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From electrography to expanded graphics: a vision on digital printmaking today and its hybridization processes

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Date of submission: November 2022

Accepted in: May 2023

Published in: July 2023

Recommended citation

Mínguez García, Hortensia; Méndez Llopis, Carles. 2023. «From electrography to expanded graphics: a vision on digital printmaking today and its hybridization processes». In: Pau Alsina & Andrés Burbano (coords.). «Possibles». *Artnodes*, no. 32. UOC. [Accessed: dd/mm/aa]. <https://doi.org/10.7238/artnodes.v0i32.408440>



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Abstract

This article outlines how, with the introduction of electrographic processes, engravers have broadened their way of thinking and producing their art in relation to the concept of *expanded graphic*. After delimiting the term *electrography* and describing its historical development, the text exposes how hybrid practices have expanded the margins of graphics in a post-digital world. They have opened the way to different lines of action that have been popularizing some terms – mainly, in Spanish –, such as *intangible matrix*, *digital print* or *digital printing*.

In this way, we will be able to observe the expansion of these languages, their theorization and their implementation through several artworks that will show the discursive possibilities of graphics, from this extended hybridization to other fields, helping to describe different ways of understanding the creative processes of contemporary electrographic art.

Keywords

art; electrography; printmaking; digital printmaking

De la electrografía a la gráfica expandida: una visión sobre la impresión digital hoy y sus procesos de hibridación

Resumen

Este artículo ofrece un recorrido sobre cómo, con la introducción de los procesos electrográficos, los grabadores han ampliado su forma de pensar y producir su obra en relación con el concepto de gráfica expandida. Tras acotar el término electrografía y describir su desarrollo histórico, el texto expone de qué manera las prácticas híbridas han ampliado los márgenes de la gráfica dentro de un mundo posdigital, abriendo camino a diferentes líneas de acción que han ido popularizando algunos términos, como matriz intangible, estampa digital o impresión digital.

De esta manera, podremos observar el desarrollo de estos lenguajes, su teorización y su puesta en práctica por medio de varias obras que mostrarán las posibilidades discursivas de la gráfica, desde esta hibridación extendida a diversos campos, ayudando a describir diferentes maneras de comprender los procesos creativos del arte electrográfico contemporáneo.

Palabras clave

arte; electrografía; grabado; gráfica digital

1. An introduction to electrographic art

For quite some time, the processes traditionally associated with engraving have been assimilating other digital processes without much trouble. In fact, the repertoire of engraving has benefited from them, although we know of the suffering of many people who do not fully understand most of the instant processes offered by commercial printers (Fishpool 2009). Actually, they know that this digital integration always implies the use of any software through the computer, but that is not all.

At present, any visitor to a museum, exhibition or gallery will notice the prolific production of digital graphic art and wonder if it really has the same value as a traditional engraving. A serial digital impression – at times named by distortion “digital print” – is one of the multiple heterogeneous ways of conduct of electrography or electronic art graphics. According to the Cuenca International Museum of Electrography, electrography is:

“Any gesture generated by the use of electric systems and technologies, electromechanical or electronics. So, we can define as electrographic work, all creative production that for its execution considers the use of systems and technologies of these characteristics. We can technically define as ‘electrographic’ all those artistic works executed by the use, total or partial, of photocopiers, faxes, computers, videos and generally digital systems of generation, manipulation, printing or reproduction of images (such as plotters, printers, digital cameras, etc.), multimedia systems such as the transfer systems which transform images carried out by the aforementioned procedures and technologies.” (1998, 13)

For this reason, terminologically speaking, electrography means “electrical writing”, so it can be considered, in the words of José Ramón Alcalá and Beatriz Escribano (2018), any artistic work made by means of electrical, electromechanical or electronic technologies. Regarding the terminology, Escribano (2015) points out:

“Copy Art, Copigraphy, Xerox Art, Xerography, Xerocopia, Electrostatic Art, Electrography, Electrografia... could seem concepts referring to different movements, languages or artistic techniques that make use of the commonly called machine photocopier, but they are really different terms that have emerged to define the same set of artistic proposals of an underground nature and belonging to the experimental avant-gardes of the late 20th century and early 21st century that have remained isolated from the “official” historiographical line, precisely, among other reasons, because of its relationship with the traditional concept of copying.” (§. 1)

So, electrography in correlation with graphic art would be close to the copy-art, fax-art, digital print, and also maybe near to computer graphics, multimedia electrography, animated engraving (animation or experimental video that in its process uses the symbiotic relationship between engraving and those computer systems and digital technology), and the topographic graph of the Web, obviously as long as we are within the purposes of artistic production.

