A Fine Place for a Storm
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The current begins to flow in unexpected locations. In an upstairs room at the back of the Cultural and Historical Museum in the small East German town of Görlitz is to be found the Physikalisches Kabinett (physical cabinet) of the eighteenth-century aristocrat Adolf Traugott von Gersdorf. Among the objects in this room are numerous electrical machines, Leyden jars, telescopes, thermometers, barometers, metal bands, toys, measuring devices, jars of minerals, and various other instruments of undefined purpose. There is a faint tang here of electrical discharge.

On the rear wall of the room are hung framed sheets of paper, showing what first appear to be circular figures, perhaps suns or stars, in black and white or faded color. The casual visitor would hardly notice these sheets, or might simply pass them by as yet another item in a provincial museum. They are images produced electrically by Gersdorf, known as Lichtenberg figures after the German scientist Georg Christoph Lichtenberg, who had, almost by chance, discovered the technique, when dust formed patterns on a resin cake he had charged. Lichtenberg had other scientific paths to investigate and left the figures to others to explore further. Such images were referred to at the time as electric pictures, a first step in producing visual recordings from invisible electrical phenomena, already hovering uncertainly between science and art. The Görlitz museum possesses 1,359 sheets of Gersdorf images, each carefully notated with details of how it was produced, all stored away out of sight of the public in folders to prevent damage from excessive exposure to natural light. The quality of the actual figures is remarkable, bright, precise, and they show traces of how they were produced. Some of the sheets smell very slightly, a faint mineral odor, perhaps, of the original electric force.

The interest in these Gersdorf images lies in their mix of art and science, in the curious story of how they came to be preserved in
the Görlitz museum, and in what they convey of Gersdorf’s unusual personality. *One must do something new*, runs one of Lichtenberg’s aphorisms, *in order to see something new*. The study of electricity had aroused considerable interest in the second half of the eighteenth century. Benjamin Franklin, Luigi Galvani, Michael Faraday, and Alessandro Volta among many others experimented with electrical machines and produced competing theories about the nature of electricity—as a life force, an energy, a fluid or fluids, a phenomenon that existed within objects or in the atmosphere, as a chemical or physical reaction. The Lichtenberg figures were well-known and there were even commercial toys available to produce such effects, as electricity was used for ingenious parlor games. Gersdorf had first been entranced by such figures in 1783, on a visit to Lichtenberg’s house during one of his journeys through Germany. However, he did little with the technique for about ten years, and then only because
of his interest in mineralogy and the electrical charging of powdered minerals. He must have then devoted considerable amounts of time producing by hand over thirteen hundred of these images, annotating carefully the details of each, but never explaining quite what he was hoping to discover. They appear to be purely scientific, but they are also elegant, mysterious intimations of another world.

Gersdorf produced his figures using a simple but rather curious technique. A large “cake” of resin, a flat disc about thirty-five centimeters in diameter, is electrically charged via a device for manually producing static electricity, such as an electrophorus with a circular glass blade wound by a handle, on a principle similar to the wind-up electric torches currently on the market, but on a larger scale. The surface of the cake is sprinkled with positively or negatively charged mineral dust, which then forms various patterns, according to how it reacts to the electrical charge within the resin cake. A sheet of lightly oiled paper is pressed over the cake, which picks up the pattern from the mineral dust, recording as a print the previously invisible electrical forces within the cake.

Gersdorf worked on the images with a landscape artist, Christoph Nathe, using the finest handmade vellum paper from Leipzig, as the enterprise began to drift over from scientific investigation into a form of fine art. Nathe, the son of a farmer whose artistic education at the Academy in Leipzig Gersdorf had supported, had gained a considerable reputation as a painter of landscape and city views. Nathe traveled widely in the mountains of Switzerland and southern Germany, was a talented pianist, and studied the ideas of Immanuel Kant on the nature of the sublime. He appears to have worked with Gersdorf as an assistant, but was something more than this, providing vital knowledge about the creation of different colors from minerals and the use of different papers, and perhaps also evolving a certain aesthetic for the electrical images. Nathe represented the artistic side of the project, balancing the more scientific approach of Gersdorf. Yet even if today we might see the electrical images as linked to certain kinds of abstract art, they would not at the time have been seen as part of an artistic culture, which remained resolutely figurative.
At first sight these prints produced by Gersdorf and Nathe seem rather similar, all derived from the same circular cake, but the patterns are never the same; each print is unrepeatable, an original. Positive discharges tend to create circles, negative ones lines that split into smaller branches. Different mineral dust produces different patterns, as does each charging of the cake. Some show what look like suns or planets with a series of halos, others exploding stars, furry trees, minute points against a darker background, frizzy lines, scratchings, random scatterings of material, landscapes. An entire natural world, previously concealed, seems to be emerging from the effects of the electricity charge on the minerals.

