for example, one could include acting, directing, scenography, lighting design, etc. Still further, one might isolate mime, voice, movement, and dance techniques within acting. Yet suddenly dance is simultaneously identified as both a "super-" and "sub-discipline." One finds similar overlap with yoga and martial arts. Such crossovers occur frequently, as artists borrow techniques to bring to their craft. It convolutes any clear-cut definition, but the terms are still useful. In this research paper, the word "discipline" will be used with as clear a context as possible, referring primarily to a subject that is taught. Likewise, the word "interdisciplinary" will be used, disregarding complicated level breakdown, mentioned above.

Technology: Technology could be used in reference to the most primitive of tools (thus making even stage props technological elements). However, in this research paper, technology will refer to all technological elements used in the theatre from the introduction of stage lights and sound onwards. In particular, it will refer to digital technologies (technologies using computers), which may include projections, sound, motion capture, video/camera technologies, sensors, and so forth. "Media" will also refer to each of these technologies and multimedia refers to their combination.

Acting: For some, acting is synonymous with a hyperrealist Oscar-winning movie performance, for others it could be as abstract as Beckett's Rockaby, a Balinese Legong dance, or even a performance art piece. In this research paper, acting is not tied to any particular tradition. It is simply defined as a live presentation, one that is deliberate and is supported by a training history. The actor is considered to be an actor-creator; one who takes an active role in the creation of a piece. Actor training refers to any exercises students perform in preparation to act, whether the

exercises themselves lead directly to a performance or not. Continuous training refers to training that continues regularly after an actor's initial training period, with the goal of honing new skills or of keeping previously learned skills sharp. The reason for this relatively open definition is that the results of this research are useful not only in traditional forms of theatre, but could serve in a number of other disciplines as well.

This paper is divided into five chapters. They briefly cover the relevant actor/technology histories in the 20th century, as well as David Saltz's work and theory on technology in detail. The practical research component is then introduced and outlined, including results. The concluding chapter brings together the historical, theoretical, and practical components, and suggests paths for future research.

The first chapter briefly traces the parallel histories of actor training and the use of technology in theatre. By juxtaposing them, it becomes possible to identify key developments, similar trends, meeting points, and points of conflicts within their histories, leading up to the present. In the early part of the century, technology is closely tied to the scenographer's work, but it eventually branches out to touch all aspects of production. Examples are taken from within theatre and the arts in general as aesthetics overlapped increasingly from the 1960s. The chapter ends with some of the most recent developments and practitioners who continue working today.

The following chapter, on David Saltz's work, covers in further detail his research at his Interactive Performance Laboratory at the University of Georgia. It examines some of the pieces he has directed, and looks at the taxonomy of 12 roles he suggests technology takes on when incorporated into a performance. The roles later serve as a framework for the practical component in this research. In particular, technology as interactive costume becomes the focal point of study.

The third chapter outlines the practical approach undertaken to look at acting with technology, based on Saltz's technological roles. Taking off from technology as interactive costume, a workshop was devised which would allow this single role to be

explored in depth. Projection technology was selected as the technology of choice, and physical theatre was chosen as a complementary form of theatre training. By narrowing the focus of study, the workshop allowed for a research setting akin to Grotowski's or Barba's laboratories, but incorporating technology as well. Training techniques were borrowed from neutral mask and mime. The projected images and video inspire the movement and voice in the actor, which can be seen on the body with the aid of mirrors. A third-eye is also used in the process to provide another perspective. A number of different images and video were tested, with successful acting-technology blends serving as "germs" for creation, be it in theatre or otherwise.

The fourth chapter discusses the results of the various trials in workshop. It presents the projections and physical work which were most successful, proposes suggestions as to why certain combinations meshed together better than others, and offers some general guidelines for effective work when performing with projections. Key aspects discussed include colour, patterns, images, and video/animation. Suggestions are made related to colour selection, dimensionality, the use of abstract images, the incorporation of movement, and the importance of surface area. Supplementary elements explored during the research are discussed as well, including props, live camera, and sound.

The final chapter presents the overall conclusions of the work, and places it in the greater context of Saltz's theory, as well as within the domain of actor training and technology more generally. It gives a post-research commentary on the experience and possibilities of this type of work. It also suggests practical applications for the exercises completed, further areas of research, and ideas for incorporating other technologies.

At the completion of this research project, the examples and conclusions presented should offer new insights into acting with digital technology, open up new areas for discussion, and offer suggested paths for further practical exploration.

CHAPTER I

TWO HISTORIES: TRACING THE PARALLEL PATHS OF TECHNOLOGY IN THEATRE AND ACTOR TRAINING IN THE 20TH CENTURY

In his exhaustive book, *Digital Performance*, Steve Dixon (2007) divides the history of multimedia theatre (theatre incorporating technological elements) in the 20th century into three approximate periods: the 1910s (and the beginnings of futurism), the 1960s (multimedia experimentation), and the 1990s (and the rise of the computer). This division is useful because, with the exception of the 1990s, each period corresponds roughly with the major developments in actor training of the 20th century. Konstantin Stanislavski, followed later by Jacques Copeau and Vsevlod Meyerhold, worked in the early part of the century, while Jerzy Grotowski, Étienne Decroux, Peter Brook, and later Eugenio Barba, Ariane Mnouchkine, and Jacques Lecoq were active in the 1960s, 70s, and 80s. The parallel development of multimedia theatre and actor training is not surprising, since the two world wars define the periods. It is worth noting, however, the absence of a third major period of actor training in the 1990s (up to the present). Few new figures have devoted themselves to the work, or taken it further.

1.1 The Early 20th Century

The paths of multimedia theatre and actor training developed at times independently, at times complementarily, and at times in opposition to one another. Matthew Causey notes discordance between the two worlds as early as 1810 in Heinrich von Kleist's *Über das Marionettentheater*. Causey (2006) writes that "the problem of the actor, according to Kleist, is the materiality of the body, which is limited by the forces of nature and by its own strength, as well as by the nature of

consciousness, which creates egocentric self-consciousness that undermines the free play of art and the theatre" (p. 78). The primary hindrance for Kleist is likely the egocentric aspect of man, as the forces of nature equally limit the other aspects of theatre creation.

The preference for the marionette would be taken up again more famously in 1908 by Gordon Craig, who, in *The Actor and the Über-Marionette*, wrote "the actor must go, and in his place comes the inanimate figure - the Über-marionette we may call him, until he has won himself a better name" (p. 81). A tone of violence is manifest throughout the essay, which opens with a citation by Eleanora Duse: "To save the theatre, the theatre must be destroyed, the actors and actresses must all die of the plague...they make art impossible" (p. 54). Though the absence of actors on stage is becoming increasingly common, the words are still striking today, both for their revolutionary ideas, and their contemporary relevance. During production, however, Craig's bold declaration remained undemonstrated. As Jean Benedetti (1990) relates on his participation in Stanislavski's 1910 production of Hamlet:

> *The company did not find rehearsal easy mainly because Craig did not know how to rehearse. He kept himself aloof from the company except for Alisia Koonen, to whom he had taken a fancy. This champion of the Übermarionette was prepared to allow actors total freedom of choice in the means they selected to convey his abstract ideas. Thus, while the cast were willing to try anything he cared to suggest to them, he suggested nothing.* (p. 190)

Like Antonin Artaud's Theatre of Cruelty, Craig's ideals would remain theoretical.

In 1925, the scenographer and futurist Enrico Prampolini took a similar position to Craig's, writing in *Teatro Magnetico* that he believes the actor to be useless and dangerous for the future of theatre (as cited in Kirby, 1966, p. 229). Likewise, Oskar Schlemmer held an equally foreboding vision of the future, but tied it more to realist theatre (T. Schlemmer, 1990, p. 126). He favoured abstract scenography and believed that in theatre there were two possibilities of representation. In his essay, "Mensch und Kunstfigur," Schlemmer (1961) explains this duality:

> *Man, the human organism, stands in the cubical, abstract space of the stage, Man and Space. Each has different laws of order. Whose shall prevail? Either abstract space is adapted in deference to natural man and transformed back into nature or the imitation of nature. This happens in the theatre of illusionistic realism. Or natural man, in deference to abstract space, is recast to fit its mold. This happens on the abstract stage. (p. 22)*

In the same essay, Schlemmer cites Craig's über-marionnette, as well as Valerij Brjusov, who wanted to replace the actor with mechanical dolls. Schlemmer (1961) diverges, however, stating: "such paradoxical exclusiveness is less significant than the enrichment of modes of expression which is brought about by it" (p. 28). For Schlemmer (1961), then, it is not about replacing the actor, but that he should enter into a mechanical style: "Everything which can be mechanized *is* mechanized" (p. 17).

While an antagonistic relationship is clearly evident from a scenic perspective at the beginning of the century, there are less occurrences from the actor's perspective (likely because the scenographer depended more on the actor, and not vice-versa). In Stanislavski's writings, scenography is not greatly explored, and where it is discussed, it is not done so in any kind of dualist sense, as in Schlemmer's essay. He remained focused on his acting 'system'. As mentioned, the director did collaborate with Craig for the Hamlet production. During the collaboration, however, Stanislavski, who was more interested in proving his system, rejected many of Craig's abstract ideas (Benedetti, 1990, p. 185).

Jacques Copeau also met Craig briefly, but like Stanislavski, he was more interested in the actor's work, favouring a direct actor-spectator relationship. In "To the Playhouse," he even states: "What is the new theatre, the new movement in theatre? It is scenery, that is all. And I am most of all against scenery" (as cited in Rudlin, 1986, p. 51). In his 1920 production of *The Winter's Tale*, he went so far as to remove scenic elements altogether (Kurtz, 1999, p. 83).

Meyerhold, by contrast, was greatly influenced by constructivism, and was much more conscious of the relationship between the actor and scenic elements. His

interest in Frederick Winslow Taylor's 'time-motion' industrial studies, which led to the creation of his biomechanics exercises, puts him much closer to Schlemmer's mechanical aesthetic. Nonetheless, Dixon (2007) explains that for Meyerhold: "the 'actor of the future' is compared not to a machine, but to a skilled worker, who demonstrates rhythm, balance, stability, and an absence of movement superfluous to productivity" (p. 65). The aesthetic, then, has more to do with ideal human ability and control, rather than rendering the actor into an automaton. The relationship between actor and scenography is complementary, with the actor remaining at the center of creation.

Lastly, where cinema was used in the theatre, collaboration between actor and scenographer seems to have increased. In 1911, Adolphe Appia experimented with projections of film on the dress of Loïe Fuller. Winsor McCay, in 1914, played in *Gertie the Dinosaur*, in which he played with the projection of a dinosaur and finished by entering the projection himself. These productions demanded a collaborative relationship between actor and scenographer, which was imperative to their success. Many other artists, including Sergei Eisenstein, Erwin Piscator, and Frederick Kiesler, used cinema in theatre, but it was generally employed more as a background. Meyerhold was relatively pessimistic towards film and underestimated its impact. Cited in Braun's (1995) *Meyerhold: A Revolution in Theatre*, the director stated: "My opinion of cinematography to date is totally negative...It is still too early to say whether the cinematograph will become an art form in its own right or simply an adjunct to the theatre" (p. 135). Yet film undoubtedly influenced Meyerhold's mise-en-scène, as one film critic wrote of Meyerhold's *The Forest* that it "isn't theatre at all but a film...Meyerhold cuts and edits his scenes like film; as in film he works through gesture; as in film he uses close-ups and long-shots; as in film he changes the location for each scene." (Braun, 1995, p. 209) Already modern staging techniques, which portend the work of companies such as the Wooster Group, could be evidenced.

1.2 The 1960s

Following the Second World War, the relationship between actor and technology in theatre became increasingly complex. The period is notable not only for its prosperity and the return to artistic creation, but also because television became omnipresent in American households. The future artists of the 1960s would be among the first generation of children raised with the new technological presence in their homes.

In *Liveness*, Philip Auslander (2008) postulates that television had a greater impact on theatre and the performing arts than cinema, because it usurped its immediate aspect. He states, "it is my contention that this ideologically engrained sense of television as a live medium makes its historical relationship to the theatre different from that of film, and enabled television to colonize liveness, the one aspect of theatrical presentation that film could not replicate" (p. 13). Through live acts such as sketch shows and musical revues, television began emulating theatre in ways cinema previously could not. The new medium would influence the foremost artists of the 1960s and would eventually become identified with advertising and mass production.

