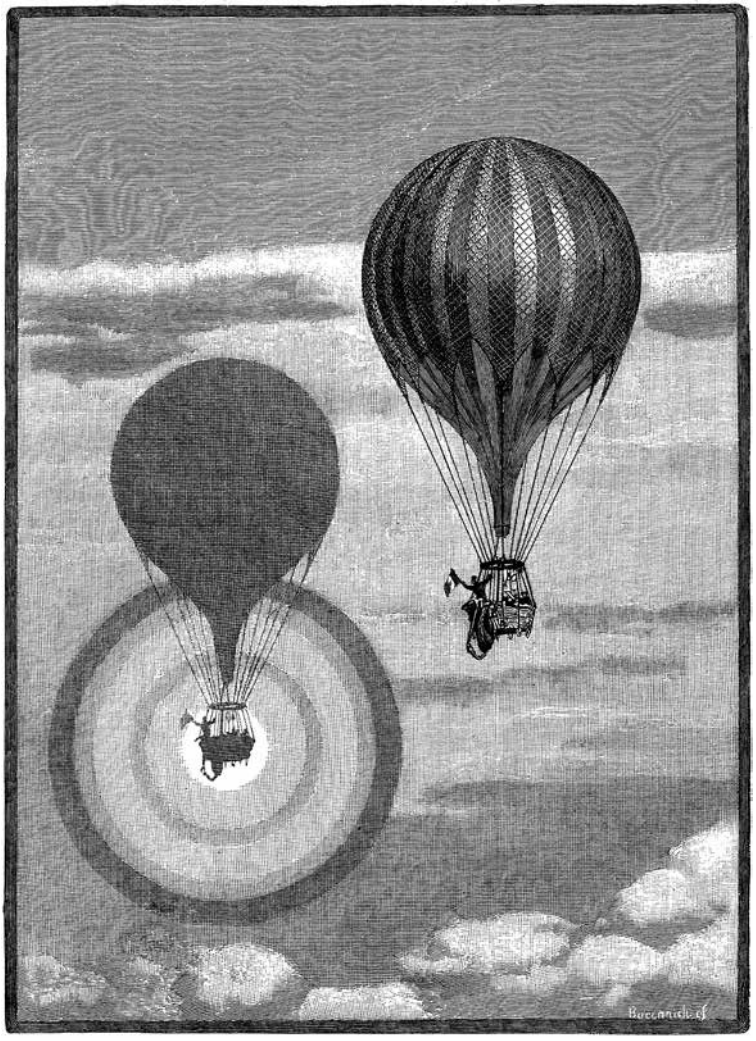


Rachel Withers

The Library of Marvels (Expanding Version)

Rachel Withers

The Library of Marvels
(Expanding Version)

English version

About *the Library of Marvels*

Swiss artist Roman Signer is famous for making works that hinge on the basic laws of mechanics. He conceives a plan for a physical process, sets up his materials, and then lets nature take its course. His epigrammatic pieces often resemble basic scientific or technical experiments, but they are something quite different. They are experiments in poetics – in the creation of resonant new images, ideas and feelings from familiar objects and natural mechanisms.

When Signer is off-duty he enjoys walking, the movies, relaxing with family and friends and browsing his books. He is a self-confessed book addict. Over many years he has accumulated a large collection of mostly second-hand, mostly illustrated, books that cover a huge range of subjects. However, he insists, when he dives into his library he is not researching ideas for works but escaping from studio concerns. The current art-school-academic phrase 'practice-based research' emphatically does not apply to Signer's approach. He doesn't develop pieces following abstract 'research questions'. He has ideas for artworks, then goes off and makes them.

I first met Signer in the early 2000s and since then have written about his work and conversed with him frequently. In 2011, I proposed to him that I should make a project exploring his library, the location of many of our talks. I thought it would be really interesting and fun, and as a UK art school academic, I thought I could disguise the enterprise as 'practice-based research'.

That meant cooking up 'research questions'. I was aware that the plan fell under the general heading of 'biographical criticism', a label that many art historians hold in deep suspicion. However, I speculated, what if 'biographical criticism' was, in fact, an umbrella term under which a wide variety of art-critical operations might take place? After all, what exactly is 'biography'? Influenced by philosopher Galen Strawson's argument that selfhood *per se* is not a coherent, linear narrative but *episodic* – kaleidoscopic, fragmentary, discontinuous – I began browsing Signer's books 'episodically', in search of an episodic picture of an episodic imaginative world that might (or might not) have something to do with the artist and his practice.

Pictures became important, not least because my German is rudimentary, and Signer's books feature a variety of languages. Using a bottom-of-the-range A4 scanner, I digitised illustrations that snagged my attention, then deployed my (sketchy) Photoshop skills to shock them into a new kind of life. Colours became bright. Yellowed paper turned white. Creases were smoothed. Tears were healed. Diagrams of ants' stomachs, cross-sections of volcanoes, hand-coloured prints of debatable animals (see *sukotyro*), illustrations of obscure Swiss sports, pre-war Soviet cuisine, Geissler tubes, nineteenth century parlour games, seventeenth century artillery, detonators, ballooning disasters, plankton and much more, all got the treatment.

A confession: my sense of critical direction, vague to begin with, crumbled fast. Episodicity turned into caprice as, aided and abetted by Signer and his partner Aleksandra, I unearthed one beautiful, or intriguing, or hilarious image after another. A plan had been conceived, materials assembled, and multifarious interests and inclinations took their course. I wondered if I had become a component in an (albeit atypical) poetical Signer experiment.

Eventually I had to decide what to do with the hundreds of images I'd gathered and 'reanimated'. *The Library of Marvels* is the result.

About *the Library of Marvels (Expanding Version)*

The Library of Marvels first saw the light of day in London in 2015, in the main staircase at Hackney's Rose Lipman Building, a community centre and ex-public library. I combined selected prints in thirteen large frames, theming each montage around a title from the *Bibliothèque des Merveilles* (1865–1956), a French vulgarisation or popular science series. Signer owns a fair number of its volumes, but not all: there are more than 170. The *Bibliothèque* has been described as an *encyclopédie en désordre*, or 'disorderly encyclopaedia', a phrase that resonates with Signer's library, so the curatorial strategy felt appropriate. Behind the montages I installed bespoke wallpapers featuring motifs from Signer's books, some self-consciously 'Signery': a Piaggio van, a Leonardo-esque flying man. The sophisticated London art world stayed away in droves, but a local group with age-related memory problems, who met weekly at the centre, declared it to be marvellous indeed, and asked that it stay there forever. One unidentified local resident, captured on CCTV, liked the montages so much that she crept in at 7.00 am and stole one.

