1 Introduction: Hunters and Gatherers of the New

The artist picks up the message of cultural and technological challenge decades before its transforming impact occurs. He, then, builds models or Noah's arks for facing the change that is at hand.
—Marshall McLuhan[1]

The primary purpose of this book is to uncover the history of the development, in Australia, of art that in some manner utilizes technological (and especially electronic) means in its realization. It covers the period from shortly after the inception of computers in Australia (around 1951) until 1975. In doing this, I will look at not only the artists and the artworks they produced but also at the evolution and use of computing technologies and video displays as they developed into the forms that artists could use to make images and the other things that artists make (e.g., videotapes, installations, performances, etc.). This requires that I also look at the relationships that artists may have had with the application of these technologies and—most important—the artworks that were made for them. Image production technologies are not the only technologies to be examined but, as my bias here is toward the visual arts, they form the primary focus.

Although some of the artworks that I will be looking at are the product of existing electrical technologies, a major portion of the work produced during this early period of art and technology required the incorporation of recently developed electronic and computing devices into the art-making process and thus required a great deal of collaboration between those who were able to handle the technologies and those whose interests lay in using the technology to make new artworks. The choice of a technological realization and/or presentation medium, for most artists, entails collaboration with the technologists who develop, produce, and make those technical media available. This may be either by teaching the artist how to use "the device" or by using it with or for the artist through the direct provision of a service. Ultimately, all art and technology is a collaborative process. My second purpose is thus, wherever possible, to indicate the interactions that took place between the artists, the technicians, the institutions, and the overall cultural frameworks within which they worked.

A further purpose that will weave its way through the discussion is to elucidate some of the aesthetic issues that the works bring to the fore, both in looking at the cultural and political conditions of the times and in looking at questions of how art and technology relates to the mainstream of art theory and history as well as to how its productions might be critically appraised.

At this point, I would like to indicate a way of understanding the relations that operate between the various individuals who may be active in the production of art and technology. To a large extent, this activity is a cybernetic process involving multiple layers of conversation, probing, feedback, and learning—but it is not my intention to do more than show the relations operating within some of these situations. Although I will canvass certain aspects of the use of technology in art that I consider to employ cybernetic principles, I am not suggesting that early electronic art was primarily cybernetic in its concept. Nevertheless some of it clearly was compatible with Jack Burnham's systems aesthetics[2] or Roy Ascott's notion of art that behaves.[3] Australian examples include David Smith's *Kinetic Kaleidoscope* and much of Philippa Cullen's dance performance work, both of which possessed a substantially interactive intent (see chapter 6). However, as the production of artworks made with technological media necessitates coupled systems of artists and engineers, and of artworks and technologies, entailing layers of interaction and feedbacks between the artists who are making the images and the engineers or programmers who are establishing the facilities with which the image or object may be produced, the context in which art and technology is made is, in itself, a cybernetic process.

Thus much of the process of producing works in art and technology is collaborative; sometimes because the artist needs to learn how to use the technology, but more commonly because the technology needs to be developed or changed in some way to actually realize the artist's intentions. In the creative process, an artist may come upon a set of tools that will do much of what they wish to do in the execution of their ideas, but not everything. It is this gap between desire and reality that may then become the driving force in an artist's returning to the maker of the tool or system they used, or turning to another technologist whom they may know, to produce an enhanced version of those tools or a completely new instrument that will do more closely what they want. Of course, the reciprocal process may also operate, and occasionally it happens that the developer of some technology will turn to an artist to try out the technology so that they can issue feedback to the developer regarding its shortcomings and make suggestions as to its enhancements.

