CORONAVIRUS
A wave of optimism hits the Swiss stock market

PORTRAIT
Alcon dreams big

E-COMMERCE
Etsy, the crafts master

DOSSIER
A TRILLION MICROCHIPS
The ultra-connected future has already begun
Donald Trump is not a geek, he’s a real estate developer. However, the White House’s current resident does understand the importance of semiconductors. Found inside smartphones, aeroplanes, data centres and even everyday smart objects, electronic chips are everywhere, and in the near future, with the emergence of artificial intelligence, these chips will make decisions for us, drive our cars, steer missiles, and more.

So it’s not surprising that the United States is trying to maintain control over the development and manufacturing of these electronic components. While the current industry leaders are American companies, the trade war that the US president is currently waging against Chinese telecoms provider Huawei is largely designed to stop Beijing from acquiring these skills, because while China is indeed the world’s factory, semiconductors are still its Achilles heel. According to a report from the Centre for Strategic and International Studies (CSIS) published in February 2019, China produces only 16% of the semiconductors it consumes, which is not enough to ensure its autonomy.

However, ironically, pressure from Washington may not have the intended effect. Rather than submit to the trade war, China is now fast-tracking its own development and investing heavily to do so. Its objective: to produce 40% of all semiconductors sold in the country in 2020, and 70% by 2025. The initial results of this policy are beginning to become clear. According to the firm IC Insights, HiSilicon, Huawei’s driving force in the semiconductor industry, made a dramatic entrance into the global top 10 chip manufacturers in Q1 2020. Thus far, HiSilicon has only designed electronic components, with their production outsourced to Taiwanese company TSMC. However, the Chinese company is sending more and more of its manufacturing orders to its compatriot SMIC.

And where is Europe in all this? With start-ups such as UK-based ARM, Dutch company ASML and Swiss group Centu, Europe is mastering crucial elements in the steps to manufacture electronic chips. However, it will need to do more to become a top player, like the United States is now, and presumably China in the future. Good reading!
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Erratum
An error was made in our last edition on page 25.
The figure 3.6 is the number of hospital beds in acute care per 1,000 inhabitants in Switzerland and not the number of beds in intensive care. Our apologies for this unfortunate mistake.
**SCANS**

**LOON BALLOONS DEPLOYED IN KENYA**

The Loon project from X, the Alphabet subsidiary, aims to provide internet access to some of the world’s most remote regions, via stratospheric balloons filled with helium. These balloons, which were launched from the United States, now make it possible for Kenyans to access 4G from Telkom Kenya in every region of the country. This is the first commercial deployment of Loon balloons, but the Alphabet subsidiary was able to test their effectiveness in Peru and Puerto Rico, where internet users were provided free access if the traditional cellular data network was down. The COVID-19 pandemic spurred the Kenyan government to fast-track the project’s approval. Mozambique has already followed suit, making a similar agreement with the operator Vodacom.

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**PHARMA**

**ROCHE STRENGTHENS ITS POSITION IN GENETIC SEQUENCING**

Roche acquired US-based genetics sequencing specialist Stratas Genomics in May for an undisclosed sum. In 2014, the Basel pharma giant had already injected $15 million into the Seattle-based company, whose board of directors includes Heiner Dreismann, former director of the Diagnostics division at Roche. This acquisition gives Roche access to the procedures developed by Stratos. The objective is to bring DNA sequencing to market, making diagnoses faster and cheaper, at a cost of around 200 Swiss francs per person, according to experts from ZKB. As a comparison, the first commercial DNA sequencing cost $3 million per patient.

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**THE WORLD’S TOP 5 HIGHEST PAID DOTA 2 (E-SPORT) PLAYERS**

<table>
<thead>
<tr>
<th>Player</th>
<th>Earnings (in millions of dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N0tail (Johan Sundstein)</td>
<td>5.5 M</td>
</tr>
<tr>
<td>Jerax (Jesse Vainika)</td>
<td>6.9 M</td>
</tr>
<tr>
<td>Adarkhan (Pham)</td>
<td>6.47 M</td>
</tr>
<tr>
<td>Ceb (Igor Kostin)</td>
<td>5.5 M</td>
</tr>
<tr>
<td>Topson (Topias Zawitskainen)</td>
<td>5.4 M</td>
</tr>
</tbody>
</table>