It was during this period, sometimes characterized as postmodern, that the boundaries between artistic disciplines began to blur considerably. Artists coming from all disciplines started working together, mixing and recycling their materials, which lead to the creation of new genres, such as multimedia works, installations, and also performance. Television and other audiovisual technologies were often central to these experiments. In 1956, for example, Alwin Nikolais projected abstract images onto the bodies of his dancers in *Prism*. In *Variations V* (1965), Merce Cunningham and John Cage collaborated on a dance performance where the dancers modified sounds when they approached antennas or blocked lights. Trisha Brown, in *Homemade* (1966), danced with a projector on her back, her image projected on the walls, ceiling, and floor. Experimentation continued into the 1970s, as Nam Jun Paik created sculptures from televisions and screens, including his

playable TV cello (1971), which incorporated three televisions. Laurie Anderson, echoing Appia's and Nikolais' projection experiments, started playing with the body as screen. She also began modifying her voice electronically and in *At the Shrinks* (1975), foreshadowing the work of Denis Marleau, she projected images on three-dimensional figures. The artists of this period played with disciplinary peripheries, as well as new ways of approaching audiences. Using technology, artists began creating interactive environments, installations, and performances, which not only broke down disciplinary boundaries, but raised questions about the role of the audience and that of the performer. Günter Berghaus (2005) comments generally on the quality of these developments:

> *Early interactive Media Art was rather basic in concept and execution...these works possessed only a limited range of operational possibilities. This was due partly to the limitations of the hardware and partly to the inexperience of the practitioners. Artists required time to complement their artistic education and acquire - usually in an autodidactic fashion - the necessary technical know-how to produce media artworks that truly explored the inner logic of the digital world...This may explain why so many early media installations only demonstrated a* potential*, rather than a* fully developed *accomplished work of art." (p. 238)*

As today, technology developments were evolving rapidly, leading to many unfinished *works in progress*. Nevertheless, the technological experimentation of the 1960s paved the way for more sophisticated creations later on, and, more importantly, forced artists to ask fundamental questions about their respective disciplines. No longer would a simplistic characterization of music, theatre, dance, visual arts, suffice; and no longer would artistic roles be taken for granted. Definitions continue to evolve to this day as artists transgress boundaries, often facilitated by the incorporation of technology.

Looking more specifically at traditional theatre in the 1960s, artists were likewise experimenting, albeit less rigorously. In 1958, Josef Svoboda's Laterna Magika company developed a complex system of 'polyscreens' to better synchronize the actors with the projections. For Svoboda, "conjoining film and theater offered a unique cross-disciplinary art form that would expand dramaturgic possibilities, and

create new meanings and artistic dimensions" (Dixon, 2007, p. 83). In 1961, Roberts Blossom's 'filmstage' also began synching film and theatre. Auslander (2008) writes, "Blossom acknowledged that the competition between the actors' live bodies and the filmed images in these mixed-media performances was intrinsically unfair because the filmed images were inevitably more compelling" (p. 37). It was during this period of experimentation when film (and video) started becoming a potentially threatening presence on the stage. In 1964, in *You*, Wolf Vostell experimented with three televisions on stage. Fifteen years later, the actors in Vostells *Hamlet* were on stage with 120. A similar aesthetic would be taken up by the Wooster Group, who would use cinematographic montage techniques. According to Causey (2006), "the filmic techniques of montage, dissolves, jump cuts, and split edits are translated into the performance gestures of the Wooster Group" (p. 40). The impact of film and television was thus not only their physical presence on stage, but also permeated into the acting style. The use of technology then does not simply lead to an interdisciplinary aesthetic, but can alter fundamentally the way of creating and thinking about each artistic discipline.

Outside of the performances themselves, Auslander additionally suggests that the perceptions and expectations of audience members are also affected by the use of media and technology. He cites Norbert Bolz and Willem van Reijen (1996): "our world-view is [not only] being increasingly dominated by technical equipment. Even more important is the fact that we often perceive reality only through the mediation of machines (microscope, telescope, television). These frame works...preform our perception of [the world]" (p. 71). The result, according to Auslander (2008), is that the public expects live shows to resemble the mediatized performances to which they have been accustomed (p. 25). The situation becomes further complicated because an infinite cycle (see Baudrillard's simulacra) establishes itself, as the public forms their ideas about reality according to their mediatized experiences, which refer to real performances, which refer to mediatized performances, etc (Auslander, 2008, p. 39). Consequently, Auslander believes that there are fewer and fewer differences between 'live' performances and televisual

performances. The argument is easy to understand, particularly as real-time technologies improve. However, Dixon (2007) contends that the attention and behaviour of audiences changes significantly when they enter or leave a performance space (p. 129). Certainly the experience is different for an actor performing in front of an audience versus a camera, but as 'live' and televisual performances overlap more and more, again roles and definitions begin to blur, and the raison d'être for theatre itself comes into question.

Sometimes in reaction to these developments, sometimes for unrelated reasons, some theatre artists working in the 1960s isolated themselves from these technological incursions. Certainly the most antagonistic of these practitioners was Grotowski (1968), who advocated for a poor theatre:

> *The Rich Theatre depends on artistic kleptomania, drawing from other disciplines, constructing hybrid-spectacles, conglomerates without backbone or integrity, yet present as an organic artwork. By multiplying assimilated elements, the Rich Theatre tries to escape the impasse presented by movies and television...No matter how much theatre expands and exploits its mechanical resources, it will remain technologically inferior to film and television. Consequently I propose poverty in theatre. (p. 19)*

Through exploring rituals and actor training, Grotowski tried to reduce theatre to its most essential form, defined by the actor-spectator relationship. Despite the absence of technology, artistic peripheries were again the site of experimentation, as he focused on defining theatre, the work of the actor, and the role of the spectator. Similar work would be undertaken by his apprentice, Barba, in the 1970s and 1980s, as well as other less radical practitioners. Decroux, a student of Copeau's, elaborated corporeal mime. He was not necessarily against technology, but in *Paroles sur le Mime*, Decroux (1963) prescribed a 30 year period of body training before other elements, technological or otherwise, could be incorporated (p. 42). Lecoq was also interested in body work, but concentrated more on mask technique. Brook and Mnouchkine focused their work on intercultural exchange, using improvisation as a learning tool. Finally, the primal theatre of the Living Theatre was very politically oriented, while Richard Schechner's Environmental Theatre (1973),

which preceded his Performance Studies, aimed at the elimination of the performance context. Any space was a possible space for performance: "The fullness of space, the endless ways space can be transformed, articulated, animated – that is the basis of environmental theatre design...all spaces are actively involved in all the aspects of the performance [...] there is no dead space nor any end to space" (p. 1). In this case, the use of technology is one of many possibilities in a performance. Yet again the boundaries between disciplines were the sites of activity, as artists tried to grapple with increasingly loose definitions.

1.3 The 1990s until the Present

The last period of multimedia theatre is marked by the introduction of digital techniques into the artistic domain. According to Berghaus (2005):

> *The electronic and digital media ushered in a new age of avant-garde experimentation, which helped to overcome the long phase of postmodern stagnation. Rather than recycling trends and fashions of the First Modernity, the Media Arts of the fin-de-millenium moved into genuinely new territory and reflected upon altered modes of communication, their aesthetic and social implications, and people's radically changed modes of interacting with the world around them. (p. 237)*

Currently, technology has been integrated, to varying degrees, into most artistic disciplines, and continues to be a source for experimentation. In particular, research has intensified at the level of interactivity and virtual reality, which inclines toward a complete departure from the body. In 1992, for example, the first CAVE (Cave Automatic Virtual Environment) was developed, permitting experimentation with interactive architecture. Other interactive laboratories were created for theatre and dance, such as David Saltz's Interactive Performance Laboratory (discussed in the following chapter), the Performance Animation Tool Box at the Interactive Institute of Sweden, and the interactive workshops offered by Troika Rance. New technologies, such as sensors and motion capture are often central to these labs.

On the performance side, Stelarc and Antúnez Roca have also experimented with technology, creating a variety of prosthetics that could be controlled by

spectators. These new explorations have presented many new possibilities, but also raise many important questions. Berghaus (2005) asks, for example, "How can a user be considered a free and creative co-producer of a work of art when the interactions are predetermined by the author of the software?" (p. 239) An "interactive" installation or performance, even with hundreds of pre-programmed responses, can still feel mechanical when compared with an interactive performance with a live actor or artist. Moreover, Berghaus (2005) notes that in spite of technological advancements, basic problems still remain unresolved: "Despite the strong emphasis on vision, the quality of VR graphics is still so poor that it quickly causes simulation sickness. The only high-fidelity component employed is sound, and even that is not much better than a medium-priced personal stereo" (p. 249). As in the 1960s, these developments can still remain at the *work-in-progress* level.

In dance creation, technology is particularly present. The use of projections is now very common. Dumb Type, Igloo, and Hiroaki Umeda are among the many artists incorporating them. Johannes Birringer (1998) comments on the use of technology in dance:

> *Our experimentation with cameras, camera movement, screen projections, closed circuits, scanners, electronic sampling, mixing and image-processing techniques, and computer interfaces creates challenges to our understanding not merely of the functioning of the new hardware and software but of our acceptance of machines that are perhaps becoming more lively and competent, more flexible and attractive, than our fantasies about computers had envisioned." (p. 134)*

Janis Jefferies (2009) sees a similar substitution potentially taking place when she reflects on the use of motion capture: "Technical ability could just as well be made by synthesizing the motion dynamically with genetic algorithms, neural networks, and optima controllers." (p. 47) Incorporating technology is still very much tied to idealized sci-fi notions of the future; the experiments reflecting the dreams hybrid man-machine creations.

As with the Wooster Group, in addition to its material presence, technology also affects the way in which dance is envisioned. Birringer (1998) describes the notion of 'hyperdance' which he observes more and more often: "a kind of athletic brinkmanship and daredevil movement...there is a rapidly growing scene of younger companies...which seem to celebrate vigorously the sense of risk, danger, and physical abandon proffered by movement aggression and a furious use of energy. Are these dancing bodies furiously resisting the hollowing out, the dreaded yet expected future of the cyborg and its computerized memory?" (p. 76) He cites dance companies Ultima Vez and Lalala Human Steps as examples. Birringer (1998) declares his dissatisfaction with these works, because he feels the speed and the sense of risk are the only elements they bring; "It is the only content of the action." (p. 79) Outside of performances, technology is also used in dance to record choreographies, to make dance videos, to submit work samples, or as a pedagogical tool, in the case of Merce Cunningham's Life Forms software, or William Forsythe's Improvisation Technologies. Birringer (2008) writes on these uses and how they could be incorporated into theatre, which often lags behind in technological developments:

> *Theatre education has much to learn from this and can now turn to the published resources, which enable a systematic study of the aesthetic, technological, and theoretical issues in the historical relations of dance and media over the past hundred years, and specifically in the development of cine-dance or videodance as an independent crossover artform. (p. 10)*

Technology then also has roles beyond performance, namely in education, and can even lead to the inception of other art forms. When criticizing theatre, Birringer speaks primarily about text-based theatre; he does note, nonetheless, an increase in the use of new technologies in postdramatic theatre.

Today there are more and more theatre companies that could be characterized as postdramatic, who work with technology in a similar way. George Coates experiments extensively with projections, as well as Robert Lepage. In Lepage's *Zulu Time* (1999), the stage itself was a giant machine capable of

transforming itself in numerous ways. Marie Brassard experiments with microphones and sound in theatre, while Gob Squad uses technology to play with the actor-spectator relationship. In Gob Squad's *Room Service* (2003) the audience was situated in the foyer of a hotel and watched, through screens, the actors who were in different rooms. The actors contacted members of the audience regularly via telephone. In their *Kitchen* (2007), some spectators replaced actors, who relayed instructions via headsets. These are just a few of an increasing number of contemporary theatre companies who are incorporating technology into their performances.

Continuous actor training, conversely, is found less and less in theatre today. Practitioners, such as Jean Asselin or Anne Bogart, continue their teachings, but are faced with a diminishing interest from younger generations. In some cases, the desires of some scenographers discussed earlier in this chapter have practically been fulfilled. The disappearance or near-absence of the actor can be seen in more and more theatre pieces today. Auslander (2008) discusses PPS Danse's *Pôles* (1996), for example, in which the dancers intermingle with holograms. Reflecting on the company's marketing as Dance + Virtual, Auslander characterizes the performance closer to Dance + Virtual = Virtual, finding that the dancers are the foreign elements in the piece (p. 38). The creations of Robert Wilson likewise reduce the role of the actor, who perform very simple rhythmic actions. During rehearsals, the actors even wear numbers: "quand on a besoin de nous, on nous appelle par ces numéros; d'ailleurs nos noms ou prénoms ne seront jamais prononcés sur le plateau." (Alquier, 1998, p. 365). In the works of 4D Art, some of the actors are replaced by holograms (or more accurately, by pepper's ghost technique). In Heiner Goebbels' *Stifters Dinge* (2007) and in Marleau's *Les Aveugles* (2002), the actors are completely absent from the stage, replaced by sound machines and projections, respectively. A renaissance of actor training does not seem likely, particularly given present challenging economic factors and a lack of interest in the new generation of actors, who are accustomed to the omnipresence of technology.

At several moments in history, in reaction to the content (or lack of content) in the theatre, various figures proclaimed the death of theatre. It is interesting to note similar proclamations are no longer heard, faced with the disappearance of the actor. Nevertheless, in reaction to *Zulu Time*, Patrice Pavis (2003) did write an article supplicating against the contamination of technology in the theatre: "So much technology talks so much it forgets what it is talking about, it becomes an end in itself and exhausts us." (p. 189). His article resonates well with Dixon who comments on technology and content, and those who confuse the two. According to Dixon (2007), it is the equivalent of considering the theatre building as a piece of theatre itself (p. 6). At the end of his historical overview, however, Dixon notes a recent decrease in the use of technology in the theatre, perhaps reflecting the lack of content, and signalling a return to the human body.

CHAPTER II

THE INTERACTIVE PERFORMANCE LABORATORY AND DAVID SALTZ'S TAXONOMY OF 12 TECHNOLOGICAL ROLES

Various contemporary practitioners have presented theories and categorizations to help organize the increasingly diverse artistic works incorporating technology. Among these, David Saltz's taxonomy of 12 technological roles proves quite useful within a theatrical context.