In fact, over time, and after a long journey since its inception, we have been able to observe, above all, 3 relevant lines of action for the development of graphic art that have intertwined or mixed in various ways: first, the study and experimentation of the different devices and their potential for plastic languages; secondly, the theorization and development of methodologies that conceptualize matrix possibilities (both from the material and from the immaterial) and the processes of artistic creation from the copy as an epistemic element; and a third place, in which the previous lines are focused on specifying new hybrid forms of creation in which traditional image reproduction procedures join electrographic processes for the generation of works conceived from the disciplinary combination.

In this sense, since it is highly complex to summarize in a brief text the historical thread, its implications, and the different actors and developers of the electrographic universe, we will focus here on tying

together some points that helped to expand the multiple graphics through the appropriation of new processes, with the introduction of new electronic and mechanical devices in graphic processes or with the projection of valuable hybridizations between tradition and technological innovation for the creation of graphic work.

Digital work is mainly defined by the binary nature of its eidetic form of creation: computing. We can assume from this that digital graphics officially began in correlation with the first image made under binary parameters in 1921 or, by default, with the appearance of the Electronic Numerical Integrator and Computer (ENIAC), the first electronic computer made in 1946 at the University of Pennsylvania. Also, as a virtual map, it inevitably requires systems, resources, technical teams, tools and peripheries for its production, manipulation, visualization, storage, virtual reproduction and print.

The creation of computer-assisted images under the creative, intuitive and imaginative sensibility of artists appeared in the seventies. It was used by research centres such as Bell Laboratories of Murray Hill in New Jersey or Technische University Stuttgart of Max Bense. Gradually, personalities such as Frieder Nake, A. Michael Noll, Georg Nees and Béla Julesz, among many others, became pioneers of computer art, together constituting a very important point of reference for the next generations in terms of the possibilities offered by the convergence between art, science and technology. Little by little, the limits of engraving would be expanded (and crossed) through the combination of media. This objective was personified by Kenneth E. Tyler in the late 1960s, when he founded Gemini G.E.L., and later Tyler Graphics in 1974. We can also observe this transgression from the creations of the Fluxus group and their use of the printing press and of multiple objects to document their actions. Nor, in this sense, can we forget the important task of promoting digital prints within the tradition of engraving at the Alan Cristea Gallery¹ (Coldwell 2010).

In broad strokes, in combination with the computer or in isolation, we will look at how the artists will use 3 very important technological tools in the electrographic field: the photocopier, the printer and the scanner. These are different devices that have been used to record, capture or reproduce images printed on paper (Alcalá & Escribano 2018). In addition to these 3 elementary tools, we can add plotters, faxes, digital cameras, and so on, with which artists exploited different languages and registration and reproduction procedures, expanding imaginaries, encoding images, processing objects and transforming plastic elements (Alcalá 2011).

The concern of this first generation of artists with creating neonatal aesthetic experiences soon spread to the next generation from the mid-1980s and 1990s.² However over the course of these thirty years, the evolution of digital art was, to an extent, limited until the advent of some technological advances in the field of computing. In addition, its production was restricted to laboratories or research centres provided with the necessary resources and infrastructure. Also, we must not forget that the high cost of computing was one of the main challenges to overcome and, in fact, although Xerox PARC's personal computer Alto had previously been on the market in 1973, we had to wait until the summer of 1981 to be able to buy that computer domestically after IBM marketed the first personal computer (IBM/PC 5150) at a base price of \$1,500. The memory size, the quality of the information processing and the graphics card were other issues to consider.

In spite of everything, what initially converged in the constant quest to idiollectically self-define digital art making use of basic concepts such as randomness, mathematical programming, virtuality, immateriality, interactivity, multimedia, and so on, given the profile of these creatives, soon added other types of creative interests to the above.

