# BETWEEN MAGIC AND THE ALGORITHMIC IMAGE

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Emile Reynaud, often regarded as a pioneer of animation in film, was a man who led a poignant life. In his later years, he invented a projection-type animation system called 'le théâtre optique.' Anticipating the work of Auguste Marie Lumiére and Thomas Edison, his 'le théâtre optique' involved screening images which had been handpainted, frame by frame, on perforated film. The images were accompanied by simple but wondrous stories sung in chanson.

The film-feed system was a manually controlled mechanism that allowed improvisational repetition, rewinding and adjustment of the film speed. This provided for a variety of tricks of movement, time and perception during the course of the performance. One day in 1910, however, he threw most of his film and equipment into the Siene: he died four years later. In successive years, improvements in silver chloride film and in cinematic technologies, as well as in the development of a filmic language, rendered the experimental techniques of Reynaud as increasingly quaint. The endless loops of the phenakistiscope came to be replaced by the rectilineal movement of narrative film, becoming the paradigmatic medium of twentieth century art.

Toshio Iwai's experiments with pre-cinematic technologies are meant to recall the magic that moving images must have possessed, in the days before their tethering to the logic of capital. Iwai's work is nostalgic in the truest sense of the word: not as regression to a memory of the past, but as an entering into the past to revive such memories as new knowledge. His journeys into pre-cinematic history reached the end of one stage with the production of his *Time Stratum* series. *Time Stratum 1* (1985) is based on images derived from dozens of sequential photos (produced by video printer) that are put on the surface of a rotating cylinder. The cylinder, is then illuminated with a synchronized strobe light.

If the technique used in this work were no more than that, any number of examples of this mode could be found in scientific movies. In this case however, the cycle of the light (and the changes in the color of the light as it strobes) have been obtained by computer processing, recorded on videotape, and regenerated on a television monitor. The use of the television as the light source in the piece revives the forgotten technology of the animation disc through the intermediation of the computer.

In the second *Time Stratum* series, Iwai moved further into the third dimension. In this piece, several hundred images of the figure are affixed to a clear turntable created from four stacked circles of plexiglass. The circles spin at varying speeds. Mounted above the turntable is a strobing TV monitor. As in the earlier series, this work is also based on the principles of the zoetropic/phenakistiscopic interaction between flipping movements on a concentric circle and centripetal/centrifugal movements around the rotating axis of a turntable. In this work the figures spin as though participating in an astonishingly elaborate dance. The complex visual movement of these figures, according to the artist's explanation, was established not by the correction of the figures in an overly logical design, but rather as the natural outcome of the principles which he had mastered during the production of an earlier piece, *Computer Phenakistiscope*. Iwai's work is thus characterized by the revival of the magic of forgotten technologies, in combination with the emerging world of computer technology. More specifi-

cally, the work from the last several years could, in a phrase, be characterized by the term *algorithmic image*. This term references a concept which will prove impossible to ignore if we hope to better understand the substance of our contemporary media environment and the place of computer technology within it.

In the modern sense of the relationship between technology and artistic expression, technology is assumed to serve as an intermediary between what is expressed and the world in which expression is situated. This is especially true when technology is regarded as an 'extension of man' (McLuhan). From this perspective technology assumes the social function of a 'tool'. Tools such as musical instruments and paintbrushes are privileged symbols of our mastery of the means of our self-creation. As long as we follow this modern (and Platonic) recognition model, the subject and object of expression are brought together in a unitary relationship which corresponds to the relationship established by a lens or mirror, or between an actual and virtual image.

In mathematical terms, the relationship between an algorithm and data structure is described as the space of 'function' where no intuitive prediction can be established between the targeted variables and the solution. In the realm of aesthetics, an algorithmic image may sometimes take the shape of a mimetic image on a video display or on a print-out. The image, does not, however, represent a function or its variables, only an aggregate of 'attributes' on the output terminal. On the contrary, as in the

production of graphics involving fractal geometry, the algorithmic image even provides for the recursive introduction of one solution as a new variable to give a visual attribute to a number of operations, performed until the solution diffuses or converges. It is as though the final stroke of the paintbrush were perpetually deferred. The only image allowed on the display is a superlatively beautiful array of 'dead bodies of numbers'. An algorithmic image can therefore be described as a play on formative indeterminacy, developed by a computer and an algorithmic computing machine analogous to it (in A.M. Turing's terms: the human being as a thinking machine).

