

# lettres

DU BRASSUS

*Tourbillon*



*Carrousel*

SWISS ● MADE





*Dear fellow watch connoisseurs  
Welcome to Issue 14*

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What does it mean to undertake the development of a watchmaking grand complication? For us at Blancpain it is not simply to produce a complicated timepiece but to expand the art of watchmaking in an important way, to open new frontiers, to create something that has never been achieved before. That is a high calling and a heavy commitment. Every time we undertake a project of this kind, I think of it as if we are embarking upon an adventure where the destination and the time of arrival can never be known at the start. So it is a given that not every year will witness the unveiling of such a watch. But this year at Basel, Blancpain debuted *two* world first grand complications, the Le Brassus Tourbillon Carrousel and the Le Brassus Carrousel Répétition Minutes Chronographe Flyback. Both of these ultracompliated timepieces showcase Blancpain's exclusive flying one minute carrousel—a construction which no other watch company has been able to equal. I hope you will enjoy the stories in this issue that illuminate the ambitious creative path which we followed in the development of these two grand complications.

There is a second adventure which we highlight in this issue: that of Laurent Ballesta and his perilous dives to find, study and photograph one of the rarest and oldest creatures on earth, the prehistoric coelacanth. We at Blancpain are proud to have had the privilege of sponsoring this important scientific study.

Enjoy Issue 14!

Marc A. Hayek  
*President and CEO Blancpain*

## Issue 14



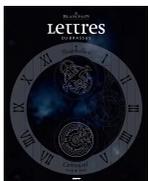
6

### 6 *Le Brassus* TOURBILLON CARROUSEL

A world first: a carrousel and a tourbillon brought together in a wristwatch.



Download the free Blancpain Library App for iPad; Search for Blancpain in the Apple App Store.



Cover:  
*Le Brassus Tourbillon Carrousel.*



22



38

### 22 PETRUS

What sets Petrus apart as the most distinguished, storied and sought after wine in Pomerol?

### 38 *The Carrousel* GRAND COMPLICATION

Entering the Pantheon of its grand complications is Blancpain's new Le Brassus Carrousel Répétition Minutes Chronographe Flyback.



52



72

## 52

### GOMBESSA *Expedition*

The cœlacanth, a plunge towards our origins.

## 72

### *Return to the classics:* MICHEL ROSTANG

There is unbounded joy in rediscovering the wonders of venerated French cuisine grand standards.



86

## 86

### WHEELS *and* PINIONS

What watchmakers know and many collectors overlook: the vital importance of equipping a timepiece with the highest quality wheels and pinions.



A close-up, artistic photograph of a luxury watch. The watch face is white with gold Roman numerals. The watch case is made of polished gold. The crown is visible at the bottom, featuring a textured, ribbed design and a gold-colored cap with a logo. The background is a dark, starry space.

TEXT: JEFFREY S. KINGSTON

*Le Brassus*

# TOURBILLON CARROUSEL

A world first: a carrousel and  
a tourbillon brought  
together in a wristwatch.



The instruction from Marc A. Hayek in 2009 *seemed* crisp. “Let’s explore making a watch that marries a tourbillon and a carrousel.” *Marries?* What in the world did he mean? That was left to Blancpain’s watchmakers to decide. They had just been given the ultimate in creative freedom, to develop proposals somehow linked to the concepts of tourbillons and carrousel and that could be tucked into one of the many definitions of the word “marries”.

Flights of fancy soared from their commission. “What if we somehow merge a tourbillon into a carrousel or the reverse?” That idea lasted not long at all. The key element of a tourbillon is a fixed gear around which the timing components of a watch rotate and the key element of a carrousel is that it rotates the timing components without a fixed gear. No way to mash those two into a single device. So early on the focus became the development of a timepiece never before created that would feature both a tourbillon and a carrousel; they would be *married* by putting both of them into the same watch.

As with every “never been done before” project, the next steps pointed in multiple directions. If both a tourbillon and carrousel are placed in the same watch should there be a single barrel which powers both of them and, if so, where should each of these elements be placed within the case? Barrel on top, with the tourbillon and carrousel placed somewhere below or the reverse or perhaps left side/right side? Each of these configurations was explored before a better idea emerged: have separate winding barrels for the tourbillon and carrousel. With separate barrels an harmonious arrangement with the tourbillon and carrousel aligned vertically could be achieved.

That decision charted the course for what followed. That’s not to say that invention stopped at that point or even began with the delivery of Marc Hayek’s challenge in 2009. The Tourbillon Carrousel that debuted at Basel 2013 was the product of inventions that began in the mid 1980’s and that have steadily continued for the following more than quarter century. Logically there have been three principal theatres of innovation that come together in the Tourbillon Carrousel: first, Blancpain’s original creation of its tourbillon, the world’s first one minute flying tourbillon; second, the development of its carrousel, the world’s first flying one minute carrousel; and three, the development of the means to put both these core inventions into a single watch.

Before turning to the four year development path for the combination, step back for a moment to examine the two “marriage partners” for each on its own represents a landmark development in watchmaking.

*The development of  
the Tourbillon Carrousel  
was a “NEVER BEEN  
DONE BEFORE” project.*

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*Blancpain Flying One Minute Tourbillon.* Blancpain's flying one minute tourbillon, in common with all tourbillons since the invention of the first tourbillon patented by Abraham-Louis Breguet in 1801, is designed to overcome gravity caused variances in the running rate of a watch associated with changes in vertical position. It is inevitable that a mechanical watch, no matter how carefully made, will run ever so slightly faster or slightly slower depending on its vertical position (the positions are classically defined as crown facing up, facing down, facing right, facing left). The core idea behind the tourbillon is to rotate constantly the rate keeping components over a full 360 degree circle on a periodic basis (one minute rotation is the overwhelming norm with modern watches) so that these positional rate errors produced by gravity will cancel each other out. In all tourbillons the way in which this rotation of the time keeping components is accomplished is to place them within a cage which is rotated about a fixed gear. That was the core of the original 1801 patent and remains the core of tourbillon design today.

Blancpain's original tourbillon, developed beginning in the mid-80's, elaborated on what were seen as standard tourbillon constructions. The norm over the preceding 180 year period of tourbillon watchmaking suspended the rotating tourbillon cage between two bridges (one on top, the other on the bottom) and centered the balance wheel within the cage. The design team saw a way to enhance this standard construction by eliminating the top bridge and by moving the balance wheel slightly off center in the cage. These enhancements carried with them enormous advantages. First by removing the top bridge, visibility of the tourbillon mechanism was greatly improved, since no longer would there be a bridge standing between the tourbillon and the owner. This type of single bridge design is termed a "flying tourbillon" as the sole support for the rotating cage is a bearing on the bottom side giving the topside appearance of a cage "flying" in space. Second, by decentering the balance wheel Blancpain was able to reduce greatly the thickness of the cage, thereby creating the world's thinnest tourbillon.

Both of these Blancpain tourbillon innovations made the construction significantly more difficult than with the pre-existing standard designs. The description itself of the flying design teaches the added difficulty that it carries with it: one bridge instead of two for the support of the rotating cage. This necessitated the development of a ball bearing support system for the cage on the lower bridge, which over time has been improved by fashioning the bearings in ceramic. How revolutionary was it to build the first wristwatch flying tourbillon? Not only was Blancpain the first to notch this achievement, its flying tourbillon was the first one minute flying tourbillon in any size watch—pocket or wrist.

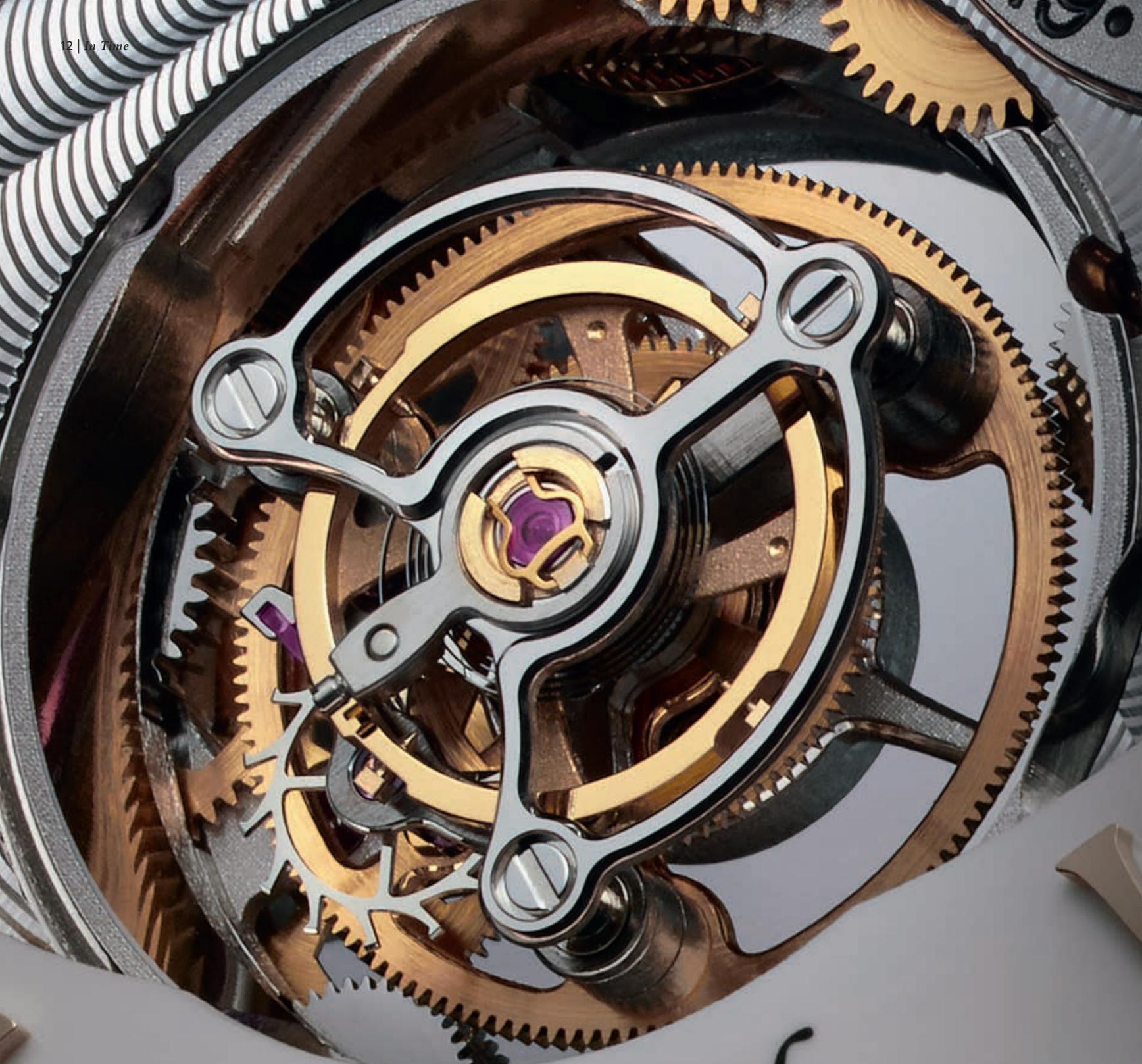
*Creating a tourbillon with A FLYING DESIGN and with an off-center balance wheel was more difficult than following pre-existing designs.*

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# Tourbillon





*Carrousel*

SWISS  MADE



*Blancpain Flying One Minute Carrousel.* The basic idea of the carrousel is identical to that of the tourbillon: constant rotation of the time keeping elements of the watch in order to cancel out gravity caused variances in running rate in a vertical position. The key difference between the carrousel and tourbillon is the *means* by which this rotation is accomplished. With the tourbillon a fixed gear is employed. That rotation is used to deliver power to the balance wheel/escapement. With a carrousel there is no fixed wheel and two power trains are employed, one to rotate the cage and the second to power the balance wheel/escapement.

The carrousel was originally developed by a Danish watchmaker then living in England, Bahne Bonniksen. Bonniksen's original idea was to develop a precise watch which would avoid Breguet's tourbillon patent. Secondarily, he hoped that the construction

would be less costly than that of a tourbillon. He succeeded magnificently on the first objective and failed on the second. Although carrousel pocket watches proved themselves superior to tourbillons from a performance perspective, far from being less expensive to produce, as they were more complicated with a higher component count, they were more costly.

In spite of the extra cost, carrousel pocket watches inspired by Bonniksen, largely produced in Coventry where Bonniksen lived, flourished for a period around the turn of the century. Indeed, in 1904 38 of the best 50 watches submitted for a timing competition at the Kew Observatory in England were carrouseles and those watches swept the competition. Unfortunately for the world of watchmaking, construction of carrouseles was completely centered in Britain so that when the English watchmaking industry collapsed, carrousel production fell with it and disappeared from view.

When the team was assembled to construct the first carrousel for a wristwatch, it was reviving what was essentially forgotten watchmaking art. As it had with the tourbillon, Blancpain was not content merely to re-create existing designs. The resulting construction broke new ground on many fronts. When it debuted at Basel 2008, Blancpain's carrousel was not only the first carrousel in a wristwatch, it was the first flying one minute carrousel ever produced and offered the longest power reserve of any carrousel in history.

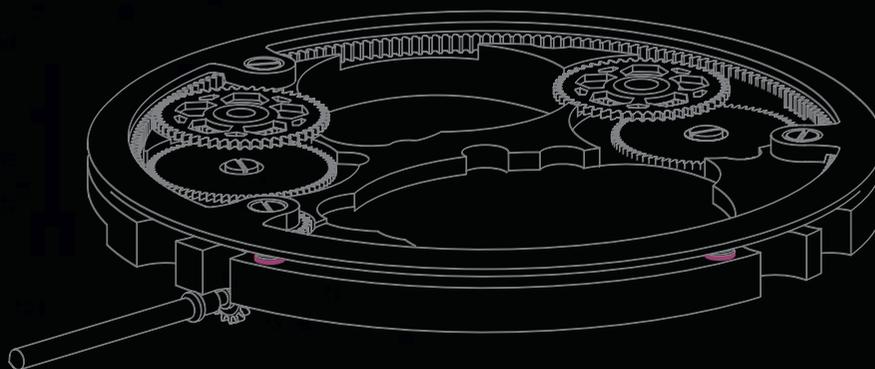
There was one more respect in which this ground breaking carrousel opened a new pathway, one dipped in a degree of irony. Blancpain's flying tourbillon set itself apart from the pack by de-centering the balance wheel. Precisely the opposite architecture was employed with the carrousel. Whereas historical pocket watch carrousel designs featured balance wheels de-centered in the cage, Blancpain distinguished its carrousel by centering the balance wheel in the cage.

*The Marriage.* Resolving the dilemma of one barrel for both and the placement of the elements was only the

beginning of the design challenges for the incorporation of these two iconic Blancpain constructions into the same watch. One of the first to be faced, at first blush, might seem mundane, trivial even. If there were to be two barrels, one each for the tourbillon and carrousel, how should they be wound? With a single crown, certainly. However, with the tourbillon and carrousel arranged vertically in the watch, the two barrels could not be located adjacent to each other. Indeed, they would need to be placed opposite each other. So the question became how to wind two barrels remote from each other.

The solution took the form of a large winding ring running around the circumference of the movement. Fitted with teeth, this large exterior ring engages winding gears for each of the barrels simultaneously. Despite its “ring-like” shape, Blancpain’s movement designers prefer referring to the ring as the “crown” because its purpose is in fact that: winding the two barrels.

The realization of this exterior winding ring solution was far from simple. The issues centered around how to support the ring. Several different elements were designed to hold the ring in position. To center it laterally, four ruby bearings have been located around the exterior of the movement. The placements are strategic, three of them at the points of greatest stress—adjacent to each of the two winding wheels for the barrels and next to the staff of the crown. A steel bearing in the form of a disk is located on the top surface of each ruby bearing to provide vertical support. Vertical support in the other direction comes from



An exterior ring connected to the crown winds both barrels simultaneously.





disk shaped steel bearings built into the interior surface of a circular bridge which lies above the full circle of the winding ring. The ring itself is exceedingly difficult to produce. Because of its complex shape each and every tooth along its circumference must be individually cut.

There is another aspect to this “marriage” beyond common winding: bringing some common design elements to the tourbillon and carrousel. Both the balances and spirals of each have evolved and now are shared. For the first time Blancpain has fabricated the balance spirals for the tourbillon and carrousel in silicium. Along with the new silicium spirals come new balance wheel designs with inset gold inertial regulation screws. This type of screwed inertial regulation (a feature of all recent Blancpain movements) allows for greater precision in the regulation of the watch and superior resistance to changes if the watch is subjected to shock. For the Tourbillon Carrousel, there are insets in the balance wheel at each of the four locations of the regulation screws. This allows for a slightly larger diameter balance wheel to be fitted within the cages. In each of these respects—silicium spiral, inertial regulation, design of the balance wheel—the tourbillon and carrousel are identical.