For example, the vast majority of artists trained as photographers or printmakers gradually began to investigate the eventual possibilities offered by different digital printing systems, the compatibility and durability of inks, experimentation with various supports, as well as in other types of inquiries regarding the durability of the work, its appraisal or reproduction limits. With exceptions and almost by inertia, many of them were attracted to correlate within the process of creating their immaterial matrix, their physical achievement. That is, to the printing of their work on a tangible support. However, this experimentation with digital images has meant an omnipresence of prints, where most of the time it is not even necessary that they be advertised as prints (Coldwell 2010).

We know that a certain debate continues concerning the unreality of the digital image or its lack of attachment to reality. However, for artists, it seems that this challenge has made it possible to create links between the creators' imagination and the image itself through the computer (Noyce 2006).

Obviously, the practice of printed digital art graphics in particular has always been linked to the limitations of its present and to its indissoluble connection, correspondence and regulation, with and from technologies. In this sense, the history and evolution of printed digital graphics has inescapably been subjected to the gradual introduction of new printing technologies. For example, going back in time, as Zamarro (2007) pointed out, when the so-called matrix or impact printers³ appeared in 1957, a

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1. For more than 30 years, this place has been home to works by artists such as Craig-Martin, Julian Opie, Terry Winters, and even Damien Hirst.
 2. We are talking about authors such as the German Gerhard Mantz, the New Zealand Micha Klein, the Russian Olga Tobreluts, the American Tony Robbin, the Spanish Guillem Ramos Poquí and the English James Faure Walker, Paul Coldwell, Mike King, Stephen Bell and Jeremy Gardiner. All are some of the greatest precedents in this regard.
 3. The source of inspiration that gave shape to impact printers was basically the mechanism of a typewriter: a device equipped with a moving head with individual shapes or characters in relief, which impacts on a ribbon with ink register to leave its imprint on paper. The first impact printer was the "dot matrix" printer, perfected in 1970 by Centronics Data Computer Corporation with the Centronics 101 model (seven-pin) in a wide variety of models – mainly from the hand of Epson – and it was commercialized on the market at a generally low cost for the printing of invoices or forms. They had a head with longitudinal mobility composed of a group of rectangular needles (from 9, 18 and 24). Actuated by an electromagnetic mechanism, the needles strike an ink-laden ribbon interposed between them and the paper, to generate, according to their grouping, graphics from the conjugation of characters or lines. The other version of impact printers, known as the daisy printer, would not hit the market until 1978, and could only generate images from the combination of letters and numbers. Unlike the previous one, the "daisy" printer was basically an electronic typewriter that functioned as a peripheral portal for a computer. Provided with a disk in the shape of a daisy, each of the extremities of its arms featured a character or symbol in relief. The interchangeable rotating disk acted in the same way as the needles since, when one of its elements hit the ink ribbon, it transferred the imprint of the symbol it contained onto the paper. Ultimately, the results came to form images like those produced by conventional typewriters with which visual poets had worked so hard years previously.

new field of research was opened for the image in art and the concept of *stamp* or *stamping* in relation to electromechanical technology.

After matrix printers, different methods were introduced to the market that offered a substantial improvement in the quality of printing both images and text without resorting to the impact mechanism of the previous printers, since the new ones provided the ink in the direction and amount needed without touching the paper and are based instead on chemical, thermal or electrostatic phenomena.

In this sense, we have seen many other incursions since the first photocopier came onto the market (1962), with important artists who would revolutionize the field of electrography: Jürgen Ölbrich photocopying rock steps on the photocopier, James Durand multiplying breads through photocopiers running for hours, Ariane Thèzè transferring images of the body onto acrylic polymer, later taken to life-size for her installations, and Rubén Tortosa focusing on the processing of the work to address the dissolution and transfer of authorship that these technologies allow.

Other authors, such as Sonia Landy Sheridan, Bruno Munari, Christian Rigal, and the Alcalácanales tandem – formed by José Ramón Alcalá and Fernando Níguez Canales in 1993 – focused on electrographic language both theoretically and practically. Sonia Sheridan was a pioneer in the use of technology for artistic creation from the Department of Generative Systems at the University of Art in Chicago – a place where numerous artists went to investigate different processes and machines⁴– and Bruno Munari was one of the first Europeans to use the photocopier for expressive purposes, like Christian Rigal who had just graduated from the Center of Mass Communications at Columbia University (NY). Alcalácanales studied electrography as a creative medium to investigate it within contemporary art.⁵ The various mixtures and technical hybridizations that artists experience shows the qualities that can be obtained with these convergences, above all, because they enrich the more traditional field and the technological emergence, both for artistic creation. (Alcalá 1998)