The Vadiana's display is likewise organised around the *Bibliothèque des Merveilles* titles, but in a much changed and expanded form. 26 connecting panels form a concertina or giant *leporello* – the simplest, earliest form of the book. Previous themes, such as *Motherly Love in Animals, Civic Courage and Aviation Today* are joined by new ones: *The Fantastic Atomic Universe, Subterranean Marvels, Marvels of Strength and Skill, Marvels of the Invisible World, Ants,* and others. In addition, some panels show trompe-l'oeil bookshelves stocked with books bearing all the titles of the *Bibliothèque*: from *Celestial Marvels* (1865) to *The World of the Stars* (1956).

Complementing the leporello, vitrines showcase Signer's personal selection of books from his collection, and a monitor screens his 1984 Super-8 film *Bücher*. In this work, Signer despatches a pioneering team of books into one end of St.Gallen's Steinach tunnel and salvages their mortal remains at its outflow. In the course of their watery journey under the city centre, they undergo a definitive 'final edit'.

I've produced the screen's collages under Covid-19 lockdown conditions in a UK box room, using what was to hand: a cheap, non-archival A3 printer, scrap paper, office gluesticks, stubs of crayon, leftover inks etcetera. The displays have been divided into sections, shipped to St.Gallen in boxes and reassembled on site. Therefore, the work is explicitly a very big sketch, provisional, improvised and chemically very unstable. Enjoy it while it lasts!

This is not the only 'viral' aspect of the project. It will be accompanied by a website where a selection of my Photoshop files may be downloaded for use under a multiple free license. Anyone who wishes may adopt, adapt and transform the images following the terms of the license, which requires all future uses to be similarly free-licensed. With luck, the website launch date will coincide with the *finissage* of the show in St.Gallen – stay tuned for more details.

This presentation is also expanding and decentred in more metaphorical ways. Its aesthetic is conspicuously mine, not Signer's. Signer's artistic address is always direct, clear and economical: he can always see the wood for the trees. Language-led and left-brained, I am a pattern-maker, endlessly accumulating details and shuffling them into changing configurations as if they were words and sentences in a protracted, rambling, unfinishable book. However, of its own volition, the work has ended up hinting at ambivalences that haunt many Signer works, particularly recent ones – to do with the simultaneous comedy and tragedy of obsolete objects, or the simultaneous heroism and absurdity of human endeavour, or the extreme precariousness of all humanity's toehold on existence.

This outcome is in part do with *the Library of Marvels'* balance towards images from the history of science. As they came together, the montages' connotations seemed to point three ways: towards the modern habits of thought and action that have (variously) got us into the interlinked crises of Covid-19 and the global environmental crisis; to the ones that could potentially get us out of it; and to the fact that, at times, the two can be hard to differentiate. This ambivalence seems very much in step with the tenor of Signer's practice, and is a quality that emerged unbidden.

Volcanoes and Earthquakes

Signer has long been fascinated by volcanoes, and in 1997 created a work by rolling a bright red gymnastics ball down the smoky, ash-strewn slopes of Stromboli in Sicily. He is also a frequent visitor to Iceland, another obvious hot-spot for seismophiles.

This panel features diverse images relating to volcanoes and earthquakes, taken from many sources, including the *Bibliothèque des Merveilles*: for instance, a nineteenth century relief engraving of the caldera of Thira (Santorini), now thought to be the origin point of the legend of Atlantis. The panel's design is inspired by the illustrations in pioneer volcanologist William Hamilton's 1776 publication, *Campi Phlegraei* (Flaming Fields). Signer's collection includes a modern reprint of this beautiful book.

Matter and its Transformations: Thin Slices

A panel featuring six highly enlarged scans from palaeontologist Melchior Neumayr's *Erdgeschichte* (History of the Earth) of 1887. In the book they are identified as *Dünnschliffe* or 'thin slices'.

The original hand-coloured source illustrations for this panel measure approximately three centimetres across. High-resolution scanning, photoshopping and enlargement reveal many details of both the original images and the paper on which they are printed. They are a reminder of the profoundly collective character of book production: for example, of the printers, paper makers, book binders and hand-colourists (these last, usually women) whose work is preserved in books such as *Erdgeschichte*. The artist Susan Hiller once dubbed the hand-colourists of the nineteenth century the 'unknown artists', and we can also see their work in the panel «Butterflies: Ernst Hofmann, the Butterflies' Friend»

These images have a talismanic significance in the Library of Marvels project, since 'thin slicing' in the psychological sense of making rapid intuitive judgments has been so important to its evolution. As Withers 'fished' in Signer's diverse, multi-linguistic book collection, her search became largely instinctive: a process of hunches and fast choices. Curiously, these specific images themselves fell victim to 'thin slicing' during the London 2015 exhibition of the Library of Marvels, when a very small woman already burdened with shopping ran into the building on a Saturday at 7.00 am, hefted the bulky framed version of the Thin Slices off the wall and spirited it away into deepest Haggerston. Various displays were possible targets, but this was the one that caught her eye.

Thunder and Lightning

Thunderbolts and lightning, very very frightening! The journalist, science writer and daring aeronaut Wilfrid de Fontvielle (1824–1914), author of the *Bibliothèque des Merveilles* volume *Thunder and Lightning* (1866), would certainly have agreed with Freddy Mercury on that. This display reproduces various scenes of high-voltage horror (some with more than

a whiff of Edward Gorey about them) from de Fontvielle's book. Other pictures from this source include father and son Benjamin and William Franklin's probably apocryphal 'kite experiment', in which the pair supposedly flew a kite with a damp string and iron key during an electrical storm; St. Elmo's fire (luminous plasma) playing on the masts of a ship at sea; and a useful anti-lightning umbrella (modern versions available for just £18.49 plus p&p from Amazon.com – be the first to review this item!). Signer has made many works using umbrellas, including, just once, a bulletproof model – but so far, not a lightning-resistant one.

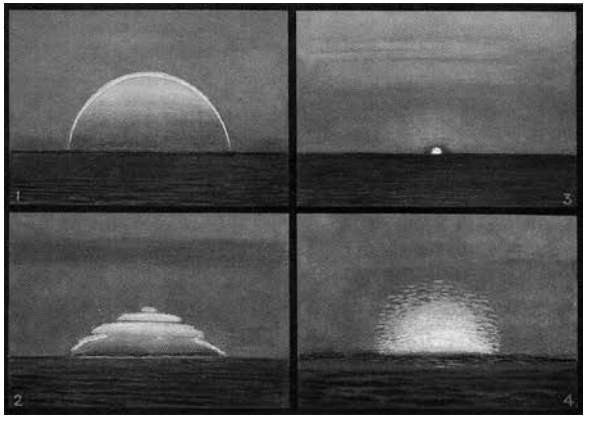
Also reproduced is a picture depicting the phenomenon known as ball lightning. In a 1999 book on the subject Mark Stenhoff dubs the phenomenon 'an unsolved problem in atmospheric physics' and this remains true. According to one theory, ball lightning is a consequence of transcranial magnetic stimulation: in other words, it's a kind of electrically induced hallucination rather than an 'external' phenomenon.