Savvy watch collectors, by this point, will no doubt be asking themselves how the outputs of the two time-keeping elements are combined into one time display. The answer is a differential. There are two exterior wheels which are fabricated for the differential, each engaged with a pinion, one from the tourbillon, the



*The* **BALANCE WHEELS AND SPIRALS**  
*are identical featuring inertial  
regulation and silicium hairsprings.*

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other from the carrousel. The pinion is mounted upon what is termed a "satellite". The minute hand of the watch, in turn, is connected to a staff which rotates with the satellite. If both the tourbillon and carrousel are running at an identical rate, the relative position of the satellite pinion will not change and it will rotate at the common speed of its two inputs. On the other hand, if there is a difference in the rate of the two inputs, the satellite will rotate at a rate which averages the difference. Although the construction is complex, the result is rather simple to understand. With two inputs the results are averaged. So, for example if the tourbillon were to be running +2 seconds a day and the carrousel -2 seconds a day, the result would be perfect timing. Another example: if the tourbillon were running at +/- 0 second per day and the carrousel +2 seconds per day, the result would be +1 second per day.

In fact, there are three differentials which have been built into the movement of the Tourbillon Carrousel. In addition to the differential to combine and average the outputs of the two timekeeping elements, there is a differential for the power reserve display and another for the correction of the date display. The power reserve indication, itself, is found on the reverse side of the timepiece.

There is one final movement design detail that needed attention for the marriage to be successful: the power reserve. Blancpain's original carrousel that debuted in 2008 had a power reserve of 100 hours, which was at the time a world record for a carrousel timepiece. Also establishing world records when they debuted, Blancpain's tourbillons boasted power reserves of up to eight days. Since, of course, both need to run together, Blancpain's designers set the power reserve bar at seven days and designed a new larger winding barrel for the carrousel for it to achieve the new mark.

*The two barrels WIND TOGETHER  
via the large wheel circling the movement.*

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The decoration of the movement reflects the sophistication of its construction. The dial side of the Tourbillon Carrousel is opened to place the main plate directly in view. For the first time on one of its movements, Blancpain has hand carved a guilloché finish, in a motif known as “flanqué.” On the back side, the bridges feature a rhodium plated fine frosted finish on the flat surfaces and hand filed and burnished anglage on the edges. If you have an eye for refined detail, note the precision with which the frosted finish has been applied; there are distinct borders between the edge of the frosted finish and the bright polished edge of the anglage which highlights the beauty of both. Two final flourishes. The power reserve display uses the

contrast between a background frosted finish and mirror polishing to show the state of wind. A ring has been placed around the carrousel porthole, which like the front of the movement, has been hand guilloché. The dial of the watch has been realized in full fired enamel. To give the dial added depth, layer after layer of enamel are applied, each baked before the next is applied. Unusual for an enamel dial, red gold indexes have been added.

The Tourbillon Carrousel is housed in a 44.6 mm red gold case. •



Tourbillon

BLANCPAIN

Carrousel  
SWISS MADE

25 27 29 31 1 3 5 7  
9 11 13 15 17 19 21 23



The Petrus vineyard with the village of Pomerol in the distance.

TEXT: JEFFREY S. KINGSTON

# PETRUS

What sets Petrus apart as the most distinguished, storied and sought after wine in Pomerol?







*Winemaking on the Petrus hill*  
**DATES BACK TO 1745.**

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“It’s the hill.” Olivier Berrouet, the second generation wine maker from his family at Petrus, gesticulates toward a barely perceptible swelling of the ground in the vineyards opposite the Petrus chai. To our Swiss and Idaho sensibilities there is no visible hill at all. To put it in other terms, nothing by way of a rise that would cause even a novice weekend bike rider to notice that there had been a change in grade, much less encourage a downshift. Whether or not it would be recognized as a hill were it placed not near Libourne but in Switzerland’s Lavaux, Berrouet is explaining what it is about Petrus that sets it apart from its Pomerol neighbors, that makes Petrus the most distinguished, storied, sought after, and, yes, most expensive wine in the region. The “hill”, in fact, far from being a towering rise above ground, is largely a geological phenomenon *below* the surface. For the rest of what is known as the “right bank” in Bordeaux, Saint-Émilion and Pomerol, approximately a million years ago the

Dordogne river deposited gravel on the clay surface of what formerly had been the ocean floor dating back another 39 million years. Everywhere, that is, except for the privileged now underground clay hill of Petrus. As it was in fact a clay hill, the gravel was deposited broadly around it but not upon its summit. So the clay, that elsewhere lies buried in gravel deep below the surface, actually rises to the surface at Petrus. It is this clay, blue in color, that gives Petrus its unique power and breed.

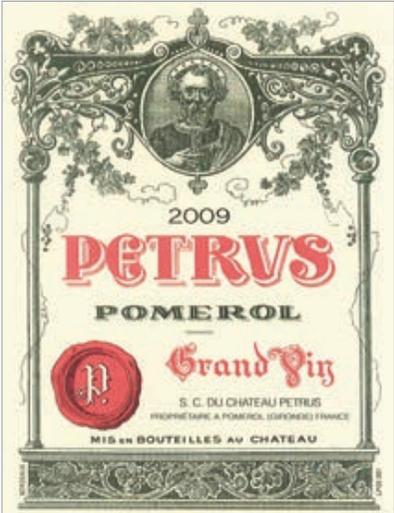
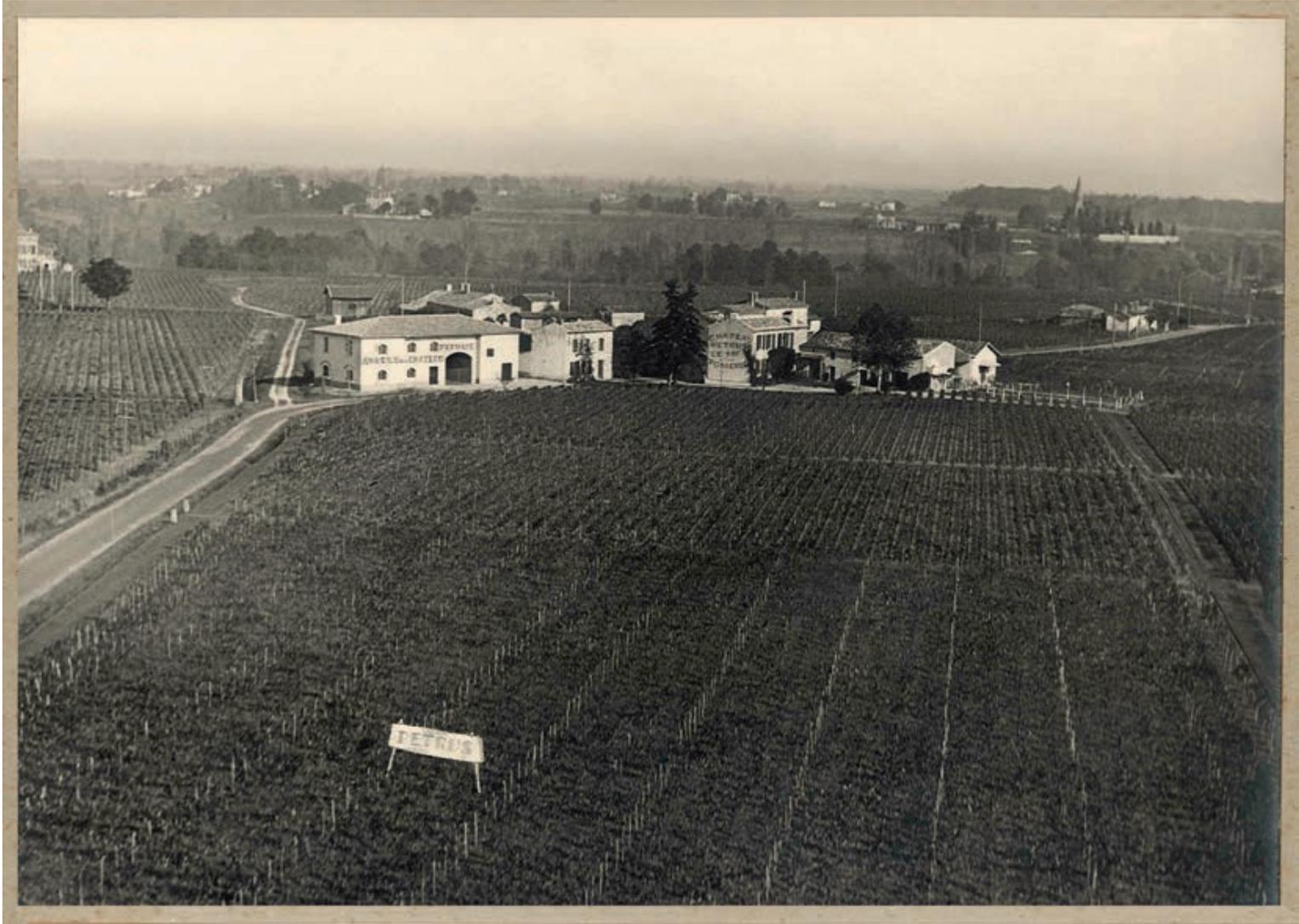
Berrouet’s explanation certainly spotlights an important quality factor, but a deeper look turns to Petrus’ history and broader winemaking philosophy. Wine making here began in 1745 when neighboring Vieux Château Certan first planted the hill. Before the turn of the century, noticing the excellent wine being produced by Vieux Château Certan, the Arnaud family bought the hill parcel, naming their winery Château Petrus Arnaud. Success arrived when the Arnaud’s

won a gold medal at the 1878 World's Fair. Under their stewardship, the vineyards were transformed. Previously planted with a broad variety of grapes, between 1880 and 1890 the vineyards were entirely replanted in Merlot, which today is used exclusively for the wine.

Beginning in 1925 M<sup>me</sup> Edmond Loubat began to acquire ownership shares in Petrus. Her holding percentage grew over time so that by the arrival of World War II, she was the sole owner. It was her vision that both Petrus, in particular, and Pomerol, in general, were underappreciated, and, as follows from that, undervalued in the market. In part this may have been due to the fact that the famous 1855 classification of Bordeaux châteaux was confined to the Médoc and Graves, omitting Pomerol and its right bank companion Saint-Émilion entirely. Largely this was due to the fact that, in spite of being proximate to Bordeaux,

Pomerol and Saint-Émilion were not considered Bordeaux wines at all. They were, after all, on the other side of the river near Libourne. Although Pomerol and Saint-Émilion wines are often referred to as “right bank wines,” with the main Bordeaux appellations (Saint-Estèphe, Pauillac, Saint-Julien, Margaux, and Graves) being located on the “left bank,” in fact Pomerol is not even on the opposite bank of the same river. The left bank wines flank the Garonne or the Gironde, while Pomerol is on the right bank of the Dordogne, which eventually joins the Gironde. Pomerol and Saint-Émilion, according to the 1855 view, were, therefore, *Libournais wines*. Thus, this glaring omission from the classification had nothing to do with any quality shortcoming, merely a narrow view of geography. In any event, M<sup>me</sup> Loubat set out to rectify the omission and put Petrus on the map. She began by prioritizing quality over quantity in the winemaking ensuring that the substance was there. Demonstrating the strength of her commitment was her response to a murderous frost in 1956. Unlike most others in the region, she did a *recépage* in the vineyard, which severely pruned the vines, nearly to the ground, a technique which preserved the old vine root stock. Although fully two years of harvests were sacrificed, quality was greatly enhanced.

*Omitted from the 1855 CLASSIFICATION because it was located near Libourne, Petrus set out to establish its ranking through its devotion to quality.*





With her energy and dedication to growing the reputation of Petrus there was a bit of moxie and no small touch of marketing genius. In 1947 when the Lord Mayor of London paid a visit to the region, M<sup>me</sup> Loubat stepped forward and offered two magnums of Petrus to the Lord Mayor as a wedding gift for then Princess Elizabeth. Not only was the gift widely publicized, she was invited to attend the gala pre-wedding dinner. There was one other marketing dimension to Loubat's ownership of Petrus. In 1940 she elected to drop the word "Château" from the name, contenting herself with a label that simply said "Petrus." Today only two other Bordeaux châteaux have followed the practice, both on the right bank.

Rising in parallel with M<sup>me</sup> Loubat's rejuvenation of Petrus in the vineyards, was the Moueix family empire, founded by Jean-Pierre Moueix beginning in 1937.

Moueix began with the establishment of a *negociant* firm in Libourne, buying and selling right bank wines. One of his principal relationships was with M<sup>me</sup> Loubat and Petrus. It was through Jean-Pierre Moueix that Petrus acquired its fame in the United States. Recognizing the importance of the market, Moueix approached Henri Soulé the owner of the fashionable New York restaurant Le Pavillon and convinced him to promote Petrus in the restaurant. Petrus became the favored Bordeaux for many of the glitterati who frequented the Pavillon such as the Kennedy's and Aristotle Onassis.

M<sup>me</sup> Loubat died in 1961. Three years later, in 1964, Moueix made his initial purchase of the stock, acquiring a 50 per cent share. At the same time, he brought with him Jean-Claude Berrouet as the winemaker. Full ownership came in 1969. Since that time the destiny of Petrus has been in the hands of the Moueix family on the ownership side and the Berrouet family on the management and winemaking side. Today, matters have moved generationally: it is Jean-Pierre's grandson, Jean Moueix, 27 years old, who is the most active member of the Moueix family and Jean-Claude Berrouet's son, Olivier Berrouet, 37, who is the director and winemaker.

*Petrus is one of ONLY THREE  
Bordeaux producers which do not use  
the word "Château" on the label.*





*The Petrus APPROACH TO WINEMAKING disfavors artificial methods practiced elsewhere.*

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Certainly the “hill” plays an important role in cementing Petrus’ place at the top of the world’s wine pyramid, but equally so does the meticulous attention to detail both in the vineyards and in the chai. Unlike most vineyards that are planted with rows oriented in a single direction, Petrus’ vines are planted in different orientations depending upon location. This is to maximize the advantage of its hill’s blue clay soil. When rained upon the clay quickly expands and forms a nearly impermeable barrier to further water absorption, with additional rain merely producing runoff. The different planting orientations are designed to promote this runoff rather than soaking into the ground. For the quality of the wines this is important as it diminishes dilution of the fruit from rainfall. The clay helps in other ways as well as it not only brings minerality to the wine, but prevents the vines from growing too vigorously, both of which enhance quality.

The Berrouet approach disfavors artificial methods practiced elsewhere. He does not believe in the so-called “green harvest” where berries are pruned when small and green in an effort to reduce yield and thereby increase concentration in the wine. Instead, his belief is that the green harvest increases dilution in each remaining berry, even if the overall yield is reduced. Nor does he favor artificially late harvesting. Although it is possible to produce flatteringly lush rich wines that way, at least when the wine is youthful, with time the wine cannot achieve its full aromatic potential. Berrouet is firm setting out his winemaking objectives. He is not crafting for “flash,” not to triumph in young wine tastings, not to produce youthful fruit bombs. Instead his time horizon is 20 years and his decisions are directed to fashioning age worthy wine. A further dimension to his anti-intervention approach is Berrouet’s avoidance of pesticides (preferring more biologically clever solutions such as use of

Sorting grapes on arrival at the chai.

natural pheromone hormones which sexually confuse the insects, reducing their numbers). For him, the greatest challenge is having the confidence to know when to do nothing, said another way to let nature run its course for a better result than with artificial manipulation. This was particularly true in 2003 when a brutal heat wave, known as the *canicule*, struck France baking the vineyards in 40 degree temperatures. Trusting that nature could handle it, Berrouet left well enough alone and was rewarded with a splendid vintage.

The Moueix's, both Jean and his father, Jean-François, and the Berrouet's, father and son, take part in the tasting process, which determines when to harvest. Of course, modern winemaking techniques demand chemical analysis of the grapes to determine sugar content, acidity and other variables, but at Petrus chemistry does not trump skilled palates. The tasting team validates what the chemistry shows as they taste for ripeness and acidity. Sadly, today acidity is all too often overlooked as an essential in wine. However, it is in fact vitally important if the wine is to age well.

As with other top Bordeaux wines ruthless selection of the grapes for vinification into the top wine is a key element to quality. At Petrus the handpicked grapes (all wines within the Pomerol appellation must be picked by hand) arrive and are sorted on an optical

sorting machine. If you will, they undergo a "berry scan". The advantage over a manual scan is that process proceeds more quickly; Berrouet's desire is to minimize the time the grapes are sitting around. As much as 50% of the harvest is rejected and used for lesser wines than Petrus.