Different elements of the mineral world come into contact with the electrical discharges with differing results. Gersdorf notes in his records: **Strong positive: gunpowder. Weak positive: field powder. Middle negative: chalk, Frankfurt black. Strong negative: vermilion,**
umbra, sulphur, light red, horn, resin dust, indigo, green earth, English red, dragon blood, Braunschweig green, Berlin blue, gum Arabic. The images are colored according to the type of mineral dust, with shades of blue, distant reds, brownish grays, blacks, faint greens. Although the images are two dimensional they suggest an uncertain depth. The overall effect of examining a large number of examples from the museum’s folders is like looking through a telescope at the night sky, or at minute organisms enlarged through a microscope. One realizes slowly that one is peering into another realm, either vast or minute, but quite what this realm is remains concealed.

Gersdorf produced this remarkable number of images, but never gave any reasons for making them, never attempted to publish them or exhibit them. He was a landowner with pragmatic concerns, but also an autodidact who cultivated a wide range of interests across the natural world—the weather, temperature, pressure, minerals, medicine, geography, geology, agriculture, social economy. Although
he maintained an extensive correspondence with other scientists, Gersdorf was by nature silent and rather detached, a man building his world around himself, living a little apart from society. He was precise, even pedantic. The many drawings of mountain chains he produced are meticulous, filled with detail, listing topographical and geological features. He witnessed the first ascent of Mont Blanc and had a model constructed to show the route, which is to be found in his collection. His extensive collections of minerals are all precisely annotated in a minute script, each sample in a small box, each box carefully laid out within the drawer of a wooden cabinet, each cabinet placed slightly apart from the next. His writings, preserved in the library of the museum in thirteen volumes of letters and thirty-one volumes of scientific notes, consist of one fact after another, endless details of things he observed. His travel notebooks are filled with comments on the landscapes he passes through, the atmosphere, the crops, the rock formations, rather than on people or events. Only on rare occasions does he unexpectedly reveal something personal. “I left this peak with such sad feelings, hardly to be described,” he writes of leaving one mountain, “similar to those when one departs from a trusted friend, whom one has little hope of ever embracing again. Every time I turned around it was though bidding a last farewell.” Every year he wandered in the hills of Oberlausitz, Northern Bohemia, Switzerland, sometimes accompanied by companions but often alone, carrying on his back his barometer, telescope, thermometer, and other measuring instruments, noting in particular storms and lightning, crossing the countryside in straight lines rather than following roads, living off the land, sometimes sleeping in haylofts.

Electricity fascinated Gersdorf. He studied the effects of electrical storms and the construction of lightning conductors to prevent fires in the agricultural buildings on his estates. He collected the typical electrical toys of the period—the Electrical Cannon, the Electrical Cloud, the Burning Air—then moved on to electrical devices from Amsterdam, at the time the world center for electrical craftsmanship. Since machines from abroad were costly and often hard to repair, he had local craftsmen construct complex electrical machines to his
specification, and added a certain amount of kitchen technology, emptying the storage jars from the larder of their preserved fruit and using them to make Leyden bottles. He became fascinated by the possibility of using electrical forces as a medical cure for various diseases, and devised equipment to cure paralysis and arthritis (with inconclusive results). Colors, cures, minerals, and patterns of electrical discharges became associated with one another, sometimes more like magic than science.