Saltz is a theatre director, professor, and director of the Interactive Performance Laboratory (IPL) at the University of Georgia. His research focuses on integrating interactive technologies into live theatre. While musicians and dancers began to experiment early with interactive technologies, theatre has been slower to incorporate them. Saltz (2001) argues, however, that interactive technologies are well-suited to theatre, because of theatre's immediacy – the performers must always be ready to adapt to present circumstances (p. 109). By working with a number of different interactive technologies, including sound, projections, sensors, and motion capture, Saltz attempts to demonstrate the possibilities that interactive technologies can bring to theatre. After a number of years of experimentation, he also suggested a non-exhaustive taxonomy of the roles technology can play in theatre creation, based on his experiences.

In *Live Media: Interactive Technology and Theatre*, Saltz presents a retrospective look at his work, going over three different pieces which incorporated different interactive technologies.

In *Hair* (1997), for example, a remount of the popular 1960s musical, Saltz worked primarily with projected images. Static images projected behind the actors

suddenly came to life with projected actors or burst "into a psychedelic flow of colors and images" (Salt, 2001, p.111). Actors jumped behind the screen and appeared on screen, and a projected image of John Wilkes Booth fired a gun at a puppet on-stage who consequently dies (Saltz, 2001, p. 113). The interaction, admittedly rather basic as the technique is similar to that used in the 1914 *Gertie the Dinosaur*, went two-ways, the actors both affecting and reacting to the images. Unlike in *Gertie*, though, the projected images were actually controlled by technicians, and not simply a video that was set to play. It might thus be hard to qualify the "interaction" as truly actor-technology, since the technology was mediated by a third party.

In Saltz's following production, *Kaspar* (1999), however, the actor-technology interaction was far more palpable. While in some scenes actors and technicians controlled the interactive technologies, there were many which incorporated various sensors. These included accelerometers, pressure-sensitive resistors, motion sensors, and voice recognition. These sensors were part of the set design, which reacted to Kaspar's actions, mainly through audio, but there was also a large eyeball on stage that followed Kaspar's movements (Saltz, 2001, p. 115). According to Saltz (2001), this made the stage into a giant Skinner box, which complemented Handke's themes of surveillance (p. 117). While the technologies in Saltz's piece were made visible to the audience as part of the aesthetic, one can easily conceive of productions using the same technologies, but hidden and taking on other dramaturgical roles. One obvious limitation with the "interactive" technologies used in Kaspar, however, is that it is always the technology reacting to the actor; it is unable to perform autonomously (as a live actor might). They should perhaps more accurately be qualified then as "reactive" technologies, rather than "interactive."

The last piece Saltz discusses in his article is *The Tempest* (2000). In this production, Saltz again returned to using projections, incorporating "virtual scenery" – projected backgrounds which changed throughout the play. However, more novel was his use of real-time motion capture for the character of Ariel, a computer-generated image. An actor, on-stage, but not interacting directly with the other

performers, was strapped with various sensors, which controlled the actions of Ariel's character. In this case, the actor-technology relationship became more complicated as it was between actor and actor-guided technology. The actor playing Ariel was somewhere between actor and technician, and did not necessarily need to be on-stage, showcasing the technology. Indeed, Saltz later imagines a more sophisticated interactive technology, a completely independent computer-generated character with an artificial intelligence so advanced that allows it to act and react to a live actor on-stage. It goes beyond 4D Art's holographic actors, and recalls Auslander's questions concerning "liveness": What changes when one actor is completely artificial? Or when all of them are? A "theatre space" would become redundant, save being a place to house the hardware.

Following Saltz's overview of his works, the author presents a preliminary taxonomy of the roles technology can play within a theatrical creation. The complete list of 12 roles, including descriptions, is as follows:

> *Virtual Scenery. The media provide a backdrop depicting the environment within which the staged action takes place. This virtual scenery can either be static or animated. The projected island landscapes in The Tempest exemplify this use of media in performance.*
>
> *Interactive Costumes. Interactive costumes invert the relationship established by virtual scenery: while virtual scenery provides a backdrop against which the live actors perform, interactive costumes use the body of the live performer as a canvas for the media. For example, the choreographer Alwin Nikolais painted his dancers with changing patterns of light, and the Gertrude Stein Repertory Company is currently experimenting with the projection of video images on masks. During the final scene of Kaspar, nine Kaspar Doubles came onstage and ritualistically donned black muzzles; a row of LED lights was sewn into each muzzle, and they all blinked in the same changing pattern in sync with a computer-generated musical score that grew to a crescendo until the final moment of the play.*
>
> *Alternate Perspective. The media depict the events enacted onstage from another visual perspective. During a scene in Hair, as actors jumped out of an imaginary helicopter into the wings, on the screen the audience saw silhouetted images of men in parachutes falling out of a helicopter to show the events from another perspective.*

Subjective Perspective. The media depict the thoughts, fantasies, dreams, or sensations of some or all of the characters onstage. The image of Claude falling into the vortex clearly exemplified this use of media, as did an extended nightmare sequence in which Claude imagined a series of pop culture icons (including the Beatles, Bugs Bunny, Superman, and Mighty Mouse) annihilating one another.

Illustration. The media illustrate the performer's words. A common impulse, this use of media can in certain instances be effective. Too often, however, it is merely redundant. I discourage students from using media this way in their projects and usually eschew such use in my own productions. Nonetheless, I have at times resorted to illustrative media, as in Hair when actors sang "my body is floating in space" while the audience watched images of their bodies doing just that. This use of media, however, had a dual function, serving not only as a literal illustration of the lyrics but also as an expressionistic doorway into the characters' hallucinations.

Commentary. The media have a dialectical relationship with the stage action or serve as epic commentary on it. Erwin Piscator's use of slides and documentary film clips as a stage director in the 1920s provides the model for this use of media, which the Federal Theatre Project's "Living Newspapers" of the 1930s famously emulated. Hair provided a straightforward example of media as commentary when, as two live actors sang "What a Piece of Work Is Man," video clips and still photographs depicting the brutalities of the Vietnam War appeared on the screen, highlighting the lyric's irony.

Diegetic Media. Diegetic media exist as media within the world of the narrative--when, for example, a character onstage turns on a radio or television set. Kaspar did not perceive the images of furniture on the screen as real furniture in the room but as representations created by the prompters for his instruction. In The Tempest, Prospero's private cell contained two small video monitors that replicated whatever was being projected on the large screen. The purpose of these monitors was to make clear to the audience that the island landscapes, which all the characters but Prospero and Ariel accepted as real, were actually images manufactured by Prospero. Hence, not only were the images on the monitors themselves examples of diegetic media, but more importantly, the monitors served to alienate the audience from the images projected on the large screen, transforming those images from virtual scenery into diegetic media.

Affective Media. The media produce an emotional effect on an audience. Affective media are nondiegetic; they do not exist within the character's world. The most familiar form is the background music that gave melodrama its name, now ubiquitous in film. While affective media is most often auditory, visual media can also be used for this purpose. In The Tempest, Prospero used his

magic staff to give Caliban cramps. As Caliban writhed in pain, a deep red glow pulsated over the virtual landscape.

Synesthesia. Synesthetic media are similar to affective media, but do not serve so much to tell the audience how to feel about the events onstage as to mirror the performance in a different sense modality. Synesthesia is a neurological condition in which stimulating one sense organ triggers the experience of another sense; for example, a person might "hear" colors or "see" temperature. The undulating bubble in The Tempest, which automatically changed size and shape in response to Ariel's voice, was a classic example of synesthetic media. The animation functioned here as a picture of the sound, translating the music's rhythms, tone, and intensity into images.

Instrumental Media. Interactive technology is used to create new kinds of instruments. For example, one could cover the stage floor with pressure-sensitive tiles and program each tile to produce a different sound or different image when a performer steps on it. This use of media is similar to synesthesia in that it can track the performer's actions very closely. However, in semiotic terms, synesthesia is iconic, while a virtual instrument is symbolic: the relationship between action and effect can be entirely arbitrary, as long as it is predictable. In effect, each sensor-enhanced set piece in Kaspar was a different instrument; once Kaspar learned how it worked, he had complete control over when the audio played. These instruments, of course, were very crude, allowing Kaspar only to turn the sound on or off.

Virtual Puppetry. The media create a performer's double. For example, the animations of Ariel in The Tempest were virtual puppets that the live actress controlled with the motion capture system. Just as synesthesia blurs into instrumental media, instrumental media blur into virtual puppetry. The difference is that while an instrument is an extension of the performer, a kind of expressive prosthesis, a virtual puppet functions as the performer's double. In other words, instruments are something performers use to express themselves (or the characters they play); a puppet is a virtual performer in its own right. This difference is clearest when one considers how the performer's own voice functions in the two cases. When a performer sings while playing an instrument, the audience does not associate the voice with the instrument but with the singer. The instrument "accompanies" the singer. By contrast, one would not say that a puppet "accompanies" a puppeteer. Rather, a puppeteer, such as the actress playing Ariel, gives her voice to the puppet.

Dramatic Media. This type of media representation functions dramatically by interacting with the performers as a character in the narrative. Hair provided a number of simple examples, such as when the live Indians shot arrows at animated soldiers and when the animated Booth fired his gun at the live Lincoln. TheTempest took the dramatic use of media much further. While the relationship between the computer animation and the actress playing Ariel was

> *one of virtual puppetry, the relationship between the same animation and the other characters in the play was dramatic. The animated Ariel was a full-fledged character in the world of the play. (*Saltz, 2001, p. *126)*

Saltz writes that it is this last role, dramatic media, which has been the primary focus of his research; using technology to create increasingly interactive and autonomous characters. The conception of such technological characters raises complex questions regarding "acting". A technology programmed to be Ariel is not "acting" Ariel. It is Ariel (or the programme Ariel). Could a programmed technology ever "act"? If one imagines a live dog on-stage, for example, an audience may be amused by its mere presence, and even be impressed when it completes a "programmed" trick. However, there is no illusion or suspension of disbelief, since the audience is aware of the process that goes into the dog's training. The same goes for watching technological characters in theatre or in films. Could a technology ever "lie" about what it is – the way actors "lie" when performing - and could audiences be taken in? The answer to these questions may reveal whether or not a true "interactive" technology on-stage is actually possible.

Saltz' work and writings have often been used to situate theatre creations incorporating technologies. His taxonomy, in particular, has been used to contextualize graduate work, as found in Ross Brannigan's (2009) examination of digital technologies or Michelle Mills Smith's (2007) look at machine actors in the role of dramatic media. It is certainly not the only taxonomy that has been proposed. The Performance Animation Toolbox, for example, proposed a classification system, though it is specifically based on the technologies used in their laboratory (see figure 2.1). The general nature of Saltz' taxonomy makes it more useful and easily applicable in work and discussion around theatre and technology. While not comprehensive, it is certainly a valuable tool for focusing research on theatre and technology. It presents a useful vocabulary for discussing technology in dramaturgical terms, and can help creators define how they are using technology. If, for example, one decides to look at the role of dramatic media using sound

technology	*dramaturgy*		*aesthetics/design*
	sensors/mapping techniques	*dynamic systems/databases*	*audio/visual expression*
	Magnetic MoCap Video tracking Infra red Joystick Temperature Touch pads	Inverse kinematics Steering behaviours Games / AI State machines Self organising maps	2D/3D graphics Character design Digital set design Trick film Sound design Electronic music

Figure 2.1 Classification Used by the Performance Animation Toolbox (Callesen, et al, 2005, p. 71)

technologies, one can already anticipate that the research will likely be limited to vocal recordings. Of course, there may be exceptions, and the roles may overlap; however, the taxonomy is not used to impose limits, but rather to help define the research focus. It is in this way that the taxonomy has been applied to the practical component of this research. Where Saltz experimented with technology as dramatic media, this research paper looks at the role of interactive costumes. This role and the subsequent choices which proceeded will be discussed in further detail in the following methodology chapter, including issues which recur when trying to characterize technology as "interactive."

CHAPTER III

PRACTICAL RESEARCH METHODOLOGY: CORPOREAL ACTING WITH PROJECTIONS AS INTERACTIVE COSTUMES

As the goal of this research is to better understand the acting possibilities with technology, the practical work proposed did not focus on presenting a final creation, but on the exploration process itself. This allowed for greater time dedicated to exploration and workshop and also provided an open platform for discussing the work.

To begin, it was necessary to narrow the field of study, given the multitude of technologies and actor training techniques. Using Saltz's taxonomy of technological roles was useful in this regard as it provided a clear delimitation of the subject matter, which could be easily applied to practical research. Based on the selected role, interactive costumes, a complementary acting technique, corporeal training, was chosen. This association, of course, assumed that different technological roles favour different acting techniques and vice-versa; however, it is certainly conceivable that such preconceptions could be broken.

Beginning with one of Saltz's technological roles allows one to narrow the research focus and investigate a single technological aspect in depth. Interactive costumes were selected because the role corresponds well with physical theatre training, which is often associated with continuous actor training (for example in the work of Bogart, Barba or Decroux). By looking at technology within an actor training context, new links should arise that foster further acting developments in contemporary theatre. The role was also selected with projection technology in mind, since the hardware is both very accessible and aesthetically intuitive to implement.