Once safely in the chai, Berrouet has the same philosophy of a deft touch that he practices in the vineyards. Believing that the Merlot fruit is sensitive, the cooling before fermentation is done delicately. The cooling is important as that slows the start of fermentation. During fermentation, there is a gentle pumping of juice over the fermentation cap to enhance the extraction of color, tannins and flavor elements (when the harvest ferments in the vat, the skins and any other solid

*The decision on WHEN TO HARVEST depends not only on analyses and measurements but tasting of the grapes by the Moueix's and Berrouet's.*

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material float to the top forming a cap; pumping over, as the name implies, consists of taking juice from the below the cap and pouring it back over the top). At the same time, Berrouet avoids over extraction which would produce an imbalance in the wine. Throughout this time, he tries to minimize the contact with oxygen. In many ways this approach underscores a great difference between the Merlot of Petrus and the Cabernet which is the dominant grape of the left bank wines. For Cabernet with its harder tannins, oxygen is required to help break them down; ripe Merlot with its more gentle tannins does not require oxygen that would otherwise reduce the aging potential of the wine.

Although Petrus eschews many of what some see as modern innovations such as green harvesting and pesticides, there is one area in which they are pioneers with new ideas. The combination of limited production and insatiable demand for Petrus has greatly elevated its price in the marketplace. As Jean Moueix has observed the ever soaring price levels, he feared that many would be denied the pleasure of his patrimony. And so his program “Carte Sur Table” was born. Together with nine other prestigious Bordeaux châteaux he approached six Parisian restaurants with a novel

idea. He would sell them Petrus, joined by the other nine châteaux, at a fraction of the market price *provided* that they would place the wines on their lists at a modest mark-up and only sell bottles to patrons of the restaurant for drinking during a meal. Carte Sur Table, thus, placed Petrus on these Paris wine lists at a price of approximately 500 Euro. The program has been an overwhelming success, restaurateurs and diners alike reveling in the new affordability for these stellar wines. The number of restaurants in the program has now grown to twelve and Moueix is evaluating the expansion of Carte Sur Table to yet other restaurants in Paris and elsewhere.

For oenophiles, every single occasion accompanied by a bottle of Petrus is seared in memory. Its breed, finesse, complexity, and frankly majesty are so riveting that Petrus naturally becomes the undisputed center of attention and conversation for each special event when it is served. Wine tastings are no exception; tastings that include Petrus set themselves apart. •

*Every single occasion*  
**ACCOMPANIED**  
**BY A BOTTLE OF PETRUS**  
*is seared in memory.*

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## TASTING Notes

These tasting notes combine the memories and experiences, accumulated over the past three decades of Dr. George Derbalian, the *Lettres du Brassus* wine expert, and yours truly.




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1953 (JK AND GD TASTED 1983).  
A monster wine. Deep purple color. Brooding and powerful all supported by massive structure. Legendary.

---

1961 (GD TASTED IN 1991).  
Tasted alongside all the '61 giants. Tied with Latour at the top. Pretty bouquet, packed with sweet berry saturated flavors. Likely will outlive all the rest of this revered vintage. A monumental wine.

---

1964 (GD TASTED IN 1999).  
In a vertical tasting of landmark vintages of Petrus, tied with the '66 as the star. Voluptuous, almost Burgundian in its character. Round with waves of beautiful fruit. Can a wine this big be called a "darling"? A monumental wine.

---

1966 (GD TASTED IN 1999).  
Tied with the '64. Long, linear, elegant, and pure. Doesn't ram all of its fruit out front. Exceptional length. A monumental wine.

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1970 (GD TASTED IN 1999).  
Fleshy and fat. A mouthful of wine. Superb. A great wine.

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1973 (JK TASTED 2013).  
How did Petrus pull this off? With a vintage that was disastrous throughout Bordeaux producing lean, nasty wines, this is a charmer with now fully resolved tannins and lively fruit. Not a heavy-weight but satisfying.

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1975 (JK AND GD TASTED 2013).  
Astonishing. Deep purple color and not a trace of brick. Dense and powerful with waves of sweet fresh cassis fruit backed by minerals and hints of chocolate. Underneath there is structure and a bit of the firmness that characterizes the vintage. A great wine. For both GD and JK the best Bordeaux of the vintage.

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1978 (GD TASTED 1999).  
Almost Médoc in its character. Not as rich as '75. With more recent tastings the wine has become fatter and richer.

1986 (JK AND GD TASTED 1989).

Tasted blind in a flight of '86 Pomerol. Firm and brooding in its youth. Not as fleshy as '89 or '90 but clearly a wine built to age. Still need to wait for this wine to mature fully.

1989 (GD TASTED IN 1999).

Dense, chewy, structured wine. Packed with sweet fruit. Will age magnificently.

1990 (GD TASTED 1999).

Diplomatic, racy, flows. Seductive with beautiful ripe tannins. In the long run will be surpassed by the '89, but when young its flash carries the day. A monumental wine.

1993 (GD TASTED 1999).

Not as concentrated as '90. Well balanced and complete like the '90 but at a lower amplitude. Fleshy round tanins, particularly remarkable for a vintage that is not well regarded.

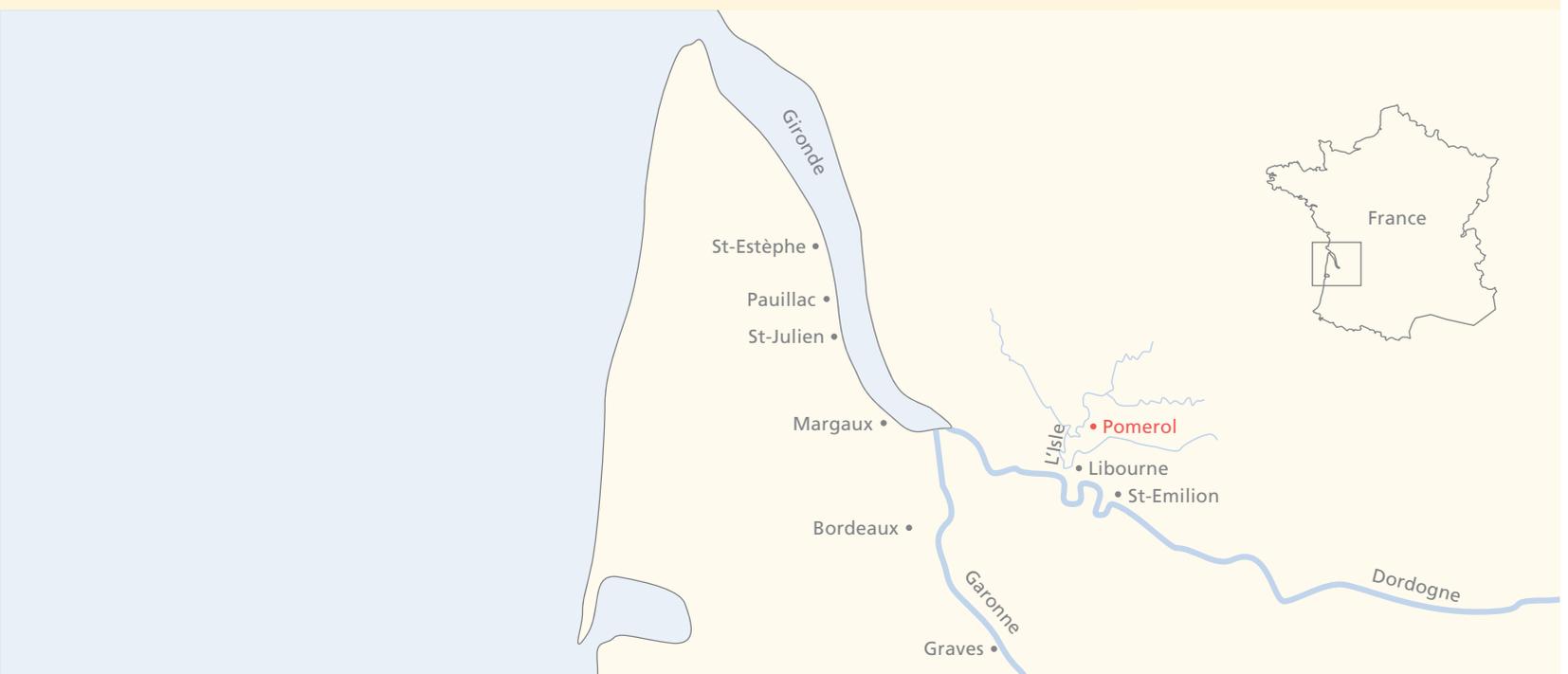
2012 (JK TASTED IN 2013).

Remarkable. Surprisingly open and accessible. Deep purple color with blackberry nose. Almost chewy texture revealing currants. Tannins fully ripe and round. Great concentration. Huge finish.



#### DR. GEORGE DERBALIAN

Dr. George Derbalian is the *Lettres du Brassus* wine expert. Dr. Derbalian is the founder of Atherton Wine Imports, located in northern California. Not only has he become one of the United States' premier importers of fine wines, but he has acquired a well-deserved reputation as one of the leading and most respected wine connoisseurs and expert tasters in the world. Each year, Dr. Derbalian travels the wine circuits of Europe and the United States, meeting with wine producers, owners of the finest domains, chef de chai, and other key figures in the world of wine. Throughout the course of each year, he tastes literally many thousands of current production and vintage wines.







*The Carrousel*  
**GRAND  
COMPLICATION**

TEXT: JEFFREY S. KINGSTON

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Entering the Pantheon of its grand complications is Blancpain's new Le Brassus Carrousel Répétition Minutes Chronographe Flyback.

*Blancpain is resolute in believing that A GRAND COMPLICATION must be innovative in all its dimensions.*

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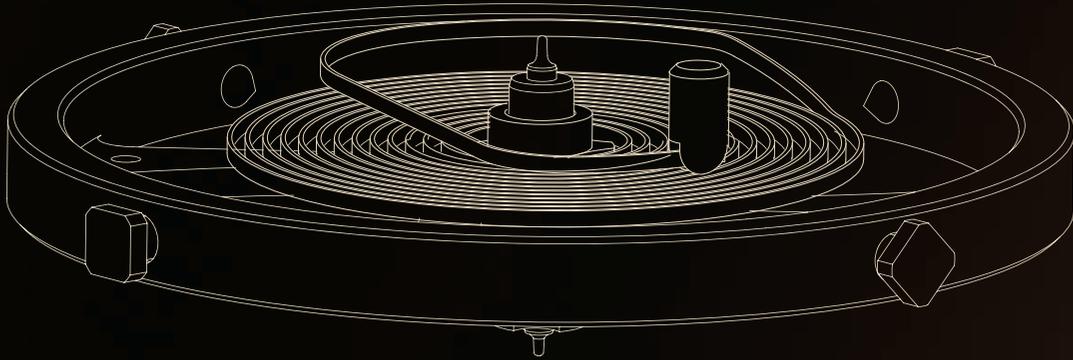
**A logical proposition. The creation of a grand complication timepiece, which by definition must offer a combination of complications, can occur in one of two ways. The first is the bringing together of classic complications, created in the usual ways, so that the “creativity” consists merely in assembling the package, so to speak. The second is bolder. Innovate around each of the complications and then innovate further in bringing them together. With the Le Brassus Carrousel Répétition Minutes Chronographe Flyback Blancpain has resolutely cast its lot in the latter camp. Each principal element of this grand complication watch stands on its own feet with true inventiveness and creativity in its category. And underscoring the innovations: never before has there been a wristwatch offering this unique combination of complications.**

As it must be for any watch, the heart of Le Brassus Carrousel Répétition Minutes Chronographe Flyback is the central timekeeping element which in this case is the carrousel. Blancpain was the first to develop a carrousel for a wristwatch and, as we explain further in these pages 6-21 presenting the Tourbillon Carrousel, there were many world firsts that accompanied this achievement: the first flying carrousel in a wristwatch, the first one minute flying carrousel in any

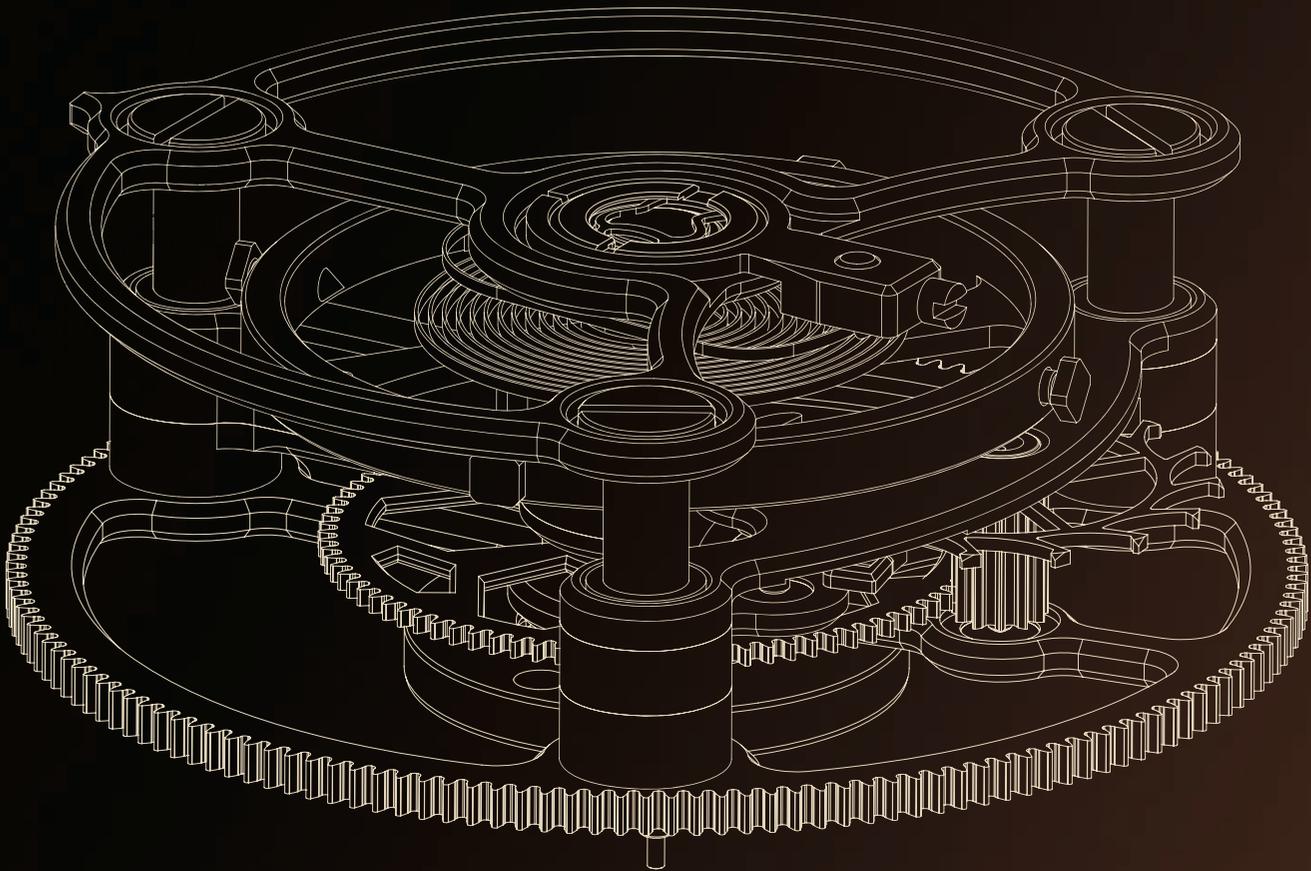
form of timepiece, the longest power reserve for any carrousel, and the first carrousel with a centered balance wheel. Although the Le Brassus Carrousel Répétition Minutes Chronographe Flyback adheres to the basics of Blancpain’s record breaking design, subtle enhancements have been added. Blancpain’s original carrousel utilized a flat hairspring for the balance. In this new implementation the hairspring now has what is known as a “Breguet overcoil.” The overcoil is an invention originally developed by famed watchmaker Abraham-Louis Breguet in 1795. With standard flat construction, the inner end of the spiral is attached near the center axis of the balance wheel while the outer end is attached to an arm. With this arrangement it is impossible to achieve perfect concentricity and centering of a spiral as the outer portion of the spiral that is attached to the arm is not matched on the opposite side. Abraham-Louis Breguet discovered that if the outside portion of the hairspring’s coil were bent upward and inward over the main part of the coil

Figure A. The balance wheel showing its Breguet overcoil spiral.

Figure B. The carrousel cage, balance wheel and escapement.



A



B

(hence the term “overcoil”), both centering and concentricity would be improved and along with that rate keeping of the watch. As it has done with several of its newest movements, Blancpain has constructed its balance spiral with a Breguet overcoil. The fabrication is painstaking as the upward and inward bend of each balance spiral is delicately fashioned by hand.