One thing that should be said of collaboration is that the interaction between engineer and artist is not necessarily driven by an artist's needs. It is often the offerings of the engineer that stimulate ideas in the artist as much as it is the needs of the artist that stimulate the engineer to develop a solution (I will discuss at length one example of this in chapter 4). What we have here is something akin to a gift-based

social ecology, but not one where, as in the potlatch, obligation is assured through the gift giving;[4] rather, it is one in which feedback in the form of comment, exploration, and suggestions for extension generated by the receiver of the gift is welcomed by its giver. It is a pure form of generosity, a gift in which there is little reward expected, other than its take-up and the recognition of its value to the receiver as well as the value that the progenitor held in it.[5] This notion of the gift—generally of information or knowledge—is fundamental to science. The knowledge necessary to make a technological instrument for use in the making of art itself often derives from the research of the scientist as materialized through the filters of the engineer. In the early period of art and technology, artists were often able to connect with engineers through some sort of sponsorship, either through the enthusiasm of a faculty member in a university or research organization, or through the generosity and interest of someone in a private or public company. Stan Ostoja-Kotkowski's support from the R&D branch of Philips Industries in Adelaide (see chapter 5) or, in the United States, the support provided by Bell Labs to Experiments in Art and Technology, are good examples of this. In more recent times, a great deal of the software that artists use for development of interactive or 3D digital art is made available through the Open Source network. But the primary gift is always between the artist and their collaborators, and sometimes this is the only reward that the technologist gains from the process. Importantly, this gift economy, as a social ecology, is a cybernetic process and, in certain situations, when it evolves, may form an autopoietic system running through some period as a collaborative unit. However it is the art and its making that I want to discuss and I shall leave the systems theoretic aspects of this implicit.

Technology in the Culture

The post–World War II reconstruction of the world during the 1950s saw the conversion to civil needs of much of what had been learned about electronics and computing during the war. Radar was adapted to civil aviation and many of the wartime-trained radar engineers went into computing. Computers became available in academic institutions and gained more public presence through the press, open days at universities, and so forth. In the institutions, they were utilized in scientific calculation and data reduction, which led at first to the use of graphics for data visualization and later to graphics for their own purposes as computer art, figure animation and the design of objects (which became computer-aided design, or CAD) and then, much later, tonal images. The development process involved a sequence of collaborative relationships between engineer and scientist (in the 1950s and 1960s) and subsequently artists entered the mix (from the mid-1960s through to at least the early 1990s). Each new piece of technology developed for the computer was produced through a perceived need for the logical completeness and operationality of the machine and each new

piece of the system has then enabled the production of new or enhanced kinds of outputs, either as scientific data visualization or artistic 2D or 3D image making or its more performative elements (dance, music, and the like).

Meanwhile, through the burgeoning entertainment technologies of radio and television, electronics itself underwent a drive into miniaturization. This, in consequence, brought a considerable expansion of the possibilities for more advanced and more complex electronics. It also had, by 1970, two effects on the arts: on the one hand, making electronics more accessible to artists who could learn to solder and assemble small circuits that, for example, provided triggers for sequences of events or oscillators for early electronic music; and on the other, by producing technically trained people for whom the arts became an active interest. Australian examples here include the Optronic Kinetics group at the Fine Arts Workshop at the University of Sydney; the composer Greg Schiemer working with the dancer Philippa Cullen (both of whom I will introduce in chapter 6); and the artist/technicians Jack Jacobsen and Mark Evans (a.k.a. Ariel), who worked with Bush Video (which I will discuss in chapter 7).