Source: Statista

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**THE WORLD’S TOP 5 HIGHEST PAID Calls of Duty Mobile (Call of Duty: Mobile) PLAYERS**

<table>
<thead>
<tr>
<th>Player</th>
<th>Earnings (in millions of dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strick (Jonathan &quot;Strick&quot;)</td>
<td>11 M</td>
</tr>
<tr>
<td>职业 (职业)</td>
<td>7 M</td>
</tr>
<tr>
<td>Tajan (Tajan)</td>
<td>5 M</td>
</tr>
<tr>
<td>Strick (Jonathan &quot;Strick&quot;)</td>
<td>5 M</td>
</tr>
<tr>
<td>职业 (职业)</td>
<td>5 M</td>
</tr>
</tbody>
</table>

Source: Statista

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**RANKING**

**TOP 5 SUPPORTED COMPLETED CAMPAIGNS ON KICKSTARTER (total funds pledged in dollars)**

<table>
<thead>
<tr>
<th>Project</th>
<th>Funds Pledged (in millions of dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pebble Time Smartwatch (2015)</td>
<td>20.34 M</td>
</tr>
<tr>
<td>Coolest Cooler Portable Refrigerator (2014)</td>
<td>15.29 M</td>
</tr>
<tr>
<td>Frosthaven Board Game (2020)</td>
<td>12.97 M</td>
</tr>
<tr>
<td>Pebble 2, TIME 2 Smartwatch (2016)</td>
<td>12.78 M</td>
</tr>
<tr>
<td>Kingdom Death: Monster LS Board Game (2017)</td>
<td>12.39 M</td>
</tr>
</tbody>
</table>

Source: Kickstarter

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**THE WORLD’S TOP 5 SMARTPHONE COMPANIES**

<table>
<thead>
<tr>
<th>Company</th>
<th>Phones Sold (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Samsung</td>
<td>58.3 M</td>
</tr>
<tr>
<td>Huawei</td>
<td>56.7 M</td>
</tr>
<tr>
<td>Apple</td>
<td>49.0 M</td>
</tr>
<tr>
<td>Xiaomi</td>
<td>36.7 M</td>
</tr>
<tr>
<td>Vivo</td>
<td>29.5 M</td>
</tr>
</tbody>
</table>

Source: IDC

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**SCANS**

**SWISSQUOTE JULY 2020**

The number of countries in which 5G is now available.

24

As cinemas worldwide were forced to close, production studios had to rethink their distribution channels. In the United States, several feature-length films, such as Bloodshot and The Hunt, went live on streaming platforms just a few days after their release, bypassing the 90-day period that is usually reserved for cinema-goers after the release date. *Troll 2: World Tour*, produced by Universal, was even available live on streaming platforms the very same day it was released for $19.99 — a relatively high price for a VOD rental. It was a huge success, with Universal reporting that the film has already brought in more than $100 million. CEO Jeff Shell later announced in the *Wall Street Journal* that his studio would continue to release films simultaneously in both formats, even after the health crisis ends. But Universal quickly had to retract its statement, as cinemas threatened to boycott the group’s studio productions.

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The social network Instagram, owned by Facebook, will now provide its members with the possibility of monetizing their live video services. This new functionality in the test phase, called “Badges”, allows spectators to financially support the content creator of their choice, by paying a flat rate of $0.99, $1.99 or $4.99. Depending on the amount invested, one, two or three hearts will appear next to their names in the comments, improving their visibility. For their part, content creators will have the list of all badge holders for their account. Instagram currently has no commission on transactions, with creators pocketing all monies paid. Live video is a booming format on Instagram, with live viewing having jumped 70% between February and March.

“For customers want Replay and going against their wishes will not work”

Urs Schaeppi, CEO of Swisscom, regarding TV companies’ desire to remove the Replay functionality.

The Banque de France announced on May 20 on Twitter that it had “successfully tested the use of a blockchain to experiment with the use of a central bank digital currency”, adding that other tests will be carried out in the weeks to come. The test took place in partnership with the Société Générale bank. In practice, the latter issued 40 million euros in financial securities in the form of security tokens, which were settled on the blockchain of the Banque de France’s digital euro.

“Customers want Replay and going against their wishes will not work”

Urs Schaeppi, CEO of Swisscom, regarding TV companies’ desire to remove the Replay functionality.