From the 1960s onwards, artists began to visualize digital printing as a graphic tool for their works. However, the computers and software that enabled these prints were hard to come by, highly complex, or tremendously expensive, so first prints were limited to rather precarious

paper and layouts. That said, the attraction to novelty meant that bad results were not dismissed, because they helped to understand this language and review its graphic possibilities. This digital technology has propitiated, over time, a wide range of results that, saving their originality or detail, focused on incorporating all this technical panorama into traditional engraving processes. Coldwell (2010), in this regard, reminds us of the vector silkscreen drawings of Julian Opie and Michael Craig-Martin, the digital woodcuts of Terry Winter, the digital reconstructions of Deborah Speerber, the seascapes of Susan Collins, the expanded practice of Massimo Bartolini and the suspended printed dresses of Marija Staric and Almira Sadar.

Specifically, some of the digital printing systems that have had the greatest impact on the artistic field of reproducible images are basically three: the two most basic and popularized systems are the Electrographic process (Laser print) and Inkjet technology⁶ (inkjet printers), and the Chromogenic print known as the Lambda Photographic Laser System (LED system),⁷ commonly used in digital photography (Figure 1). The Lambda system is a much more expensive printing system, but the printing finish is impeccable in terms of image definition, the printing quality of the colours and the brightness of its finish. The Inkjet is a much more economical and popular printing system,⁸ as well as versatile.

All those technological resources to which many artists have turned help shape their creations. Jesus Pastor (2004) wrote about all these creative possibilities:

“Always from the reference of the creative image, electrography turns, like other strategies of other languages, towards displacements of an aesthetic, social-political, or technological type. But, perhaps at present, technological and social-political decentering are the most decisive in electrographic creations; the technological one due to the variety of results obtained in a chain of media that unites analog photography, digital photography, video, scanners, software programs, screens, electrographic printers, bubble printers, film cameras, etc.; the social-political from a critical position thanks to the circulation capacity of the image, for its normality, for its ease of use, for the importance of conformation of and in the information in front of the objects, for the diffusion capacity in the media channels and the instantaneous transmission of signals.” (31)

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4. An activity that, in Spain, was undertaken by the Centro de Cálculo of the University of Madrid, where artists, engineers, architects and programmers pioneered the automatic generation of plastic forms between 1965 and 1982. The place meant a focus of creativity that produced all kinds of tangible and intangible heritage from the study of generative grammars and the relationship between natural and artificial languages. That centre was a meeting point for the cultural panorama of the moment that generated computational aesthetics, theories on communications and information systems (López Juan 2012).
 5. Alcalácanales wrote the first publication in Spanish on electrography: *Copy Art: la fotocopia como soporte expresivo* (1986).
 6. Inkjet technology involves different modalities such as Continuous flow (Iris) or Demand jet (by thermal injection or piezoelectric injection). In the case of piezoelectric print, although it has improved the print finishes on different printing media as well as the use of different types of ink, whether water-based or oil-based, if the artist wants to obtain quality results, we need to work with special inkjet papers. In the research “Piezoelectric printing, the injected stamp” (2006), Kako Castro and Ana Soler concluded that most of the papers commonly used for printmaking provide a finished dull colour and “hairy” look. Hence, large companies such as Somerset with Epson, Canon, or Hahnemühle with HP, are investing in the development of handmade finishing papers that favour the printing quality of digital artwork (Castro 2007).
 7. Lambda is perhaps one of the most important hybrid systems of recent times. Half printer, half enlarger, this system allows, by means of an RGB laser, the printing of a digital file without inks directly onto special paper, which must be photosensitive. The durability of these types of prints is 100 to 200 years depending on the amount and intensity of their exposure to direct light and the type of paper used; those from Kodak offer greatest reliability in the current market. Its advantages include: better resolution than other media, opacity and intensity of tones, brightness, quality in transparencies, subtleties and degradations. Even so, to date, digital printing made with Inkjet technology offers greater durability and possibilities for working on a wider range of media.
 8. In Inkjet technology, tiny drops of ink are injected into the surface of the media to be printed through nozzles also known as conduits. The type of directed deposition always gives us, on a microscopic scale, a patterned image formed by points, as we said before, with an opaque and fuzzy finish.