On Art and Technology in International Art

The history of art and technology in international art circles is well covered in existing literature. The most important work is probably Jack Burnham's *Beyond Modern Sculpture: The Effects of Science and Technology on the Sculpture of this Century*, in which he covers the history of kinetic art, though with an emphasis on more traditional sculpture, and explores the role of systems theory and cybernetics in sculpture and installation through his notion of the "systems esthetic."[6] Following on Burnham, Maurice Tuchman's *Art & Technology—A Report on the Art & Technology Program of the Los Angeles County Museum of Art, 1967–1971* reports on their attempts to develop art and technology collaborations with industry,[7] Douglas Davis presented *Art and the Future*, which, though covering territory similar to Burnham—constructivism, kinetics, and what was by then accepted as "systems" art—has more of an emphasis on the machine and the direct use of technology to make art,[8] and Stewart Kranz explored science as art, art and technology, the sociology of art, and intermedia in his *Science and Technology in the Arts*, which includes a collection of interviews with many of the active participants of the time.[9] Herbert W. Franke's *Computer Graphics, Computer Art* provides a solid introduction to computer art in Germany and the United States;[10] Jasia Reichardt's *Cybernetics, Art and Ideas* is a collection of essays by members of the cybernetics and computer arts communities, including Max Bense, Iannis Xenakis, Gordon Pask, and A. Michael Noll.[11]

In some ways, the most important event setting the future stage for art and technology was *9 evenings: theater & engineering*, the Experiments in Art and Technology (EAT) season at the 25th St. Armory[12] in New York (October 13–23, 1966), which

featured works by John Cage, Lucinda Childs, Robert Rauschenberg, Yvonne Rainer, and David Tudor, among many others. EAT was organized by Billy Klüver, an electrical engineer working at Bell Labs, and the artist Robert Rauschenberg. Its purpose was to provide a context in which "the artists will open new doors for the engineers and the engineers will give a fresh license to be poetic."[13] More formally, its intention was to "further the creative interaction between industry, engineers and artists."[14] As with all these things, *9 evenings* received mixed reviews, with long setup times annoying the audiences and, at least over the first couple of evenings, the technology did not work well, but ten thousand people came and a number of important interactive pieces were performed. As Douglas Davis notes, *9 evenings*, and EAT in general, put artists and engineers on an equal footing,[15] and this is essential for collaboration.

However, 1968 may well have been the peak year for early art and technology. Apart from the appearance of Burnham's book, there were two important exhibitions that year. One was K. G. Pontus Hultén's *The Machine as Seen at the End of the Mechanical Age* at the Museum of Modern Art in New York (November 25, 1968–February 9, 1969), which comprehensively summed up the situation to that moment and gave some indications of where things might go with its associated EAT competition for new works.[16] The other was Jasia Reichardt's *Cybernetic Serendipity* at the Institute of Contemporary Art (ICA), London (August 2–October 20, 1968), which was a survey of the state of the art in cybernetics and computing and all the modes of art that had grown from this framework and its technological manifestations, including computer images, computer poetry and computer music, interactive and responsive sculptures, and robotics.[17] Within British art education and among a small number of artists, it had a galvanizing effect.[18] It also had a very important effect here in Australia and is at least partly the trigger for there being a computer art experiment in Australia in the first years of the 1970s. This will be covered in chapter 4.

Following these exhibitions, in Germany, Herbert W. Franke was involved in several exhibitions of computer art, including *Auf dem Weg zur Comptergrafik* in Karlsruhe (for the Karlsruher Tage für experimentelle Kunst und Kunstwissenschaft 69, October 18–November 12, 1969)[19] and the *Computer Impulse* exhibition at the Kunstverein in Münich (May 8–June 7, 1970), curated by Käthe Schröder, for which Franke edited the catalog.[20]

Video art was given its imprimatur by the Howard Wise gallery's "TV as a Creative Medium," which opened on May 17, 1969. Wise had supported many one person and small group shows of kinetic and light art in the previous decade. The next important American show was Jack Burnham's *Software—Information Technology: Its New Meaning for Art* at the Jewish Museum in New York (September 16–November 8, 1970).[21] It was at this show that Ted Nelson introduced his concept of hypertext,[22] and it also included the infamous *Seek* from MIT's Architecture Machine Group, wherein a colony

of gerbils tested the responsiveness and adaptability of a computer in keeping their environment in order.