On the technology side, then, the practical research focused on using projection technology to costume the body of an actor.

On the acting side, techniques drawn from mime and neutral mask were selected, because again they are the most natural fit for projection technology. If, alternatively, a sound medium had been selected, corresponding exercises would likely have been drawn from vocal techniques. As in mime technique, mirrors are used in the research. This allows the actor to observe himself from the outside, in addition to being able to see the projection directly on his body. They also give the actor autonomy from the director or technician, since he can see directly the results of his actions. The distance gives an overall perspective of the image or video, which is not possible otherwise. Nevertheless, a third-eye was also present during some of the rehearsals, to provide additional feedback on the progress of the work. For a diagram of the technical setup, see figure 3.1.

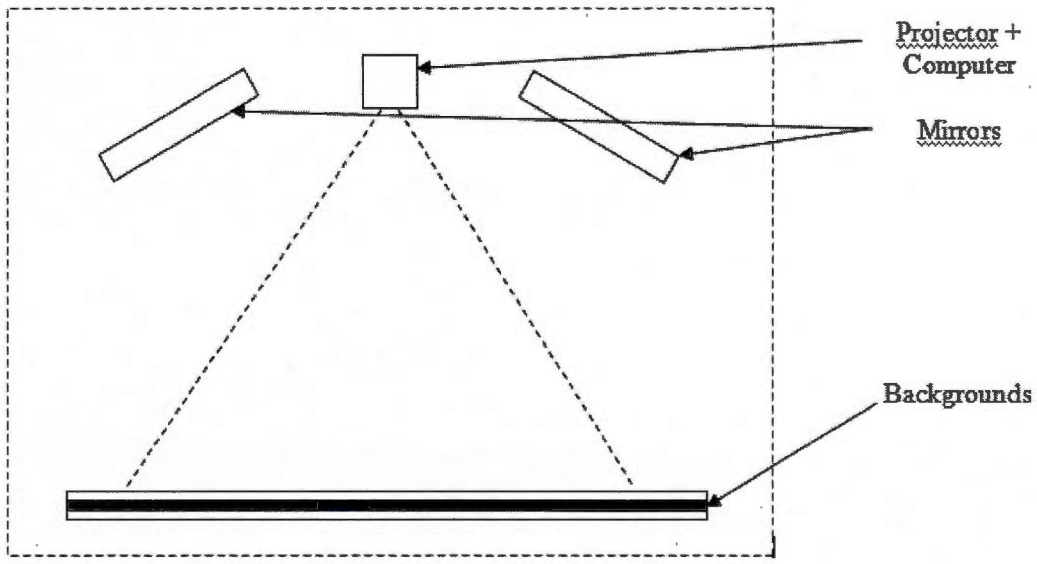


Figure 3.1 Diagram of the Technical Setup

Seeing the projections on his body, the actor can be inspired by what he sees to find a corresponding movement and voice. In this sense, it resembles Lecoq's neutral mask work, though replaces the actor's internal imagery with an external stimulus. Simon Murray (2003) describes the neutral mask as a "tool towards characterisation," and in this way, working with projections is no different (p. 73). The actor uses the projections as a starting point or entry into creation. Themes traditionally used in neutral mask exercises, such as colours, elements from nature, materials, and animals, were transposed into projections. Unlike the neutral mask, though, which stays in the rehearsal space, the work with projections can later be presented in a more formal context.

At this point, it has likely become clear that "interactive costumes" is a misnomer for this exploration, as it is primarily the actor reacting to the technology. Indeed, even in Saltz's description of the role, the actor and technology are relatively independent. At least within this research project, there was a dependent relationship between actor and technology. Nonetheless, to truly be dubbed "interactive," a co-dependent relationship would need to be established - the projected images also reacting to the actor's movements, likely through the use of sensors. A clear example of this could be found in Cirque du Soleil's *Totem*, where infrared cameras detected the actors' movements, so that their footsteps created ripples in the water as they walked through.

Explorations began through improvisation with projections, but with the goal of finalizing certain movement passages. Successful matches could serve in both actor training exercises and in final creations, just as with mime and neutral mask (minus the mirrors and masks). It is the latter that is the primary focus of this research. While the practical research component did not result in a final creation itself, the movements that emerged could serve as the "germs" towards a final creation. Depending on the technological role, the technology selected, and the performance style, the outcome might lend itself to certain styles of theatre more than others (for example, corporeal theatre rather than realism). Of course, it is

entirely contingent on the artist's conceptualization of a piece. The germs could feasibly lend themselves to a number aesthetics, be they in performance, dance, theatre, or otherwise.

Regarding the projection content, the images and video were selected based on the corporeal acting techniques. This assumed that images which would create an "immersive environment" were the most suitable for stimulating the actor's movement. These included colours, patterns, textures, photos and video. Live video (using a camera) was also used in order to explore Dixon's notion of the "digital double". Other technical aspects were also explored, including the positioning of the projector, the background, and the dimensions of the image/video. As some projections were more likely to "work" better than others, based on the actor's and the outside eye's subjective perception of the actor-projection synthesis, a certain amount of trial-and-error was required. However, such a period is both necessary and beneficial, as it allows the actor to understand more fully the possibilities (and impossibilities) of a technology, and to appropriate it more thoroughly into the acting technique. In this case, the actor becomes the site of interdisciplinary creation, mastering several art forms at once, in order to better synthesize them.

Towards the end of the exploration period, other elements were added to the research in order to anticipate further potential research possibilities. Props, costumes, text, and sound were introduced. Their inception provided a glimpse into both promising and challenging avenues. However, these additions were only briefly explored, as they were peripheral to the research focus.

Throughout the exploration process, detailed notes were kept regarding all aspects of the work. These included inventories of images, videos, and other elements that were used. They included notes on successful matches between various projected images and acting styles. They also included personal thoughts, feelings, and reflections on the work as it progressed. Of particular interest were comparisons between work with and without the projection technology. Did certain projected images heighten aspects of corporeal theatre? Were other aspects

diminished? Are there are any rules or guidelines that could be derived from the work, which would be useful in future research or creation? What are the most significant challenges posed by this type of work? By identifying the advantages and disadvantages of the technique, it becomes easier to understand under which circumstances this type of work is best suited. One can also infer what other actor-technology areas merit research.

Following the practical exploration phase of the research, the most pertinent results and successful matches – the germs towards actor-technology embodiments - were presented in a conference-demonstration. The conference briefly covered the historical and theoretical basis for the work, but focused primarily on the key results of the practical research. It concluded with a mini-creation, which demonstrated a variety of discoveries found throughout the explorations. The mini-creation was made by creating a montage of selected movement-projection combinations, leading to a short performance text. This was then followed by a short question period, which allowed opportunity for dialogue. The questions and comments have been considered for this submission and the recorded conference-demonstration accompanies this paper.

The results of this practical component, presented in the following chapter, should serve in suggesting further research and creation possibilities with other technological roles, other technologies, or other acting techniques. They also place one in a better position to understand acting with projection technology, as well as the actor-technology work process more generally. By complementing the historical and theoretical aspects of acting with technology with the practical exploration presented here, it is hoped that this research will not only present the reader with a more global picture of the actor-technology landscape, but advance the debate as well.

CHAPTER IV

RESULTS OF THE PRACTICAL EXPLORATION

The practical investigation with projections was broken down into a number of steps, from very basic and technical explorations of light, to projected colours, patterns and images, moving onto video (and live video), and concluding with the addition of supplemental elements, including props, costumes, and music. The breakdown was partly inspired by exercises found in neutral mask, where actors work according to various themes, including colours, nature, materials, animals, and so on. Dividing the work this way helped focus the trials further and to note changes as complexity increased. This in turn allowed one to take advantage of the best qualities of each element.

4.1 Technical Exploration and the Projector as Light

Workshop began with a brief look at the fundamental changes that occur when selecting the projector's placement. The changes are quite obvious, affecting primarily the projection size and shape, as well as the actor's shadow. These are important to note, however, as they impact the initial setup for the projector, and also aid in guiding the actor.

As trials with different images and video progressed, eventually the projection area was limited up to the actor's neck, cutting out the head, as it was found that the appearance of the head often broke the total effect of the projections, perhaps because it was too distinct from the projections, which were often abstract. If one wished to illuminate the head, however, the actor could always duck down into the light, or the projection area could be modified. Alternatively, a stage light could be

used to light only the head or torso of the actor, splitting the actor's body into a projected area and a stage-lit area.

Unless one wanted to play deliberately with the actor's shadow, it was important for the projector to be placed relatively level, if not above the actor, so that it would be the least distracting. The actor can also help reduce the effect by staying close to the background. Shadows are also useful for the actor to gauge his placement within the projection, in a relatively subtle manner, and free from the mirrors. As shadow work (including shadow puppetry) necessitates only light rather than digital projections, it falls outside of this research project's focus; however, it is certainly an area that would merit research.

4.2 Backgrounds

Again briefly, different backgrounds were used, mainly white and black, in order to understand their differences in relation to a moving body in front of them.

With white backgrounds, images and video stand out clearly, which may be desired, but generally distract attention from the actor's body, as the projections are too crisp and clear. Particularly when a realistic video is used, it is very difficult for an actor to distinguish himself, and he is often relegated to playing as a chameleon within the projected image or video.

Black backgrounds, on the other hand, absorbed most projections, especially darker ones. This was more ideal if the focus is on the actor's work. When an actor dressed in white plays in front of a black background, focus is drawn much easier to the actor, unless the projection is a very bright one. Thus, for the majority of trials, a full white costume was worn to maximize the projection surface on the actor. A number of different costumes were tried out. Generally speaking, the smoother the costume's surface areas the better the results; wrinkles tend to take away from the hybrid effect between the actor and the projection. Note that in this chapter's photos, the background images are difficult to distinguish, but are present in a live setting.

The configurations mentioned all assume a direct frontal projection, where the background can at times complement the actor's performance, but at others distract the audience's attention. To eliminate the background all together, one would need to project from high above, so that the only spill is onto the floor. If the actor was playing on a raised stage, audiences might then only see the actor's body with projections. However, this type of setup is fairly rare, so could not be experimented with much during workshop, and would not be particularly useful in practical application.

4.3 Projecting Colours

In neutral mask, playing colour is a classic, if challenging, exercise that students undertake. Asked to imagine a single colour, the actors then begin to move and eventually use their voice according to how they imagine that colour would be.

Initially, it was assumed that this exercise would lend itself easily to working with projections. Rather than imagining the colour, though, the actor would see it on his body, and react. However, for purely physiological reasons, this is actually impossible in practice. The reason for this is that the eye adapts to the colour that is perceived. Much like wearing sunglasses, when an actor looks at himself in the mirror with a projected colour on his body, little or no colour is actually perceived beyond the colour of his outfit. There is thus no stimulus to react to.

In order to distinguish projected colours, some kind of reference is needed. If, for example, both blue and white are projected, then the blue becomes much more evident, and can become a source for movement inspiration (see figure 4.1). It is easy for the actor to perceive such changes in colour when looking in the direction of the projector. Nevertheless, viewing a projected colour on one's body (which often appears quite

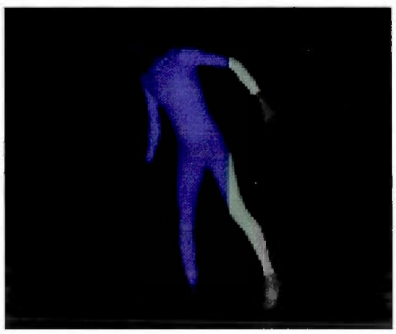


Figure 4.1 Revealing Blue

distilled) is far less stimulating than imagining it, so overall the exercise failed. As mentioned in the previous section, though, it is worth noting that certain colours - darker colours - do emerge more than others, particularly when an actor in white steps into a dark projected area. This information is useful when selecting images, photos and video. It was also useful in devising a "discovery exercise," wherein the actor, standing outside of the projection, slowly dips his fingers into it and gradually immerses his entire body (see figure 4.2). The slow revelation of the body can be used to playfully dissect the parts of the actor's body, as well as help more fully engage with the projection. In general, the edges of the projected area are full of potential for exploration, as actors or props can instantly appear and disappear.

Figure 4.2 Discovery Exercise

4.4 Projecting Patterns

Patterns projected ranged from simple patterns of black and white lines or dots, to more colourful and complex designs and fractals. Basic patterns began to bring out the dimensional qualities of projection. Simply walking back and forth through projected black lines or dots, it appears as though the actor is moving behind the black projected areas, covered in the projected elements or peering out as he comes into the light (see figures 4.3 to 4.5). By moving towards and away from the projector, the projected plane also appears to shift, as if pushed by the actor. Additionally, by waving an arm, leg or object, the projection is revealed closer to the spectator, as if it were one of many otherwise invisible planes (see figure 4.6). One can take advantage of such optical illusions in a number of ways. On a basic level, they could be used to evoke floating props or simple set elements, such as a prison bars or a window, crossing into the technological role of virtual scenography (see figures 4.7 and 4.8). One can use the effects to hide parts of the head or body.