Take computer graphics for example. Generally considered to be a technology for the visual representation of mathematical abstractions, they are in fact nothing more than one clue towards such an understanding (with the remainder of the accepted model mired somewhere in the dregs of the Platonic model). This is not what computer graphics truly are; they are, rather, computer generated images breaking through one dynamic equilibrium on their own. They are prepared for their materialization into a number of forms — like an embryo, that rudiment of plant and animal morphogenesis. With the embryo, however, the development process (the differentiation of individual organs) takes place according to a biochemical program for the control of deformation — registered somewhere in the genes — to allow completion of its final form, while computer graphics have the potential to release every possible deformation

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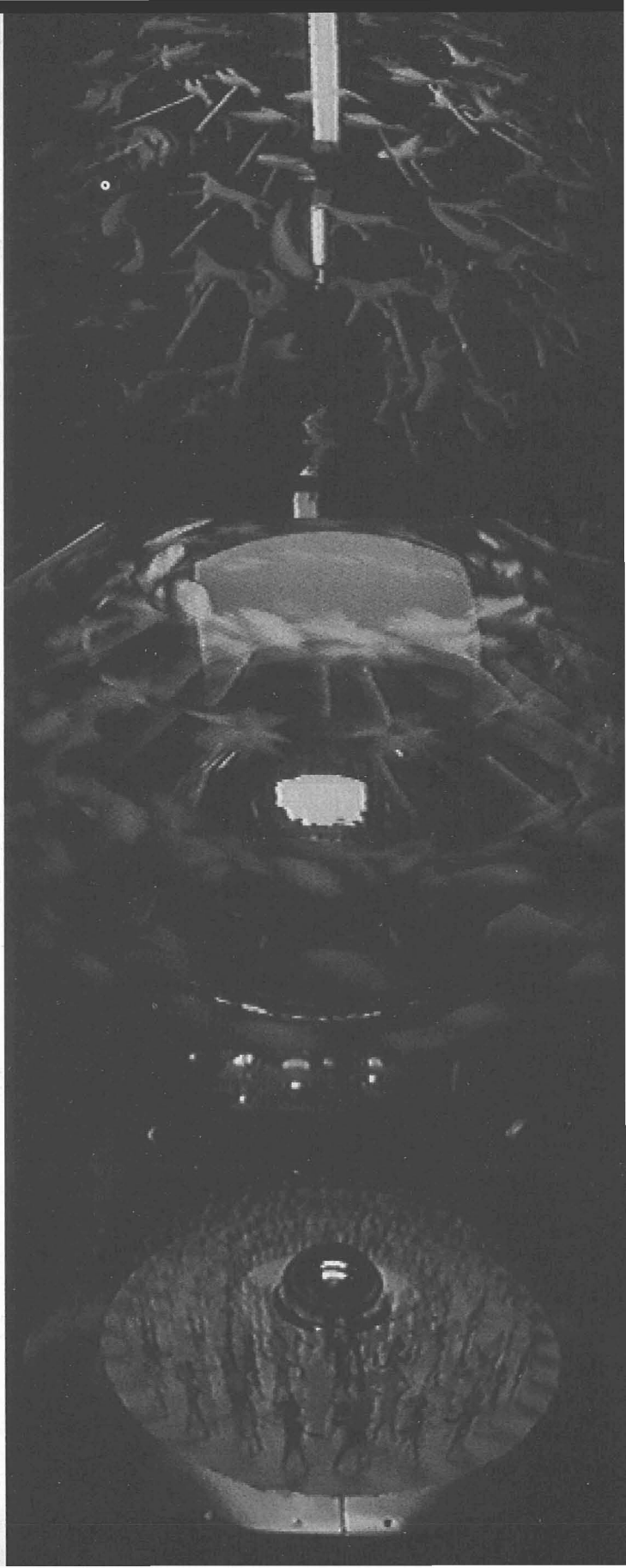
beyond what we might imagine. A computer is not only able to generate forms beyond the imagination of an ordinary person, but it is also a medium free from the history of forms, and of all the restrictions imposed by the formalities that have controlled the human imagination.

Following the *Time Stratum* pieces, in computer installations such as *Digital Portrait* (1986) and *VA Game II* (1987), Iwai raised the question of classical formalities, re-rendering them in the language of the algorithm. His *Digital Portrait* is based on a video image of the viewer standing in front of the installation work. The elements of this image are converted into digital signals within the computer, and modulated for representation on the display. The work uses a MS specification computer, one with a relatively low processing speed, which thus allows the viewer to observe the process of his or her image slowly disappearing into a chaos of noise on the display.