In adding a chronograph to the carrousel Blancpain achieved a world first as that combination has never been done before in a wristwatch. Indeed, because the chronograph incorporates a flyback function, meaning that instead of three pushes to command a stop, return to zero and restart for the chronograph, a single push of the lower button will suffice, the combination is a “double world first” in that a flyback has never before been combined with a carrousel in a wristwatch.

In the same way that the carrousel is heart of the grand complication’s timekeeping, the vertical clutch mechanism is the nerve center of the chronograph. Although Blancpain drew upon its nearly thirty years’ of experience in the construction of vertical clutch chronographs for this new grand complication, the design for the Le Brassus Carrousel Répétition Minutes Chronographe Flyback was evolved considerably. Throughout its collections, Blancpain’s chronographs have placed the minute counter for the chronograph in a subdial at the 3 o’clock position. A completely different architecture was sought for this first pairing of a chronograph and carrousel, one with a central large minute counter hand which would read upon the outer chapter ring of the watch dial. Much more was

involved than changing the gearing to move the indication from 3 o’clock to the center. Because the hand would be considerably longer than with a small subdial, the minute counter gear train was entirely redesigned. The minute counter hand is expected to move smartly to the next minute as the chronograph seconds hand passes 60. In order to ensure perfect motion without flutter or oscillation, Blancpain’s movement designers determined that a form of gear construction was required which differs from that which it has previously used in its chronographs. Instead of a classic solid tooth profile, the ideal answer was found with teeth that incorporate a “split.” The purpose of the “split” was to build into each tooth a form of shock absorber. These miniature shock absorbers not only produce a perfectly smooth advancement of the minute hand, they prevent unwanted wiggles if the watch is subjected to an external blow.



The dial side of the movement.





The idea of shock absorption wheels was perfect; the method for producing them required a radical departure from old methods. Ordinarily, the teeth for gears (which watchmakers prefer calling “wheels”) are carved into the wheels with a milling cutter. From a high level perspective this is thought of as a subtractive process—material is cut away to produce the teeth. Although today’s subtractive processes for cutting teeth are staggeringly precise, they are insufficiently precise to form the type of split shock absorption teeth which Blancpain desired. Blancpain’s movement designers thereupon turned to methods oriented in a direction opposite from subtraction, namely, additive techniques. Instead of cutting away material from a disk to produce the teeth on a wheel, additive methods form the wheel, molecule-by-molecule, from the ground up. The wheel and its teeth are, thus, created together. Of course this calls into play leading edge

technology. Although vastly more expensive than traditional cut teeth wheels, these additive wheels can be formed with tooth profiles far more complex and with greater precision than with subtractive cutting.

Blancpain has employed an additive process gear before in the X-Fathoms diving watch. As with the new grand complication, the demands of the X-Fathom’s mechanical depth gauge for a complex shape and extraordinary precision drove the decision to fabricate one of the key gears molecule-by-molecule.

There are two such high tech wheels in the Le Brassus Carrousel Répétition Minutes Chronographe Flyback, one located at 3 o’clock and the other at the center, both part of the chronograph’s minute counter gear train.

The shock absorber wheels guarantee perfect movement of the minute counter hand; it is the vertical clutch which produces perfect movement of the chronograph seconds hand. Except for some rare constructions that rely upon what is essentially a separate movement with a separate chronograph barrel, all chronographs employ some form of switching mechanism. The reason is intuitive. When the chronograph start is commanded, its gear train is “switched” or connected to the regular running train of the watch. Similarly, when a stop is commanded, the chronograph train is disconnected from the running train. Historically most *haut de gamme* chronographs utilized a horizontal clutch mechanism for this switching for start/stop. Unfortunately there are significant drawbacks to these designs which rely upon two gears suddenly coming together when the chronograph is

*For the development of the chronograph,  
BLANCPAIN’S MOVEMENT DESIGNERS  
turned to cutting edge technologies.*

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started. Ideally two gears should mate with the teeth of one falling into the troughs of the other. But as starting is a random event, the mating of the gears may not necessarily occur with teeth oriented toward troughs; sometimes a tooth will first contact another tooth. This causes an undesirable jump in the movement of the seconds hand. Further, to compensate for play in the engagement of teeth and troughs which would produce unwanted fluttering of the chronograph's seconds hand as it circles the dial, a tension spring is employed with these designs. Although the tension spring helps smooth the movement of the hand, it adds drag to the running of the watch, changing the running rate when the chronograph is operating in comparison with its rate when it is not operating. Finally as the teeth of the wheels for these high grade chronographs are extremely fragile owing to their fine sharply triangular shape, to minimize wear, it is always advised to avoid running the chronograph constantly.

All of these drawbacks are cured with Blancpain's vertical clutch design. Instead of relying upon the mating of two gears when the chronograph is started, two disks are pushed together. Starting takes place perfectly every single time with no jumping. Nor is there a need for a tension spring. The two plates rotate together

with no risk of flutter. And with no need for a tension spring, there is essentially no change in the running rate of the watch when the chronograph is engaged. Finally by dispensing with fine triangular shaped gears that wear upon each other when engaged, the chronograph can be run constantly if the owner so desires. In short, Blancpain's construction delivers the type of chronograph performance and operation that befits a true grand complication.

There was one more challenge associated with incorporating the chronograph within this new grand complication. As one of the complications is a minute repeater, its gongs (which are in the form of steel rings) encircle the movement. The standard placement of the chronograph pushers for start/stop and

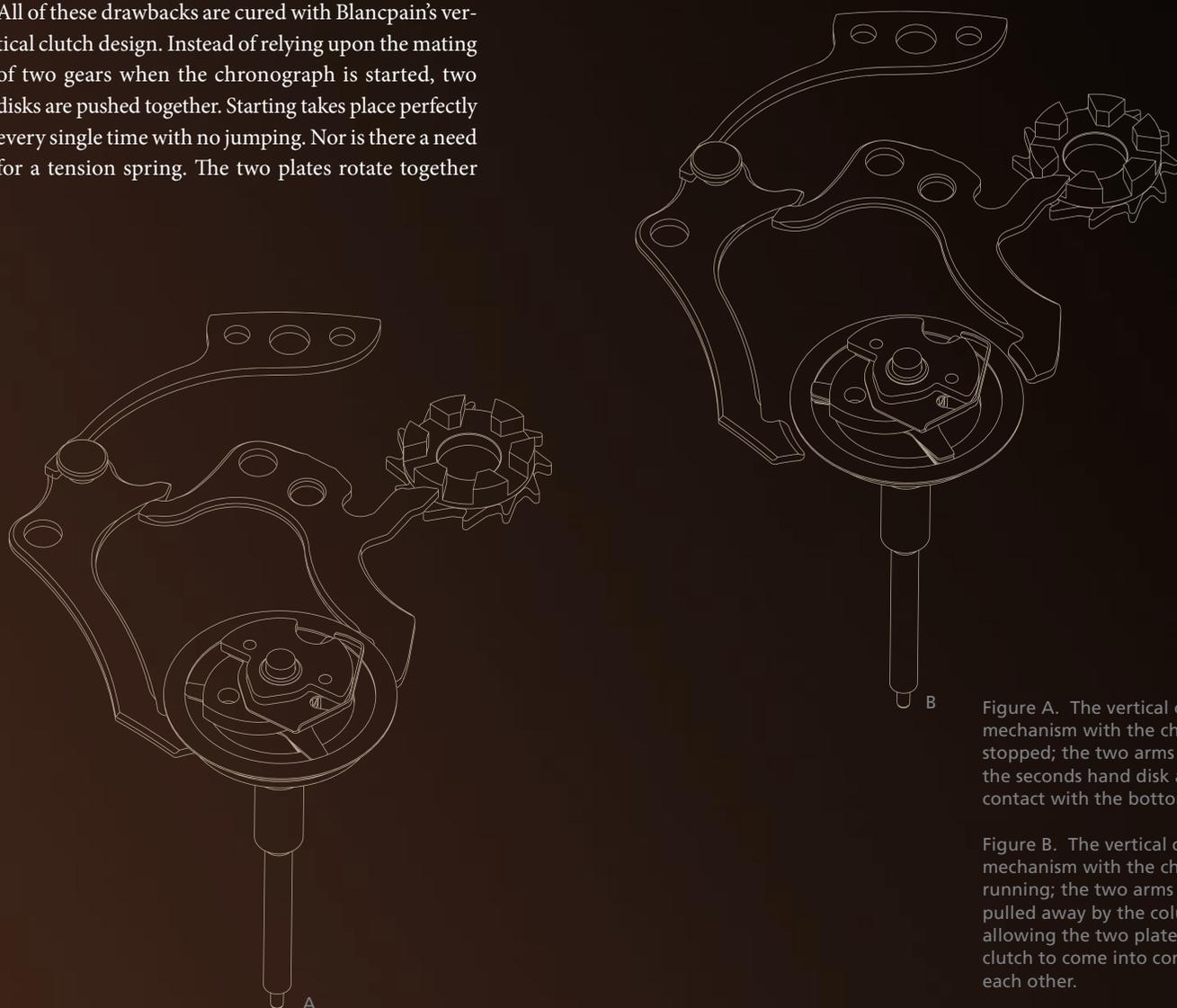


Figure A. The vertical clutch mechanism with the chronograph stopped; the two arms are holding the seconds hand disk away from contact with the bottom plate.

Figure B. The vertical clutch mechanism with the chronograph running; the two arms have been pulled away by the column wheel allowing the two plates of the clutch to come into contact with each other.



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BLANCPAIN

XI

X 25

30

II

III 5

XVII

VIII 20

IV

VI

10

SWISS 15 MADE

V

return to zero would cause their shafts to collide with the repeater's gongs. So Blancpain had to develop a method to lower the shafts of the pushers so that they would pass below the encircling repeater gongs. This slight repositioning of the pushers, in turn, dictated a repositioning of the crown as well so that both pushers and crown would all be at the same height on the side of the case. Instead of a straight shaft running from the movement to the crown, there are two plates, one attached to the shaft from the movement and the second to the lowered crown and separate shaft to which it is attached. When the crown itself is pulled or turned, that motion is transferred via gears to the separate shaft in the movement. The two plates act as bearings for each of the two shafts.

From one perspective there is no such thing as a "standard minute repeater". Producing crystal clear rich sound from a chiming mechanism is an artistic endeavor that can never be labeled "standard". But

beyond that, the minute repeater complication in this newest grand complication incorporates several innovations that set it apart from others in the industry.

Blancpain has long believed in secure movement constructions. By "secure," Blancpain means that the movement will be protected against misuse by the owner. Of course, there is always the expedient of inserting warnings, usually in a large bold type face, in owner's manuals, but Blancpain believes that a studied design delivers more genuine value and security than a written list of forbidden operations. In the case of a minute repeater the risk of misuse is the adjustment of the time while the repeater is sounding. Whereas others sternly instruct against such an adjustment, Blancpain goes further. When the repeater slide is pulled to initiate the chiming of the hours, quarter hours and minutes, the crown is disconnected from the movement. Thus, if the owner were to try and change the time setting, an action that would break the mechanism of other timepieces, nothing will happen; the crown will turn harmlessly.

There is a second important innovation which has been built into the Le Brassus Carrousel Répétition Minutes Chronographe Flyback, an extra-large repeater barrel. The energy for the sounding of all minute repeaters comes from the pulling of a slide on the side

*Framing the movement is a*  
**FULL FIRED ENAMEL dial.**

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The chronograph features two large hands, the red tipped hand for the minute counter, the longer hand for seconds.



BLANCPAIN



of the case. This action winds a repeater barrel that powers the chiming. It has become standard practice in the industry that repeater barrels are wound for 1.5 turns when the slide is pulled. Unfortunately, for a long chime such as the one to sound the time 11:59 (which would require 11-hour strikes, 3 quarter-hour strikes — each of which consists of two strikes — and 14 minute strikes) the barrel is essentially exhausted for the final minute strike. As a result, the volume is generally lower and, in many cases, there may be a slowing of the chiming pace at the very end of the sounding. To address this problem, Blancpain has designed the repeater with an extra-large barrel which receives a full five turn wind when the slide is pulled. Instead of being completely unwound after 1.5 turns, the Blancpain barrel still stores 3.5 turns of energy during the final chimes. Both the volume and the pace are fully maintained even for the longest sounding, that of 11:59.

There is a third important dimension to the minute repeater: its gongs. The gongs (or if you like “rings”) of the Le Brassus Carrousel Répétition Minutes Chronographe Flyback repeater are extra-long; instead of circling the movement for one turn, they circle for one and half turns. This extra length, which confers the title “cathedral” upon the chiming, brings

added richness and vibrancy to the sound. Of course, if the sound is not transmitted well from the movement to outside the case, all the design effort goes for naught. To enhance the transmission of sound, Blancpain has attached the cathedral gongs to the red gold walls of the case itself. This direct attachment significantly increases volume and clarity.

All of these innovations demand a worthy aesthetic package. To highlight the complexity of its sophisticated movement, the components of the Le Brassus Carrousel Répétition Minutes Chronographe Flyback are set upon a red gold stage, so to speak. Both the movement main plate and its bridges are fashioned in solid red gold. The bridges have been hand carved in Blancpain’s Le Brassus grand complication workshop. The decoration of the faces of the bridges requires a full day of hand work on each bridge. Of course, further patient work is required to bestow a hand filed anglage finish (using files and wooden burnishing tools) on the edges and even hand applied perlage to the hidden sides. All of the other components are equally decorated by hand, angled, brushed, and polished. The chapter ring dial is crafted in full fired enamel. And finally, as this is an automatic winding grand complication, the winding rotor is fashioned in 22 carat red gold.

A grand complication should be an emphatic expression of watchmaking art. Taken separately the complications of the Le Brassus Carrousel Répétition Minutes Chronographe Flyback—the flying carrousel, the flyback chronograph, the cathedral gong minute repeater—all lay claim to important horological advances. But the sum is greater than its individual parts. They have been integrated together into a single movement whose beauty and functionality transcends any individual element. Every owner can derive enormous pleasure in knowing this is a grand complication that has never been achieved before. •



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TEXT: LAURENT BALLESTA

# GOMBESSA

*Expedition*

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The coelacanth, a plunge  
towards our origins



*At the bottom of the sea, one is alone,  
deeply alone, but this ALONENESS IS  
ONLY POSSIBLE WITH THE SUPPORT  
OF OTHERS.*

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**This story starts the previous day. Today's dive is over and the sea disappears behind us. The road winds across a huge dune covered in trees. The road spits out tons of sand in the wake of our pick-up. Between the car and the cloud of dust is a boat on the trailer with us on top of it. Equipment is everywhere—14 air cylinders and 400 kilos of accessories for just four divers.**

It takes 40 minutes to reach the base camp, 15 km from the sea. It is 3.30 p.m. Our precious high tech dive gear is laid out in a garage under the gum trees at the end of the world, where any motor from the 20<sup>th</sup> century can be repaired. Here, lost in the bush, independence is luxury.