Figure 4.3 Projected Dots

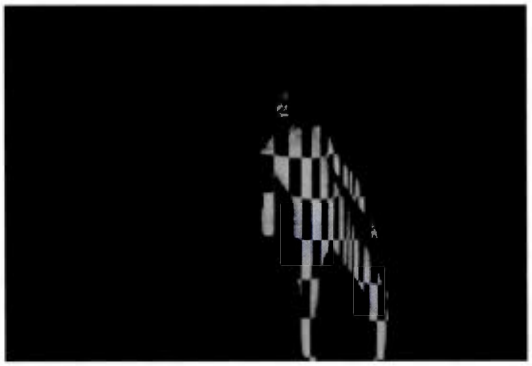


Figure 4.4 Peering Around the Black

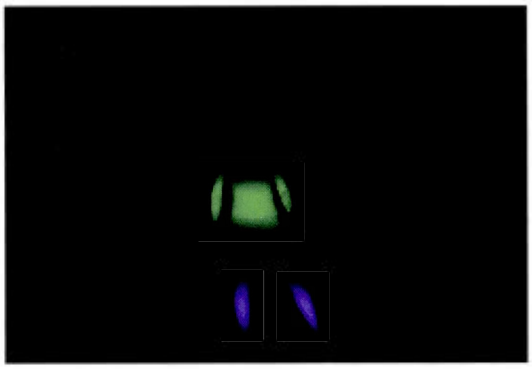


Figure 4.5 Hiding Behind Colours

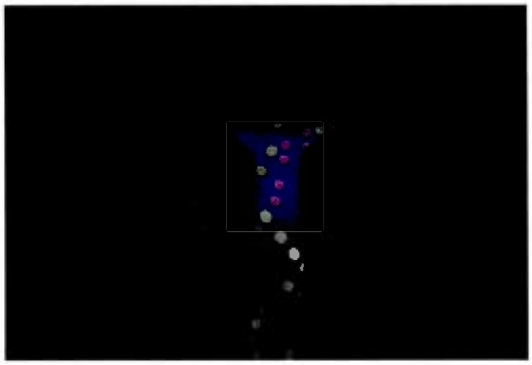


Figure 4.6 Revealing Coloured Dots

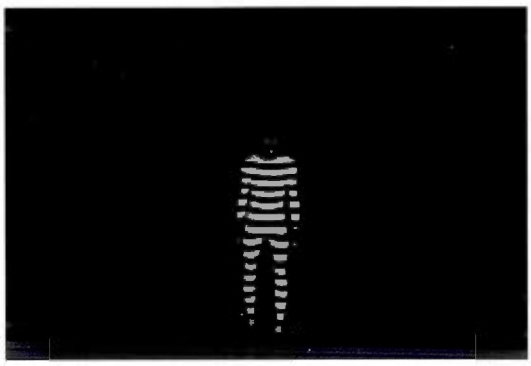


Figure 4.7 Window Blinds

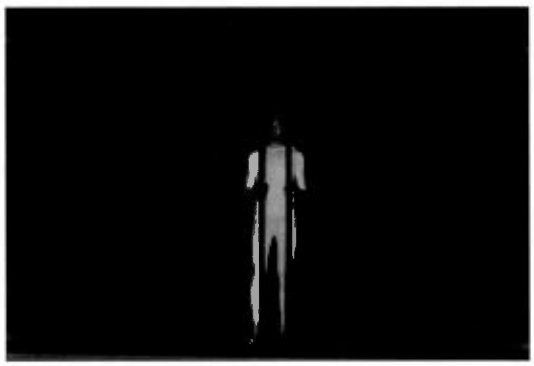


Figure 4.8 Jail Cell

They can also be used for playing with abstract movement across the three-dimensional plane. A projection of red and white curved stripes, for example, lends a sinuous and sinewy quality to the torso, as it flexes forward and away from the projection (see figure 4.9). Of course, the effect can be exploited simply for its inherent aesthetic qualities. Interesting patterns can suggest shapes to trace or inspire various movements. The projections themselves could then become rich source material for the performance text of a creation. It is not difficult to orient oneself within patterned projections, which makes it easy to work independent of the mirrors and to easily take advantage of these effects.

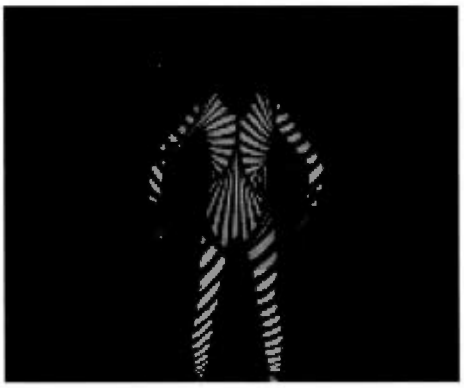


Figure 4.9 Muscular Effect

It is beneficial for the actor to be aware of these dimensional qualities. When a suitable image is used, the actor can make the most of the three-dimensional effect with movement towards and away from the projector. The torso, being the body's largest surface area, has a heightened role in this regard. It is thus crucial to develop its expressivity, and mime or other corporeal exercises would lend themselves well to this. Working with the mirrors, one can also measure how much one needs to move in order for dimensional effects to be perceived.

4.5 Projecting Textures

Both images of real and abstract textures were used in workshop. Real textures included fabrics, metals, stone, water, and other natural elements, as well as human and animal skin or tissue. Abstract textures included paintings and computer-generated images. Textural projections began to bring the work much closer to neutral mask exercises. This was largely due to the fact that, unlike projections used in previous sections, the projected textures allowed the actor to disappear (or be integrated) completely within them, making the projections far more

stimulating to the imagination. By contrast, the work also began to distinguish itself from neutral mask, as the immersive environments are not possible without the use of projections. Acting with projections thus has a small niche for itself, existing not as a substitute for other performing techniques or exercises, but parallel to them.

While some projections (particularly lighter projections or more realistic projections) were less successful, others were very evocative, creating an immersive environment for the actor to explore with his body. Darker textures which contained some variation were most successful, as they left much for the audience to discover when actor moves through them. The computer-generated image featuring reddish oil in a starry landscape, for example, works very well because of its dark colours, and numerous areas that can be explored with different parts of the body (see figure 4.10). Many other variegated computer-generated images were successful as well (see figures 4.11 to 4.16). Such images could be interpreted as being part of a cave, a section of outer space, under the sea, or an alternate dimension, depending on the actor's movement.

Overall, the projection work resembles neutral mask work most when the images are abstract, rather than realistic, as they lend themselves to wider interpretation, both in the actor and in the audience. Real images from nature, for example, are far less stimulating than simply imagining the elements, as they point directly to a single signifier, while imagining a natural element may reference many. Nevertheless, some images, such as fire or oil (see figures 4.17 and 4.18) were successful in evoking strong impressions, both mental and aesthetic. Certain animal skin projections also worked well, but might lead to rather obvious dramaturgical choices. Cow, tiger, zebra, and cheetah skins were successful in evoking a human-animal hybrid (see figures 4.19 to 4.21).

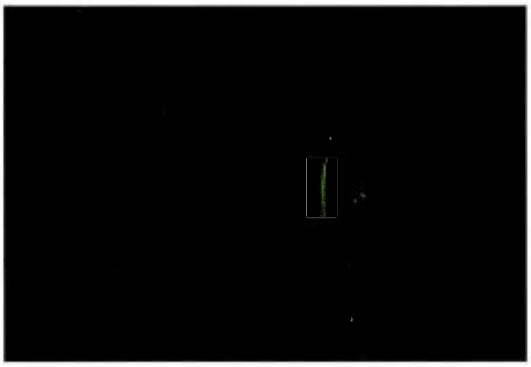


Figure 4.10 Red Starry Oil Texture

Figure 4.11 Flower Pattern Texture

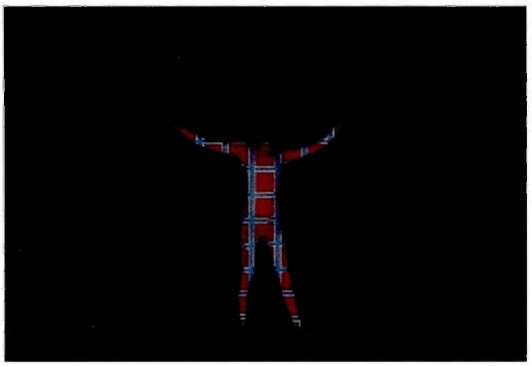


Figure 4.12 Plaid Texture

Figure 4.13 Ice Fractal Texture

Figure 4.14 Red Fractal Texture

Figure 4.15 Black Liquid Texture

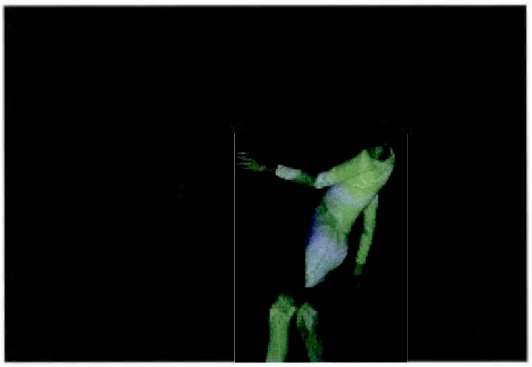


Figure 4.16 Leafy Texture

Figure 4.17 Fire

Figure 4.18 Oil

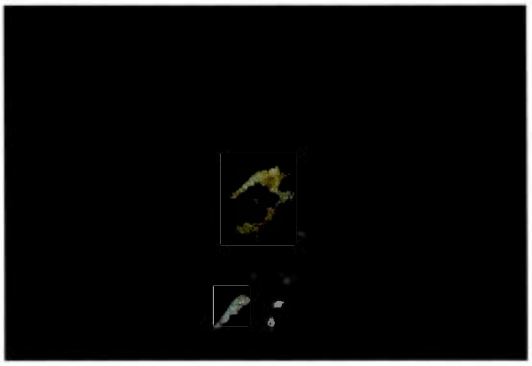


Figure 4.19 Cheetah Skin

Figure 4.20 Pink Zebra Skin

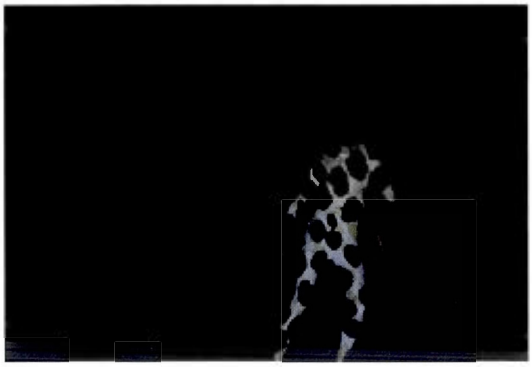


Figure 4.21 Cow Skin

4.6 Projecting Text

A number of different text samples were projected, ranging in size, font, and colour. However, in general, textual projections were far less immersive than previously attempted textures (or even patterns). Using the body as a canvass for text can, nevertheless, lead to some interesting scenographic effects, with the audience reading passages on the actors' bodies. However, this falls outside the technological role of interactive costumes, being better to suited to virtual scenography.

4.7 Projecting Images and Photos

Photos and realistic paintings followed textural and text projections. As found with textures, realist projections, such as landscapes, objects or portraits, were often less stimulating, and more difficult to work with. This is likely due to the contrasting nature of the realistic projections and the more abstract corporeal movement, or simply the mere presence of a distinctly human body within the image. Realistic photos and images could certainly be useful in other technological roles, such as virtual scenography (as background settings behind the actor), for commentary (for documentary purposes – interacting with a slideshow, for instance), or even as dramatic media (if the images - of people or animals, for example - were to take on a persona). Alternatively, the actor could highlight different parts of a projection with his body to illustrate a narrative, which might fall into the roles of illustration or perhaps virtual puppetry. However, as these examples fall outside of the realm of interactive costumes, they were not researched extensively.

Where real images were occasionally successful was when the images projected onto the actor took on a role that differed from the image itself, as it was reshaped onto a human body. A cable, for example, transforms the actor's arm into that of a cyborg (figure 4.22). A steel

Figure 4.22 Cable

water tower gives the actor's body a more metallic feel (figure 4.23). A hand x-ray becomes a full skeleton for the actor (figure 4.24). Zoomed-in images of smaller objects, such as the hand x-ray, fruit innards, viruses, or fingerprints can be quite evocative (figures 4.25 to 4.27). Objects can also be only partially revealed, as with the corpse or brain (figures 4.28 and 4.29). Layering objects or even human and animal bodies onto the actor's body renders the image abstract and, when successful, quite stimulating to both the actor's and audience's imagination. Unfortunately, because the images were realistic, this type of merging requires a high-degree of control from the actor, who must make sure he is correctly positioned at all times, in order to preserve the illusion. With practice and by well-placing the images in space, however, the reinterpretations could be promising. Though many realistic images work poorly, they are still worth exploring as those that do work can be highly effective and add contrast to a repertoire of abstract projections. One easier image category to incorporate of note is map imagery (see figure 4.30). The vague outlines on a human body often work well aesthetically, and could be interpreted in multiple ways. The actor can often move in them relatively freely, as they border on the abstract. Even subtle motions can be easily registered due to the sharp lines, fine details, and numerous crisscrossing shapes.