The number of guns sold in the United States in April, an increase of 71% compared to 2019. In March, 2.6 million guns were sold, up 85% compared to the previous year.

“1.8 M

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“My grandchildren are demanding more environmentalism at Nestlé”

Paul Bulcke, CEO of Nestlé, in an interview with RTS.

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Projects that exceed $2 million on the crowdfunding platform are rare – but Swedish start-up Mendi achieved this milestone with the new brain training method it has developed, whose design was financed by the European Union, among others. Previously, this type of training was reserved for those who could spend $15,000 for a few sessions in specialist clinics – but Mendi offers its system for $500. The device is a band equipped with sensors that measure the cerebral activity of the pre-frontal cortex. It also includes a mobile application that translates your brain activity into a score. Users can play a game on their mobile devices to consciously control this score, and in time, control the activity of the pre-frontal cortex in order to strengthen this area. Benefits include improved concentration and greater capacity for memorisation, as well as the ability to fall asleep faster or reduce the amount of sleep needed.

For the first time, organic food products exceeded a 10% market share in Switzerland in 2019.

10.3%

For the first time, organic food products exceeded a 10% market share in Switzerland in 2019.

$900 million – that’s how much Intel will spend to acquire a 200-person start-up that was worth $131 million in February 2018. Israeli start-up Moovit saw its user base skyrocket over the last two years, now reaching nearly 800 million. The app, which helps users travel through a city in the most efficient way possible using all types of transport, is available in 3,200 cities in 103 countries. Intel plans to integrate Moovit into Mobileye, another Israeli start-up acquired in 2017 that develops anti-collision and advanced driving assistance systems.
AUTONOMOUS VEHICLES AT A STANDSTILL

Tech companies promised that functional autonomous vehicles would be on the roads by 2020, but perfecting the technology is taking longer than expected and the pandemic has made the task even more difficult. Social distancing has prevented tests from being carried out, as test drives often require two people in the vehicle to prevent accidents. Faced with astronomical operating costs and no revenue, start-ups are conducting mass layoffs (Zoom, Lyft, IKE, Kodak Robotics), being acquired (Drive.ai by Apple) or closing down (Staraday Robotics). At Waymo, an Alphabet subsidiary, development has been delayed by several months. The California company was nonetheless able to raise $750 million in early May, which is in addition to the $2.25 billion raised in March. Large manufacturers aren’t faring any better: Ford announced that its autonomous vehicle would now be delayed from 2023 to 2022, and PSA has long abandoned the sector. Only Cruise, supported by GM and Honda, recently presented a functional model, dubbed Cruise Origin, which is currently limited to travelling only in relatively enclosed environments.

THE FLOP

The Smart City of Toronto is no more

Sidewalk Labs, an Alphabet subsidiary, hoped to create an ultra-modern living space in Toronto, built on a 5-hectare abandoned port area. An ambitious smart city project was first proposed in 2017. It included numerous innovations such as cycle tracks that were heated, social distancing that was collected in the winter, and spaces that could be transformed based on the day of the week. Robots were also supposed to deliver packages and collect rubbish. But local opposition became increasingly vocal over the last two years, notably due to a lack of transparency from Google regarding the use of the data it was collecting. Along with the company’s recent austerity cuts as a result of the pandemic, this opposition was the last straw for the Google smart city project.

$150 M

The total amount raised in gaming platform Roblox’s latest fundraiser. Thanks to its flagship game Minecraft, the company is now valued at €4 billion, according to the Wall Street Journal.

ANIMAL CROSSING AND NINTENDO: LOCKDOWN’S WINNERS

With children (and adults!) at home, the timing of the release of Animal Crossing: New Horizons couldn’t have been more perfect for Nintendo. The latest version of the popular simulation series was an immediate success. It was the most-sold game in March across all platforms, becoming the third-best launch in Nintendo’s history. Only Super Smash Bros. Ultimate (2018) and Super Smash Bros. Brawl (2008) sold higher in their first month on the market. In the midst of lockdown, the social component of the game seems to have played a crucial role in its success. Sales of the Switch console also boomed during this time. In March 2020, sales doubled compared to March 2019 — the highest Q1 sales of a Nintendo console since 2010. The Japanese company increased production of the Switch by 10% to keep up with demand.