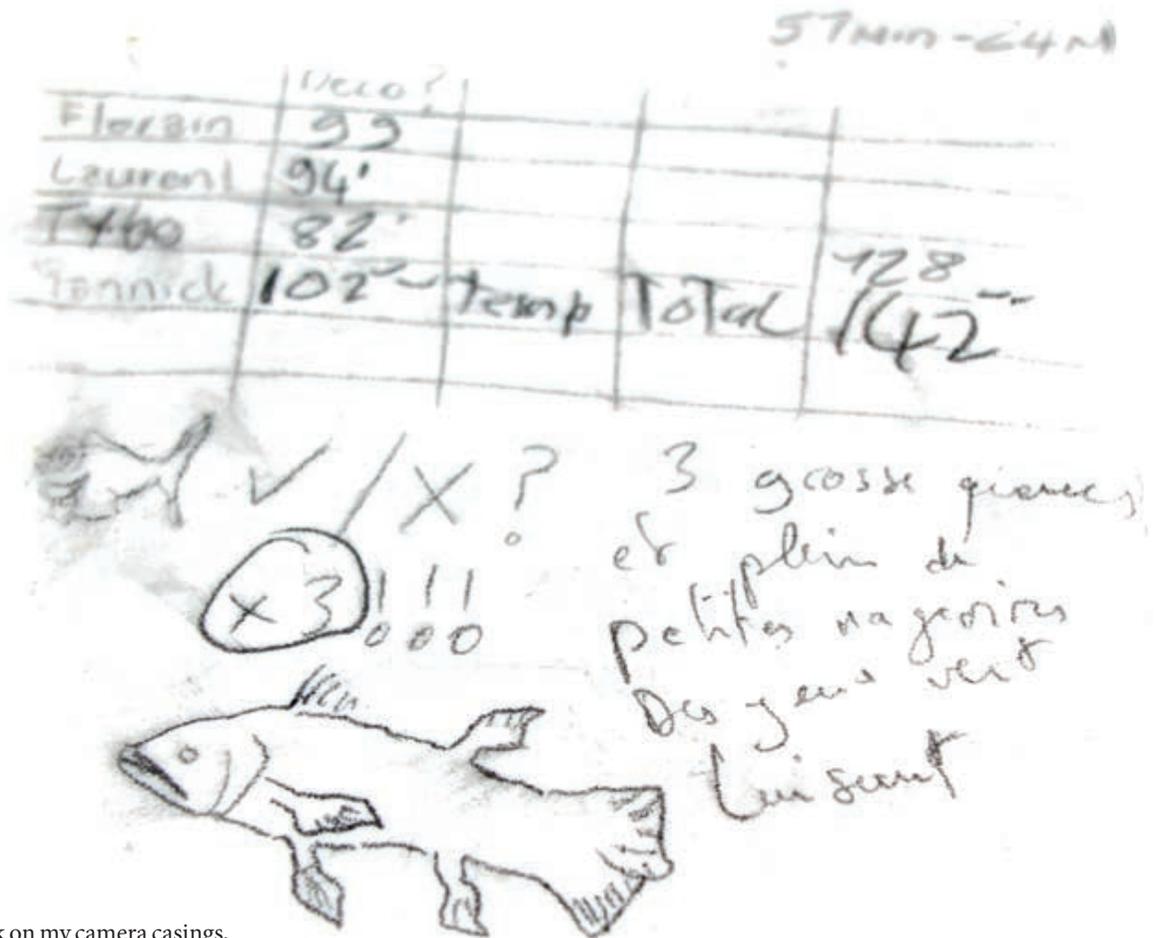
It is here that every morning and evening, we service our valuable recyclable diving equipment. This is when we empty and replace the soda lime that has filtered the CO<sub>2</sub> from our exhaling during the dive, and take apart the six bottles of compressed gas connected to the loop on which each breathes. The gas cocktails have to be redone with enormous precision every day. One has to be aware that each gas is only breathable at certain depths, and making a mistake could—in the best-case scenario—result in nitrogen narcosis and, in the worst case, in epilepsy and loss of consciousness.

All this takes until supper time, followed by a little time out. By the end of the day, everyone has done his bit for the team. The team... such is the paradox of deep diving: at the bottom of the sea, one is alone, deeply alone, but this aloneness is only possible with the support of others. The others are Jean-Marc and Eric, a good 15 years older than me and with great knowledge of the experimental art of decompression. I ask them to plan the dives on my behalf, lest my obsession lose sight of reason. They are the moderators. Cédric, an amazing logistician, who is indispensable when it comes to finding solutions for the smooth running of our adventure—that sexy synonym for our hell. He is also the diver who carries a couple of camera casings for me “in addition, just in case.” Then there are Tybo and Florian—both calm, enthusiastic, experienced divers (a rare cocktail)—who play porters, serve as lighting technicians and even operate the scientific cameras, consistently driven by the same incessant desire to go and see what is happening down there. And finally Yannick—physically unbreakable, never tired, and always good tempered no matter what—serves as head cameraman whose job is to film the event at 120 meters—the first time in the world that one will see a man and a coelacanth in the same picture. His composure faced with a challenge of this size either has me on my knees in admiration or climbing the wall with irritation—it just depends.



*A 20-MINUTE ride takes us to the area, 3 MILES from the shore, but we are still a long way from getting in the water.*

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After dinner, I still need to work on my camera casings, which take a pounding from the intense pressure. This involves oiling them, checking that all the seals and o-rings are watertight, etc. I won't even mention the sleepless night spent with a casing whose window imploded 111 meters below the surface following an unfortunate shock. A tough test of emotion after the dive, with a completely wrecked D3s, the best Nikon available, with a sensibility range of up to 100,000 iso, and which is irreplaceable if I wish to immortalize the weak but so particular underwater rays of light that survive to a depth of more than 100 meters.

We go to bed early between 9 and 10 p.m. The days are so intense that only the nights provide a little time to stop and think, and the luxury of realizing what I am in the process of achieving. As for my days, they consist solely of making decisions and actions in a tense oscillation between planning and improvisation...

Wake up at 5.30 a.m. Thirty minutes of gym to fix my back. 6.15 a.m., after a quick breakfast, its back to our dive gear to assemble the main pieces and complete the checklist, which includes the waterproofness of the closed circuit, battery check, calibration of the oxygen analyzers, checking the decompression parameters, BCD inflate and deflate functions, etc. At 7.30 a.m.,

we load the pick-up and leave with our 7 meter rib on the trailer. At 8 a.m., we reach the beach—a vast beach that is unceasingly redesigned by the estuary of a river with red water and by the huge tractor that takes over from the pick-up in the soft sand.

Time to go. Aboard the boat, everything has to be firmly attached—the trip out through the waves is a critical moment at which, each year, in this exact location, several boats overturn. A 20-minute ride takes us to the area, three miles from the shore, but we are still a long way from getting in the water. The GPS and sonar are switched on in order to pinpoint the location. I am in front with Peter Tim, the only person who can take us vertically to the place that is most likely to house the coelacanths. He was the first person who, during a very deep dive in 2000, discovered a coelacanth in a cave in a canyon. Earning his trust has not been easy:



We had to make a good impression and reassure him as to our intentions before he agreed to go back to where, ten years earlier, he took two divers keen to take on this challenge... two divers who died that day. Today, the current is quite strong, so we decide to enter the water 150 meters ahead of it and the chosen arrival place. My three partners and I kit up, which is another painful moment in which we don around 70 kilos of equipment.

A final check of the electronic displays, everyone is ready and the boat is repositioned over the entry point. Since I woke up, a knot in my stomach has prevented me from smiling, a bit like the fear of forgetting something. I need to think of everything before taking action and at that point stop thinking. The most important moment approaches and paradoxically frees me. The change of phase happens with the back-tilt of the rib. No more time for self-questioning—going down chases away our concerns, no more thinking, reflexes kick in, the apprehension is gone, the time has come to go for it! The descent is rough—as vertical and quick as possible, our ears must just put up with it, and happily, in my case, the voluntary tubal patency of the Eustachian tubes works well—in other words my ears equalize by themselves without any intervention from me.

This means that I can go down even faster. In less than a minute I reach a depth of 50 meters in the open water, and when I get here, I slow down a bit, looking behind me to see if my companions are with me, and check my compass to set the course to follow. 60, 70 meters—I maintain my course and the speed of my descent. Eighty meters—I start to watch out for the edge of the canyon. Ninety meters signals a transition,

since I can see the contrast between the vertical, obscure rock of the canyon on the one side and the white expanse of sand on the other! The tough yet liberating descent has gone well. Now comes a delicate phase that I have been obsessing about since I got up—not messing up the landing. If this is badly managed, the entire exploration will be cancelled and there is no way of attempting another dive on the same day...

One hundred meters and I reach the top of the cliff with its gorgonian and black corals, pineapplefish, barberfish with mauve spots, and golden striped soapfish, all living indications that tell me, in case I wasn't already aware of it, that I have gone past 100 meters and am entering the aphotic biological universe, that dusky zone where there is less than 1% sunlight. Another planet.

And yet... only 100 meters lies between us and this other planet; an opaque, heavy layer. One hundred meters of water, 100 meters high—nothing at all, really—and seen from space a virtually negligible ribbon. One hundred meters is as if it were but a single step to take, barely a few kicks with one's fins, and yet I have changed worlds—a veritable spatiotemporal door

*No more thinking, reflexes kick in,  
the apprehension is gone, THE TIME  
HAS COME TO GO FOR IT!*

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worthy of the best in science fiction—my very own “Stargate.” An extraordinary passage which, in just a few minutes, is supposed to take us to an animal which supposedly has not been visited for 65 million years... Something straight out of sci-fi, I’m telling you!

One hundred and twenty meters, and the rocky wall with its horizontal caves lie before us. The search begins here and the chronometer is ticking. Here, where every minute counts, and where I am paradoxically collecting a lifetime of memories. Each cave, each overhang, is swept by our torches. Today, fate smiles upon us. I see it right from the second cave! Sitting in the entrance, with all its lobe fins working, the imposing coelacanth is there, indifferent. Our descent took less than three minutes. How can one believe that this other planet is but three minutes from our own? Time no longer has the same meaning. The proof? The way there takes three minutes—the return trip five hours.

I move slowly closer to it, for I am, after all, approaching a dinosaur. The closer I get, the stronger the emotion, and I know I have to put this aside and concentrate. I need to observe properly, to illustrate this encounter properly, since no other naturalist photographer has ever found himself face to face with this creature. I keep my distance, fearful of scaring it. How will the coelacanth react to a diver? No one really knows. After so much preparation, the worst-case scenario would be to frighten the living legend and see it disappear, thereby challenging the conviction that I have defended for so long: my belief that wherever we go physically ourselves, we will achieve more than robots.

The first emotion is that I know it has seen us—it turns its head towards me but doesn’t go and hide at the back of its den! It is curious about us? No, I don’t think so—and I must avoid any such childish mystical thoughts. Indifference? Yes, I think so and I am happy about it: I want this unprecedented, much dreamed-of picture, this moment in nature that I am finally being granted, to take place “as if I wasn’t here” and thus remain intact, wild, natural.

Contrary to all expectations, it emerges from its cave and moves along the wall. We follow. For slow movement, it appears to use its anal fin and second dorsal which turn like slow propellers. It is enormous—nearly two meters long I think. I can clearly see the short white spikes that cover the blue stripes on its back fin. With every movement it makes, I can see its enormous primitive scales, also covered in thin spikes, delicately overlapping. I can also see the bony plates of its skull, its spiracle at the very end of its large gill covers, the little conical teeth that protrude from its fleshy lips, the deep holes on the mouth of its system of sensitivity

*Few kicks with one’s fins, and yet  
I have CHANGED WORLDS*

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to electric fields... It is to describe the feeling of intense inner joy. This is an addictive combination: The experience of beauty and the exhilaration of privilege. But there is more than that: At this exact moment, my hopes, my determination over the past four years, my strongly defended beliefs, my totally concealed doubts, all these emotions are crystallized in this amazing meeting. We are swimming next to our last aquatic ancestor—in its own environment—and we are the first to do it. There are more human beings that have walked on the moon than there are people who have swum with a coelacanth.

The experience of the moment is powerful, but we must remain focused on our work as naturalists. I face a cruel dilemma in that I want to admire it but I must observe it: I do not have a second to lose. The minutes pass—34 exactly—until the coelacanth finally comes back to the edge of the canyon, rushes over it and disappears into the black beneath my fins. “Oh, to be able to follow it some more...” I am sure that we all had the same heady, obsessive, suicidal idea...

It is time for us to pay the price of this privilege. I look at my dial—235 minutes of compulsory decompression before we can come out into the fresh air. If I add the time spent in the depths and the unexpected

events involved in coming up, I know that we should emerge from the water five hours after entering it. The slow ascent begins. The decompression stops are longer and longer the closer you get to the surface. And finally, half the dive is spent between 12 meters and the surface.

For the last little while there has also been a very aggressive white-tip reef shark with us which swiftly calms our giggles. It is young (less than two meters), impetuous, and annoyed, I assume, because of the two enormous hooks which are sunk in its jaw and the several meters of nylon that it is trailing and which are injuring its fins. Every day, it harasses us from the beginning of our ascent and up to 15 meters—a full hour and a half during which we need to keep an eye on it.

*There are more human beings that have walked  
on the moon* **THERE ARE MORE PEOPLE  
WHO HAVE SWUM WITH A CŒLACANTH.**

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*We have just emerged from the water  
and yet the EVENT TOOK PLACE  
MORE THAN FOUR HOURS AGO.*

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On three occasions I have had to fend off its advances and even had to whack it on the nose... Thinking back, I realize it is the only time in my life that a shark has come close to the point of contact with absolutely no food incentive—amazing. Anyway, there is plenty to keep us occupied, including ensuring that our dive gear is working properly in this critical physiological decompression phase. We are constantly checking that our gas mixture is transforming as it should. Slowly, helium is replaced with oxygen, finishing up with pure oxygen about six meters from the surface, where we will spend the last two hours.

The final hour is often uncomfortable. The weight of our dive gear starts to make itself felt. The swell shakes us around enough for everyone to complain about their lumbar regions when they get out of the water. At last the five last minutes arrive. Everyone turns their reels gently to the surface. The boat is there, having drifted with us. Once aboard, I can see a moving

combination of expression—fatigue and satisfaction—on faces now devoid of their masks and snorkels. After more than four hours, everyone can at last talk, and tell his own story, always a little different from one another, proof that at these great depths, all our senses are slightly distorted and result in different impressions. It's a weird feeling: We have just emerged from the water and yet the event took place more than four hours ago. "It was great, but it was a while ago..." It's almost already imperceptibly receding into our memories—once again proving that we have returned from another planet...

The tension has finally gone, but the day isn't over. Back to the beach, off-loading the equipment, loading the pick-up, hitching the boat, etc., and everything starts over like the day before. We are already preparing for tomorrow. Forty days of this, one after the other. For me, it is a culmination point, which I hope will mark a special phase and is in any event a very special moment in my life.

The above account corresponds to a perfect day, one in which everything went according to plan and when the cœlacanth was there. But such was not always the case. In fact, it generally wasn't there and sometimes incidents occurred such as shortness of breath, finding

ourselves off-course, equipment issues, camera problems—all resulting in a somewhat completely unsuccessful dive. On those days, it is hard to maintain one’s enthusiasm when all those hours of preparation are not enough to make the most of those few dozen minutes in the depths. “All this for that?!” is the kind of sinking feeling that threatens us each evening.

Deep dives are like that—sometimes unforgettable but always thankless. If I take a look at the logbook of my dive computer, I see that if you add up all the dives, I spent exactly 160 minutes next to the coelacanth. One hundred and sixty minutes of swimming with the oldest fish in the world. One hundred and sixty minutes of enjoying such intimacy for a total 185 diving hours. It’s both pitifully little and yet more than I ever hoped for.

For 30 days in 2010, and then 40 days in 2013, we learnt a lot about it, but each discovery raised more questions. After all, what do we know about the coelacanth? Virtually nothing except that it exists!

During the last expedition, we performed a whole series of scientific protocols that were both complex and daring given the depth where this all took place. The results are still being evaluated, and we are extremely impatient to find a bit more about the most legendary fish in the world. I promise to share it with as many people as possible in the very near future! •  
[www.andromede-ocean.com](http://www.andromede-ocean.com)  
[www.coelacanth-projet-gombessa.com](http://www.coelacanth-projet-gombessa.com)

*One HUNDRED AND SIXTY MINUTES of enjoying such intimacy for a total 185 diving hours. It’s both pitifully little and yet MORE THAN I EVER HOPED FOR.*

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TEXT: JEFFREY S. KINGSTON

*Return to the classics:*

# MICHEL ROSTANG

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There is unbounded joy in rediscovering  
the wonders of venerated  
French cuisine grand standards.