Literature covering more recent developments includes Frank Popper's *Art of the Electronic Age*, which surveys the later developments of specifically electronic art,[23] Christiane Paul's *Digital Art*,[24] Michael Rush's *New Media in the Late 20th-Century*,[25] and Charlie Gere's *Digital Culture*,[26] which all cover the history and much of the art right through to the Internet. On film and video art, the most important early books are Gene Youngblood's *Expanded Cinema*;[27] Michael Shamberg and the Raindance Corporation's *Guerrilla Television*, the book that probably introduced more early video makers to the sociology and the technology of video than any other;[28] followed by the journal *Radical Software* (which had a huge influence in Australia) and Ira Schneider and Beryl Korot's book/catalog *Video Art, an Anthology*.[29]

More recently, the series of conferences beginning with ReFresh! (2005)[30] in Canada and continuing with Re:Place in Berlin (2007)[31] and ReLive in Melbourne (2009) have begun to detail the diverse history of the computer and digital arts; and Paul Brown, Catherine Mason, and their colleagues detail the story of the beginnings of computer art in Britain in their *White Heat, Cold Logic: British Computer Art, 1960–1980*.[32]

The Rolling New

The progress of the relations between art and technology appear to express a repeating pattern, which may be discerned in the examples that I will discuss throughout the book. The forms of the works made by artists coming early to computers and other technologies result from the constraints effected by the limitations of the technologies that are available as much as they arise from anything else. It is out of these limitations that the constraints on the type and presentation of the image or work arise. These constraints govern the affordances[33] of the machine and it is in them that *the signature of the machine* can be found.

New technologies continually arise, providing new and interesting opportunities for artists, establishing art and technology as a form that is constantly renewed and regenerated. I describe this as the "rolling new" as it applies to the continual recurrence of new media in art over the last thirty-five or so years.[34] Although subject to much variance on a case-by-case basis, the development and artists' use cycle of a new technology runs roughly as follows. There will, almost necessarily, be a period during which it is immature and still being formed. It is especially in this period that the technology is open to change and it is often precisely in this period that artists (those regular hunters and gatherers of the novel when transducing their ideas into works) discover the technology and make greatest use of it. Once a technology reaches maturity, it becomes simply a tool in the hands of the artist, invisible in its extension into the world, and its products become ubiquitous for the rest of us. When mature in its

daily use, its ubiquity and its rigidity to further change (commonly in the interests of its promoters) render it of little interest, and there arises, somewhere else, a new technology undergoing its immature growth period and being changed through its reciprocity of engagement with its newest users.

But the period of immaturity in a technology's development is immensely important in the arts. During the early period I am exploring here, this immaturity not only provided open access to new tools, but also allowed loose groupings of Australian artists and experimentalists—particularly those reacting against certain aspects of modernism (primarily those espoused by Clement Greenberg) in developing their aesthetics—to gain access to newly available conceptual paradigms such as post-object theories (which I will discuss in chapter 6). In turn, the use of new technologies by artists opened up, in various ways, the range of ideas that engineers could work with in developing new technologies. This is particularly evident in computer graphics (see chapter 4), in certain aspects of experimental video (see chapter 7), and in experimental music, and is most expressively dynamic during periods in which a technology is undergoing development. Once a technology matures, the dynamic slows down and the range of expression is less determined by the affordances of that technology.

The development of computer art particularly shows this behavior. Over the period from the appearance of the earliest electronic computers (in the early 1950s in Australia) to the ubiquity of Microsoft and the personal computer in this new millennium, there has been wave upon wave of new forms of art. What is particularly interesting with computer art in the art and technology frame is that although the technology has gone through more or less five generations, each offers something of a complete renewal—and it appears that this will continue. In consequence, the affordances provided by digital technology remain relevant to the reading of the image (as perceptual object) produced with its aid, and the qualities of the image that are the result of those technologies used show the signature of each stage of the machine. For example, the types of output and display technologies that were available in computing at different periods make for the production of very different kinds of images. As we will see with computer graphics, the progress in the development of cathode ray tubes (CRTs) constrains the image at every stage, from the 20-"pixel" by 16-line image from CSIRAC (the Council for Scientific and Industrial Research Automatic Computer), Australia's first computer, in 1957 through to the animated vector images from the PDP-8 circa 1972. These then continue into the high-resolution bitmap images of the 1990s and on to the point where they become invisible in contemporary film special effects.