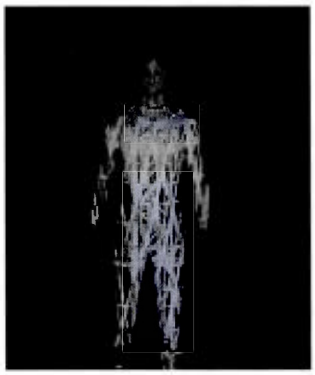


Figure 4.23 Water Tower

Figure 4.24 X-Ray

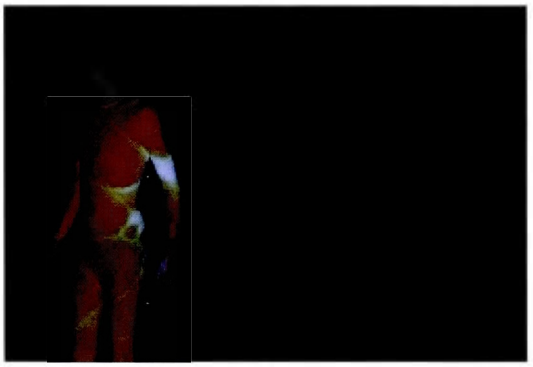


Figure 4.25 Enlarged Orange Interior

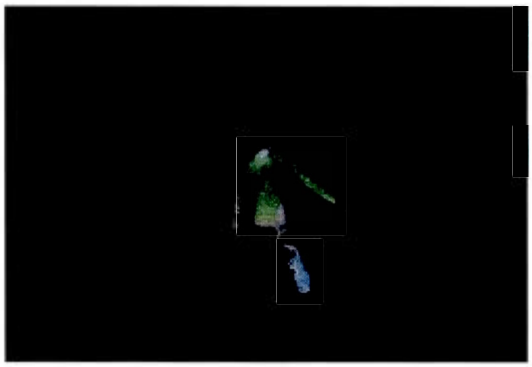


Figure 4.26 Enlarged Virus Image

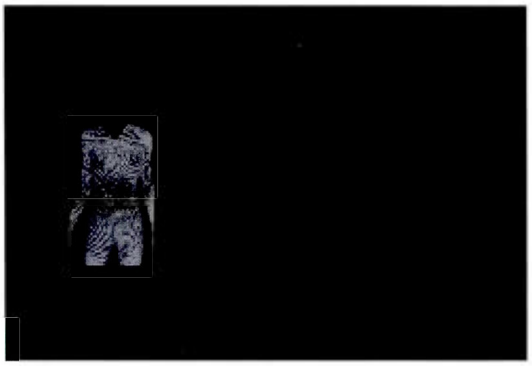


Figure 4.27 Enlarged Fingerprint

Figure 4.28 Body Revealing Corpse

Figure 4.29 Hand Revealing Brain

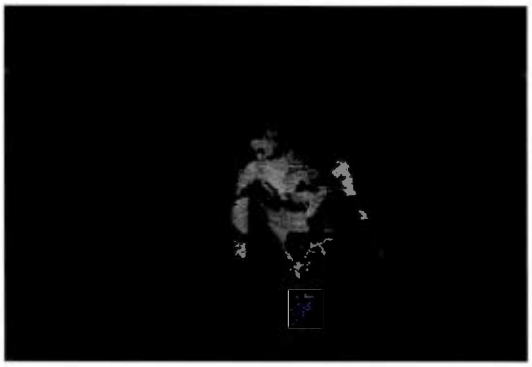


Figure 4.30 Static Map Projection

4.8 Projecting Animations

Moving on from images, basic animations were introduced. These ranged from projections of moving objects to projections with general movement in one or more directions, such as waves or animated fractals. Again both abstract and realistic projections were used, and again abstract animations were easier to incorporate. The most successful animations were looped, reversed or slowed down, so they could be worked with for extended amounts of time.

With animations and the addition of movement into the work, new insights concerning the actor's movement, as well as the selection of projections, presented themselves. Most notable was the need for slow movement. Already with static images, slower movement tended to work best, allowing the spectator time to see the details of the projections on the actor's body. When the projected images are moving as well, the choreography between actor and projection becomes more complicated. Generally speaking, the faster the animation, the slower the actor's movement must be, likely because it gives the audience that much more time to take in the synchronization of the projection and the body. If the movement in a projection is rapid, the actor must practically freeze in place to avoid a muddled picture. There are of course exceptions, particularly if the animation is relatively simple, as found with a projection of simple animated squares (figure 4.31). Nevertheless, it is a significant limitation of acting with projections.

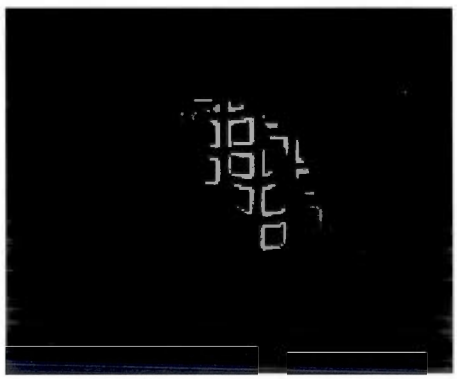


Figure 4.31 Animated Squares

In addition to movement speed, the direction of the actor's movement can be played with in order to parallel or contrast with the animation's direction, depending on the desired effect. Moving up in sync with bubbles that are floating up, for example, gives a different impression of speed than actor falling down through the same bubbles (see figure 4.32). A

similar effect occurs with a rotating globe (figure 4.33). Again, maps lend themselves to many interpretations, including robotic or science-fiction qualities (figure 4.34). Obviously animations with more generalized movement are easier to work with than those where the movement is more precise.

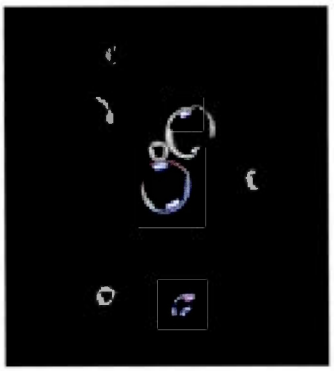


Figure 4.32 Bubbles

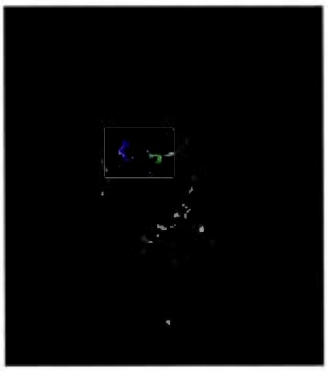


Figure 4.33 Globe

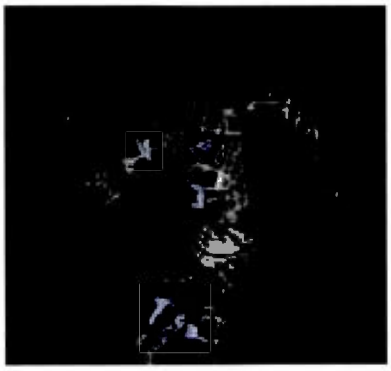


Figure 4.34 Map

As with static patterns and images, the content of the animations will likely inform the dramaturgy of the actor's movement. The actor may derive his movement choices from the projection's motion or shapes. For example, the perpetual slow motion of the black and white striped form led to equally slow and abstract movement choices (figure 4.35). Alternatively, the animated projection may become a scenographic or character element in a scene. In figure 4.36, an approaching green mass, which eventually envelops the actor, could have both abstract and literal interpretations in a piece. In this case, the technological role overlaps into virtual scenography.

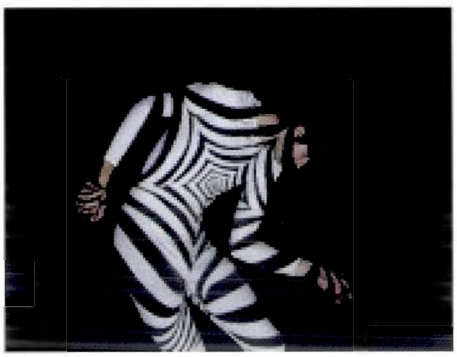


Figure 4.35 Striped Animation

Figure 4.36 Green Animation

4.9 Video Projection

There is some overlap between animations and video projections, particularly if only a short segment of video was cut, looped, reversed, or slowed down in order to give time for performance. As with animation, the actor's movement was better if it was relatively slow, and abstract projections tended to work best. Large realistic scenes (of people, for instance) draw too much focus away from the actor. However, videos could be modified to balance the view between actor and projection. By slowing down video, for example, the audience can take in both the video and actor relatively easily. Similarly, if the content of the video is quite limited, it is quite easy to take in both the actor and projection. For example, a large set of mirrored clock gears that slowly turned and moved back and forth worked well with an actor's "ticking" movements (figure 4.37). Repeating flames worked similarly to their static

Figure 4.37 Rotating Gears

counterparts (figure 4.38) and a wave of water could be played with as with a real wave, both over and under the tide's surface (figure 4.39). Smoke rising is also a particularly effective choice (figure 4.40). Fast motion night-time sequences, featuring numerous city and car lights, also work successfully as the focus is relatively simple, and the dark projection is revealed to great effect on the actor's white outfit (figures 4.41 and 4.42). Lastly, a recorded road sequence, following a car in the center of the projection, worked relatively well if the actor's movements followed the movement of the road (figure 4.43). In this last case, once again, the technological role overlaps with virtual scenography.

Figure 4.38 Fire

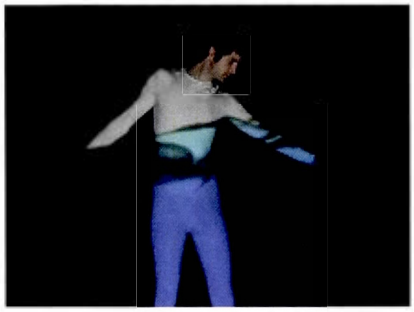


Figure 4.39 Water

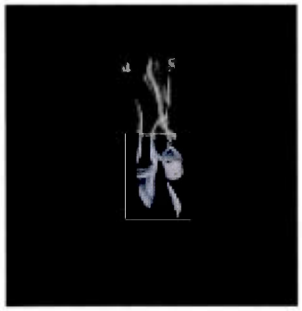


Figure 4.40 Smoke

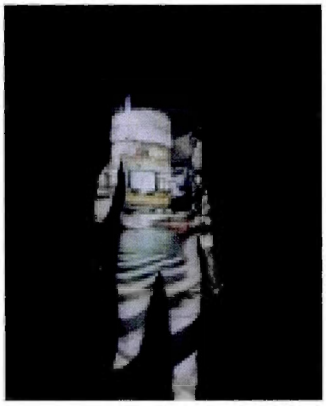


Figure 4.41 Cityscape 1

Figure 4.42 Cityscape 2

Figure 4.43 Following a Car

Abstract computer-generated videos, such as video fractals and textures or 3D CGI videos, worked very successfully. They were particularly successful if the

content was dark, engulfing the body and stimulating both the actor's and spectators' imaginations. With such projections, the movement is likely to be abstract, which could work in a theatre piece, but lends itself equally well to dance or visual art aesthetics. The abstract shapes and bright colours of the projections in figures 4.44 to 4.47 were particularly captivating as they continual morphed. Such projections could be enjoyed for their own sake, and thus demand equally captivating movement if the actor's presence is to be justified. The fast kaleidoscopic video projections of figures 4.48 and 4.49 generally worked well, contrasting successfully with the actor's slow movement. Again, such projections would likely be employed for a relatively abstract scene or else in dance, performance or the visual arts.

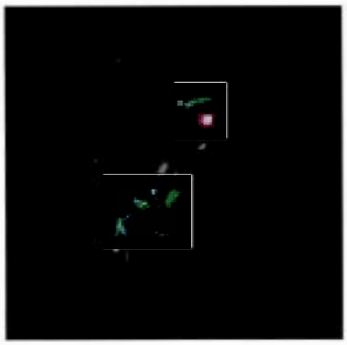


Figure 4.44 Abstract I

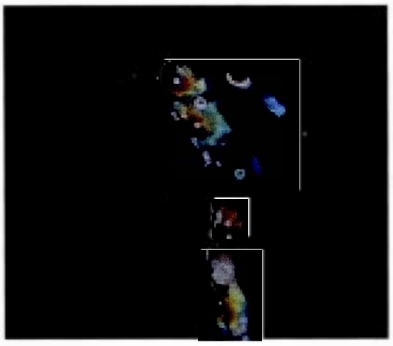


Figure 4.45 Abstract II

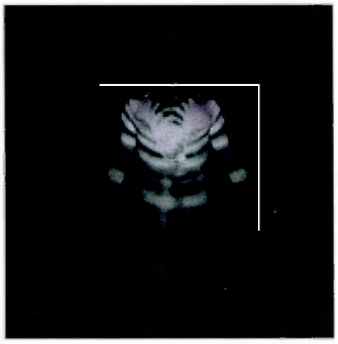


Figure 4.46 Abstract III

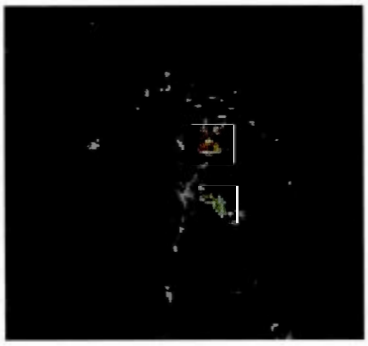


Figure 4.47 Abstract IV

Figure 4.48 Kaleidoscope I

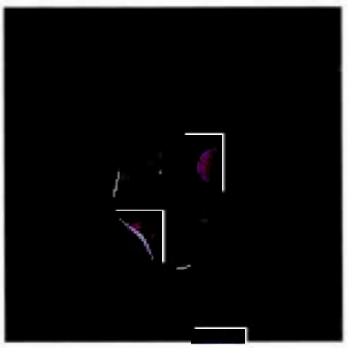


Figure 4.49 Kaleidoscope II

4.10 Live Video Projection

Live video projection deviates significantly from the previous projections. Not only does it require an additional video camera setup, but the nature of the projection is also different, as it responds directly to the actor's movement. It could thus be considered the only truly "interactive" costume in the repertoire of projections. Nevertheless, while perhaps interactive, the digital double, as Dixon terms it, is relatively limited in the role of a costume. It is better suited to other roles such as subjective or dramatic media, where it could be used as a fantasy or character. The actor's relation to his projected image could be manifold, but wearing the projections presents few widely applicable possibilities. For this reason, workshop with live projection was relatively brief.