In 1767 Gersdorf built a large mansion on his estates in the village of Meffersdorf, southeast of Görlitz, in what was then German-speaking Silesia, but is now Poland, at a location where electrical storms were frequent. Gersdorf was married but had no children, and acquired a large number of noisy and quarrelsome relatives who lived with him in this house and who had little interest in his scientific work. The mansion was designed in the restrained classical style of
the period, a block with two small wings, surrounded by extensive gardens. It was laid out with the usual suites of rooms, but featured also various minor staircases and corridors, private routes set within the grander system, so Gersdorf could move through the building and reach his work and collection rooms without encountering the other inhabitants. Various rooms were filled by his mineralogical collection (stored away in wooden chests of drawers), his collection of mosses and molds, his large library on the first floor, the physical cabinet with its growing number of electrical instruments, his collection of drawings, and his workroom where he produced the Lichtenberg figures. The two sets of occupants—the quarreling relatives who grew in number and the ever-expanding scientific collection—competed for space within the house. At some point Nathe, tired of disputes with the other occupants, departed suddenly to pursue his successful career as a landscape painter. Gersdorf carried on alone.
Just to the north of the village, up on a hill beside some woods, Gersdorf built himself an observatory to record the movements of the night sky, a three-story tower that he named, appropriately, Mon Plaisir. The tower was of stone, with a wooden cupola, surmounted with a large lightning attractor, on occasion augmented, in the style of Benjamin Franklin, with a kite flown up into the storm clouds and linked to the observatory with a metal cable. The lightning attractor was connected to the worktable within the tower, so that blitz could be measured, a dangerous business through which other scientists lost their lives. Gersdorf reports in his notebooks that he was flung across the room on various occasions by the electrical bursts. While in the house science had to compete with the relatives, in the tower there was peace and isolation, and also a connection to the forces of the skies. Lightning produces of its own accord three-dimensional Lichtenberg figures in the sky. Its sudden violence suggests a very different approach to Gersdorf’s patient production of images. So interested was Gersdorf in the effects of lightning that in his garden he built another pavilion with a lightning attractor and a domed room, where he now preferred to live.

Following the work of Galvani, Gersdorf experimented with the effect of electricity on the muscles of dead creatures. One of the birds used for this work is in the physical cabinet. Up in his tower, playing with the electrical storms, Gersdorf seems a benign progenitor of Mary Shelley’s Dr. Frankenstein. His workshop, as recorded carefully by Nathe in a series of drawings, was neat and well-organized. The instruments sit on the table, a series of wires lead through the window to the outside where they are linked to a kite, the quiet interior awaiting the shock from the exterior.

In 1779 Gersdorf, with another scientifically inclined aristocrat, the linguist Karl Gottlob Anton, founded The Oberlausitz Society for Science. Anton was a mover and shifter, and he produced the idea for the learned society and bought the baroque house at 30 Neißstrasse in Görlitz (originally constructed by a wealthy cloth merchant) to house its activities. Their two portraits hang side by side in the salon of what is now the museum. They make an unlikely pair: Gersdorf bewigged,
with black clothing, formal, serious, reticent, not giving anything away; Anton with his gray hair swept smoothly back, also in black but relaxed and gesturing with his left hand, open, about to speak. Anton’s principle work was research into the Sorb language, spoken by the large group of Slavs living in Oberlausitz, a language that still survives today, partly due to assistance given by the Soviet authorities to the Sorbs as fellow Slavs, during the long Soviet occupation of eastern Germany. The two men’s combined aim was to create a scientific institution of national renown, with a library, collection, and lecture rooms, including in this one location the various disciplines of linguistics, topography, meteorology, electricity, chemistry, and medicine.

As Gersdorf grew old and increasingly sick, he realized that his relations would have no respect for his collection and would most likely disperse and destroy it on his death. He wisely left his collection, including the physical cabinet, to the scientific society in Görlitz. He died at his worktable in June 1807, as Napoleon’s troops entered Oberlausitz and the landscape was ravaged by rival bands of soldiers. Gersdorf was buried in the churchyard of Meffersdorf, not in an aristocrat’s tomb, but with a simple headstone, among the farmworkers and people of the village. One hundred and twenty carts carrying his instruments, books, and recordings trundled across the Silesian landscape and over the river Neiße to the house in Görlitz. The city authorities took particular care that the tax officials at the gates of the city should not disturb his collection, and should not tax his bequest. His large library, together with the many volumes donated by Anton, became the basis for the library of the society, set off in a series of grandiose baroque arches, a demonstration of books as architectural elements.