At first glance, its effects appear similar to those produced by a video synthesizer (widely used in early video art), or currently available digital video effect units — though both are quite different from each other in their aims. In this computer installation, the 'mirror image effect' of a real-time video feed (which allows for the maintenance of one's self identity through his or her reflected image) begins to disappear the moment the viewer presses the digitization START switch, which allows the viewer to encounter countless images of themselves in the alternate nature of the computer. This matter has been more definitely represented by *VA*

*Game II*, where the pressing of several switches in an appropriately rhythmic manner allows simplified human images on the screen to start movement with music being automatically performed at the same time. This work has been programmed so that, even if the switches are manipulated at random intervals, the resultant melodies and rhythms are produced in a manner regular enough to make it an 'interactive work' — allowing for the sensual involvement of even the most untutored player. In 1987, Iwai produced a commercially available game software entitled *Otocky* (1987), which derived from the technological principles of *AV Game II*. This work, to be sure, is a sort of shooting game, but is based on a story concerning the collection of musical notes escaping out of a sound monument — an aggregate of all sounds worldwide — which is combined with the task of fighting monsters. This game transcended the concept of simple science fiction fantasy games then available, and signaled the emergence of a new type of narrative game software rooted in the characteristics of an electronic media society. This type of game often requires the player to maintain his or her concentration, eventually bringing the player into a specific state of sober excitement, or a state of 'game high,' but *Otocky* is an exception in that its players can also experience performing music. As a matter of fact, this game is also equipped with a mode for easy-to-execute music composition, which allows the player to enjoy an exclusively musical performance, releasing him or her from the obligations of offense and defense.

In addition Iwai has participated in the production of some experimental TV programs and music video works. Among his works of this kind, the one which first attracted the most attention was *TV Evolution*, a midnight program telecast by Fuji Television on September 12, 1986. The program consisted of a three and a half hour lecture by economist Akira Asada on postmodernist image and urban theories. Graphically, The program was modeled on the multi-windowing technique common in computer operating systems. The television screen displayed a plurality of documents and images, thereby helping the viewer understand the multi-faceted content of the program. As Paul Virilio has put it, the concept of television has recently been undergoing a great change towards a possible final target of 'the third window', to the personal information terminal, which provides for a stratified look into the outer surface of the information-oriented society flashing back at a tremendous speed. The devices that Iwai employed in *TV Evolution* indicated a course for multi-task TV media formats to come.

In Japan, as in every media saturated country, the 1980's brought the advent of the home video game and the dramatic popularity of the VCR: events which forever transformed the concept of television. In contrast to the North American and European context, Japanese cable networks and satellite television are only now in the early stages of development, lagging 10-15 years behind these other markets. At the same time, personal electronic gadgets have pene-trated the typical Japanese home to a degree unparalleled in North America or Europe. This is not the place to analyze the causes of these differences. I mention them only as way of indicating that these new methods of information consumption: the VCR, the non-linear story structures born of video game interactivity and the visual styles of bitmap graphics (which didn't exist in traditional visual or comic arts), did not represent a threat to Japan's mass media broadcast industry. Rather, they provided an important stimulus to the young talent working in the television industry.

By the end of the eighties, the young minds in Japanese television had acquired the means of referencing this new culture and forming a new television language. Shinji Fukuhara, director of the aforementioned *TV Evolution*, was one of these. Entering the 1990's, Fukahara joined once again with Iwai as technical director to create the scientific 'news' program *Einstein* (1989-91), and children's program *Ugo Ugo Lhuga* (1992). Both programs shared techniques for skillfully synchronizing and recompositing the movements of the performers with those of pre-pre-pared computer graphic files to produce their final images.

In order to obtain the quality of computer graphics typically used in broadcast television, expensive workstations and enormous production budgets are typically assumed from the outset. In a trade for high resolution, these systems are not generally 'performance sensitive'. By using several Amiga computers, Iwai was able to realize a great volume of graphics,

manipulating them in real time. Also, the unique style of the characters and the virtual 'environment' are those which, in the context of the standards which Nintendo and Sega game software GUI's (graphical users interface) have established, do not rely on the power of the machine, instead demanding the maximum visual effect from a fixed size of bitmap. While at first sight the animations seem to share a common lineage with the tradition of comic characters represented by Disney and other producers of cartoons, they are in fact of a fundamentally different order. Born from the necessities of digital image theory, Fukuhara and Iwai's unique form of 20th century iconology depicts an absolutely new digital landscape on the television screen. Within their world, even the recomposited live actors and performers seem to be the products of Iwai's computer generated imagery.

At present, Toshio Iwai alternates between his 'museum pieces' and his mass media television work. Although the ends may differ, all his work can be characterized as a rebuttal to formality and rationality; the work manifests itself as a form of electronic magic, as a 'pageant for the declaration of knowledge'. At another level, Iwai's work is an example of risk in contemporary art, involving, as it does, a utilization of the authority of massive infocapitalism. However, it does not read word-for-word the ruling decrees of the world of information and technology. His work speaks to us through the rearrangement of these terms, provoking us to wonder.

▼ Toshio Iwai, *Ugo Ugo Lhuga*, 1992.