Because both analog electronics and digital computing techniques have shaped early Australian electronic art in many ways since its beginnings, they play a hugely important role and form a significant focus for our interest. There is a useful literature relating to the developments in computing over the period from CSIRAC through to

now,[35] and in chapters 2, 3, and 4 I will explore the development of computer-generated graphics as they develop into techniques for producing images and then focus on these techniques as they become utilized to produce art.

During this same period, there was a sudden rush of other technologies—for interactive control within performance and installation work, sound synthesis, and video production—all of which grew out of analog techniques. In particular, the means by which a system gains information about the behavior of its audience or user in an interactive technology is an analog function, and the development and incorporation of interactive sensing technologies remains a major area of innovation for engineers working in art and technology.

On Art and Technology in Australia

In the 1950s and early 1960s in Australia, perhaps the primary exploration in new art was abstract expressionism brought from Europe by artists such as Stan Ostoja-Kotkowski and others who had arrived here as postwar refugees. By the mid-1960s, kinetic art and geometric abstraction were appearing, and for this discussion, perhaps the greatest impact of international art was from European and British kinetic art. Though I have suggested that in international circles 1968 was the peak year for art and technology, in many ways this was spread over the period 1964 to 1969 in Australia. Ostoja-Kotkowski worked on his electronic drawings from 1962 to 1966 and began working with lasers in 1967. Frank Hinder's work on his luminal kinetics—which began in 1967 as well, and which showed some similarity to the work of Frank Malina in France—had provided indicators of what was to come (see chapter 5). At the same time, Gordon Thompson, then Deputy Director of the National Gallery of Victoria, was commissioned to compile a small international collection of kinetic artworks on behalf of the Power Gallery of Contemporary Art at the University of Sydney. These were presented in a Power Bequest Exhibition at the modernist architect Harry Seidler's iconic Australia Square building in Sydney, arranged by Seidler and the English-born (but by 1967, Sydney-based) critic and lecturer Donald Brook, and shown from February to March 1968.[36] Although much of the work was contemporary abstract and op-art painting it included one of Jean Tinguely's poetic machines *Bascule No.1: Sisyphus* (1965); Julio le Parc's *Continual Mobile* (1966); constructions made in then-nonstandard materials including Plexiglas and readily available metal forms, e.g., Martha Boto's *Labyrinthe Diagonale* (1965); Yvaral's study of interference phenomena using nylon thread, *Interference avec le cercle "A"* (1966); and Gregorio Vardanega's *Cercles Chromatiques* (1966–1967) that plays off the effect of being seen in different colored light. Pointing as they did to further developments in the use of light in sculpture, these works are all now part of the collection of the Museum of Contemporary Art in Sydney.[37] The Power Bequest show was soon followed by *Art of the Space Age* presented

by the Peter Stuyvesant Trust, which introduced more kinetic art and traveled Australia from 1968–1969.

In May 1968, Clement Greenberg's Power Institute lecture on *Avant-garde attitudes*[38] and *The Field* (an exhibition of abstractionism at the National Gallery of Victoria in Melbourne in September) both spurred intense reaction based in a critique led by a new generation of artists who looked at ways of making art that acknowledged its political and social contexts, especially in the area that became known as conceptual art.[39] Art's intellectual investigation was also encouraged and this was reflected in Australian responses to the systems aesthetics of Jack Burnham. These sociopolitical and systems-oriented ideas were theorized by conceptual artists like Ian Burn, who was associated with the British Art and Language group and given academic support through Brook's theorizing of a post-object art. His provocative thinking had a number of consequences, both in conceptual art and in art that engaged with technology, and these form the substance of chapter 6.

