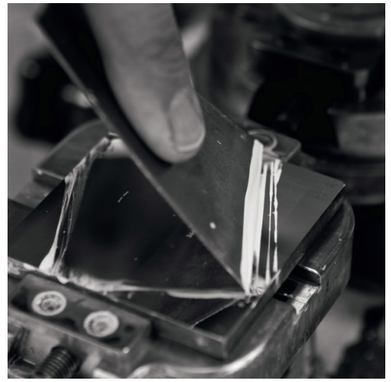
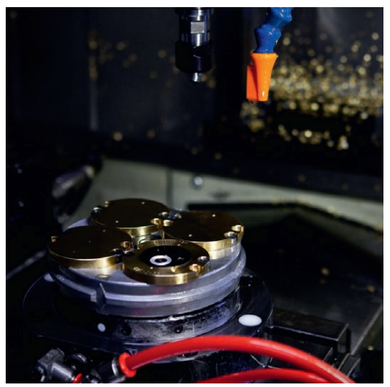
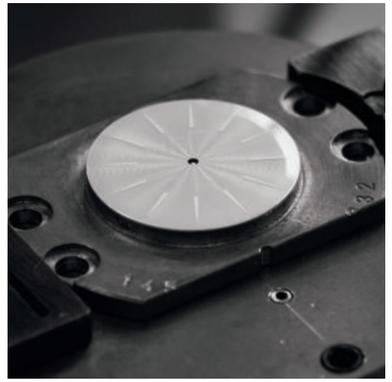
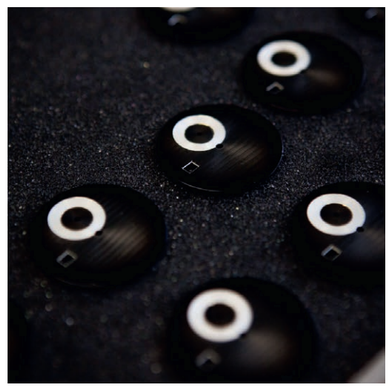








Top, from left: the exterior of the old Flückiger workshop in Saint-Imier, established in 1860; a view of the new Flückiger building, opened in 2006, where today around 100 craftsmen create dials; the galvanic-plating workshop, where surfaces are coated with a layer of metal by electrodepositing. Second row: a hand-operated transfer press is seen in the foreground of the transfer workshop. For the transfer process, a silicone pad is used to take up the ink or varnish deposited in the recessed lines engraved in the block (such as numerals and logo), and then this imprint is affixed to the dial; the silicone pad and the tempered-steel block on which the numerals, letters, logo, or images to be transferred are engraved. Third row: spreading the ink on the block with a spatula (for the Ref. 4897); taking up the ink with the pad; applying it to the dial; view of the dial with applied ink. Bottom row: the Ref. 4897 dial with transfer-printed hour markers and logo (this model has a guilloched, lacquered dial and powdered-gold markers); checking the transfer; machining the recess for a counter. The machining processes alternate with operations including polishing, galvanic plating, varnishing, satin finishing, transfer printing, and the application of a protective coating, according to the complexity of the dial; machined recesses (seen on the Ref. 5980/1)