In a conversation with Dakar-based journalist David Signer (no relation), Signer has playfully suggested that 'actually, nature is our enemy. During a thunderstorm you can see what kind of horrible weapons nature has in stock… (it) works constantly on our extinction. Although nature provides everything for us, it is not friends with humans. It has created traps – for example, deceptively hard surfaces on a volcano, under which lava lurks, just waiting for us to fall in.' Nevertheless, he adds, he loves to go out for weekend walks, commune with farm animals and watch birds through his binoculars.

Heavenly Marvels

Amongst the Heavenly Marvels is a picture of a (possibly Hawaiian) moonbow or lunar rainbow, taken from science writer Jean Rambosson's 1869 *History of Meteors and Great Natural Phenomena*. Aristotle's *Meterologica* of circa 340 BCE includes the first written discussion of moonbows, rare and fleeting phenomena that occur when a bright full moon rises at a low angle in a dark, rainy night sky. In 1866, Mark Twain visited Hawaii and noted its abundance of both sun- and moonbows, 'barred with bright and beautiful colours, like the children of the sun and the rain'. He scoffed at Captain James Cook's sycophantic name for the Hawaiian Islands – the 'Sandwich Islands': Cook should have had the vision to call them 'the Rainbow Islands', Twain objected, because 'these charming spectacles are present to you at every turn'. Hawaii's indigenous inhabitants were doubtless equally unimpressed with Cook's renaming of their ancestral home, and did away with him in 1779.

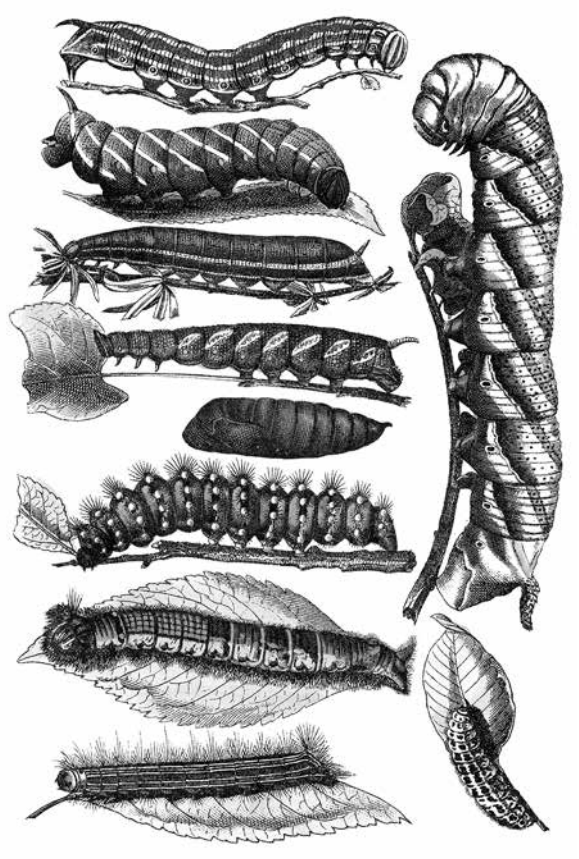
Also included is a fogbow (paler than a rainbow, and caused by smaller droplets of atmospheric moisture), a Brocken spectre, mirages, a circle of Ulloa and some impressions of the 'green ray' phenomenon that Eric Rohmer celebrated in his gentle 1986 film *Le Rayon Vert*. It has been asserted (in relation to Tacita Dean's 2001 video installation *The Green Ray*) that analogue film is a necessity for recording this delicate optical effect, which is caused by the dispersion of light wavelengths as the sun drops below, or rises above, the horizon. Here, an anonymous illustration of the green ray, initially screened and printed in a book (Alphonse Berget and art director Lucien Rudaux's *L'Air*, 1927), has subsequently been scanned, Photoshopped, adjusted in other ways and digitally reprinted. Old-media purists should probably look away.



Butterflies: Ernst Hofmann, the Butterflies' Friend

Hand-coloured butterflies and grubs scanned from an 1893 edition of Ernst Hofmann's volume *The Butterflies' Friend*.

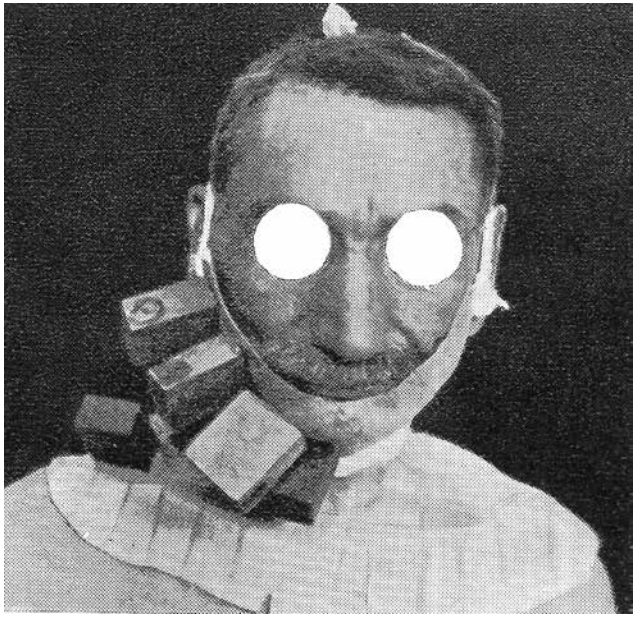
Butterflies formed a popular motif on nineteenth century decorative 'scrap screens'. They have been combined here in a similar manner.



X-Rays and Radium: Good Health, Good Spirits and High Productivity

Illustrations taken from a 1931 publication produced by the Union Minière du Haut Katanga: *Le Radium: Production – Propriétés Generales, Applications Thérapeutiques, Appareils*, promoting early therapeutic radiological apparatuses and treatment methods. In an attempt to anonymise images of patients undergoing treatment, roughly shaped blank paper discs have been introduced over the subjects' eyes during the photographic printing process. The effect is conspicuously grotesque: it is unpleasant to speculate about the mindset that would have judged this strategy appropriate.

The company name *Union Minière du Haut Katanga* carries grim connotations. This 'harshly capitalistic' Belgian company was a key mechanism in the colonial exploitation of Congolese resources and the long-term brutalisation of this huge region's population. Four years before the publication of this document, the company adopted the chilling slogan 'Good health, good spirits and high productivity'.

