

## Lignin

A sheet of paper, this sheet of paper, A4 sized, with a white value of CIE 148, and a weight of 80gsm, sold in a ream of 500 sheets and made from wood pulp mixed with small amounts of white clay, chalk and titanium oxide. Pulp sourced from the waste products of sawmills and lumber yards: woodchip and sawdust.

Wood consists primarily of three things: cellulose, hemicellulose and lignin. Lignin, a natural polymer that forms an essential part of the structure of cell walls in wood and bark, is what makes wood woody, bark thick, stems snap: it is the strength of plants. Second only to cellulose, it is the most abundant organic compound in the world. It is also one of the least understood, as all lignins show variation in their chemical composition and it is still not possible for scientists to define their precise chemical structure.

To turn wood into paper, the wood chips must be pulped: that is to say placed in a solution of sodium hydroxide and sodium sulphide to dissolve the lignin and separate the plant fibres while keeping them intact. What is extracted from this process known as black liquor, what is left over as 'wood free pulp'. Almost seven tonnes of black liquor are produced for every tonne of pulp produce. The black liquor then represents everything that this paper is not: everything that must be removed for it to be white and smooth. This pulp is then rolled, steamed, dried, stretched, flattened and then finally cut.

Cut into what though? Most likely a sheet this size: 21 x 29.7 cm: we think of offices, of school notebooks, of print-outs, of bank letters, of photocopied essays rarely read, of shoving reams of paper into the photocopier drawer and straightening their seams. It is the shape of bureaucracy, administration: the institution. A4 pages cannot be spoken back to: they are the size of standardisation: of volume, of sheer mass. They masquerade as the universal and pretend to be invisible.

As a child, during long summer holidays, I would often go to the office where my mother worked. I was always drawn towards the copy room by its crisp neatness. It seemed that adult life began here among the folders, binders, hole punchers, staplers and the warm arrival of a freshly printed page onto the paper tray.

Once I carefully photocopied a page of a book on Dali I was reading and folded it back into the book. I was fourteen and on the page was a photo of Salvador Dali and Federico Garcia Lorca at the coast near Cadaqués in 1925, when Dali was 21 and Lorca, 27. Lorca stands proud and square and solid, facing down the camera while Dali approaches him playfully from behind, placing his hands on Lorca's hips. I did not know whether or not the image was innocent but I was sure that my duplication of it was somehow not. It was a sign that had to be hidden, and yet also kept: folded so it was white again and I pressed it back into the book, which was now somehow more than it had been before.

A4, in fact, exists in order to be folded. It is a manifestation of a ratio, where every folding or unfolding, halving or doubling keeps the same proportion. It allows for filing and the maintenance of order. An order whose first trace can be found in a letter written in 1786, by Georg Christoph Lichtenberg, a physics professor at the University of Göttingen, to his friend Johann Beckmann:

I once gave an exercise to a young Englishman, whom I taught in algebra, to find a sheet of paper for which all formats are similar to each other. Having found that ratio, I wanted to apply it to an available sheet of ordinary writing paper with scissors, but found with pleasure, that it already had it. The short side of the rectangle must relate to the large one like  $1 : \sqrt{2}$ , or like the side of a square to its diagonal. This form has something pleasant and distinguished compared to the ordinary form.

This idea would later be developed by the renegade French politician and mathematician Lazare Carnot into the A2, A3, B3, B4, and B5 sizes for use by the French judiciary immediately following the French Revolution in 1789. More than a century later, the system was fully developed by Dr. Walter Porstmann and adopted as the DIN standard by Weimar Germany in 1922, since which time it has sat at the centre of modern life.

### *Flotsam and Jetsam*

A sheet of paper is flat and waiting: waiting for a mark, an image, a stain: ink or pencil, printer or pen because, before all else, a sheet of paper is a surface and what surfaces want most of all is to be a vessel, to deny themselves and to disappear. Drastic measures must be taken to make them visible again: a slash in the canvas, a crack in the screen. The sheet must be torn for us to see past the words, the images to what holds them.

The story usually told about the birth of paper is that of Cai Lun, a Court eunuch and politician during the Han empire in 1st Century China, who sat watching Paper Wasps construct their distinctive, grey, open comb hives by secreting a mix of saliva and fibres gathered from dead wood and plants and realised there was a better alternative to writing on silk. This story is almost certainly apocryphal as archaeological evidence has found examples of paper pre-dating Cai Lun by almost two centuries and early Chinese paper was made from rags and cloth, not wood, but it holds and the image remains: always at the centre of paper, the hive, the network, bureaucracy.

Actually, prior to the 1870s, nearly all paper was made from cloth. Paper made from wood is a recent development, which, like photography, was discovered simultaneously by two different men at more or less the same time: Friedrich Gottlob Keller in Germany and Charles Fenerty in Canada. Both announced their discovery in 1843, and both were initially ignored. It would be several decades before wood-pulping techniques began to spread, aided in no small part by the scarcity of cotton for paper production.