Photographs **James Bort**

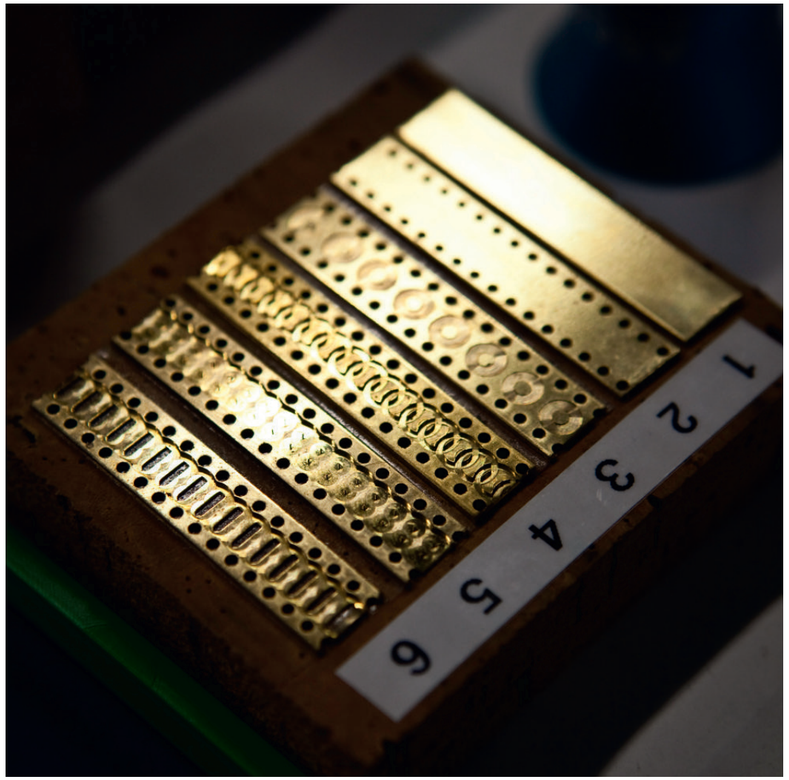
THIS IS HOW TO MAKE DIALS

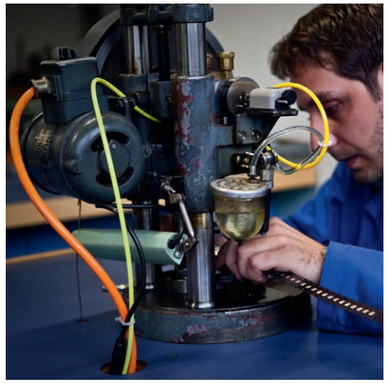
"I challenge anyone who has visited the Flückiger factory not to come away with a profound respect and admiration for the way in which its dials are made," says Nick Foulkes

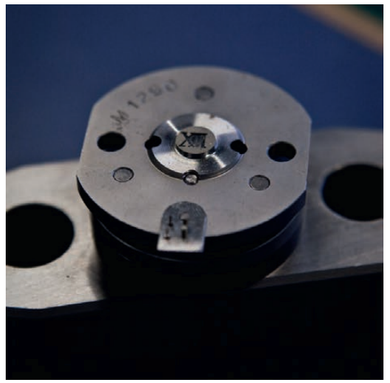
Tucked away in the thickly forested folds of the Jura mountains, the verdant pastures and pine-clad slopes of Saint-Imier seem much more distant from the wider world than the hour-long car journey that separates them from the Swiss capital of Bern might suggest. Although Francophone, there is nevertheless a hint of Switzerland's German-speaking heritage in the name of one of the small community's most celebrated businesses: Cadrans Flückiger. This small mountain town may be two hours from the Patek Philippe headquarters in Plan-les-Ouates, Geneva, but it is home to one of the great treasures of the company: a 152-year-old firm that has been making Patek Philippe dials for more than six decades and passed from its founding family to the Stern family at the end of 2004.

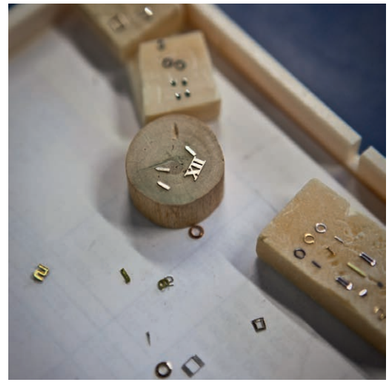
In recent years the emphasis among collectors and horolophiles has been on the complication. Risking controversy, you might argue that there has been an overemphasis on feats of micromechanical ingenuity and inventiveness, at the expense of aesthetics. As well as an example of mechanical virtuosity, a watch is also an object of beauty and, anthropomorphizing it for a moment, while its case may equate to its figure – the body – the dial is its face. Beauty may be only skin deep; nevertheless, thin though that horological skin may be, those precious few microns atop the small brass or gold disk that is the dial are sufficient to contain an entire culture, a culture every bit as engrossing and exigent as that which pervades the complications department in Plan-les-Ouates.