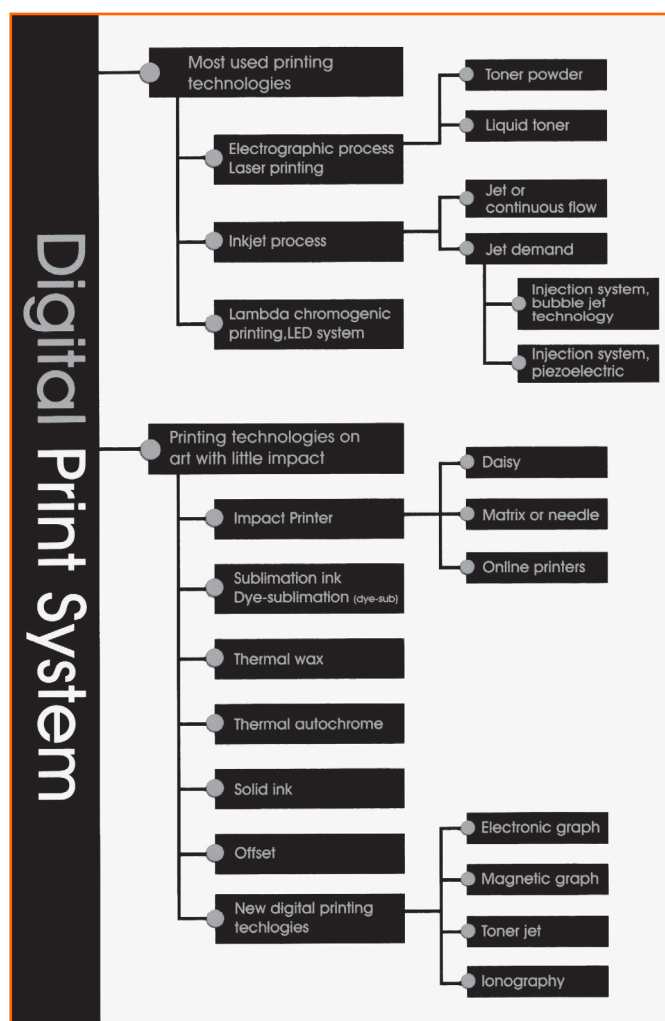


Figure 1. Digital print systems. Source: (Minguez 2013, 337)

2. About extended graphics: bridges between printmaking and intangible printing

Printmaking has always stood out as a medium that, due to its procedural versatility, can be merged with other media, languages and media, and thus enables their role to be redefined in conceptual, aesthetic and procedural terms. Under this position, Michael Schneider noted:

“During that time, we saw the digital age arrive in the field of printmaking. This process allowed many printmaking artists and printmaking scholars to return to the pattern in the use of new technology for the publication of their original art that was usual in history and to redefine the role of printmaking and to develop new concepts of content, visualization and aesthetic.” (2010, 16)

Nowadays, authors such as Megan Fishpool (2009), Paul Catanese and Angela Geary (2012) speak of hybrid prints alluding precisely to works in which “Hybridization takes places, and flourishes, to exploit new niches that appear in existing environments, processes and tools.

When two techniques interact with each other to become a single tool or material, you make a hybrid or combination” (9).

This expansion has been reflected in the thoughts of the printmaker, who shifts his or her actions to the urban landscape, installation, sculpture, and so on. Printmakers today have myriad ways of expressing themselves thanks to the technological development of laser printers, image-editing software and even the exploration of immersive narratives or expanded realities. For this reason, the use of the term “expanded graphics” has also proliferated and is established at an international level. We know this well from the theories of Rosalind Krauss presented in her text “Sculpture in the expanded field” published in 1979.

This hybridization capacity of electrography would also be addressed years later by Jesús Pastor (1998, 2013) with his concept of “extended graphics”, where he studied the possibilities of this practice to push the limits of other graphic formats. In his theoretical studies and in his artistic practice, Pastor (2013) shows a graphic environment that – in its mix of the traditional with the technological – is in a living process, in a displacement that seems simultaneously to explode into other areas and to implode, attracting them towards itself.