Over this same period, Brook conspired with Marr Grounds (of the Architecture Department of the University of Sydney) to establish a Fine Arts Workshop within the University, and recommended to John Bennett (head of the Basser Computing Department in the School of Physics of the University of Sydney) that he visit *Cybernetic Serendipity* while he was in Britain for a conference (covered in chapter 4).

Meanwhile, experimental film gathered practitioners and audiences, through Ubu Films' underground film programs and light shows,[40] which morphed into that approach to video art that appeared out of the psychedelic movement. In January 1969, the Fine Arts Workshop opened and some of the students caught the experimental and technological bug. Brook's 1969 Power Institute lecture on post-object art helped the growth of conceptual art. Experimental and improvised music took off with David Ahern's AZ Music[41] and Keith Humble's electronic music studio in the Grainger Museum at the University of Melbourne. Remarkably, the publication of several interesting electronic circuits in amateur electronics magazines, including a theremin, triggered electronic experimentation in visual art, dance, and music. Bennett, encouraged by Brook, began to proselytize the computer to artists with talks on what he had seen in Britain and the United States (see chapter 4) and at least one young artist, Imants Tillers, responded. By the time of the *Situation Now* held at the Contemporary Art Society (CAS) gallery on Central Street in Sydney (July 16–August 6, 1971), Noel Hutchinson suggested, in an interview conducted by Terry Smith, "Getting back to sculpture's future, there are other possibilities—computer art that will develop independently of the dominance of computer people."[42] Smith's response to this was the apparently scathing comment that, alternatively, "There might be art potential in the environment creating pills that some of our more advanced architects are advocating should take the place of architectural structures."[43] However, in a letter justifying his position on *The Situation Now*, he states that the CAS had listed among

its intended future exhibitions one on computer art from the University of Sydney Computer Department.[44]

But technology in art remained in the realm of the experimental. It was not regarded as something in which a serious artist might be interested. There was not so much an attitude against it—it was simply ignored, there being little or no critical framework,[45] and the kinetic art that had been brought to Australia was largely of a technically limited form. It is interesting to me that although Burn claimed that capitalism was the prime source of the censorship of new art forms that were launched onto an unsuspecting art public at various times, he himself in his most polemical article, *The 1960s: Crisis and Aftermath*,[46] had done exactly the same thing by completely ignoring the proliferation of experimental and technological forms that were (though lacking a marketable form) emerging among a small coterie of the avant-garde. This was a censorship through ignoring the new. He wasn't the only one. The experimental use of new technologies in art was also ignored entirely by large sectors of the art critical fraternity, especially those who regarded themselves as the gatekeepers of what was new and politically acceptable. In fact, apart from Donald Brook—and to a lesser extent, critic and curator Daniel Thomas and critic and painter James Gleeson—there would have been no acknowledgment of its potential at all. At the time, Brook noted that there appeared to be little Australian interest in the new technologically concerned arts, which then—apart from the work of Ostoja-Kotkowski—largely consisted in various aspects of kinetic art in which motion and light had gained important roles.[47]

In reading much of the critical writing of the time, and on a general reading of the history of art in Australia, apart from very occasional exceptions, one would be forgiven for believing, from our vantage point in history, that there was no electronic, computer, or video art practice here prior to at least 1980. Apart from what was essentially the house journal of the video access movement[48] and a 1986 video festival catalog,[49] there is almost no literature at all that actually reviews the history of Australian interest in art and technology during the period of the 1960s and 1970s, and to find any literature relating to its practice—either written during this period or referring to work made during it—has become an increasingly difficult task.