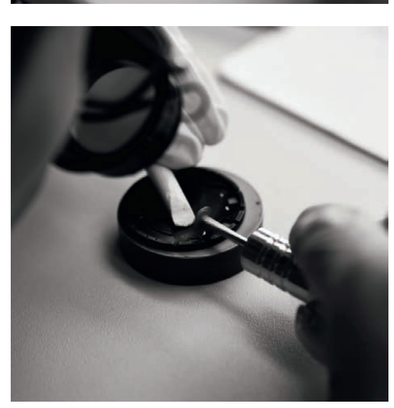
The dial is what allows the hundreds of components of a watch to make sense. Its gradations permit us to use the split-second precision of a chronograph. Its indices, its apertures, and sub-dials enable us to keep track of the year, month, date, day, and to chart the passage of the moon. The dial is also the oldest component on the watch, predating clockwork and even clepsydrae. The dial is what links the watch on your wrist to the days of the Ancients when the time was told with nothing more than a gnomon and a calibrated field across which the shadow cast by the sun











moved. And yet we take our watch dials for granted, treating them casually, thinking of them, if at all, as a cosmetic afterthought. However, having visited Flückiger, I challenge anyone who has made the same journey to the Bernese Jura not to come away with a profound respect and admiration for the way in which the dials of Patek Philippe are made. Make no mistake, Flückiger is utterly wonderful, and, having been writing about watches for the last 25 years, it is places like this that remind me why I remain perennially fascinated by fine watchmaking.

I have visited many watch factories and seen various procedures of dial manufacture, but to my shame I have to admit that until visiting Flückiger I had never crossed the threshold of a factory, and a sizeable new factory at that, that concerns itself solely with the wafer of metal that separates the microcosm of wheels, levers, pinions, and springs from the hands and glass.

Dial making is not so much a branch of the watch trade as a trade in itself with its own vocabulary and traditions and, much as the making of a movement, it begins with a blank brass or gold plate that enters the factory to emerge four months later transformed into a piece of precision engineering and expressive artistry. As at Plan-les-Ouates, Flückiger is characterized by that mixture of respect for tradition and appetite for innovation. Patient painstaking handwork that would have been familiar to the dial makers of the mid-nineteenth century is seen alongside the most precise apparatus that modern technology can offer. Thus, the equipment used here will vary from multi-axis milling machines to a simple worn wooden scrubbing brush with bristles of gleaming copper.

Once the blank has been milled into shape, it then begins its journey through the factory. There is a beginning and an end, but this is no linear journey, rather a custom-made itinerary that will see the brass disk slowly accreting its discrete and individual identity as it travels from workshop to workshop, up and down the three stories of the building, zigzagging across its various corridors, and passing through the hands of dozens of different craftsmen, each skilled in his or her métier. Between each visit it returns to a central office, is logged and then, covered in a protective varnish, it is sent on to its next station. If nothing else, the work of this central logistical office resembles that of an air traffic controller, keeping track of dozens of different “flight plans.”

Approximately 120,000 dials leave the Flückiger workshops each year, a number that is many times the annual production

Above, left: a series of operations is involved in blanking a type of hour marker: 1) preparing the rolled-gold strip 2) drilling the working holes 3) first machining of the marker feet 4) second machining of the marker feet 5) machining the marker feet to within a diameter of 0.2 mm 6) blanking the hour marker. Above: blanking the hour markers on the press (top); tool for blanking the hour markers – shown here, the Roman numeral XII (bottom). Opposite page, top row, from left: preparing hour markers whose faces are to be polished; examples of types of hour marker; a series of operations is involved in fitting hour markers on a tourbillon dial. Here the hour markers are prepared for fitting on the dial (the example seen is the Ref. 5207). Middle row, clockwise from left: this series also involves fitting the aperture frames; fitting the hour markers; and riveting them. Bottom row, from left: fitting the hour markers on the dial of the chronograph Ref. 5170J; checking the quality of the riveting on the dial

of Patek Philippe watches, and Flückiger maintains its traditional role supplying other marques. But the work it does for the parent company is at the pinnacle of its production, with some of the dials requiring anything in excess of a hundred different processes. A Patek dial is distinguished by little touches: it will never have its numbers stamped; if numerals or batons are raised they will be applied, each placed by hand, and they will be made from gold.

The visitor to Flückiger is bombarded with different, contrasting impressions. The large machines that work with components so small that they are at serious risk from inhalation. The transparent filmlike slivers of mother-of-pearl so fine that they require a thin layer of paint on the back so that the metal of the dial is not visible. The serenity of the gem-setting workshop or the incessant cacophony of alarms that warn those in the *galvanoplastie* department that the immersion period of one set of dials in an electrolytic bath has come to an end, an immersion that may only last two minutes and where the window for removal is just a few seconds.