However, in conjunction with the current conceptual openness of printmaking, it is worth mentioning some issues around the necessary use of certain terms that have been used in the tone of electrographic art and, more specifically, practices derived from the use of some of the printing technologies cited in the previous section. Our intention, obviously, is not to pigeonhole our own practices, but rather to put on the table some words that allow us a better rapprochement between us as artists. This, in turn, will favour a more concise dialogue with the market and with collectors who sometimes question our productions precisely because they do not fully understand our creative processes or the terminologies for defining our creations. For this reason, we would like to state the following:

The conjunction of words “digital print” within the art world alludes to the entire conglomerate of existing printing methods that depart from the basic principle of facilitating a “print” of a digital archive (immaterial matrix), to a physical support such as paper or another material. For Adam Lowe (1998), the qualifier “digital” was already a sign that the result of the print had been obtained through processes that required computer-generated information. Perhaps at that time it was fair, although today we know that there are already other digital creation systems and even different languages within them. Their close affiliation with traditional engraving invites reflection since, in the creative process of making a digital print, the artists can objectify their work from a digital matrix, or print it by any digital printing system or, even later, intervene in the digital printing with other manual procedures.

Unlike English, in Spanish, we tend to interchange the terms of *impresión digital* (digital print) and *estampa digital* (digital stamp) without taking into account the conceptual divergence derived from them. In this sense, the term digital stamp is strange because it combines the digital, which has an apparent but not physical existence, together with the print that indicates the reproduction of an image

transferred to a support – usually paper – by means of a press and a physical, material and tangible matrix. On the other hand, following this logic, although today the matrix can be virtual, the term *digital print* continues to indicate a printed product –in any medium – and, therefore, it is objectual. These two instances are united by the term *print* (in English), which preserves both the character of stamping and footprint and that of printing.

In other words, either of the two terms in Spanish – stamp or print – refers to the intervention of a digital technology in the objective reproduction of an image, so we recommend that, if we have to specify its origin or its digital processing, we should do so when it is required to specify the graphic process used, so as not to redound in a product already accepted by the art world.

Furthermore, in our opinion, a digital stamp attends to the description, perhaps reductionist, of printed works by electromechanical technology (as occurs with impact printers) or via digital resources which intervene in any traditional printmaking system, which would imply a miscellany of hybrid invoice in the meeting of both languages. A clear example could be found in the work of the Argentine Alicia Candiani, in which she combines and superimposes woodcuts on paper printed with piezoelectric systems or other hybrid processes. It can also allude to generated works (by pixels or vectors) and/or those scanned and manipulated on the computer with one or various software packages and subsequently transported to a physical printing resource without pressure or impact. For example, in the work *Dual* (2018) (Figure 3) by Alicia Candiani, it is a stamp print, in which the artist combines a digital image laser engraved on wood with screen-printing.

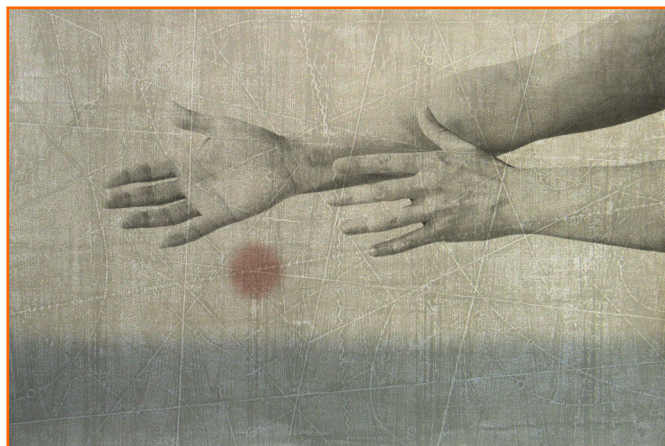


Figure 2. *CVD 1* (2020) by Alicia Candiani. Four xylography plates printed on Moku Hanga paper and a photographic image transferred by the CTP system, printed as waterless lithography. 80x120 cm. Source: courtesy of the artist

On the other hand, the work *Juggling at CVD Series* by the same artist (Figure 2), winner of the Semi-Grand Prize in the Hida Takayama Contemporary Woodcut Triennale 2020, is composed of four xylography plates printed on Moku Hanga paper, and on top of them, a photographic image transferred by the CTP system (direct printing on an aluminium

plate with an emulsion thermosensitive to the laser beam), printed as waterless lithography.