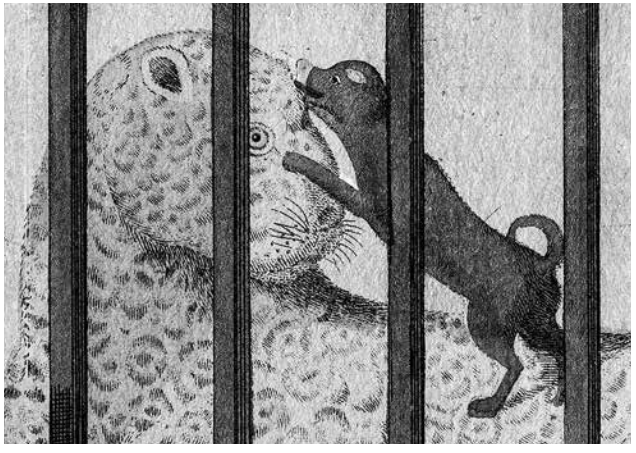


Motherly Love in Animals: A Foster Parent?

This picture is the Library of Marvels' sole representation of Motherly Love in Animals. It comes from Bergt, Baumgärtner and Bohmann's 1804 *Magazine of the Extraordinary in Nature and Art*. Also included in the three Bees' magazine are a whirling dervish, the cryptid sukotyro, the leaning tower of Pisa, Basilio Huaylas the Peruvian giant, a plague doctor who features elsewhere in this display, the Horse with the Longest Mane and Tail in the World (a possible ancestor of My Little Pony™) and a great deal more. This screen shows an endearing pair of affectionate creatures: but what are they, exactly?

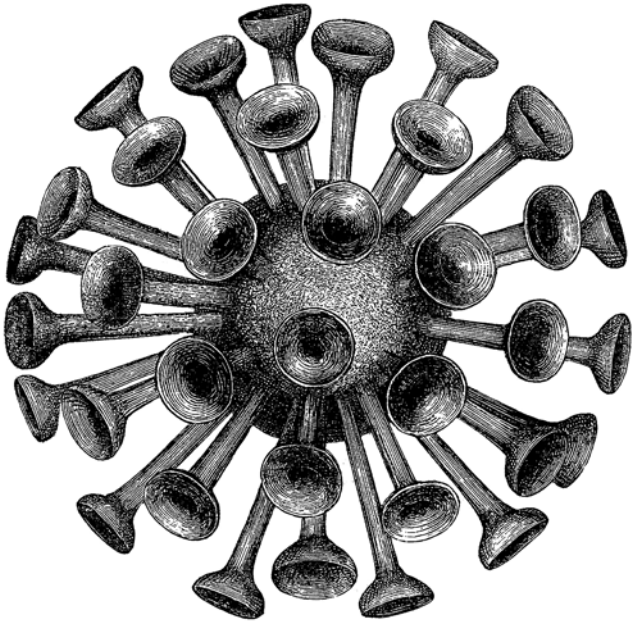
Jack Ashby, manager of University College London's Grant Museum of Zoology has kindly sketched some initial ideas. The adult animal, he suggests, is most likely a jaguar, since its pelt features complete rosettes with a spot in the centre. Regarding its 'cub', he advises that both spotted jaguars and leopards may have melanistic (dark coated) cubs if either parent has a gene for melanism. However, the 'cub' here has a short snout plus a short curly tail and (possibly floppy) pink ears: all markers of domesticated animals. In short, he thinks it's probably a puppy dog – and a lucky one at that, since the jaguar here seems to be treating it as offspring rather than a light lunch. Perhaps this picture is an early document of the phenomenon known as cross-species adoption.

The relationship between these two beasts may be touching, but this vision of a magnificent apex predator, caged, is a melancholy one. Native to the Americas, jaguars are presently classed as a Near Threatened species, their numbers declining as their habitats diminish.



Microscopic Marvels of Art and Industry

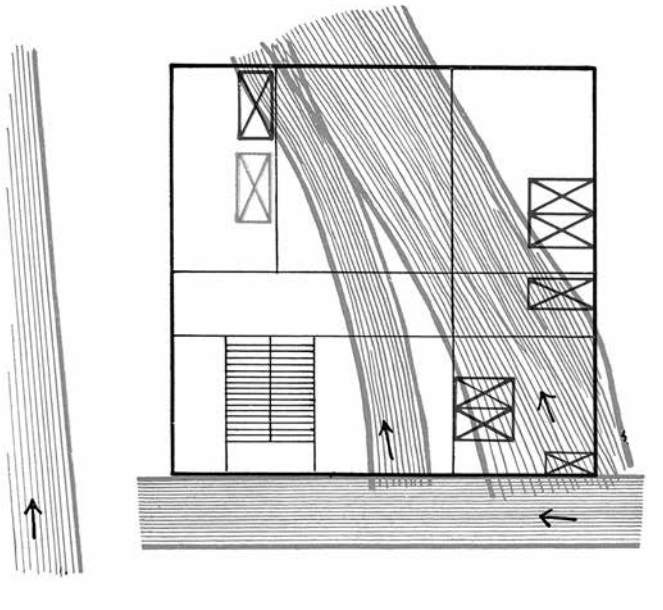
A medley of pictures from many sources, showing plankton and other single-cell organisms. The microscopic marvels are accompanied by an illustration showing three investigators using an ingenious nineteenth century 'three way' microscope. Drifting above them in a decorative 'primal soup' are diverse tiny organisms that might be the objects of their attention, or their imagination.



Marvels of the Invisible World: Earth Rays as Pathogens

Coloured diagrams from Gustav Freiherr von Pohl's *Earth Rays as Pathogens* (1932), a publication detailing von Pohl's theories concerning earth radiation as a cause of cancer. The colourful diagrams correlate data relating the incidence of cancer to supposed areas of hazardous 'earth rays' and underground flows of water.

