The Chrysotype Manual

The Science and Practice of Photographic Printing in Gold

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Preface

Throughout its 170-year-history, the practice of photography has been governed by the photochemistry of silver halides. Their ability to form a developable latent image provides the unique means of securing negatives 'instantaneously' in the camera. Making prints from these negatives, however, is a more leisured business - exposures can be lengthy and light sources intense - so the door is also open to a whole range of 'non-silver' printing processes, much slower than the bromide enlarging papers of the commercial monoculture. The so-called 'alternative' photographic printing processes, such as platinotype, cyanotype, gum dichromate or carbon, were supported by industrial products in the 19th and early 20th century, but the pressure of competition with the silver-gelatin medium has since declared them commercially non-viable. They are now finding a renaissance among specialist enthusiasts, who hand-coat their own printing papers with the light-sensitive chemicals.

At the time of writing, we are caught up in a profound revolution in the technology of lens-based media. Silver photochemistry is being forced to abdicate its hegemony in favour of photophysics: analogue chemical imaging is rapidly giving way to digital optoelectronics, and the desktop computer is taking over from the 'wet' darkroom. While the revolution is busy replacing silver-gelatin negatives wholesale by strings of binary code, there still remains the question of how best to make permanent that ultimate visual product - the photographic image. For many purposes, the ink-jet print serves well enough, but in the area of fine art and archival images, the alternative printing processes can still offer some unique and satisfying qualities.

The platinotype, once the preferred medium of many exhibiting art-photographers, has lately regained its position as a well-established minority practice. Together with its close homologue, palladiotype, it continues to justify the nineteenth century claim that this finest of processes is "simple, beautiful, and permanent". But the adjacent noble metal, gold, has never succeeded in gaining acceptance within the photographic repertoire, apart from its use as a toning agent to stabilise and improve silver images. This was despite the early invention, by Sir John Herschel in 1842, of a pure gold printing process which he dubbed 'chrysotype'. However, the only gold salts known in Herschel's day were too reactive for the sensitizer, and had to be contained in a developer bath, which rapidly became contaminated, so making the process uneconomic. Sporadic attempts to improve on Herschel's chrysotype found little success, and by 1900 all the authorities on photographic technology were unanimous in discounting the gold process *per*

se as a photographic medium. Chrysotype lay forgotten for over eighty years, until I revisited the problem armed with some knowledge of modern chemistry. By 1992 I had developed an economic working process, comparable with platinotype, which I simply called 'new chrysotype', in honour of Herschel's original invention.

Gold, as a pigment, has higher covering power than the other noble metals, a benefit which makes its use significantly less expensive than platinum or palladium. New chrysotype shares with its sister-processes, platinotype and palladiotype, the same characteristics of a totally matte print surface and a very delicate tonal gradation. It also offers a valuable bonus: besides neutral grey tones, chrysotypes can be made in a wide range of subtly-muted colours, including pink, magenta, brown, purple, violet, blue or green. The creative monochrome photographer should find here an extra dimension to explore, in which the colour of an image can be matched to the expressive intent of its maker. The hue of the print is determined by the chemistry of the sensitizer and the conditions of processing, so the photographic artist has full control of this palette of non-literal colour. New chrysotype thus offers advantages in the beauty and permanence of its images – advantages that I hope may qualify it in the future as a unique medium of artistic photographic practice.

Prospective users of the new chrysotype gold-printing process should find all the practical information they need within this workshop manual. Much of its content is also relevant to the allied iron-based processes, platinotype and palladiotype, so it should interest the practitioners of these well-established printing techniques. This handbook provides the essential working information in a suitable format; it is complemented by my companion work: *Gold in Photography: the History and Art of Chrysotype*, which explores the historical, cultural, and aesthetic backgrounds to the uses of gold for imaging.

All the preparations, materials, and equipment needed for setting-up an iron-based printing studio are listed and described in Chapter 1, with suggestions for sources of supply. An integral part of most hand-made photographs, especially chrysotypes, is the paper substrate, where the image resides in the surface fibres of the sheet and not in a binder layer coated upon it. Fine papers, their constitution and properties, are considered in Chapter 2, which lists the characteristics that are essential to their successful functioning with the iron-based processes. Chapter 3 provides some instruction in relevant chemical handling techniques and procedures, with due regard to issues of health and safety.

The core of this manual resides in Chapter 4, which publishes, for the first time, the full practical details for working three differing versions of my new

chrysotype process, explaining their differences and relative advantages. Other versions of chrysotype have also been developed, which offer further scope for modifying the appearance of the gold image, but they are not described here because their use could incur certain hazards that preclude their being published as methods recommended for the general public.

An essential prerequisite for the process is a negative having an appropriate density range; Chapter 5 therefore outlines several methods for the making of large negatives, including an introduction to the digital methods, using a desktop computer.

All the technical material that is not essential to the 'hands-on' practice, is gathered into a set of appendices, which may be consulted for reference or educational purposes. Appendix I provides a list of all the relevant chemicals in this work, their properties, and associated hazards, together with suppliers' catalogue numbers. Appendix II describes some 'do it yourself' chemistry for practical workers who prefer to prepare their own chemicals. Appendix III provides reference tables for the conversion of the antique and obsolete units that may be encountered in the early literature, largely for the benefit of those interested in re-interpreting historical recipes. Appendix IV carries an account of the chemical underpinnings of the process for those who are fluent in the language of reactions and molecular formulae. Appendix V offers a quantitative treatment, for the mathematically-inclined, of the factors influencing photochemical exposures for image-making. Appendix VI is a glossary, intended to de-mystify any technical jargon unfamiliar to the general reader.

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Mike Ware
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