Most paper then was made from recycled rags: 19th century publications would regularly remind readers of their duty to sell on their old cloth in order to keep paper production afloat. Paradoxically then rags were ubiquitous yet scarce, despised and yet precious, somewhat like the figure which emerged out of this same need for cheap fabric. The ragpicker, or *chiffonier*, was an object of abject fascination throughout the 19th and early 20th century as the urban and distinctly modern incarnation of the gleaner. There is a portrait by Edouard Manet, a famous photograph by Eugene Atget, a lost film by Georges Méliès among many other

etchings and images. However, it was in literature that the figure really took root. The figure appears in Charles Dickens's *Bleak House* and several other Victorian novels, but most influentially, it was Charles Baudelaire, who took up this figure throughout his work, notably in the poem "The Ragpicker's Wine", ("Le Vin de chiffonniers", published in *Les Fleurs du mal* in 1857) and several years earlier in a prose fragment:

Here we have a man whose job it is to gather the day's refuse in the capital. Everything that the big city has thrown away, everything it has lost, everything it has scorned, everything it has crushed underfoot he catalogues and collects. He collates the annals of intemperance, the capharnaum of waste. He sorts things out and selects judiciously; he collects, like a miser guarding a treasure, refuse which will assume the shape of useful or: gratifying objects between the jaws of the goddess of Industry.

As for Dickens we see clear analogy between the transmutation of rags into 'spick and span new paper' and the reform of the poor in Victorian London while for Baudelaire, the *chiffonnier* is the outsider collecting treasures that others overlook, an analogue to the poet isolating the neglected fragments of modern life.

*And the word was made Flesh*  
John 1:14

There is often this quick use of rag and cloth as metaphor: text and textile share the same root, *texere* 'to weave, to make', ('technology' can be traced back the same way), and fabric and fiction and the meaning are all bound together.

Cloth shrouds. It reveals what it covers. It is practical, yet erotic. It is flat, and yet its purpose is to show form. Metaphor comes from the Greek, *metapherō*, to carry over. To carry a meaning from one place to another, to bear it across, from one place to another. Metaphors need vessels (and are vessels in themselves) so they seek surfaces. Cloth, the sheet, is the image for metaphor itself.

We can see traces of this throughout history. In the late 14<sup>th</sup> century Flanders a wealthy nun commissioned a prayer book containing excerpts from the *Song of Songs* and St. Augustine's *De Trinitate* accompanied by a series of illustrations that were most likely based on her own visions. Now known as the Rothschild Canticles, the manuscript is filled with images which illustrate complex Christian theological paradoxes in concrete, material terms using a small set of visual metaphors: the circle, the sun and above all, cloth. Cloth used by angels to hoist the Virgin into heaven, the Godhead as a robed figure obscured by a Golden sun, Christ and God the Father, bundled in a length of cloth, reach up to join their hands with the wings of the Holy Spirit hovering above them, the sun is swathed in a length of cloth knotted above and below, an expanse of cloth twists into a pattern similar to a triangular celtic knot to represent the holy trinity. These are images that were not allegories to be interpreted but aides for further thought: pictures to enter. A swaddling of thought against the edges of language, a protection from its gaps: softened against thought.

*a new and living way which he hath dedicated for us through the veil  
that is to say, his flesh*

Hebrews 10:20

If metaphor is where the visual enters language, it is also at the very root of thought itself: after all which words or phrases are not in some way metaphorical? How do we understand anything new except by asking how like, or not, it is to something else: by testing novel concepts through the shell of something familiar, by performing the alien as the everyday? Metaphor is more than analogy, it contains a becoming. Something new is brought into the world so that it not only describes, it replaces.

And so from the Trinity, to the sheet, to the Web, to the Net, to the Cloud. Religion and technology are both understood through reification: knots of faith and lost assumptions. Grasping at what is just beyond us. The Internet particularly is framed by a series of terms that render it abstract and ethereal. Yet however much it may present itself as, and aspire to be, omnipresent, it remains physical, local, vulnerable: reliant upon the balance of a dense network of material things in order to function: copper, glass, silicon, steel, server farms, fibreglass cables, the router in the corner of the room. The cloud destroys. Bit-rot is technology rendering itself obsolete. It refers to when data is lost because the hardware and software needed to access it becomes redundant and files become unreadable or inaccessible. We can see the results of this process in the huge piles of e-waste gathering in Guiya, China and Lagos, Nigeria, where mountains of monitors, computer towers, keyboards, and phones shipped there from recycling plants in the West are stripped down and burnt for the few valuable strips of copper or other metals that can be extracted from them.

The surface is the plane in which authority rests. It shrouds pixels, resources, labour, waste. So to draw attention to the medium, to that which mediates, is to draw attention to the source of power itself. Relief, from the Latin *relevare*: to raise, to lighten, is surface and image at the same time. It is drapery frozen in marble, marked with the traces of touch. In reliefs we see the fusion of the surface, material and information.

Lignin then becomes the removal of everything that interrupts the surface, everything that contaminates the empty vessel, everything that would make it visible as a surface. It is the excess: the awkwardness of life itself (oily fingerprints on a screen). It is that which is taken away in order that the ideas, the thoughts, the images, the intent, are unmuddied. Lignin, this thick black liquid is everything you do not hold in your hand.