*The teachings of Escoffier CAN BE SEEN AS FRESH, BOLD, AND MAYBE EVEN HIP in a world overrun with molecular cuisine.*

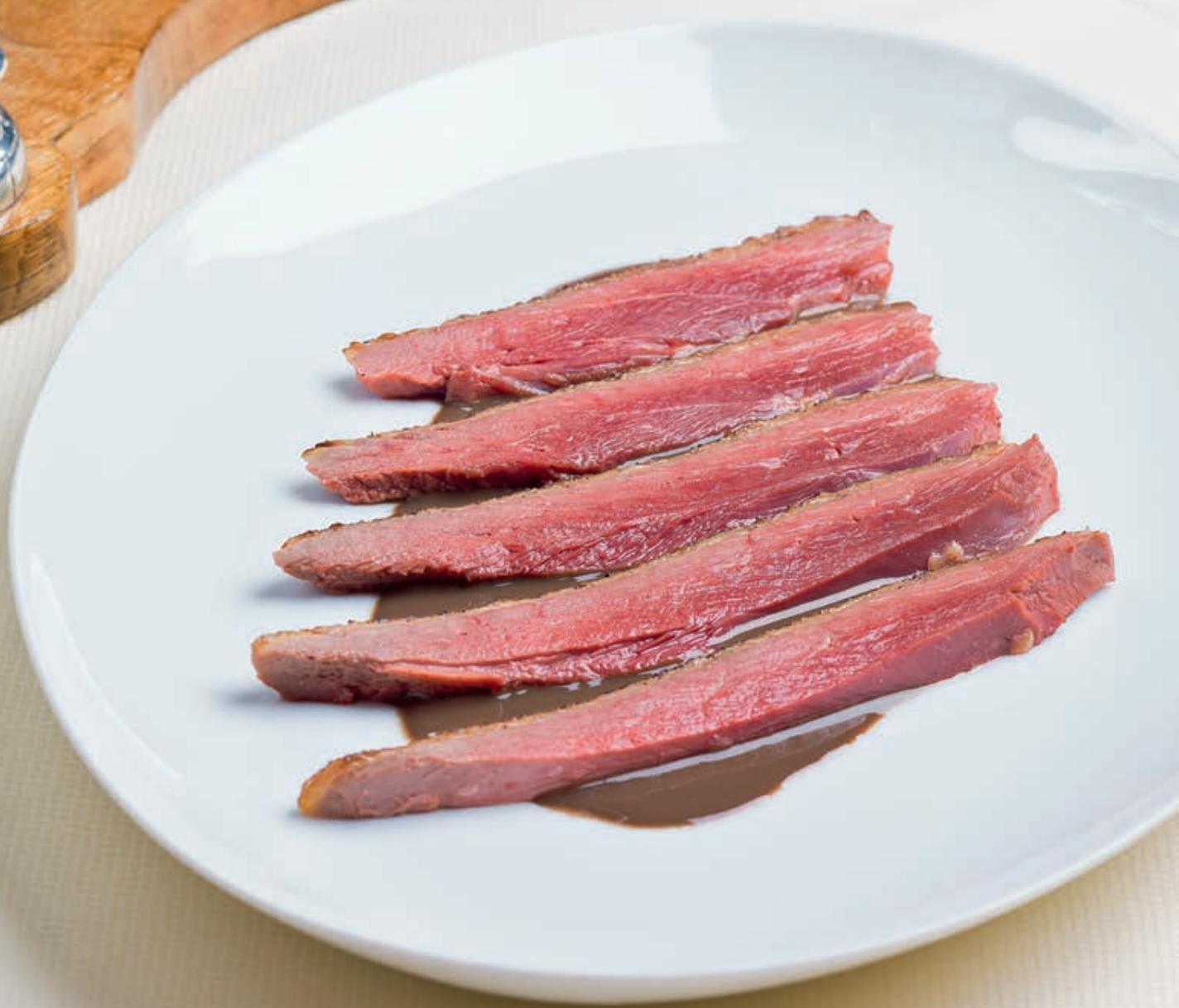
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**It is undeniably true that there is thrill in discovery. Foodies and critics the world over summersault over ground breaking creations, exotic ingredients, molecular transformations, or whatever the fad du jour may thrust into the theatres which were formerly called restaurants. But what if the “discovery” is not at the cutting edge, is not the product of herb scavenging in the Norwegian forests, is not fashioned with a particle accelerator. In fact, what if it has been with us all along, just merely forgotten in the frenzied stampedes to unearth novelties? In short, what if the discovery is of grand classics, lovingly prepared, honed to perfection, cannot the thrill be the same, if not greater? Emphatically, “yes” and convincingly demonstrated during a recent return to Michel Rostang’s rue Rennequin Parisian restaurant which brought with it a reaffirmation of the pure pleasures and joys both of the traditional pillars of French cooking and the soothing rituals of table side presentation.**

Indeed, we are not alone in this voyage of re-discovery of classical French cuisine. For those conditioned to visualize the evolution of gastronomy as progressing along an ever upward arc of audacity, there is growing evidence that perhaps cooking developments may bend in on themselves as with a Mobius strip. No less

than the ever trendy and edgy *New Yorker* magazine devoted itself to a major article chronicling the recreation of three revered reference points of classic French cooking from recipes laid out as gospel by Escoffier—a chartreuse, a coulubiach of salmon and a canard au sang. Not only were the results revelations themselves, but the remarkably difficult task of preparing them proved to be an adventure. Surprise! Far from being passé, the teachings of Escoffier can be seen as fresh, bold, innovative, and maybe even hip in a world overrun with molecular cuisine

For Michel Rostang there is no re-discovery or re-invention of many of the venerable standards; they have been with him all along. Presiding at the stoves of the restaurant bearing his name since the 1970s and for 33 years, without interruption, carrying the accolade of two Michelin stars, he has steadfastly maintained his fidelity to the grand classics.





His roots are deep as there is a continuous line of grand chefs in his family; Michel is the fifth generation (and the third generation to have earned high accolades from the Michelin Guide). Rostang's wife, Marie-Claude, who attends to the front of the house, as well hails from a family of chefs. Joining with her welcoming guests are their daughters, Sophie and Caroline, extending the restaurant generational line to six.

Like many grand chefs, Rostang's training began early, at the age of 16, essentially at the same time as nouvelle cuisine began making headlines. Michel's training, however, pointed in a different direction. His important sojourns were at Lasserre and Lucas Carton in Paris and La Marée in Biarritz, all temples of grand tradition. Together with sensibilities and inspirations from his father, Jo, Rostang emerged with a deep respect for and devotion to the defining principles of grand French cooking: a unified conception of a dish, sauces based on reductions, and, in contrast with today's modernists, absence of fear of butter and cream. Hand in hand with these axioms which guide in the kitchen is his fidelity to the long celebrated, and tragically nearly forgotten, rituals of tableside presentation, carving, and serving. Rostang's passion for tradition runs so deep that he

eagerly collects 18<sup>th</sup> century cookbooks, often searching for them in forgotten corners of Paris' renowned flea market, the Marché aux Puces. This is not to say that Rostang only looks toward and is imprisoned by the past for he has evolved and adjusted his approaches to recipes over time.

As with the Mobius strip where seeking the frontiers brings one back to the origin, what is striking is that today where else can one find an undiluted grande cuisine experience with preparations adhering to core elements of traditional French cooking, presented with élan and savoir-faire tableside? So whereas modernists struggle to emerge from the pack with ever more edgy creations, Rostang, by staying steadfast, finds himself having achieved what the others so desperately crave, uniqueness, as he stands nearly alone as the singular destination in Paris, if not the world, to indulge in a full dose of the pleasures of tradition.

Rostang's devotion to the grand rituals of French cuisine found a new forum in 2012. The occasion was the 100<sup>th</sup> anniversary dinner of the *Dîners d'Épicure d'Escoffier de Paris*. The theme for this special dinner was "from the kitchen, to the dining room with gestures and explanations". For the first time this Escoffier dinner was prepared by four chefs working together:

La canette "Miéral" au sang,  
servie saignante en deux  
services, sauce au vin rouge liée  
de son sang et au foie gras;  
salade de cuisses en fricassée.



Michel Rostang, Michel Troisgros, Pierre Hermé and Jean-Pierre Biffi. Held at Rostang's restaurant, the evening precipitated a frantic scramble by dedicated gourmets to snag a coveted seat in the dining room. Each of the chefs prepared one course of the meal. Rostang's contribution to the evening was his preparation of *canard au sang*, which harmonized perfectly with the theme as it is a preparation that demands precision in the kitchen, followed by deft carving and preparation of the sauce in the dining room, accompanied by explanations as the tableside theater unfolds.

A recent visit to rue Rennequin emphatically served to confirm all that was right with this seemingly forgotten world. In vivid contrast with many of today's eateries that inject hipness into the dining experience not only with what is on the plate but in the surroundings, Rostang confidently adheres to more time tested values. Passing the portal, one is immediately soothed by walls bathed in warm colored woods, softened still further with tapestries, well-chosen artwork, and a majestic vitrine filled with porcelain dolls. There is luxury in the arrangement of tables, each given abundant spacing from the others.

*One of ROSTANG'S  
GREAT SPECIALTIES is  
perfection in tableside  
preparation and service.*

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A small armada of preliminary bites is presented to accompany the traditional *coupe de champagne*: miniature sandwiches with a savory sardine mousse, madeleines with ham, a toast bearing a disk of lobster topped with just a dollop of pimento and finally an intense and classic pigeon mousse on a sablé crust. Not only are these perfect matches for the champagne, they ease the burden of traversing what is, without doubt, one of the finest wine lists in Paris. Rich and diverse the selection is particularly impressive in the depth and savvy choices of its Burgundy listings thanks to sommelier, Alain Ronzatti, who has presided over the cellar since 1987 and who not only possesses encyclopedic knowledge over its contents but delights in describing them.

Still in the repertoire and recalling vivid memories of our first visit to Rostang in the early 1980's is the *ravioles de Romans cuites au bouillon de volaille, cerfeuil frais*. Ethereally light miniatur raviolis are stuffed with a cheese mousse accented with chervil and floated in a doubly intense chervil infused chicken stock. Silky and light this is a perfect overture for the meal that follows.

Shellfish are a specialty with one towering preparation that has no equal, certainly in Paris, and likely the world, *la salade de homard "bleu" cuit au moment servi entier, jeunes poireaux en vinaigrette, crèmeux de homard et jus de la presse à la betterave*. Dedicated foodies are no doubt at this point questioning the bona fides of this admittedly somewhat bold assertion of uniqueness; easy to vaporize those doubts with the further description. A cart with its cutting board bearing a whole cold water Brittany lobster in shell is wheeled tableside and becomes the stage for the theater that follows. Rostang is fiercely partial to the drama of dining room presentation and this lobster

preparation furnishes vivid proof both of its delights and the enormous talent and panache required to pull it off. With not a single false thrust of his knife, Maître d'hôtel, Bruno Grimault, deftly and perfectly dispatches with the carapace extracting completely intact each lukewarm section of the lobster. Where else is a whole lobster presented and "carved" tableside? But the drama does not end with carving. Once removed from the shell, the cooked, until just translucent, meat is composed into the salad as it is divided among twelve compartments on a mighty single platter, each containing the other elements of the salad: leeks, rich beet purée, lobster sauce. The unexpected pairing in the salad is that of sections of the lobster with the beet purée. Without being cloying, the beet provides a delicate accent that amplifies the natural sweetness of the lobster. In every dimension, its precise cooking, unique tableside presentation and its salad pairings, this is a majestic dish that alone is worthy of a pilgrimage to Paris.

Rostang's *araignée de mer relevée de gingembre, crémeux de courgettes en impression de caviar Oscietre* is a further demonstration of his shellfish talents. In less capable hands, spider crab dishes more often than not disappoint. The difficulty is that spider crab is extremely delicate and easily overpowered by its accompaniments; it demands restraint and refinement and that's exactly what Rostang delivers. The courgettes take the form of a fine mousse enveloping the crab as a cannelloni. Not merely a vegetable cannelloni, this one is decorated with fine circles of caviar.

There is another specialty that may ignite a mob for the next flight to Charles de Gaulle airport, *le sandwich tiède à la truffe fraîche, pain de campagne grillé et beurre salé*. Think of this an everyday grilled cheese sandwich, with one key substitution. Out goes the cheese, in come the truffles. This is the ultimate in luxurious comfort food, simple, intense, and sinfully decadent. Rostang has developed one trick in the assembly of what otherwise might seem to be a trivially simple dish. He perfumes both the butter and bread with the truffles for three days before grilling and serving the sandwich, so that rather than having the toasted bread and butter serving as foils for the truffles, they contribute themselves to the heady aromas and flavor.

*The restaurant soothes the diner*  
**WITH ITS WARM WOOD WALLS.**

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Top: La quenelle de brochet soufflée à la crème de homard.

Right: Le tronçon de turbot rôti, jeunes carottes et morilles fraîches, coques d'oignons glacés et jus des arêtes au vin de Syrah.

A nearly forgotten staple of grand French cuisine still reins supreme on rue Rennequin, *la quenelle de brochet soufflée à la crème de homard*. The first forkful is nearly certain to launch cascades of regrets for the decades that the food world has let pass with classic quenelles all but banned from restaurant menus. Of course it is rich. Defiantly so. But do we not go to grand restaurants to escape our everyday lives and indulge in decadent pleasure? Somehow the idea that every meal, even a special night out, should ape spa food has come to monopolize the thinking of chefs and patrons alike. These quenelles, actually served as a single large quenelle soufflée, accompanied by an intense, rich, deeply flavored lobster sauce, plainly enhanced by cooking with the shell, convincingly banishes whatever politically correct thoughts of lean cuisine that might otherwise pop into one's head. No decoding, no thinking required as each morsel triggers waves of pleasure.

Lighter, and in today's idiom, more conventional, is *le tronçon de turbot rôti, jeunes carottes et morilles fraîches, coques d'oignons glacés et jus des arêtes au vin de Syrah*. Simply roasted the sparkling fresh turbot is poised next to a fresh pea "boat" bearing the carrots, onions and mushrooms.

Bruno Grimault's tableside élan and flourishes are in full flight with *la canette "Miéral" au sang, servie saignante en deux services, sauce au vin rouge liée de son sang et au foie gras; salade de cuisses en fricassée*, the dish for which Rostang, world-wide, is most renown. It is difficult to find restaurants that have maintained the savoir-faire for either the cooking or dining room carving of a whole roast duck which only enhances the appreciation for the milimetric precision of the cooking to hit that perfect rare point and for Bruno Grimault's flawless carving of the gleaming mahogany-colored fowl. But the tableside slicing is only the first act of a two act play as it is followed by the final preparation of the sauce. The finishing of the sauce depends upon an apparatus that today is nearly impossible to find, a silver duck press. As the first step of the sauce preparation, the duck carcass is placed into the towering press to extract its precious juices. Working quickly, the juices are combined with the sauce base and reduced over a hot flame; the result a thick, dark, spicy, profoundly deep sauce.

There has been one change in the presentation which has taken place over the past few years. Previously the rare duck breasts were carved into nearly paper thin slices, cutting from front to back on the breasts, and poised on the plate in a fashion somewhat resembling a carpaccio. To bring a bit more chew into every bite, Rostang now offers the slices, cut somewhat thicker and oriented from the outside of the breast inward. Over the years having enjoyed both, there is no wrong answer. With both methods the duck is ethereal, tender with just that trace of chew that Rostang sought with the modified carving method, and bathed in the decadently rich powerful sauce. There is a reason Escoffier prescribed all the details for preparing canard au sang including the duck press, as without its contribution to the sauce the full glory of the recipe would







be lost. And equally its inclusion in the 100<sup>th</sup> anniversary Escoffier dinner was at once obvious and obligatory as this dish, with Rostang's skills, is truly one of the fundamental pillars of grand French cuisine. And punctuating the message that one is not dining in a spa, but rather indulging in a true *fête*, served alongside the duck is a sinful potato gratin.

Impressive is *la noix de ris de veau croustillante aux écrevisses, fanes de navets farcies d'une crème de persil et champignons de Paris*. For his sweetbreads, Rostang adheres to classicism. Sweetbreads are always a test of a kitchen's mastery of technique; done correctly, which sadly does not often occur, there should be an intriguing texture contrast between the exterior and interior, a crispy crust and a delicately creamy interior. Rostang achieves that result perfectly. The pairing with crayfish sauce is both traditional and magnificent.

*Le soufflé chaud au caramel beurre salé, sorbet aux "poires Williams"* is a perennial favorite at Rostang. Although the description appears to tread on familiar ground, Rostang brings a few twists of his own. For

the soufflé itself, the salty caramel base is given both texture and depth with the addition of hazelnuts. Even more surprises lurk with the accompanying pear sorbet which is given an exotic racy kick with Szechuan pepper. And if you are partial to salty caramel sauces, his preparation begs for a carafe sized serving.

Rue Rennequin has been a personal destination in Paris for three decades. There is comfort in finding Michel Rostang honoring and respecting the same values that catapulted him to fame at the beginning of his career. And for those who revel in the delights of grand French cuisine or for those who in the rush for modernity skipped past and have ground to make up, rue Rennequin beckons as an oasis in Paris. •

Above: *Le soufflé chaud au caramel beurre salé, sorbet aux "poires Williams"*.

Left: *La noix de ris de veau croustillante aux écrevisses, fanes de navets farcies d'une crème de persil et champignons de Paris*.



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TEXT: JEFFREY S. KINGSTON

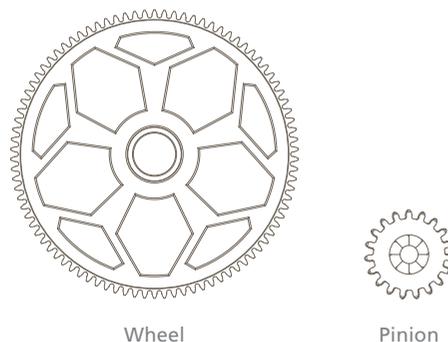
# WHEELS AND PINIONS

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What watchmakers know and many collectors overlook: the vital importance of equipping a timepiece with the highest quality wheels and pinions.