The physical cabinet was initially given pride of place in a first-floor room, the instruments demonstrated to the public by experts. However, over the years Gersdorf’s equipment began to be seen as outdated, and was moved first to a backroom on an upper floor, and then to one of the many attic rooms, where it was forgotten. During the Second World War there was considerable fear of bombing raids by the RAF, which were destroying most of the highly flammable
centers of historical German towns. Much of the museum’s collection of prints and artifacts was moved out of the old city, across the river to cellars in eastern suburbs. But Görlitz was never bombed by the RAF, being out of easy range, and was not fought over in the last despairing battles of the war, since the Red Army bypassed it to move on Berlin. Some of the museum collection was lost, plundered by soldiers of the occupying Red Army pleased enough to take souvenirs home, or, since eastern Görlitz, on the other side of the river Neiße, became the Polish town of Zgorzelec, moved to Polish cities. What remained returned to the museum, including most of the books of the library, which now occupies the first floor. The cabinet survived intact because it was forgotten in the attic, forgetting being the best means of preservation.  

Postwar, Görlitz became a socialist town in the German Democratic Republic, a Soviet client state. Businesses were nationalized, factories built, and workers’ housing constructed, and a proper
proletarian approach to culture and to science was encouraged by the socialist authorities. The old disgraced German world, with its criminal and military excesses, was to vanish and be replaced by a new world of the people, with a vision of a more equal society. The historical town center became dilapidated as the population moved to the outskirts. There were no funds for restoring historical museums, and there was no particular reason for the new socialist state to have any great interest in a minor aristocrat like Gersdorf. However, during the early fifties the physical cabinet, under circumstances that aren’t quite clear, was rediscovered in the attic, brought down, cleaned up, and once again put on display. Much of the equipment, such as the jars and metal forms for the Lichtenberg figures, was found still laid out in the arrangements of a century and half before.

The new director of the Görlitz museum, Ernst-Heinz Lemper, appointed in 1951, was a well-informed and perceptive art historian. Lemper was originally from Cologne but had studied art history in Leipzig and had chosen to remain in the East rather than return to what had now become West Germany. He seems to have coped well enough with the socialist mentality, but still engaged in his own half-concealed strategy to preserve the past. He produced several books on the historical buildings of Görlitz and wrote a life of the Görlitz mystic philosopher and visionary Jakob Böhme, who as a shoemaker could just about be fitted into the notion of an early member of the proletariat.

Lemper was fascinated by Gersdorf and wrote a detailed biography, which appeared in 1974. Lemper’s book, which is almost as packed with facts as a Gersdorf travel journal, is very curious. He begins by stating that Gersdorf does not feature in any history of electricity, that he is an unknown figure. A new version of Gersdorf was thus offered by Lemper, a reconstructed historical personality, made from parts, but still awaiting that flicker of electricity to come to life. Clearly Lemper didn’t invent Gersdorf, but the scientist appears in the biography almost as a figure in a novel, brought to life, rehabilitated as a socially responsible landowner, with purely pragmatic concerns, in line with the expectations of the 1970s socialist state. Gersdorf is
described as a precapitalist figure, linking art and science in a romanticized time where both art and science were free from the need to show a profit. Lemper makes little mention of Gersdorf’s electrical pictures, and only illustrates one. In addition they hardly appear in the museum catalogues of the 1970s and 1980s, as though they don’t exist, or are uninteresting—perhaps because his electrical images, which have no obvious social purpose, could not be easily integrated into a Marxist-Leninist account of his life. So even after the physical cabinet was once again put prominently on display, the images remained out of sight, stored in an upstairs room.