Among few exceptions are the enthusiastic provocations of Donald Brook and Daniel Thomas's acknowledgment, in his article "Art & Life: The Actuality of Sculpture,"[50] of the small amount of video art being practiced by the conceptual artists, Mike Parr and Peter Kennedy at the artist-run gallery Inhibodress, or by Tim Burns at the Art Gallery of New South Wales (AGNSW) in a very controversial talk-back video installation piece.[51] In fact, in reading the articles by Ian Burn, Patrick McCaughey, or Terry Smith in Paul Taylor's *Anything Goes*, a compilation of articles drawn largely from his journal *Art and Text*, it appears that despite the name of the collection in which all of these authors and others appear, practices other than painting or sculpture

and perhaps their conceptual antagonists were not even worthy of the attribution "art." It is clear that *anything did not go* at all, and that there was a fundamental rift between the fine-art world and those whose interests in art were the potentials of newly available electronic technologies. Of course, neither did the artists of another artist-run gallery in Sydney, the Yellow House (whose work might be thought of as deriving from Pop Art) rate a mention. This attitude of ignoring the experimental, as far as the visual arts were concerned, also extended to other forms such as electronic music and avant-garde film, though perhaps to a lesser extent. I should say here that I do not include performance art, though "experimental" in a sense, as it in general did not experiment with technology (with the exception of Philippa Cullen and Stelarc) and it has been generally well treated by other authors.[52]

Brook was the one critic who did acknowledge art and technology and experimental art in general. In some ways, he may be the person most responsible for its presence at all within academic and critical art circles in Australia. Brook had originally trained as an electrical engineer in the United Kingdom and later made sculptural assemblage works (none of them electronically active), which he described as "adopting the stylistic mannerisms of postwar humanism."[53] He lectured in the Fine Arts Department in the University of Sydney and had been promoting the use of technology in art, the post-object mode of thinking about art and new teaching methods to ameliorate the somewhat anti-intellectual stance of most contemporary art teaching in the technical colleges.

In an article in *Hemisphere* in January 1969 Brook discussed "the way scientific ideas and technical devices have found aesthetic application" in European and American art over the previous decade.[54] He laments the fact that at that point, there had been little development in the use of technology in art in Australia, because, as he noted, it was very expensive and there were no institutions that were willing to support it as there were overseas. He also comments that neither of the then-extant Fine Arts Departments (in the University of Sydney and the University of Melbourne) showed any interest in supporting "creative action," and the technical colleges were more "concerned with [imparting] manual skills than with ideas."[55] At the moment of this publication, however, the Fine Arts Workshop at the University of Sydney was being inaugurated by Brook and Grounds, with Bert Flugelman as the tutor and "manager" of the workshop.[56] The workshops turned out to be an immensely important achievement for many aspects of contemporary art in Australia.[57] I discuss them in chapter 6.

With the stimulus of the American underground filmmakers, experimental film in Australia went through an important blossoming from 1965. Around 1970, certain of the filmmakers began to look to video as a medium. By some—for example, David Perry, and after 1970, the Cantrills—video was seen, at first, as an interesting way to generate images for what were often called handmade or synthetic films. However, it

was also seen as a politically valuable tool in the liberation of the television media through independent and community production processes, and in a third stream, video art began to manifest through conceptual art with the investigations and demonstrations of Mike Parr and Peter Kennedy at Inhibodress. Although there were several group and traveling exhibitions of video art between 1975 and 1981, it was not until the 1986 Australian Video Festival that any attempt was made to remember the early work.[58] In chapter 7, I discuss the emergence of video and its variations in the late 1960s and early 1970s in some detail.

In chapter 8, I discuss what might well be thought of as the denouement of this period in a 1975 exhibition—*Computers and Electronics in the Arts*—that was Australia's equivalent to *Cybernetic Serendipity*. It provided the context for a convergence of many of the art forms that had been explored up to that point, and was something of a watershed for art and technology in Australia, as it marks a point where many of the artists were forced to go "back to the drawing board" because of a lack of funds and the political anger stirred up by the dismissal of a popular and supportive left-wing government at the end of that year.

Although I close this book with the events of 1975, overall Australian art and technology, since that time, has been very successful internationally and Australians have carved themselves out a significant reputation in what are now known as new media.