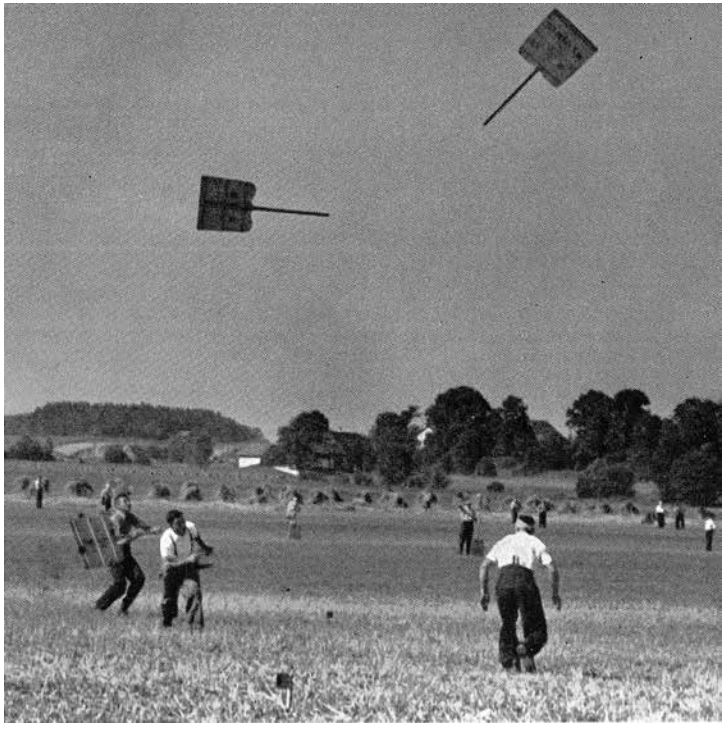
Von Pohl's book was reprinted in the 1970s and his theories continue to attract niche interest outside the scientific mainstream.



Marvels of Strength and Skill – Agility, Flexibility, Dexterity – Exercise from Ancient to Modern Times: The Players of Hornuss

A panel devoted to the strenuous Swiss sport of *hornuss* ('hornet' or 'farmers' tennis'). In this unique game (Signer explains) players hurl *schindels* (heavy wooden paddles) high in the air to bring down a puck or 'hornuss' pitched over their heads by the opposing team using a thing called a 'bock'. The defending team then has to dodge the sizeable falling boards.

These illustrations, from the 1952 publication *Fifty Years of Confederated Hornuss Teams*, include details of hornuss equipment (schindels, pucks wcontemporary art trope, the 'enigmatic grid of mugshots', to be found in various archival art projects (see here Gerhard Richter's *Atlas* or works by Christian Boltanski). In this case, though, no mysterious subtexts are being hinted at: the common denominator between these portraits is the hornuss-playing proficiency of the individuals shown, and nothing more.



Civic Courage: Stalin's Cookbook

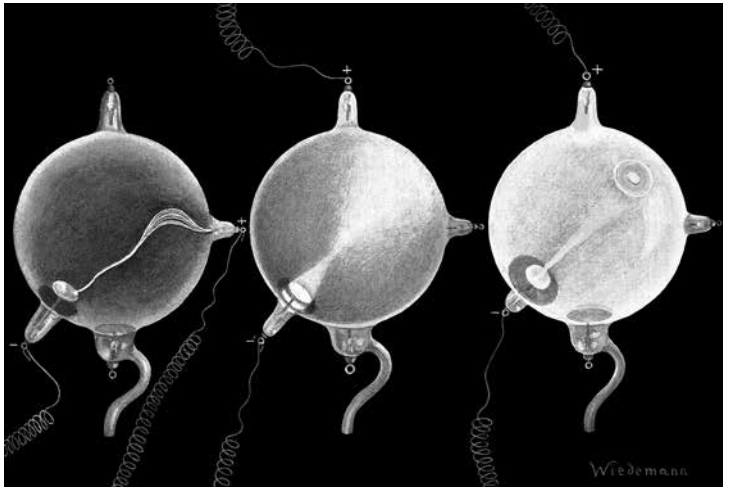
Back in 2014, Signer showed Withers this volume with some excitement and hilarity: a cookbook commissioned in 1936 by Joseph Stalin from the Commissar for Food Industry, Anastas Mikoyan. Its intention was to showcase the luxurious cuisine of the Soviet Union and get one over on the French. Titled *The Book of Delicious and Healthy Food*, it appeared in print in 1939.

Writer Elena Sorokina discusses this book in entertaining and scholarly detail in a 2011 *Cabinet* article (Summer issue, no. 42). She underlines the scientific Marxist ideology informing the book's approach. 'Simply put, food was part of the production process and had to be approached as such, rationally and pragmatically. The new bible of Soviet cuisine was thus overtly didactic, scientific, and educational: long passages on women's liberation from kitchen slavery and a thorough analysis of vitamins, minerals, and calories preceded the book's two thousand recipes. Strong political guidance was equally important: each chapter opened with a quote from Stalin, Molotov, or Mikoyan, praising the achievements of socialist industrialization, defining new far-reaching goals for meat and fish production, or reflecting on the importance of good packaging for vegetables. Recipes for soups, steaks, and omelets followed.'

The dozens of fabulous coloured illustrations in the book are pungently of their time and place: a visual feast, and a deeply ironic one. Undoubtedly, very few Soviet citizens of 1939 sat down to meals like these.

Electric Lighting: Chemistry of the Intangible

Glowing, multicoloured Geissler tubes, taken from Paul Köthner's 1906 popular science book, *The Chemistry of the Intangible*. Invented in 1857 by Johann Geissler, these glass tubes contained a variety of gasses within a vacuum. When high voltage electricity was applied, they emitted light in diverse colours. They formed the precursors to the present-day fluorescent and neon tube lighting that is so commonplace, and that has been exploited to so many differing effects by twentieth and twenty-first century artists.



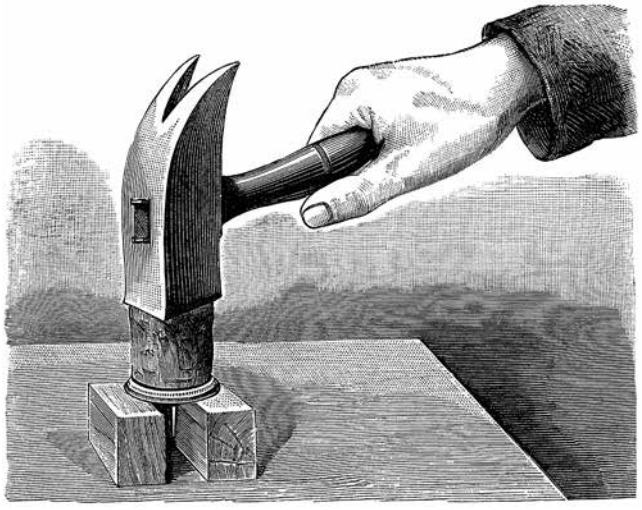
Aviation Today: Parachuting

A picture from the 1944 'Swiss Glider Pilot's Handbook' showing parachutist Ernst Schneider about to touch down.

The Forces of Physics: Columbus's Egg

The pictures in this panel come from the 1890 book *Kolumbus Eier (Columbus's Egg)*, a collection of parlour-game style entertainments based on physical science. As an expression, a 'Columbus egg' appears to be a close relative of the more famous 'Gordian knot': a simple economical solution to a complex problem. 'One-minute sculptures' *avant-la-lettre*: some of the book's illustrations strongly recall Austrian artist Erwin Wurm's entertaining early works.