One might now begin to wonder why Gersdorf carried through his relentless recording of the world around him. Lemper never gives much motivation for his version of Gersdorf: he simply exists and produces. But there is a quality in Gersdorf’s work, his methods, and his story that goes beyond the usual requirements of scientific observation, not only in all those written volumes and in his collections, but also in the patient production of the large number of electrical images, which he never sought to publish, and which remained a private, almost personal, enterprise. Gersdorf was an amateur in a period that produced a wide variety of amateur scientists, such as Lichtenberg himself, Franklin, and Antoine Lavoisier, who devoted their lives to the study of science, but away from official academies and institutions. This individual pursuit of scientific experimentation was also carried out on a more modest level in the houses of the well-to-do, almost as individual quests for enlightenment. Gersdorf was one of many men and women following this path. But what lay behind his particular devotion to producing these images, day after day in his country house, to the exclusion of a more conventional social existence? There is that sentimental comment on leaving the mountain peak, comparing the feeling to saying farewell to a “trusted friend,” as though through the experience of nature one will receive an emotional shock, reaching deep into an otherwise isolated interior.

The French writer Georges Perec—who in the 1970s developed a writing technique of sitting in Parisian cafés and attempting to record methodically and precisely everything he saw, a task that he
quickly realized was impossible because even everyday events were occurring at a pace faster than he could write them down—wrote at the end of *Species of Spaces*: “to write: to try meticulously to keep hold of something, to seize some precise pieces from the growing void, to leave somewhere a groove, a trace, a mark or a few signs.” For Pèrejic, a Jewish writer in postwar Paris, the world had dissolved into pieces that could never be put back together, but recording precisely could hold onto something of a vanishing environment. For Gersdorff, living in the comparative peace of a late-eighteenth-century German province, the natural world was still undisturbed, still in one piece, but something of the same spirit crosses over, the desire to record before things vanish. Gersdorff manages to hold onto and, with a delicate touch, possess the world around him. The figures trace out an invisible world, lying just below the visible. There are other examples of scientists from the past who meticulously and obsessively recorded the natural world. For instance in the seventeenth century Robert Hooke in his book *Micrographia* showed, with highly detailed images made by looking through a microscope, fleas, lice, the eyes of insects, plant cells, a miniature world invisible to the eye. Through the obsession with detail such investigations give the observer access into a new and personal realm, and also act as a form of escape from life as experienced on a more ordinary scale.

What survives of the electrical images in the science of today? The feathery tattoo-like patterns formed on humans struck by lightning, known as lightning-flowers or lightning-trees, formed by the transmission of static electricity through blood vessels in the skin, have fascinated many scientists. And Lichtenberg figures find their way into contemporary science, the resin cakes and vellum paper replaced by much more advanced technology. In the 1950s the physicists F. H. Merril and A. von Hippel experimented with tracing the paths of electricity through various gases at different pressures, recorded via high-speed photography that could capture the evolution of the image over minute periods of time. Today these phenomena have evolved into the filaments, beams, and multiple layers of contemporary plasma physics, with the distortions of light and extraordinary
colors produced as highly excited electrons encounter lower energy states. Traces of Gersdorf’s experiments thus survive into the nomenclature of contemporary physics, reflecting the slower wanderings of the eighteenth-century scientist.

The landscape around Görlitz, as the flat countryside rises up into the mountains of the Riesengebirge and two weather systems encounter one another, is well-known as a fine location for electrical storms. A large open quarry, five kilometers across, originally used for the extraction of lignite to fuel a massive 1970s electricity generating plant, has recently been filled with water and is now a lake for leisure purposes. Up on the hills to the west are lines of wind generators, new machines for the production of ecologically acceptable electricity from a renewable source. On a visit to the lake one evening in May, to escape the stifling heat of the city center, I passed through the socialist housing blocks built on the outskirts for the power-station workers, down through the open countryside, to the shore of the lake created from the quarry. For some time the air had been filled with the sounds of distant thunder, and gray clouds hung in the sky. The leaves shimmered with a strange electricity, dust drifted up from the path, the waters of the lake seemed tense, expectant. Groups of teenagers by the shore appeared excited by the charge in the air. Suddenly the storm broke out, rain poured down, forming a gray aquatic curtain, reducing visibility across the lake. Small flashes of lightning skittered out of the clouds toward the surface of the water, almost bouncing off the surface. Even today lightning requires its creatures, its fields, and its devotees. Gersdorf would have noted precisely all the details, would have celebrated being outside at this strange meeting of fire air land water. Go Gersdorf, freed now from the backrooms of the museum, wander up in the hills, reveal the flashes stars suns trees landscapes to be found in the dust on the mineral-electric circles.