“I look at [TikTok] as so fundamentally parasitic, that it’s always listening. The fingerprinting technology they use is truly terrifying, and I could not bring myself to install an app like that on my phone”

Steve Huffman,
CEO of Reddit, at the Social 2030 conference in late February

In episode 136 of the successful series Elementary, Sherlock Holmes 3D-printed a chocolate rabbit with the help of a Dutch scientist and his chocolatier brother in Brooklyn. Two years after the episode was released, the Zurich group Barry Callebaut has opened the world’s first chocolate 3D printing studio. The company is operating this new technology via its food decoration brand Mona Lisa. The Mona Lisa 3D Studio allows chefs to design their own bespoke confections and produce them quickly on a large scale at an affordable price.
While the COVID-19 pandemic paralysed most IPOs, Kingsoft Cloud, a Chinese company that specialises in cloud computing, was able to raise more than $500 million during its IPO in the United States in early May. Founded in 2012, Kingsoft Cloud was originally a subsidiary of Chinese software giant Kingsoft Corp., but in its IPO documentation paperwork, the company indicated that it is now independent. Alongside Alibaba and Tencent, Kingsoft Cloud is one of the cloud leaders in China. But while its sales continue to grow (from $174.5 million in 2017 to $557 million in 2019), so do the company’s losses (from $100.5 million in 2017 to $156 million in 2019).

There has been a lot of talk about robots in recent months following their contribution to caring for sick coronavirus patients, including in China, Lombardy and Thailand. Sensing an opportunity, Boston Dynamics, a subsidiary of the Softbank group, adapted its robot dog Spot into a mobile videoconferencing system. Equipped with an iPad, Spot allows healthcare workers to communicate remotely with patients waiting in line and triage accordingly, without the risk of contamination from direct contact. Spot’s four articulated legs allow it to reach many places where other robots cannot go. The city of Singapore also found another use for Spot: encouraging social distancing by patrolling parks with an audio message directed at citizens.

Meg Whitman, CEO of streaming application Dubi, which launched in early April, said, “We pay up to $100,000 a minute for our premium long-form movies and chapters.” The amount raised in 2019 globally by agri-food start-ups, an increase of 250% in five years, according to the firm AgFunder.

The budget is comparable to that of large productions from Netflix, Amazon, HBO Max and Disney.

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A top-ranked country on the brink of chaos

In 2010, Chile joined the very exclusive club of countries that belong to the OECD, the same year that it was ranked the most competitive country in Latin America by the WEF Global Competitiveness Report. But in the last 10 years, inequality has grown and Chile has become the most unequal country in the OECD. In October 2019, an increase in the price of a subway ticket in the capital city was the last straw and the country saw an unprecedented wave of protests. The government even had to mobilise the army to stop looting. The protests were expected to start again in March after the austral summer holidays, but as holidaymakers returned home, the first cases of coronavirus appeared. As a result, the government declared lockdown and postponed until October a referendum on the creation of a new constitution to replace the one from Augusto Pinochet’s military dictatorship. While the pandemic ended the protests, Chileans remain angry at the right-wing government led by Sebastian Piñera.

Networking at the head of LinkedIn

After more than 11 years as CEO of LinkedIn, Jeff Weiner has stepped down. He was replaced on 1 June by Ryan Roslansky, who previously held the roles of senior vice president and product director. The announcement was posted on LinkedIn, of course. Jeff Weiner mentioned that Roslansky was the first person he recruited in 2009 after being named CEO in December 2008. The two met while working at Yahoo!. During their collaboration at LinkedIn, the number of members worldwide increased from 33 million to 675 million, with revenue rising from $78 million in 2008 to $7.5 billion today. It is the biggest change in the social network’s executive team since it was acquired by Microsoft in 2016 for $26.2 billion. Weiner isn’t leaving the company entirely; he will remain the executive chairman of LinkedIn’s board of directors.

Stylish smart glasses

Bosch has developed a small optical device named “Smartglasses Light Drive” that can transform any pair of traditional glasses into smart glasses. Keeping the user’s hands free and leaving the field of vision unaffected, Smartglasses Light Drive can display a route, receive calls and notifications, and consult information such as a grocery list, recipe or even assembly instructions. The advantage of this new technology is that it maintains the wearer’s privacy, as the information projected onto the lenses is not visible to other people. In fact, the image is not projected onto the lenses themselves, but directly onto the surface of the retina. As a result, the German company claims that the image will always remain clear, regardless of whether it is being viewed in full sun or at night. Current smart glasses are often seen as unattractive by potential consumers, but with this miniature projection system, designers can offer more stylish smart models suitable for daily wear.
A bad trip in the country of green gold

The Canadian cannabis industry is under pressure, due to chronic overproduction and resistance from the black market.