Among these pictures is a surreal-looking scene in which a housekeeper serves up a severed head to a startled diner. This is a representation of the 'Pepper's Ghost' phenomenon that continues to be used extensively in museum displays and the theatre. The ghostly head is in fact a reflection on a glass screen of an object contained in another room (the 'blue room') positioned behind it.



The Human Body: The Fever Tree

Illustrations relating to sickness and health, including Bergt, Baumgärtner and Bohmann's 1804 *Pestdoktor* and the fever tree from the Büro zur Förderung des Chiningebrauchs 1927 volume *Malaria und Chinin*. The main image depicts the ancient Indian physician Sushruta, author of the remarkable medical treatise, *The Compendium of Sushruta*. The *Compendium*, most likely written by various scholars living around 600BCE, avoids supernatural explanations for disease and features a host of strongly evidence-based and highly prescient principles and procedures – for instance, the study of anatomy through autopsy, extended training for doctors, details of diverse operations (including rhinoplasty) and the recognition that good heath is supported by a good diet, exercise and positive thoughts.

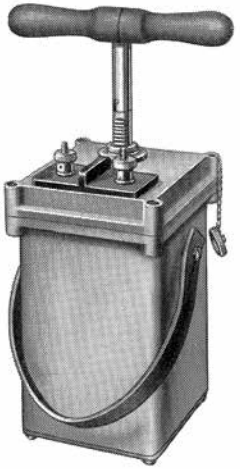
The Hachette *Bibliothèque des Merveilles* series covers some oddly specific subjects (for example, *Behind the Scenes at the Theatre, Clowns, Patriotism, Famous Shipwrecks* or *Sea Monsters*) but, surprisingly, has few titles dedicated to medicine. The title *The Human Body* has therefore been recruited as the heading for this screen.

Gunpowder and New Explosive Systems: Detonation

The bridge demolition diagrams here come from the U.S.A. War Office's 1967 *Department of the Army Field Manual: Explosives and Demolitions* and thus they are (a) in the public domain and (b) coeval with the Vietnam War, so the playfulness of some of these pictures conceals a grim historical reality. However, it's worth remembering that bridges may be dynamited for constructive as well as vicious purposes: they may become dangerous and need to be replaced, for example. Roman Signer has recounted how in the mid-1990s he and filmmaker Peter Liechti set out to film the dynamiting of an obsolete bridge using a high-speed camera. With only about three minutes of footage available, timing was crucial – and with a certain inevitability, it went wrong. 'By the time the explosion occurred the film was already used up,' Signer recalls. 'But what the film actually revealed was beautiful: snowflakes, falling in extreme slow motion. Now that's what I call failure!'

Signer has become famous for his use of many different types of explosive in his 'time sculptures': gunpowder, detonating cables, blasting caps, 'Nonel' shock tube detonator, and more. In the early days, Signer obtained explosives from his uncle, who conveniently happened to be an explosives stockist. The artist didn't exactly receive a formal training in their use: his uncle showed him how they worked and sent him off with the words 'Careful, Roman, careful'. Later, though, Signer acquired the necessary formal qualifications to work legally with explosives. In Switzerland, he explains, there are three levels of certification: A, B and C, ranging from low-level stuff (blowing up tree stumps, for instance) to master-blasting large buildings. After completing various courses and exams he has achieved the second level. 'I'm the B-man', he declares.

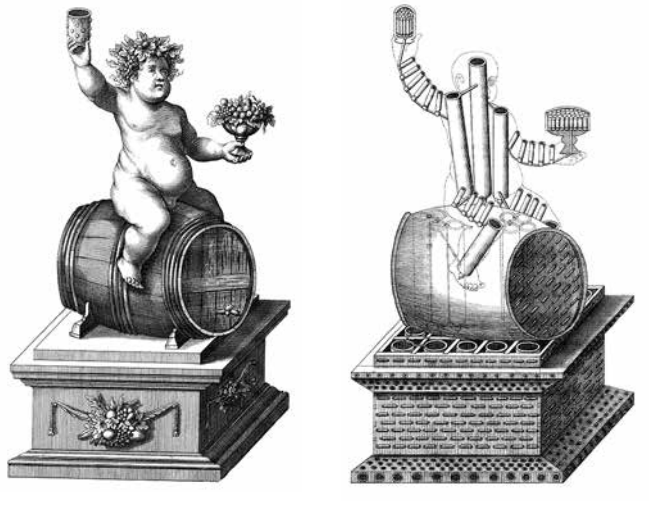
In his 1989 work *Action with a Fuse* Signer spent thirty-five days burning some twenty kilometres of fuse alongside the railway track that leads from his birthplace – his parents' home in Appenzell – to his adult family home in St.Gallen, in Switzerland. In this action the issue of connecting hundred-metre lengths of fuse together to keep the spark going was both technically and metaphorically crucial. This display includes various diagrams showing how fuses may be linked together, and sparks transferred.



Marvels of Sculpture: Exploding Statues

The origins of Polish-Lithuanian general Kazimierz Siemienowicz (ca. 1600–1651) are a subject of continuing debate between Polish, Lithuanian and Belarusian historians. However, there is no disagreement over the importance of his 1650 treatise *Artis Magnae Artilleriae (The Great Art of Artillery)*, which was translated into English, Dutch, German, French and Polish and served as an important military manual for over two hundred years. Among its many innovations was the concept of rockets with delta-wing stabilisers, and in 2000 a Lithuanian 50 litas coin depicting Siemienowicz's very modern-looking delta-wing design was minted in commemoration of the book's 350th anniversary. A contradictory figure, Siemienowicz condemned the use of poison gases in warfare, but experimented with biowarfare, firing artillery contaminated with the saliva of rabid dogs at his opponents. By placing his knowledge of rocketry so firmly in the public domain he secured his place in posterity, but may have paid the ultimate price: it is rumoured that he was assassinated by members of the pyrotechnic and gunmakers' guild as a punishment for his exposure of their trade secrets.