Though the digital double is limited as an interactive costume, it is still interesting to play with one's own projection on one's body. The projection of an actor clad in white appears somewhat greenish. When the camera and projector are similarly aligned (on the same vertical axis), the projections multiply (see figures 4.50 and 4.51). If they are exactly aligned, the projection either becomes completely white or multiplies seemingly infinitely, albeit with a slight delay the further the images go out. The result could be many of the actor's hands or legs projected onto his body, which is a fascinating effect, though perhaps limited in its practical application. It would lend itself well to a new media installation or, better yet, to dance, due to its synchronicity and repetition. The effect does not stimulate the imagination as in neutral mask work or the immersive environments of some projected textures. Rather, the movement becomes a game with the projected self, the way one might play in front of a mirror. Though a performance could be devoted solely to exploration with the digital double, it is more likely to be a relatively short segment in a final creation.

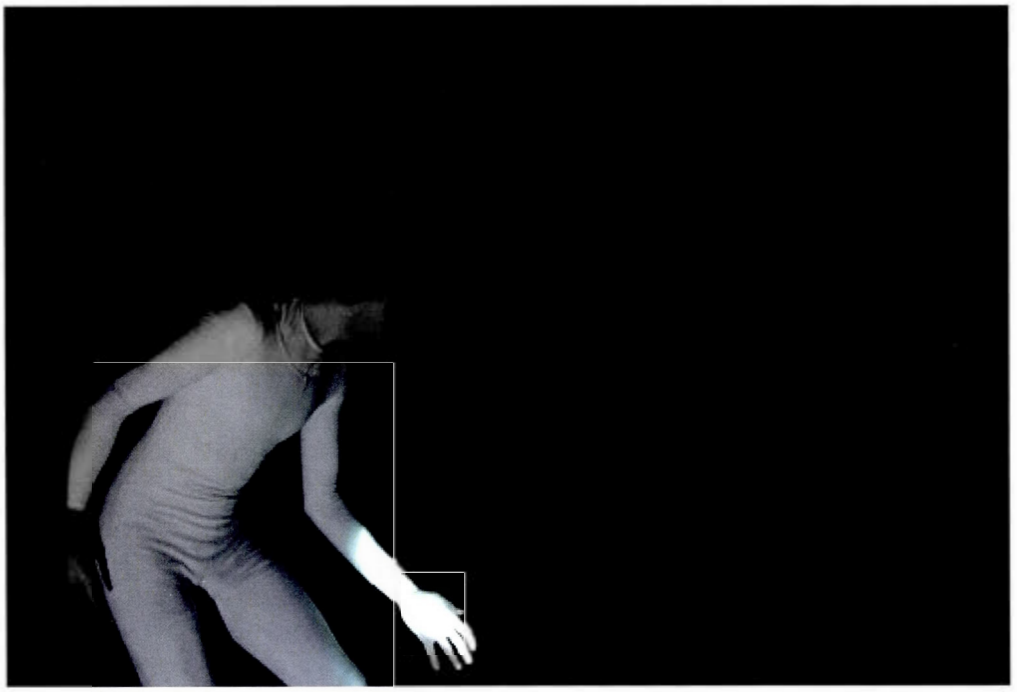


Figure 4.50 Digital Double Projected Repeatedly

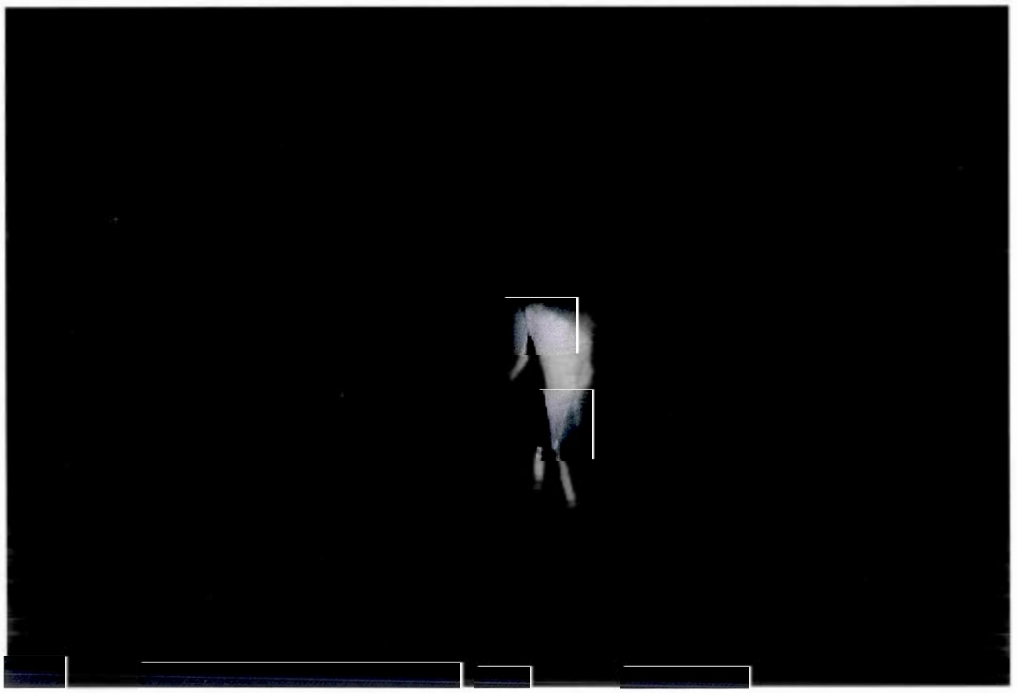


Figure 4.51 Digital Double Projected On Self

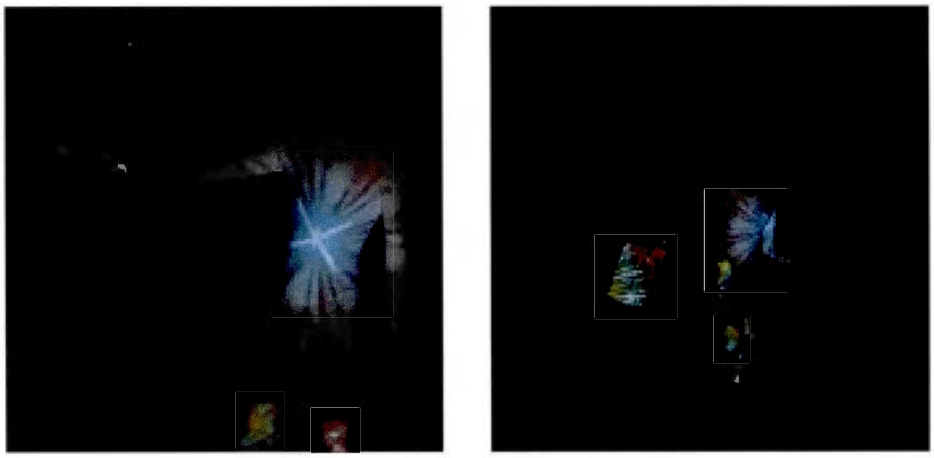
4.11 Additional Elements

4.11.1 Props

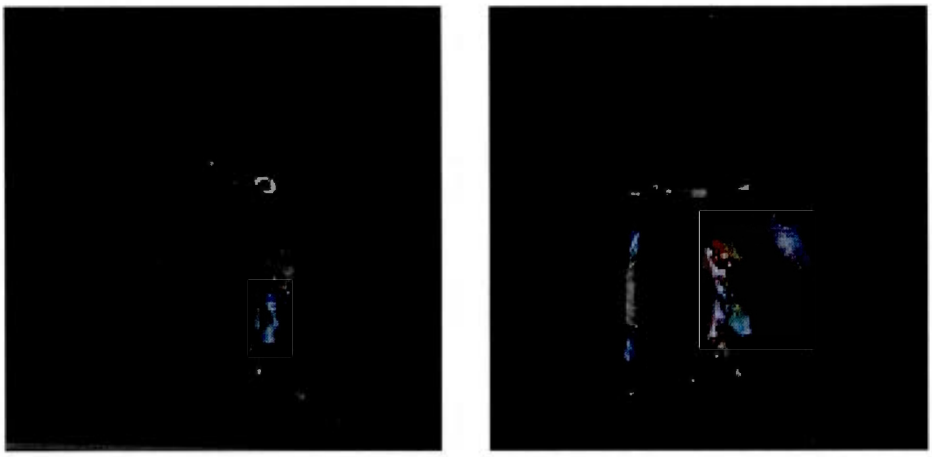
Various props were briefly looked at, in order to infer some early possible uses and general applicable rules. Props used were all white and were chosen according to their various qualities (hard, soft, big, small, etc.), so that a range was represented. They included string, sticks, books, boxes, sheets of paper, cups and plates, masks (one plain, one character), and toilet paper. Depending on their material qualities, different potential uses emerged.

As with the body, whose presented surface area dictates the effect of the projection, a basic perceptible surface area for props is crucial. If props are too thin, such as string or sticks, they can easily disappear within the projection. The exception is if the object is moving enough, revealing the projected image closer to the audience - just as when the actor waved his arm to reveal different planes within patterned projections. Whether a prop is malleable or not will alter the effect of the movement. For example, stiff props, such as sticks, that are waved in front of the projection will reveal a fuller, more complete portion of the projection (see figure 4.52), while looser items, such as string, will reveal the projection far more haphazardly. To be perceptible at farther distances, it would be better to opt for thicker/wider props such as toilet paper or ribbon over string, or larger dowels or boards over sticks (see figures 4.53 to 4.56). Smooth, clean surfaces are preferable to wrinkled or spotted ones.

Figure 4.52 A Stick Reveals the Image



Figures 4.53 and 4.54 Cup and bag: Even close up, the cup does not register



Figures 4.55 and 4.56 String and Toilet Paper: Both visible, the latter more so

Using projections on masks was surprisingly disappointing. One might have presumed that projecting images or video onto a human face is discordant because of all a face's details (most notably the eyes). However, it is less clear why projecting onto basic white masks (both plain and character) was also disharmonious. Perhaps being able to recognize a face at all through basic features creates a resistance to successful body-technology merging (see figure 4.57). Nevertheless, this is a general conclusion, and it is certainly conceivable that another selection of projections would be more successful.

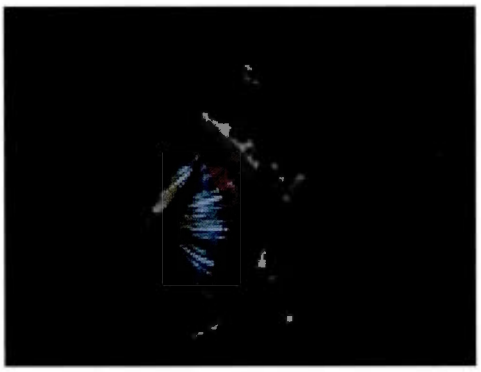


Figure 4.57 Playing with a White Mask

While the work with props is interesting, it tends to fall more within the realm of virtual scenography. Some props may serve as extensions of the body, thus appending itself to the interactive costume and influencing the actor's movement choices. However, general speaking, the props remain props on stage, albeit heightened by the projected images or video.

4.11.2 Costumes

Early in the workshop, it became quite clear that the actor needed to dress in white in order to maximize the effect of the projections. This could take many forms from a simple white dancer's unitard, to an actual costume, such as Laurie Anderson's signature all-white suit. Various articles were tried, including socks, pants, shirts, t-shirts, turtlenecks, scarves, a unitard, and a bed sheet (to create a more shapeless form). While many items worked relatively well, it became evident early on that the clothes that worked best were those that had few or no wrinkles. Perhaps even more important, however, was that clothes should fit tightly to the body, as they enhanced the body's expressiveness and the corporeal technique. For this reason, the unitard became the outfit of choice, as it allowed one to easily forget the actor's body in favour of a hybrid body between human and projection. Black clothing items were also experimented with, in order to isolate certain parts of the body. This worked quite successfully in spite of the projections landing on the black clothing as well, provided the projections were dark enough. During the conference-demonstration, a smooth white top and black pants were worn to illustrate the difference between the two (see figure 4.58).