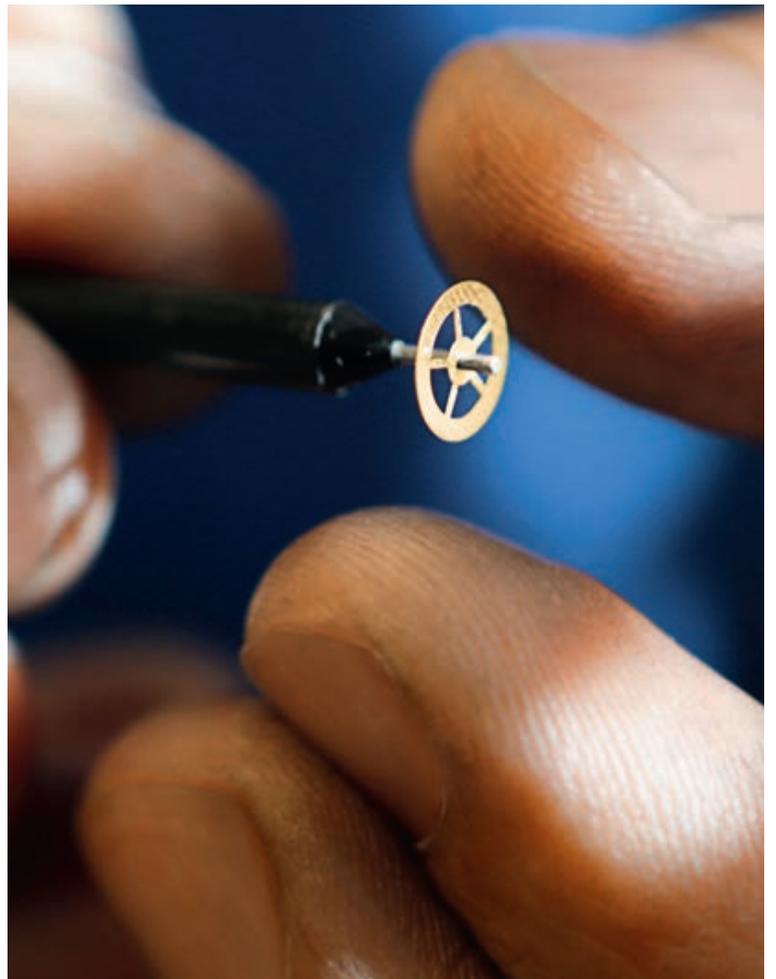
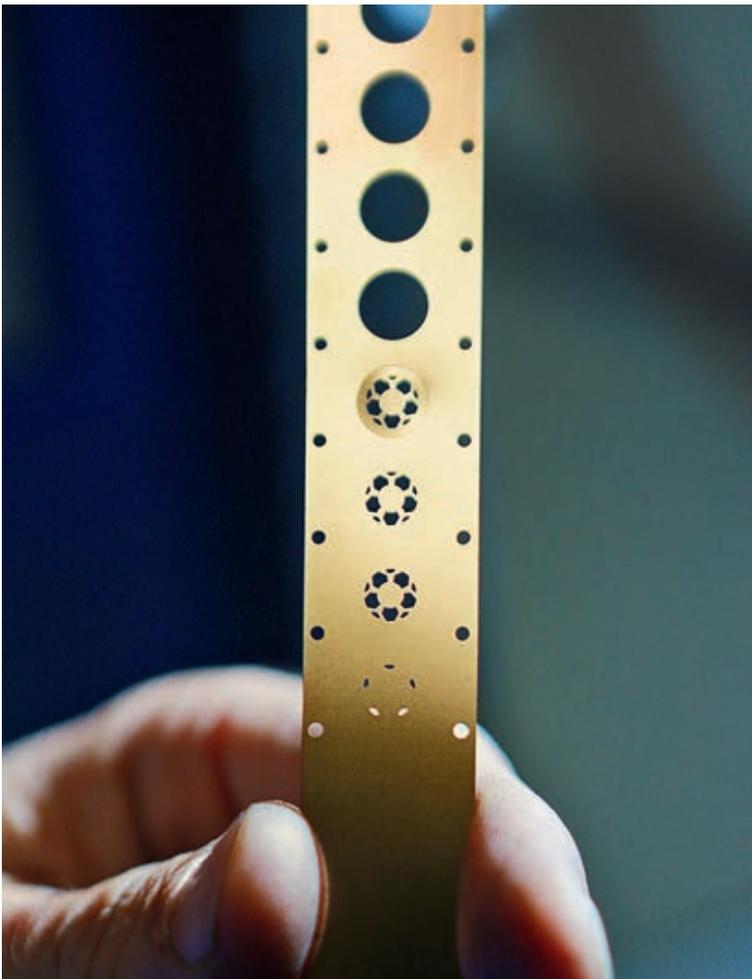
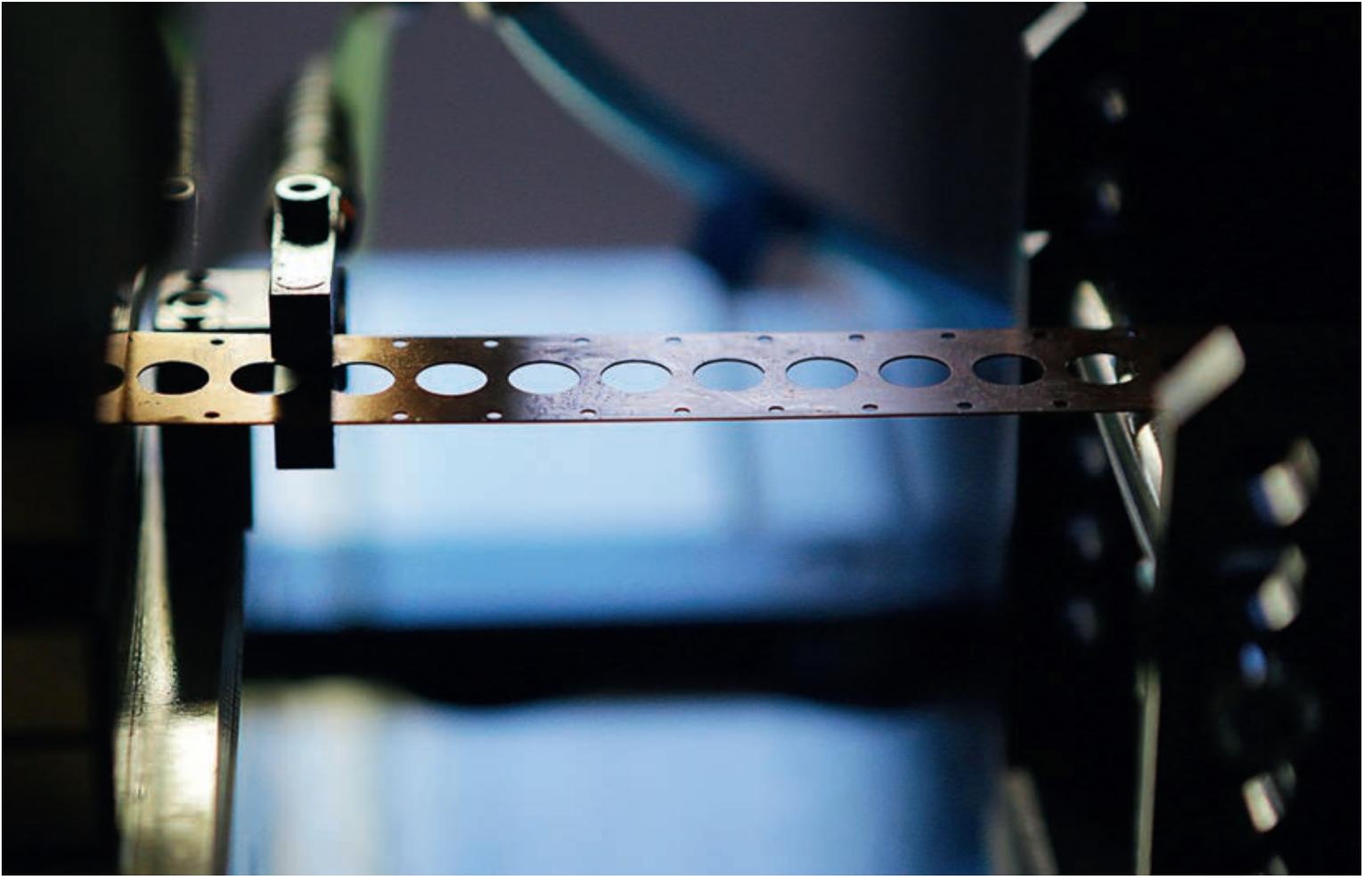
First a bit of flattery, then for most, a soaking dose of freezing rain. It is almost certain that the majority of the gentle readers of *Lettres du Brassus* are extraordinarily sophisticated watch collectors at ease in the world of haute horlogerie. And this expertise enables comfortable circulation in this rarified world with a well-developed understanding of the refined finishes of prestige timepieces. Some, without doubt, have risen to become savants eagerly sought out by friends for “watch advice.” But savant or no, how many have devoted themselves with the same intensity of study brought to bear on the visible bridges, plates, winding rotors, balances, etc., to the gears (watchmakers prefer calling them “wheels”) and pinions that are essential components for every mechanical timepiece? Great confidence in putting this forward: unless you are a watchmaker, extremely unlikely.

On the other hand, watchmakers not only focus keenly on wheels, pinions, and the combination of the two, which are termed “mobiles,” they obsess about them. The reason is not only that all mechanical constructions utilize these components, but more than that, the way in which the watch will perform and age depends upon their quality.



All of Blancpain’s wheels, pinions and mobiles are made in the Vallée de Joux within walking distance of both of Blancpain’s two workshops. The manufacture is François Golay, which is commonly owned with Blancpain. Since its founding in the Vallée de Joux in 1855, Golay has specialized in the fabrication of wheels, pinions and mobiles. It is the supplier for essentially all of the great watchmaking houses... Vallée de Joux, Geneva, La Chaux-de-Fonds, and Germany alike. One basic to get out of the way: Although Golay is the supplier for this wide industry swath, not all watch houses specify the same level of quality. Blancpain demands the highest grade in the industry and each Blancpain watch is fitted with what Golay terms “haut de gamme” components, the top.





*Why copper/beryllium? Because IT BRINGS  
ADDED QUALITY to the movement.*

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Not only does Blancpain insist upon the highest of the quality tiers, its choice of materials for the wheels sets it apart. In general there are three choices of material which may be specified: brass, German silver, or copper/beryllium. Most watches in the industry utilize brass for the wheels. However, for nearly all of its collections Blancpain has selected the most expensive option, copper/beryllium. Why copper/beryllium? Because it brings added quality to the movement as it is harder, has a lower coefficient of friction and better wear properties than brass or German silver.

The choices of quality level and material, although vital, reveal only a portion of the savoir-faire that is poured into the fabrication and finishing of these key components of every Blancpain watch. The fuller picture emerges with a day spent in the Vallée de Joux in the Golay workshops following the production processes for wheels, pinions and mobiles.

For the wheels, work begins before the first shipment of material arrives. This is because the first step is the fabrication of precision custom tools in order to produce the wheels. Each wheel requires its own special tool, termed an “*étampe de roue*,” which the craftsmen at Golay construct. In one sense the tool storage area of the workshop resembles a library, or better said an

historical archive, as arrayed together on the shelves are the individual special tools for each and every wheel that Golay has made over time.

Following the precision fabrication of the tool, production of a wheel can begin. The material for the wheel arrives as a band formed into a large roll, the overall appearance of which is not dissimilar from a huge roll of tape. In the case of Blancpain wheels it is a roll of copper/beryllium. With the custom tool installed on a stamping machine, the form of the center and arms of the wheel are cut into the metal band. For many of Blancpain’s newest movements it is easy to spot wheels in production as the form of the arms, inspired by high performance automobile wheels, termed “*à jantes*,” is distinctive.

The stamping machines used for this initial step vary according to the thickness and diameter of the wheel being produced. The smallest of the machines stamps with a force of six tons; the largest with a force of 30 tons.

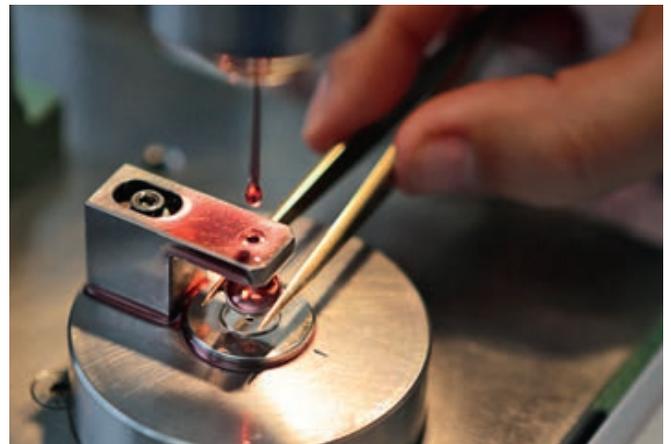
For most wheels, the next step is the precision drilling of the center hole. Here again there are advantages which come from the use of the more expensive copper/beryllium material. To create the center hole for either a brass or German silver wheel, the hole must be drilled. Inevitably, after drilling, there will be a small burr remaining on the lower edge of the hole. With copper/beryllium the hole can be stamped. Stamping brings with it two important advantages. First, stamping can be accomplished with greater precision (on the order of 3 microns) than drilling. Keep in mind that precision is a watchword when it comes to the fabrication of these components. The greater the degree of precision, the better the watch will run. Second, unlike drilling, there is no burr produced on the bottom side of a stamped hole.

There is a bit of romance in the next stage of fabrication as the machine that is used owes its origins to another product far removed from the domain of horology: religious medals! The machine is Italian and it was originally conceived to produce medals in the form of the Madonna. For watch wheels, the “Madonna machine” is used to apply anglage to the arms. The wheels must pass through the machine twice in order to angle both sides of the arms. Once gently angled in the “Madonna machine,” the arms are given a precision polish and gloss as they are tumbled with small particles of nutshells.

Through all of the steps thus far our wheels remain toothless. More decoration remains to be lavished upon them before the cutting of teeth. For most open arm wheels, the next step applies a light circular graining (termed “*cerclage*”) to both the top and bottom surfaces. Extremely fine sand paper is used for this decorative step. It is interesting that there is a choice to be made on the fineness of the graining. Blancpain selects the finest graining offered. But fineness is limited by what the eye can perceive. If the *cerclage* graining is too fine, its presence can't be seen through a clear case back. So the choice is made to apply the finest *cerclage* that can be seen by the unaided eye.

*There is a bit of ROMANCE associated with one of the finishing machines; it is called the “Madonna machine”.*

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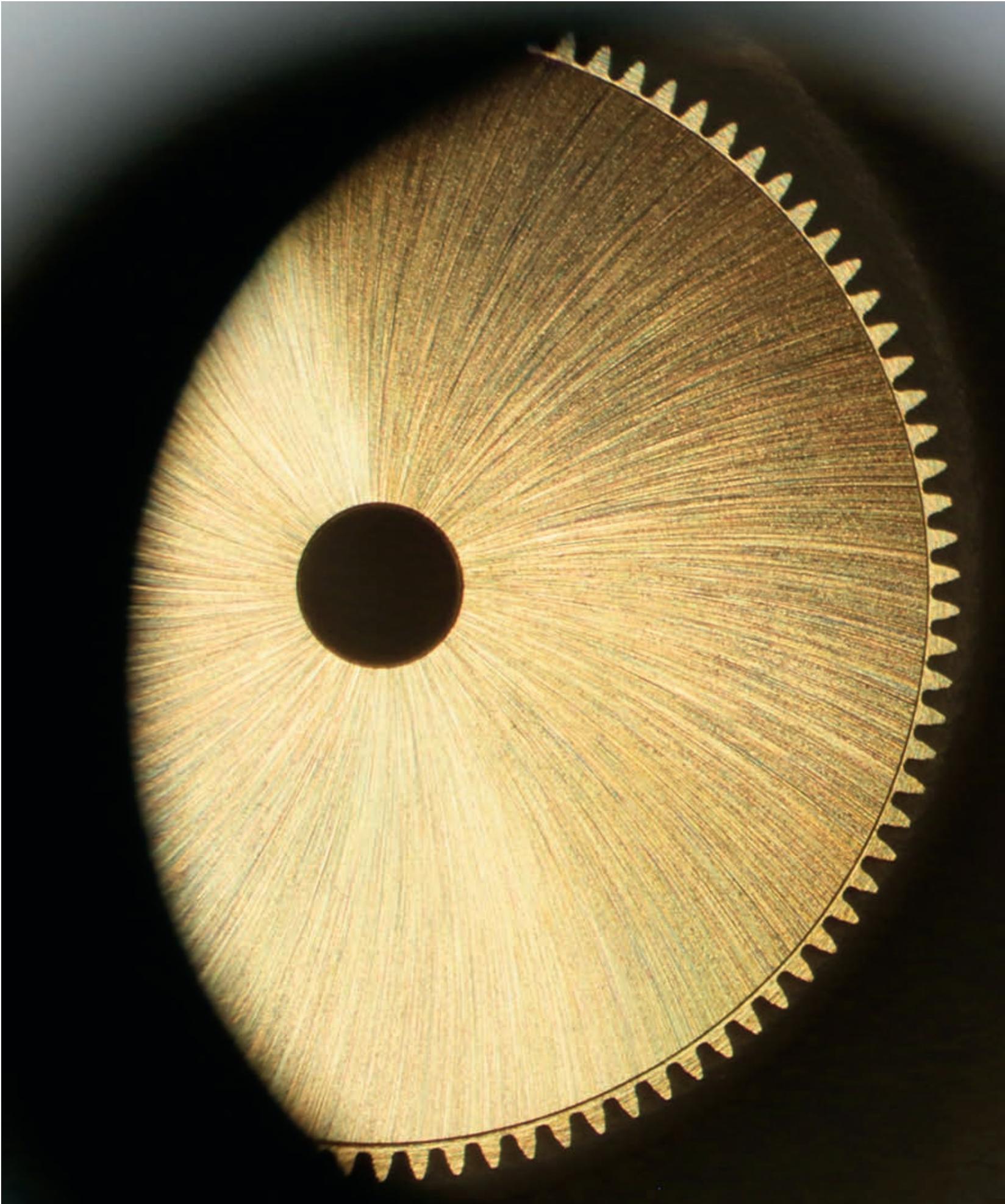


diamant

$0,05 \times 45^\circ$

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0,45  $\pm 0,05$  (mm)



*The refinement of the FINISHING  
OF A BARREL component reveals  
itself under the microscope.*

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For Blancpain there are still more decorative steps. Most wheels have a chamfer applied to the center hole. In addition there is further polishing in the form of a mirror finish to a circular band around the center. This mirror polishing is achieved using diamond.