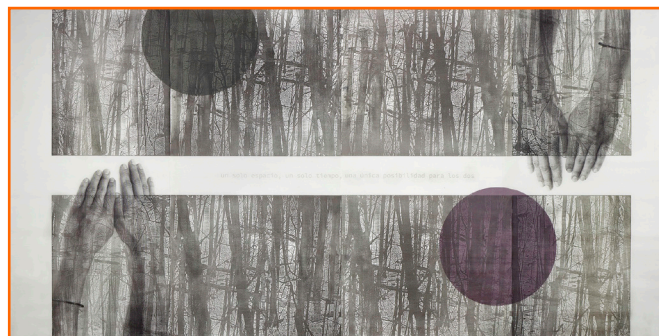


Figure 3. *Dual* (2018) by Alicia Candiani. Laser woodcut and screen-printing on Xuan paper 137 x 220 cm. Source: courtesy of the artist

Another artist who has been working on digital printing intervening in other techniques is the Mexican Coral Revueltas, who works around the concept of urban cartographies. Coral creates pieces which establish intercommunication between traditional and digital graphics. For example, in Figure 4, we can see large maps printed on canvas fabric, subsequently intervened in by a monotype with the aim of obtaining, by means of different sets of spots, more or less opacity or translucency: a resignification of the transited spatial dimension in allusion to the concept of affective spaces.

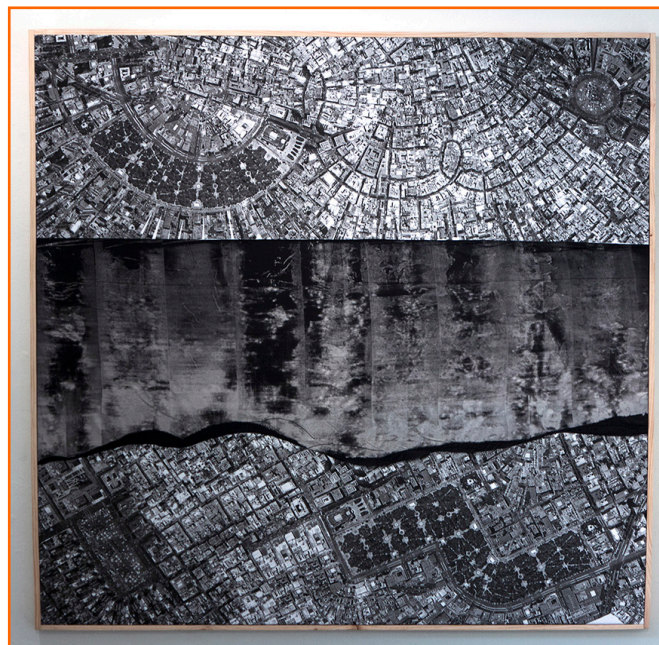


Figure 4. *Mapas afectivos. Trece de mayo* (2014) by Coral Revueltas. Monotype on cotton canvas and digital printing (inkjet on matte canvas), and hand embroidery. 215 x 215 cm. Photography: Gilberto Chen. Source: courtesy of the artist

As we can see, the computer often assumes a central role in the practice of various artists, with which they develop the representation

of concepts and spaces, with the benefit of serial forms. Both Candiani and Revueltas develop digital image themes that expand the symbolic vocabulary with great richness and refinement. These are styles that travel in the opposite direction to the particularizations of the pixel and the reduction of information that Dan Hays (2009) developed in his low-resolution prints and that he would call proto paintings. This allows us to think about the wide spectrum of action of the digital image in its short lifespan. Coldwell (2010) says in this regard that: "These prints fully developed through the computer on the screen, revisit lenticular technology (...) and through the bringing together of old and new technologies, create works of great refinement and visual intelligence." (159).

These hybrid options have for decades provoked in us a deep and continuing concern for experimentation in two ways. First, we have searched incessantly for a perfect technology for the creation and print of our digital work upon a tangible. For this, we have experiment with increasing the image resolution, colour ranges and chemical quality of the ink, opacity and resistance to light and exteriors, expanding the variety of supports and the quality of reception, among other things. Also, we are studying – both from an aesthetic and technical point of view – the benefits of combining the digital print system and traditional printmaking methods such as lithography, serigraphy, etching, woodcut, monotype, and so on.