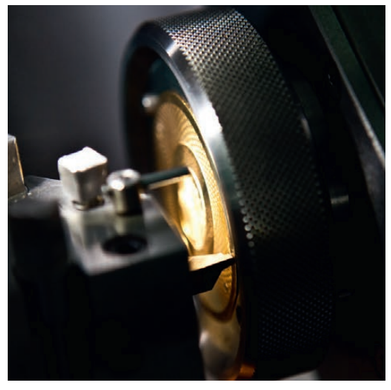
But it is not just the timing that is so exact; I have seldom seen so much attention paid to the atmosphere. A single stray mote of hygroscopic dust alighting on a dial during one of the more sensitive procedures is an agent of destruction. Things have moved on since a century ago, when a man would keep a feather tucked behind his ear to whisk away any specks that might intrude upon the precious surface. So before the varnishing or lacquering of the dial, the sealed area where this takes place is cleaned with forensic intensity, for a minimum of 20 minutes, by somebody wearing the sort of protective garments more usually associated with germ warfare. The same sort of outfit is worn by those performing the *décalque*, the name given to the delicate lithographic process during which any printing that may appear on the dial is transferred from the ink on an engraved plate using a bulbous silicone pad, a process that requires, as well as dust-free air, a steady hand; consistent, unvarying, even pressure; and a gimlet eye.

In this world of the micron, incessant vigilance is omnipresent. For instance, the man who puts what is called the "structure" into the surface of the dial – such as the vertical satin finish that plays so artfully with the light – needs to be sure that the consistency of the abrasive paste made of powdered rock is always the same, and each morning, before starting, he examines his principal tool, that copper-bristled brush mentioned earlier, to check its surface is an even plane. Any unevenness is trimmed away before the day's work begins. Following the dial through its complicated gestation, it is impossible not to think of it coming to life as the gleaming surface is brought together with the furnishings: the gold applied numerals; the batons, each tiny facet polished to a lambent brilliance; and such extra touches as the gold frame around the date window at 12 o'clock on the Ref. 5960. But even at this late stage the microscopic scale continues to amaze. The circumference of the dial is perforated by barely detectable holes smaller than pinpricks, through which fit feet so small that they are more readily felt with a finger than seen with the eye.

It is an aesthetic science in which everything from the physics of light reflection to the chemistry of electrolysis plays its part, all orchestrated by human genius to create a visual effect that is as harmonious as it is accurate.

The factory is newly built, and the firm only moved there in 2006. But spacious though it is, it is filling up rapidly, and the top floor, once empty, now has an enamel studio, gem-setting atelier and nearby, in a room of monastic simplicity, the air is filled with a clicking sound best described as like that of a large safe being unlocked. It is a noise created as the *guillocheur* turns the handle and moves the surface of a dial across the burin that etches the geometric pattern. What makes this particular room so special is that the machines, while entirely traditional, have been made exactly to meet the needs of Flückiger.

It is emblematic of the seriousness with which everything is approached...but then you might expect the Stern family to take dials seriously. After all, before they bought Patek Philippe four generations ago, the Sterns were a family of dial makers.✥



Top row, from left: the enameling process begins with the application of a liquid (tragacanth) to fix the crude enamel (silica and metal-oxide powder); the crude enamel is sifted evenly over the dial; the dial is then ready for the first firing in the furnace (800° - 820°); the finished, transfer-printed enamel dial, Ref. 5339.

Middle row, from left: Twenty~4® dial-blanks; satin finishing uses a natural rock powder, sifted to obtain a very uniform particle size. Vertical satin finishing is performed by hand to obtain a striated effect; sun-burst satin finishing is done by machine. Both dial and brush turn; setting gems on the guilloched dial of the Haute Joaillerie model Ref. 7099.

Bottom row, clockwise from left: various motifs obtained by guilloche work; the spindle of the rose-engine, seen with the Ref. 5098; a machine operated entirely by hand – these rose-engines in use at Cadrans Flückiger are exact copies of those found in the Perly workshop and at the Patek Philippe Museum in Geneva