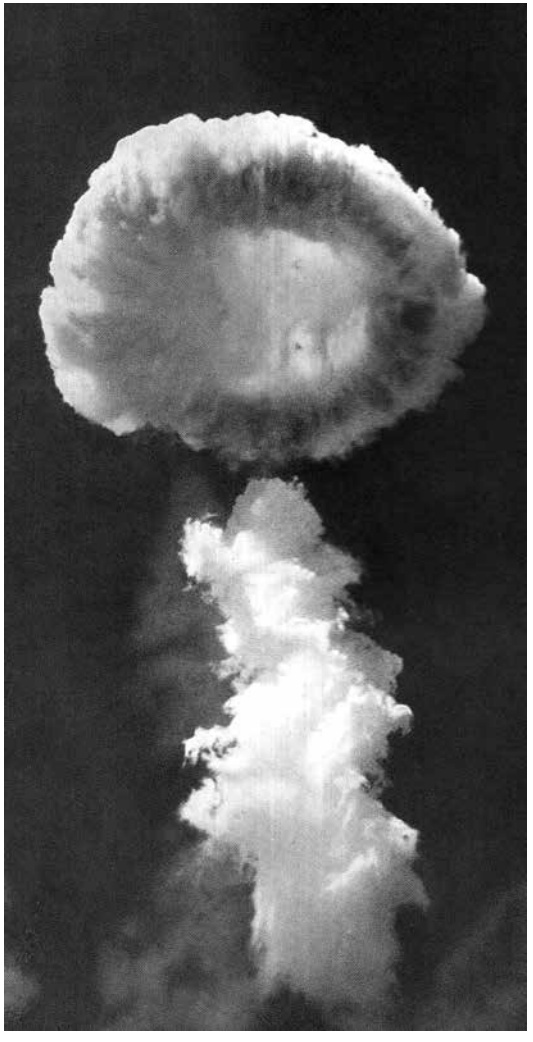
This display foregrounds the cultural rather than the military side of *Artis Magnae Artilleriae*. It features interior and exterior diagrams of three colossal statues (a Venus, a Bacchus and a ferocious fire-breathing dragon) all designed to go up in smoke. From these we might intuit that the general, as well as being a warmonger, was also a bit of a party animal.



The Fantastic Atomic Universe: Smoke Ring

A panel based on an image of a nuclear explosion, from Theo Lobsack's *Atoms of the Earth* (1957).

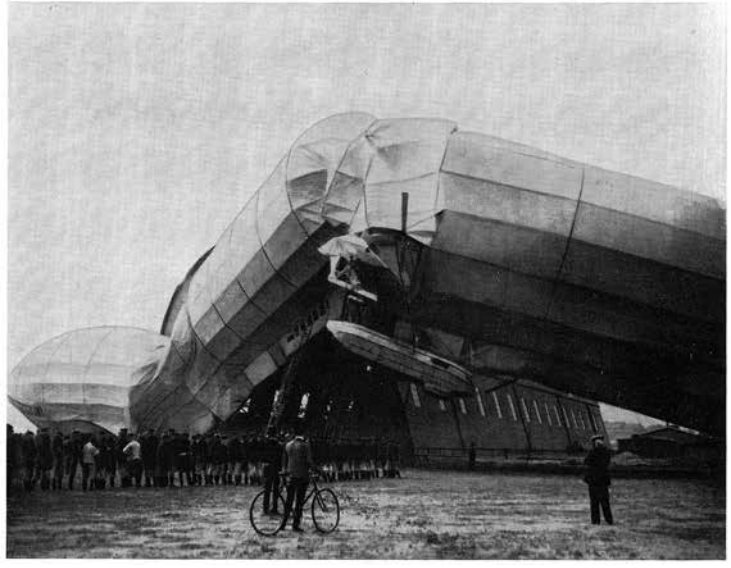
Various works of Signer's have explored the dynamics and aesthetics of smoke rings, a contradictory motif freighted with both frivolous and grave connotations.



Balloons and Air Travel

This display features illustrations organised around the theme of ballooning and airships. It includes an engraving depicting the pioneering but catastrophic 1875 balloon ascent of chemist, meteorologist and key *Bibliothèque des Merveilles* contributor Gaston Tissandier (1843–1889) in the balloon *Zénith*. In the course of the ascent, Tissandier's fellow balloonists Joseph Crocé-Spinelli and Théodore Sivel died due to lack of oxygen. The tragedy prompted a huge response from the French: the balloonists were lauded in print and poetry as heroic pioneers, and the French Republic accorded Crocé-Spinelli and Sivel a state funeral.

Four years later Tissandier published *Les martyres de la science*, a commemoration of a (largely French) catalogue of famous scientific investigators and anonymous workers killed 'in action', and a testimony to his belief that (in historian Patrick Luiz Sullivan De Oliveira's words) 'the pursuit of science could transcend class divisions and serve the national interest'.

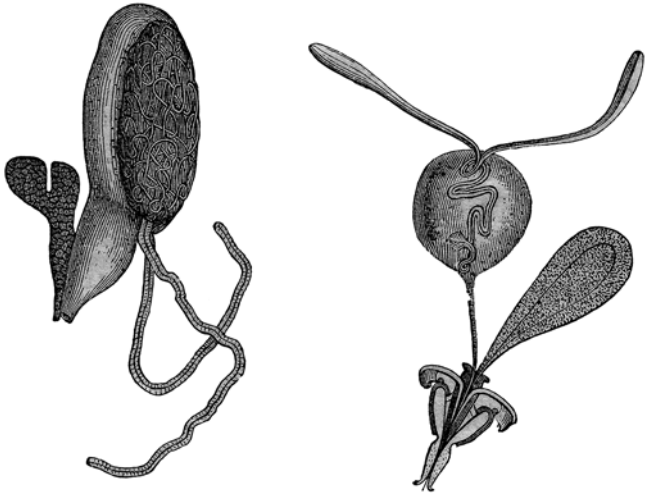


Ants

A panel featuring scenes from the life of ants, taken from Ernest André's 1885 *Bibliothèque des Merveilles* volume *Les Fourmis*. Subjects shown include ant architecture, an ants' cemetery and ants' games.

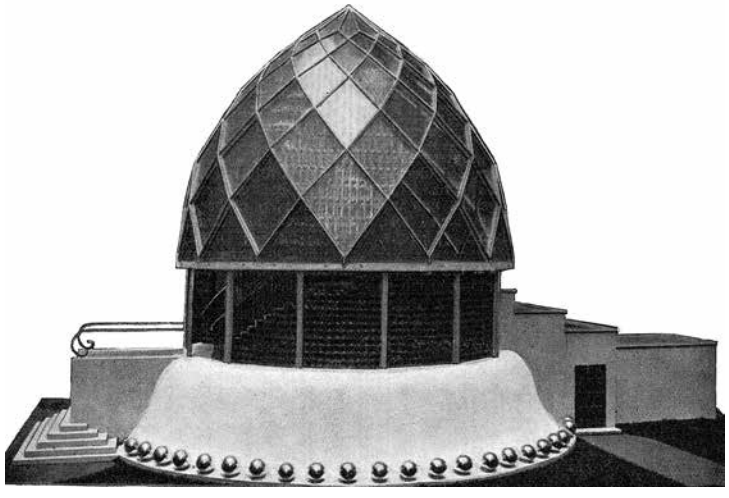
On first encounter, the notion of ants engaging in play (or mourning, or architecting, for that matter) seems fanciful, but new perspectives on play as a way of improving performance through practice in non-human species invite us to take the idea more seriously. In a 2014 interview, Smithsonian researcher Mark W. Moffett asserted that 'ants are really very much more like us than any chimpanzee', and – although sceptical about the idea that ants can genuinely be described as playful – entertained both the idea that they might practice or rehearse kinds of behaviour to get better at their anty duties, and that through 'making mistakes', they might produce useful results for their colonies. 'Such activities seem too functional to be called play, and it would certainly be hard to tell when an ant is having a good time at doing them' he commented. 'Ants always look so serious about everything, but who knows?'.