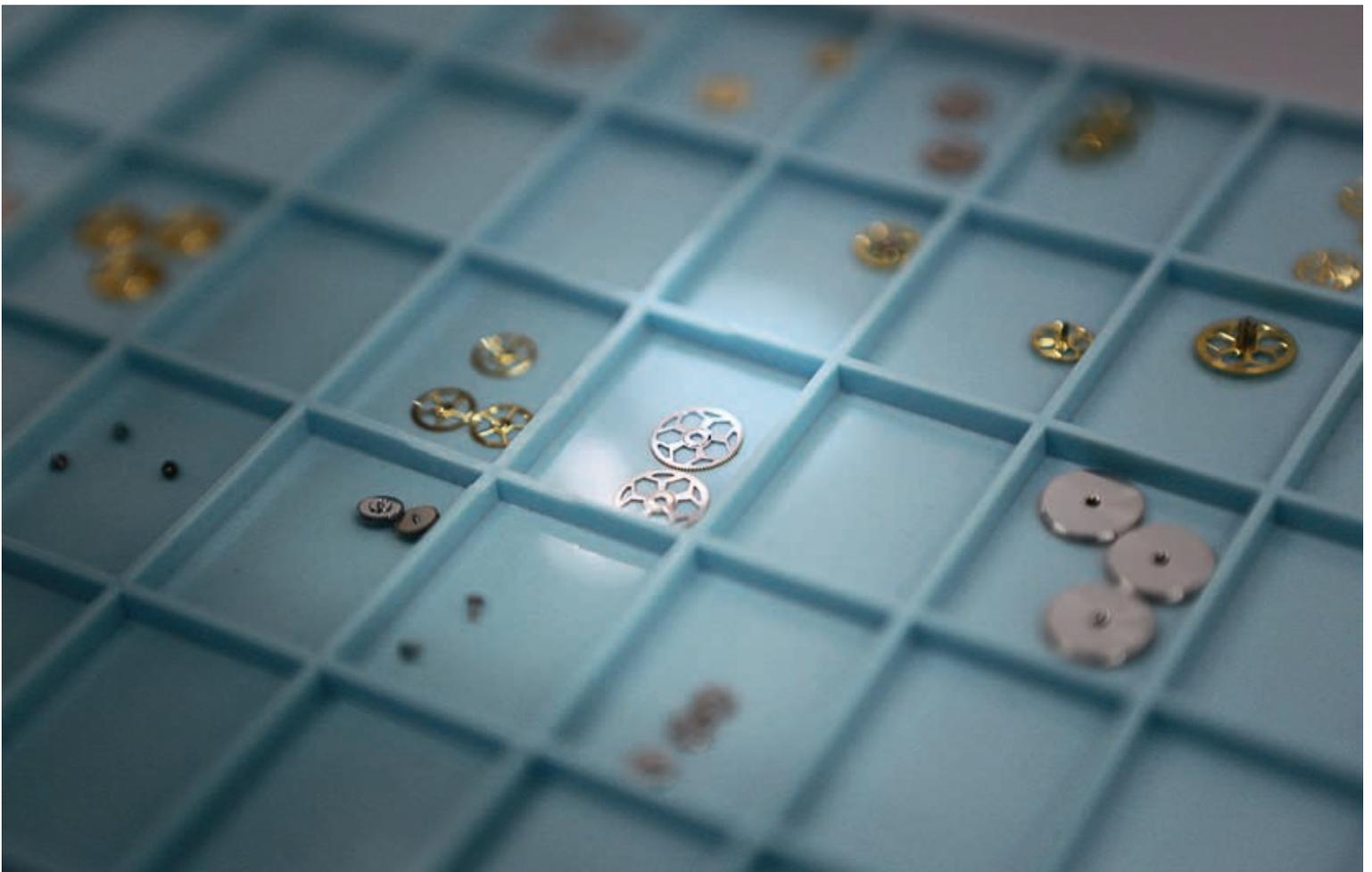
Some components, such as the winding barrel drum receive a different decoration. In Blancpain's case, the decoration is in the form of fine rays radiating from the center, termed "*soleillage*." This is cut into the barrel drum with diamond.

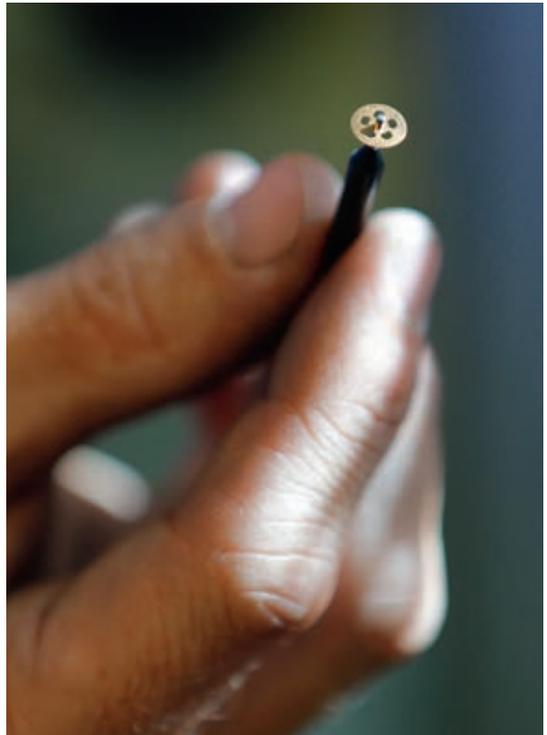
Still no teeth. But with the rest of the finishing work completed, the wheels are now ready for coloring. Barrel wheels will be rhodium plated for most movements. Other wheels will be given a golden coloring, called "*dorage*".

Finally, the time has arrived for the element which comes to mind first when thinking of gears, the teeth. For most wheels, the process begins by assembling a group of wheels on a shaft, bounded on either end by "false" or "dummy" brass wheels. Why put a dummy brass wheel at each end of the group? To capture debris from the cutting process on the real wheels. As the cutting tool proceeds down the line of the grouped wheels, cutting debris are accumulated and are deposited on the dummy wheel at the far end rather than on the production wheels in the group. The process is different for barrels, where the teeth are cut for each barrel one at a time.

The fabrication of pinions takes place in a dramatically different way. For watchmakers there are many forms of pinions, but in general they consist of a small diameter gear which is unitary with a shaft. Related are mobiles which combine a small gear which is affixed to a larger wheel. The majority of pinions and the small gears of the mobiles are made of steel, however some may be crafted in copper/beryllium. The process to make a pinion is essentially one that begins with a rod of the material to be used. That rod is fed into a single machine which cuts it into the desired final shape. Thus, if the pinion is to consist of a small gear placed in the middle of a shaft (thus with a shaft on each side), a single section of the rod will be cut, under computer control, to achieve the desired shape; the rod enters the machine and what emerges is a pinion with its gear and shafts on each end, all precisely cut to the correct dimensions and shapes.

Following initial cutting, steps remain before the pinion is completed. First the material must be hardened. The degree of hardness is specified by Blancpain and is met by heat treatment. Following the heat treatment, the pinion is coated in oil and placed in a polishing machine which utilizes small nut shell particles to polish all surfaces.





Some watch collectors have no doubt read about certifications which are awarded in the form of a “seal”, such as the Geneva Seal (in French, the “*poinçon de Genève*”) based upon meeting certain criteria. One of the criteria requires work be performed in Geneva; since the Vallée de Joux is located in the Canton de Vaud, no marque such as Blancpain which is located there is eligible. Nonetheless it is often asserted in Geneva that the hand polishing of pinions required for the Geneva Seal endows the components with a degree of superior quality. Certainly in comparison with an unfinished pinion that argument carries with it a measure of truth, but when compared to a precision polished pinion such as those utilized by Blancpain the assertion not only is no longer valid, the opposite is true. The carefully controlled polishing with nut material which is used for Blancpain pinions produces a refined sheen that to the eye is indistinguishable from hand polishing. But that is not the reason Blancpain has chosen the alternative method. The reason is the precision of the finished component. Inevitably when a pinion is polished by hand there will be alterations in the dimensions of the teeth and the shaft. Polishing a little too long on one tooth, not quite long enough on

another tooth and precision is lost. It is impossible to avoid this degradation with a hand process that depends on operator judgment and feel. On the other hand, Blancpain’s process is tightly controlled and precision in the fabrication of the pinion is fully preserved in the polishing process. Tolerances are on the order of two microns, something that no hand method can come close to achieving. Although not blessed with a “seal,” real value is delivered to the owner of the watch as these far tighter tolerances offer superior performance and less wear for the finished watch.

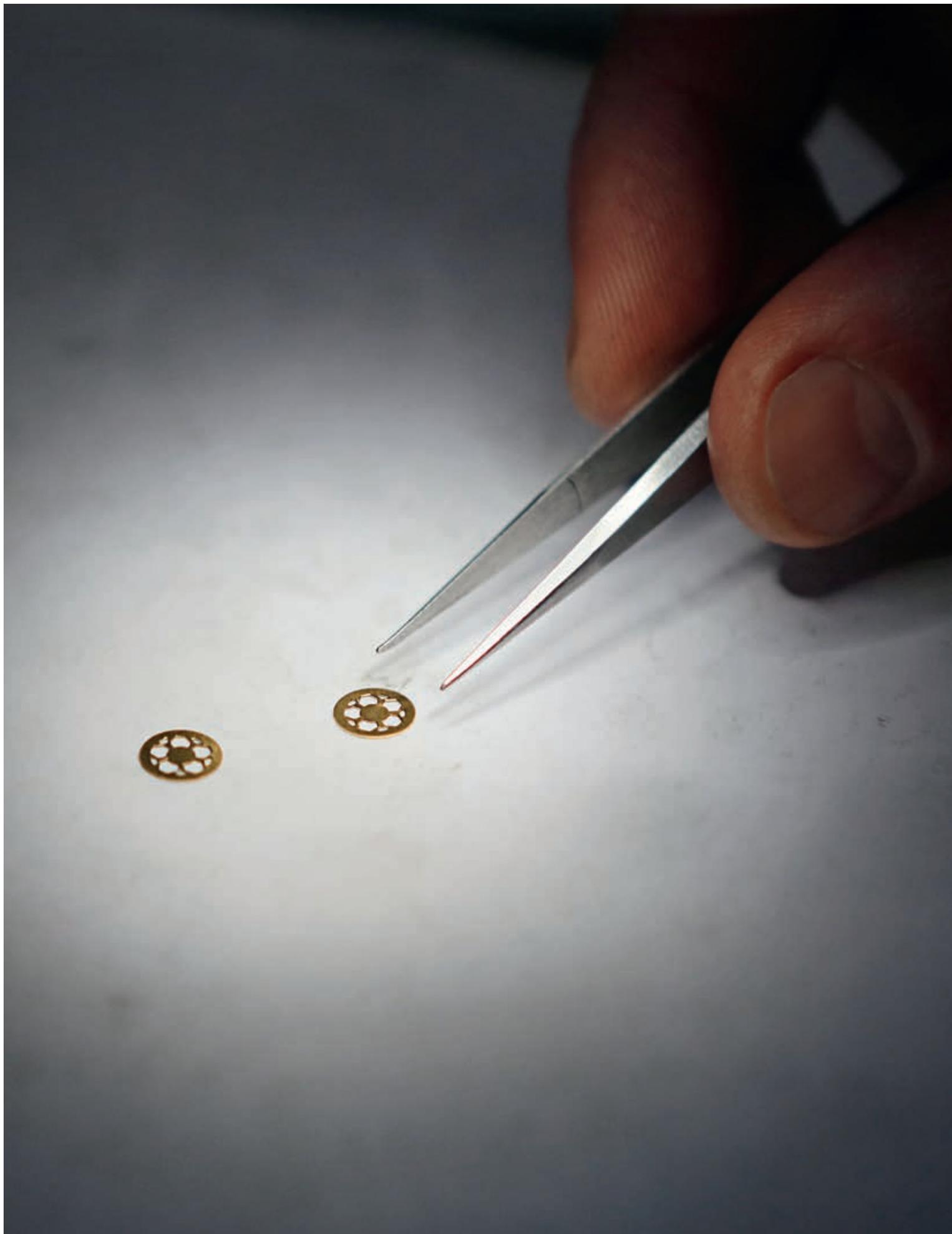
There is one more important fabrication process, that for mobiles. Mobiles are a combination of a wheel and pinion. As each element is separately made, what remains is uniting them together. This is done in an operation called “*rivetage*” or riveting. An almost microscopic edge is manufactured on one face of the pinion. When that edge is firmly placed upon the wheel and the right degree of pressure is applied, the two elements bond solidly one to the other.

If there is any single theme that emerges from the study of wheels and pinions it is the quest for precision. That same obsession with precision applies to the riveting of mobiles. The two elements must be carefully placed one upon the other so that they are absolutely concentric, solidly bonded, and perfectly flat. Quality

*If there is any theme that  
emerges from study it is*  
**THE QUEST FOR PRECISION.**

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is tightly controlled to meet each of these strict criteria. This includes verification testing, some of which is destructive. Concentricity can be measured to fractions of a micron. Validation of the method of riveting is not done on every component as it is, in fact, destructive. However to ensure that the appropriate pressures to rivet are applied a sample finished mobile is placed upon a testing machine to measure the force of the bond. In the machine, the wheel is fixed in place and the pinion twisted until they separate. The force is measured to ensure that it meets Blancpain's specifications.

One of the profound joys of watch collecting, particularly in our age of open case backs, is admiring the exquisite finishing details of *haut de gamme* mechanical movements. Hopefully with eyes now opened to the complexities and challenges of fabrication of wheels, pinions and mobiles, more collectors will gaze upon these components with same ardor and intensity as with the other finely finished components of the movement. •

*With proper perspective, the FINISHING OF WHEELS AND PINIONS warrants the same close study as the finishing of all the other parts of the movement.*

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# *Franz Josef Land: the Pristine Russian Arctic*

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2013 Pristine Seas expedition  
with Blancpain

Mission partner of



Blancpain is a proud supporter of Pristine Seas Expeditions



In the late 1800s, the North Pole was still a mystery. No one knew if there was land beneath the ice.

Many launched expeditions to reach the pole, but no one succeeded. Then, in 1873, the Tegetthoff expedition from Austria found previously unknown islands covered with glaciers and inhabited by polar bears. They named the archipelago Franz Josef Land, in honor of the Austrian emperor. In 1926, the Soviet Union claimed the islands and closed access to foreign vessels.

In the summer of 2013, almost a century later, National Geographic Explorer-in-Residence Enric Sala led a National Geographic Pristine Seas Expedition with Blancpain to Franz Josef Land, where he and an international team of scientists and filmmakers explored the land and the underwater Arctic world.

Sala will narrate the story of this epic expedition and his work with Russian agencies to protect this unique ecosystem, in the next issue of *Lettres du Brassus*.

Text: Dr. Enric Sala/National Geographic Explorer-in-Residence

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