Figure 4.58 White Vs. Black

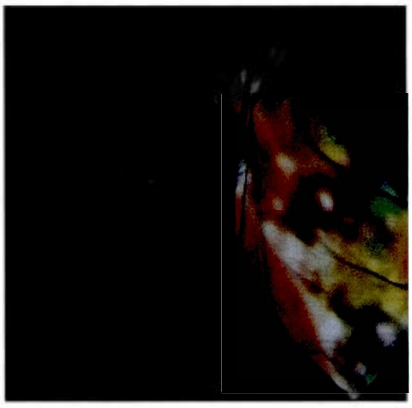


Figure 4.59 Under a Bed Sheet

Using the bed sheet presented a number of additional possibilities, both within the role of interactives costumes, as well as virtual scenography. Again, wrinkles on the fabric generally hindered the overall effect. The addition of a bed sheet or large piece of fabric means the actor can now play in front of, behind, beneath, or on top of the sheet (see figure 4.59). In many cases, the sheet becomes a scenographic element (to hide behind, for example). However, the actor could incorporate it into his performance, as a marionette or using the sheet to embody a larger, perhaps formless character. This is obviously quite difficult, as one needs to control the form and movement of the sheet, sometimes without being able to see oneself in the mirrors. Projecting a relatively simple image or video is probably the best way to successful implement such an effect.

4.11.3 Music and Sound

The practical research concluded with the basic addition of a new technology, namely sound. Sound was chosen as it was the most obvious and common addition found in intermedial creations today, from theatre and dance to movies and installations.

The addition of sound incited major changes to the work. Initially, sound and music were chosen that seemed to correspond with the "mood" of an image or video. These often complemented and enhanced the effect, though could also lead to oversaturation or over-illustration of the performance content. Working with the clockwork gears, for example, a ticking sound was added over top, which helped sharpen the movements, and provided an additional guide for the actor to follow. Later, the ticking sound effect was replaced with a rhythmic song, which gave the movement a less pronounced appearance.

However, the most interesting effects arising from the addition of sound and music took place when a contrasting piece was selected. Where simply working with images and video some projections only inspired slow movement, the addition of a more lively music or sound allowed one to break these constraints. It is as though the effects of sound and music take precedence over the image, being higher, as it were, on a technological or sensory hierarchy. The result is a multiplication of the possible movement interpretations. Projections hitherto associated with a slower tempo can suddenly be reinterpreted with quicker or sharper movements, and vice-versa. The contrasting effects incorporating sound are often more engaging than the use of projection alone.

4.12 The Conference-Demonstration: Examples, Mini-Creation, and Discussion

During the conference-demonstration, a summary of the above results were presented, with live demonstrations of many of the figures found in appendix A. Following the brief demonstrations, a mini-creation was presented, made up of a montage of successful movement-projection-sound combinations. Given the randomness of the examples presented, the narrative composed to join them was relatively simple: the projected scenes being the result of food poisoning. Evidently, for a full creation, the projections would follow the content of a given script, or be employed sporadically for individual scenes.

Following the mini-creation, there was an opportunity for questions and discussion. Two major issues were raised: 1) whether the work presented could be characterized as acting; and 2) the practical application of the work.

The first issue raised, regarding the definition of acting, is a largely etymological concern. As mentioned previously, the definition of acting used for this research paper was relatively wide, including forms as varied as realism, corporeal mime, dance-theatre, performance, and so on. The reasons a wide definition was deliberately applied are twofold.

First, the definition of acting has, since the 1960s, become increasingly vague, as art forms crossed over into each other. As it was not the intention of this paper to argue in favour of a specific definition, the wider definition was chosen. If one's definition of acting is closely tied to realism or text-based theatre, then the acting of this project deviates significantly. Aesthetically, it appears much closer to corporeal mime, which is no surprise, since this was one of its key influences. This is not to say that acting with projections necessarily leads to corporeal theatre. Rather, such a tendency is tied to the technological role selected. Looking at interactive costumes, the focus is the projections on the actor's body. While images of actual clothing or costumes may have been projected, suggesting a realistic acting style, the acting possibilities are quite limited, would likely be illustrative, and would lay more within the domain of costume design itself, rather than acting technique. A corporeal technique, which often works best with abstract images and video, presents more possible acting challenges and interpretations for the actor, which, rather than illustrating a specific costume, engages the imagination of the spectator. If, alternatively, this project had focused on the role of dramatic media, where various characters are projected, then it would likely have lead to a more realistic style of theatre. The technological role chosen for exploration is thus a central influence with regard to the acting style employed.

Second, employing a wider definition of acting is preferable because the work explored in this paper is useful to many art forms. Thus, though stemming from theatre, the actor-creator could be creating a piece for theatre, dance, performance, or otherwise. The word actor-creator was chosen to encompass all such possibilities, and to avoid an overabundance of redundant designations. Nevertheless, it is certain that to conduct a similar project from the perspective of a dance-creator or performance artist would result in both analogous and unique conclusions.

The other issue raised in the discussions following the conference-demonstration was regarding the practical application of the work. Specifically, the questions addressed the transference of the work from the rehearsal space to the

stage. Many specific details have been addressed piecemeal in previous sections. However, it is worth commenting more globally that, through regular exploration, one does become accustomed to various practical facets of the work with projections. It could thus be argued that the technology has been successfully appropriated into the acting technique. This appropriation is evinced by one's acquired orientation within the projection, by looking both towards the light and rear curtain, as well as working independently of the mirrors. One also becomes accustomed to working in the darkness (and taking necessary breaks), moving two-dimensionally within a relatively confined space, and timing one's movements to animation and video. Technically, one also learns to predict which projections will likely be successful, as well as the placement of the equipment. All these acquired techniques improve the efficiency of the work, both in rehearsal and on the stage. Most will serve the actor well in transitioning smoothly from the rehearsal space to the stage, because the same technical rules apply. The major exception would be if the projection area is significantly enlarged or warped, which would require specific on-site rehearsal.

4.13 Some Basic Guidelines for Acting with Projections

Reviewing the above results, there are a number of general guidelines that recur throughout the practical research, regardless of the subject matter explored. These, of course, are primarily applicable to a corporeal performance style, which incorporates projections as interactive costumes.

Darker Projections are Preferable - Firstly, regarding the initial selection of images, it is useful to note that darker images work better, particularly when working with a white costume and black background. If this is the case, then much time can be saved when sourcing content for a piece.

Abstract Projections Over Realistic – While some realistic images and video can be successfully incorporated into a creation, it is often more fruitful to explore abstract content. Not only are they more successful aesthetically as costumes, but they can also be interpreted in a variety of ways.

The Importance of Surface Area is Substantial – This applies to both the actor's body and to props employed. The actor should be well aware of this simple fact, and work to develop the expressivity of the largest surface of his body, the torso. Likewise, most thin props will not prove effective in the work with projections.

Projection Dimensionalities – Working with light sources, be they with projections, shadow puppetry, or otherwise, one must learn to work primarily two-dimensionally to accurately communicate dramaturgical intentions. Movements in front of the body are not perceivable, or cast a shadow on the performer's body. Moving to and away from the light, can, however, warp the images in an entertaining fashion, and this effect should also be exploited.

Slower Movement is Preferable – While there are exceptions, slower movements tends to synthesize the actor and projection more successfully, be it an image or a video. Quick movements do not allow the audience enough time to register the actor's movement and the details of the projection, unless projection is relatively simple.

Sound and Music can Alter the Effect – Sound or music can be added to a movement-projection sequence, to either heighten the impact of the projection, or contrast with its content. The incorporation of the additional medium generates further possibilities for the actor's movement interpretations.

It is also worth noting some key limitations to the work with projections. These are mainly tied to the acting space, as well as the tempo of a performance.

Since this exploration with technology centers on projection hardware, the actor is obviously confined to the projected lighting space. The area is limited horizontally and vertically by the projected image or video. Moving to and away from the projection will alter the shape, size, or focus of the projection. Acting within a projected area, one is thus quite confined spatially, and needs to develop an awareness of the limits.

As mentioned previously, the speed of the actor's movement is also limited. Generally, it is difficult to use fast movements with projections. While this limitation is not universal, it does apply to most projections, and is reliant upon the sensory reception of the audience. Simple projections or the addition of music are possible solutions to this temporal limitation.

Despite these significant drawbacks, some of which can be overcome, acting with projections as interactive costumes presents many possibilities for the actor. Not only do projections present a rich source of content for a piece's narrative, they are also a source for movement inspiration. They can be used, like the neutral mask, as a tool towards characterization. The techniques discussed here, if not directly applicable, can be learned and appropriated through regular exploration with projections. The work also provides a model framework for employing Saltz's taxonomy of technological roles effectively, and yields insights on working with technology more generally.

CHAPTER V

CONCLUSIONS

Having examined acting with technology from a three-part perspective – historical, theoretical, and practical – it becomes easier to understand the major developments that have taken place, those that remain pertinent today, and likely directions such work will take in the future. By looking at the prior experimentation of artists throughout the 20th century and then actively engaging in a practical exploration of the work, it is clear that there is little reason for a Manichaean technophobe versus technophile view of the subject. There is ample room for negotiation, and one need not eschew technology in favour of a "pure" theatre, nor over-saturate the stage with showy media. What is important, as Dixon proposed, is that the technology not be confused with the content of a piece. The use of technology must be justified and should help complement or advance the dramaturgy of a piece. Technology presents many remarkable possibilities, but one should always be questioning whether its use is the best means for achieving a desired outcome.

Looking back at the experimentations of the 20th century, one can see a natural progression throughout the three major periods of development. At first, fledgling technologies naturally had little impact on the actor's craft. A handful of scenographers with access to new hardware and media experimented with their use on the stage. Directors and actors generally had to wait to see if the emerging technologies were there to stay, or merely a passing fad. This was particularly true of cinema, which Stanislavski and Meyerhold never suspected would eclipse the theatre. Later, as technologies became established in institutions and generally more accessible, artists of all stripes began taking them into their own hands, contributing to the interdisciplinary and intermedial boom of the 1960s and 1970s. The abrupt

and growing infatuation with technology caused an opposite, perhaps predictable, reaction, as other artists – most notably Grotowski - retreated into poverty, seeking out the essence of their art forms, through primitive rituals and performance. The very notion of what "acting" meant was put into question, particularly as art forms were deconstructed, crossed over, and multiplied. It was at this point that the "schism" between technophiles and technophobes became most prominent. However, in the following decades, interest in such actor training declined, while experimentation with technology continued, becoming ever more sophisticated with the introduction of digital media. Today, though technologies continue to progress, artists and audiences have become accustomed to their presence, which perhaps allows for a more judicious and sober application of their effects.

The continual and rapid development of technology's role in the arts has meant that scholarly reflection and classification of its uses are both young and changing. Nevertheless, Saltz's taxonomy of 12 technological roles is specific enough, yet flexible, so as to provide a useful framework for defining how technologies are incorporated into theatre productions. The non-exhaustive list can be easily modified or updated, and thus is not at risk of becoming obsolete. It lends itself to multiple applications, from theory, criticism and self-evaluation to research definition or suggesting paths for exploration. Within this research project, the taxonomy has been primarily used to define the content of the images and video projected. By selecting a single role to explore, interactive costumes, with a single technology, projections, the content was immediately limited to those that would likely complement a corporeal acting technique. This allowed for a clear delineation of the subject matter, which made for a thorough and focused practical workshop.

The practical component of the research permits understanding of the subject from a different angle, as well as provides a new discussion around useful techniques for acting with technology. Evidently, the exploration is just one of many possible workshop examples. By changing the technological role, the technology itself, or the acting style, the work undertaken and its outcomes will change

significantly. One could narrow the focus even further by choosing specific narrative themes to explore. A number of permutations are possible, which provide both specific practical techniques, as well as more general insights into acting with technology.

In this particular case, acting using projections as interactive costumes, a number of suggested guidelines resulted from the workshop. Regarding the selection of the images and video, darker, more abstract content was generally preferable. Projection surface areas should also be considered, both on the body and any props. The torso, being the largest on the body, attracts the most attention. To make the most of the possibilities with projected costumes, the actor should develop his corporeal expressivity. This will allow him to take full advantage of the details of each projection, as well as their inherent dimensional qualities. Lastly, while not absolute, slower movement tends to succeed more often than faster movement. Adding sound and music, is an easy way to break this limitation, but one should be aware of over-illustrating the scene.

Building onto this workshop, one could begin including other technological roles, other technologies, or other acting styles. Already, the practical exploration began overlapping with virtual scenography and dramatic media. Adding the live camera projection introduced a subjective perspective, while the addition of sound might touch on affective media. Other roles, such as commentary, illustration, or synesthesia could easily be added as well. Gradually, the creator's toolkit becomes complete, but with the advantage that each aspect has been investigated individually, thus making the most of their unique strengths.

Following the practical explorations, one is better able to grasp how an actor-creator can appropriate digital media into his technique. It also becomes clear that there is a place for technology within actor training, particularly as media become increasingly prevalent on stage. The rehearsal or laboratory model for this research project or used by practitioners such as Saltz or Les Deux Mondes already echo, to an extent, the acting laboratories of Meyerhold, Grotowski, or Brook. They provide a

constructive setting for experimentation and discussion. Incorporating the actor into such contemporary labs is perhaps simply a question of refocusing the work. More likely, though, it may require acknowledging that technology does not inevitably need to be incorporated into every production; and when it is incorporated, its presence must be dramaturgically justified. Doing so will improve the quality, detail, and depth of such work, and lead to more rewarding interdisciplinary and intermedial collaborations.

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