This panel's images also include a diagram of the organ in which ants secrete the corrosive chemical formic acid.



Subterranean Marvels: Crystals

'I imagined I was travelling through a diamond' – an illustration from Jules Verne's *Voyage to the Centre of the Earth*, plus additional images themed around crystalline forms and the subterranean realm, in nature and art.



The Ocean Depths

A diver gazes up at a gallery of pictures showing undersea marvels and diving gear. He comes from the pages of engineer and science fiction writer Hans Dominik's *1929* publication *Above and Below the Earth: A Technical Record*.

Bibliothèque des Merveilles 1865–1956

Marvels of Architecture
Heavenly Marvels
Meteors
Volcanoes and Earthquakes
Marvels of the Invisible World
Marvels of Vegetation
Marvels of Ceramics – The Orient
Metamorphoses of Insects
Marvels of Naval Art
Balloons and Air Travel
Great Hunting Expeditions
Lighthouses
Water
Acoustics, or the Phenomena of Sound
Basic History of Ordinary Minerals
Parks and Gardens
Heat
Railways
Thunder and Lightning
Caverns and Grottoes
Famous Ascents of the Highest Mountains in the World
Sea Monsters
Marvels of Ceramics – The Occident, Historical
Arms and Armour
Glaciers
Subterranean Marvels
French Beaches
Great Fishing Expeditions
Glass, from the Earliest Times to Now
The Human Body
The Life of Plants
Marvels of Painting
Electricity
The Depths of the Ocean
Hydraulics
Animal Intelligence
Marvels of Strength and Skill – Agility, Flexibility, Dexterity – Exercise from Ancient to Modern Times
The Forces of Physics
Marvels of Sculpture
Coal
Optics
Famous Escapes
Marvels of Engraving
Marvels of Rivers and Streams
Marvels of Ceramics – The Occident – Modern
Diamonds and Precious Stones
Marvels of Chemistry
Providential Harmonies
Famous Shipwrecks
Primitive Man
Plants under the Microscope
History of Ceramics
Steam
Legendary and Historical Stories of Heroism
Machines
Marvels of Photography
Devotion
Motherly Love in Animals
Backstage at the Theatre: Devices and Decorations
Marvels of Locomotion
Iron
Air
Magnetism
History of Plate Metals from the Earliest Times to Now
Tapestry
Colossi, Ancient and Modern
Light
Waterspouts and Cyclones
Gold and Silver
Psychological Study of the Imagination
Patriotism
Famous Festivities in Antiquity, the Middle Ages and Modern Times
The Migration of Birds
Music
Journey to the Seven Wonders of the World
The Telephone, the Microphone and the Phonograph
Gunpowder and New Explosive Systems
Electric Lighting
Tombs
Musicians and Musical Instruments
The Electric Spark
Floods
Cold Weather
Telegraphy
Rediscovered Cities
Engines Ancient and Modern
Fossils
Marvels of the Polar World
Famous Sieges of Antiquity, the Middle Ages and Modern Times
Salt
Great Conflagrations
Great Examples of Moral Fibre
Clowns
Bark
Matter and its Transformations
Electric Lighting: Light Generators
Electric Lighting: Appliances
Electricity as a Propulsive Force
Marvels of Fire
The History of a Bridge
Telegraphy: Optical, Acoustic, Pneumatic and Pigeon Post
Forests
Railways and Works of Art
Railways: Locomotion, Rolling Stock and their Applications
Dwarves and Giants
Torpedoes
Eggs in Plants and Animals
Civic Courage
Speech
The Year One Thousand
Ants
The World of Atoms
The Great Rivers
High-Speed Ferries and Steam Ships
Electrical Telegraphy
Artillery
Marvels of Horology
Nineveh and Babylon
Petrol
Butterflies
Ancient Spectacles
Jacques Callot, his life, his work and his followers
Bees
The South Pole
Electricity, Electric Telegraphy and Telephones
Colour
Bronzes by Maxime Helene
Hypnotism
The Childhood of Humanity: The Stone Age
The Roof of the World
Terracotta Statuettes in Antiquity
The Desert
Enamelling
Manuscripts and Miniatures
Journalism
The Forum
Homes of Famous Men
Jewelery
The Ocean Depths
Wireless Telegraphy
Submariners
Marvels of the Sky
Cinema
Ships
Insects
Railways
Aeroplanes
Engines
The Human Body
Waves and Tides
Electricity
Great Works
X-Rays and Radium
Photography
The Atmosphere
Lightning
Agriculture
Surgery
Volcanoes and Earthquakes
Plants
Mechanics
Phonographs and Mechanical Music
Magnetism and Spiritism
Water
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The Fantastic Atomic Universe
Shipping Today
Hormones
Radioactive Isotopes
Electronic Brains and Apparatuses
At the Centre of the Earth
The Empire of Cold
The Prodigious Discoveries of Modern Chemistry: Industrial Synthesis and the Era of Plastic
The World of the Stars

End

This booklet accompanies the exhibition
The Library of Marvels (Expanding Version) – a project
by Rachel Withers inspired by the library of Roman Signer
Kulturraum S4, Kantonsbibliothek Vadiana St.Gallen
July 17 – August 23, 2020

8. Salon Hamburg
September 8 – October 10, 2020

Designed and made by Rachel Withers in collaboration
with Roman Signer
Organised and coordinated by Ursula Badrutt
Installation design: Rachel Withers
and Johannes Stieger
Graphic design: Michael Schoch
Texts and English editing: Rachel Withers
German translation: Christoph Keller
German editor: Ursula Badrutt
Printed by Druckerei Walpen AG, Gossau
on Lessebo paper in an English edition of 500
and a German edition of 500

With grateful thanks to Aleksandra Signer, Barbara Signer, Tomasz Rogowiec,
Michael Bodenmann, Kantonsbibliothek Vadiana, Roberto Ohrt,
Patricia Holder, The Sitterwerk Foundation, Lesley Sharpe and Nelson Crespo
at Wimbledon College of Arts, staff of the Schools of Art and Design
at Bath Spa University, Gavin, Oscar and Margaret Withers

Kulturraum S4 is a project by the Department of Culture
of the Canton of St.Gallen

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