This simple fact alerts us to the characteristics of the polarized world in which we live, where there is room for the old and the new and where our current practice of printmaking inevitably absorbs the emerging and the past at the same time. However, we should be careful; as Wolton said: "All that is new is not modern. All that is modern is not better" (2000, 209). From there, the total coexistence of feedback and complementarity between both traditional methods of engraving are not becoming extinct. We must not be confused. They are simply changing.

Nothing emerges from nowhere, because everything comes from a base. In this way, modern-day digital printmaking reflects our past. We can think about the legacies of the conventions of our ancestors: their strategy of the regulation edition, their way of presenting themselves before the market and defining themselves as a multiple-original, the presence of photographic imagery, iconography, graphics, textures, the use of analogous supports such as paper, presentation format, and so on. These are rescues and clear appropriations of some of the budgets and paradigms of self-defined features of previous resources.

We cannot deny our high level of accessibility to image and object registration techniques, whether photographic or by means of a scanner, which gives us a great capacity to manipulate and combine them through specialized software. In this sense, today's computers allow unlimited digital editing, printing or dissemination of images (Noyce 2006).

The old and the new endured a process of bilateral transformation, and today we are immersed in the unstoppable continuum: a cyclical process in which the artist adapts the artworks in a space between the ancient and current ways of understanding and approaching printmaking today. Marilyn Kushner announced this in her interesting reflection:

"In terms of the medium of engraving, we are, in fact, in a decisive period. At the beginning of the 21st century, information technology is creating a revolution in branding and, by extension, in other media as well. And digital technology seems to have revolutionized not only the field of printmaking, but also the way some artists look at the world." (2005, 138). For this reason, Graphic Art "today, no longer involves only marks, traces and physical wounds on a support but also light, electricity, bits, virtual, intangible pixels." (Alcalá 2011, 27)

Final reflection

As we have seen, contemporary engraving is positioned from a multifaceted art with overlapping processes, as well as old and new technologies that are revisited and revised and which coexist. Jacon Lillemnose said that, when artists took technology into their own hands, "they challenged the common notion of the correct use of technology and expanded, distorted and transformed its capabilities as a means of perception, opening up a plethora of visions of the unknown, unimaginable dimensions of the new electronic world." (Sheridan 2014, 5)

Thus, while it is true that there is a current attraction to digital printing media and available technology, we also see that the stage does not abandon traditional expressions or their development in the visual arts. The domestication of technology has allowed great accessibility to its increasingly affordable processes and an exploration of its technical diversity for the production of images. It seems that the dilemma, rather, as presented by Noyce (2006), lies in the artist's decision to select which techniques or paths to follow when creating.

As Coldwell asserts, we think that: "The definition of engraving should change to adapt to these developments as the boundaries between disciplines blur and the nature of art practice changes in response to technological advances" (2010, 178).

The artist jumps from one medium to another and from one technique to another, using all the resources that facilitate the construction of the idea or message he or she transmits. Hence, although we appear to think that the end of every knowledge would be for each of its disciplinary parts to end up defining themselves, with boundaries for a specific audience and not for another, the reality is that, even despite their necessary idiomatic self-determination, the confluence between fields will be essential and uncontrollable.

The presence of printed digital graphics is undeniable today because, as a developing research-creation field, it denotes a boisterous experimental interest in all of us. However, to think that the versatility of multimedia, the speed of execution and work facilities that digital allows us and the attractiveness of the new can unseat engraving and traditional stamping systems, relegating them to the oblivion of our ancestors within a few decades, is one of the most presumptuous arguments of recent times. Have artists stopped sculpting, drawing or painting with the introduction of new technologies? Of course not. As

we have seen in the works of artists such as Alicia Candiani or Coral Revueeltas, we continue to use traditional approaches, sometimes placing them in dialogue and combining them with digital processes or techniques. Expanded print ultimately constitutes a new way of encompassing this hybrid interpretation of graphic language today.

Let us remember that Marcuse (1991) predicted the growth of technical progress within a framework of domination, in which technological reason would become political reason, by being able to create forms of life. That said, he also assumed a qualitative direction capable of social change and productive processes. Perhaps, as Lillemose (Sheridan 2014) suggests, the use of artistic imagination to manipulate technology constitutes a real alternative to technocratic reason and rational logic, where electronic images contain the understanding of the current digital eation picture.

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