BY ANGÉLIQUE MOUNIER-KUHN AND BERTRAND BEAUTÉ

J ust a flash in the pan? At the start of the COVID-19 cri- sis, legal cannabis sales saw an unprecedented boom in Canada as consumers swarmed shops to stock up before quarantine. Over Q3 which ended on 31 March, Aurora Cannabis – one of the most prom- inent companies in the green gold market – sold 12,729 kilos of can- nabis, a 39% increase compared to the same quarter the previous year. But the coronavirus effect quickly dissipated, and the sweet scents of cannabis faded away. According to Michael Singer, the interim CEO of Aurora Cannabis, April sales have returned to their pre-pandemic level and companies in the industry have plunged back into the bleak climate that the industry faced previously.

In autumn 2018, the legalisation of recreational marijuana in Canada piqued incredible interest from investors. Dubbed the “green rush”, the hype caused share prices of Canadian producers to skyrocket (read our May 2018 edition). Ontario-based Canopy Growth saw its share price go from CAN$3 in 2016 to more than CAN$60 in September 2018. The other major players in the industry, such as Aurora Cannabis, Aphria and Hexo, also benefited from this enthusiasm. But since then, the companies that invested in the buzz are now tumbling on the Toronto stock market.

On average, the primary companies in the industry saw their market capitalisation fall nearly 70% in 2019, despite the fact that the year was quite successful for Canadian stocks (+29% for the S&P/TSX Composite, the main index of the Ca- nadian stock market). And because of the pandemic that has upended the world since the start of 2020, the market will not be restarted in a sustainable way after reaching its lowest point in mid-March at under CAN$15. Growers shares are now around CAN$25, slightly higher than at the end of 2019.

“The problem is that too many companies entered this young market and were valued based on their production capacities,” said Nikolaas Faes, an analyst at Bryan, Garnier & Co. “In recent years, more than 200 production licences were granted by the Canadian govern- ment. Together, these companies have a total production capacity of 3.2 thousand tonnes, whereas global demand is probably around 700 to 750 tonnes per year, of which 227 is for legal consumption. Therefore, demand is nearly four times less than production capacity.”

This is because, despite legalisation, the number of total users has not grown: according to Statistics Canada, 1.8 million Canadians, or nearly 4% of the population, consume cannabis every day, which is the same amount as before the mar- ket opened. Furthermore, the black market is still functioning much better than expected. According to Statistics Canada, 24.2% of consum- ers purchased marijuana from illegal suppliers in Q2 2019.

As a result, prices went down and stocks took the hit. Furthermore, exports will not be able to absorb overproduction. Even though medic- ical marijuana is now legal in 33 US states and 11 authorise recreational marijuana, cannabis remains illegal at a federal level in the United States, and is therefore illegal to import. Europe is a modest prospect, even though the medicinal market lead by Germany and Italy is expected to grow. Legal consumption would increase for the time being to a dozen tonnes, according to Faes, which is certainly not enough to help Mexican producers get rid of their unsold stock.

Aurora Cannabis announced a shocking cost-savings plan in early February. The plan included: 500 employees (nearly 15% of the workforce) terminated, debt re- structuring, suspended investments, and the retirement of its founder and CEO Terry Booth. The aggressive development strategy of this inte- grated company (including produc- tion, marketing and transformation), was backed by a series of expensive acquisitions. But it is struggling to fulfill its promises: in the quarter that closed at the end of December 2019, Aurora Cannabis generated a net loss of CAN$1.3 billion.

The rationalisation programme shouldn’t be a surprise to anyone: even the most optimistic investors knew that it was inevitable,” said analysts from the Canadian Impe- rial Bank of Commerce (CIBC) in a recent note. What’s more surprising, according to the analysts, is that the downturn hit almost everyone equally. Whether full of cash or drowning in debt, profitable or not, engaged in solid partnerships or all alone, cannabis stocks have all seen a somewhat uniform devaluation. “To a lesser extent, this situation is similar to the burst of the Internet bubble that put a brutal end to the overvalued IPOs in the tech industry in 2000. However, the cannabis industry re- mains promising. “There will be more losses and bankruptcies,” predicted Faes. “Just because a bubble burst on the stock market, it doesn’t mean that the black market has dis- appeared. Gradually, the legal market will overtake the black market.”

According to a report from firm BDS Analytics, published in late April, the global cannabis market is expected to reach $47 billion in 2025, which is an annual growth of 21% compared to 2019. “Growth outlooks for long- term sales in the global legal can- nabis markets remain exceptional,” said Roy Bingham, co-founder and CEO of BDS Analytics. “The cannabis industry could soon reach a decisive moment where US states, faced with an imminent global recession, will consider legalising cannabis as a potentially lucrative new source of tax revenue.”

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The Swiss National Bank (SNB) seems to agree. According to in- formation in Swiss daily Le Temps, the Swiss bank took advantage of the coronavirus crisis to double its shares of Aurora Cannabis. In late March, its portfolio held 4.2 million shares in the Canadian company, compared to 2.4 million previously. For companies in the industry, the green light at the end of the tunnel could come from institutional inves- tors. Indeed, while individuals have been closely following the cannabis industry since the very beginning, asset managers waited for quite some time due to “too-limited per- formance history, too-high valuation levels, or internal restrictions,” said the CIBC. The fact that a certain number of players have reached operational profitability (EBITDA) and are generating positive cash flows, probably starting in 2021, will “force” institutional investors to reconsider the industry. For analysts from the Canadian bank, the count- down for the rebound has begun.

The Canadian cannabis industry is under pressure, due to chronic overproduction and resistance from the black market.
Alcon has its eye on the future

Separated from Novartis last year, the Geneva-based group stands out in the promising ophthalmology market. We take a closer look.

BY JULIE ZAUGG

The divorce took place on 9 April 2019. Alcon was independent once again, after more than 40 years under Swiss giants Nestlé and Novartis. Originally from Texas, the small company specialising in sterile ophthalmic products has taken an unusual path. It was first acquired by Nestlé in 1977 and, under the food giant, quickly became one of the main players in the eye care market. “Nestlé invested a lot of money in Alcon, but also gave it enough autonomy to develop its own products and strategies,” says Sibylle Bischofberger, an analyst at Zurich Cantonal Bank.

In 2008, the Vevey-based group decided to sell off Alcon in increments to Novartis, and the acquisition was complete in late 2010. But working within the Basel-based group proved to be less comfortable. “Novartis focused all its energy on its pharmaceutical division and ignored its other segments, such as ophthalmology and generics,” says Bischofberger. “As a result, Alcon suffered from years of under-investment in its research and development department, as well as in its sales force and factories, which caused a loss of market share.” In the second half of 2015 and into 2016, Alcon even slipped into the red.

The poor performance convinced Novartis to give Alcon its freedom back as part of a split transaction that led to Alcon being listed on the Swiss exchange and NYSE in April 2019. The company used the transaction to move its headquarters to Geneva. It is now valued at 24.7 billion Swiss francs.

Freed from the yoke of the Basel-based group, Alcon can now “focus on its growth strategy and devote more energy to launching each new product,” says Scott Bardo, an analyst at Berenberg. Alcon, which has 22,142 employees and is present in more than 180 countries, will become “quicker and more agile”, said...
Bardo believes that the Swiss company, whose shares he recommends purchasing, is a good medium-term investment due to its dominant market position in the eye health market and the strength of its brand, which is synonymous with quality. But Alcon needs to continue to innovate in order not to lose any ground to its rivals such as Carl Zeiss, Abbott and Bausch Health in the surgical sector and Johnson & Johnson and CooperVision for contact lenses.

Another issue is its heavy dependence on reusable lenses, which need to be changed once a week or once a month. “This type of lens is declining compared to daily lenses, which require less maintenance,” says Bucht. And if the reusable market shrinks, it would hurt sales of contact lens cleaning solution. “Here again, Alcon is very exposed,” adds Bucht.

Nevertheless, Alcon’s medium-term outlooks are favourable. “As the population gets older, demand for cataract surgeries will increase significantly,” says Bibo Schicho. The prevalence of myopia among young people will also increase, as they spend more and more time looking at screens. “In China, 90% of this segment of the population is already affected,” she said. This is great news for contact lens sellers such as Alcon.

Furthermore, there is also increased demand from developing countries, in which cataract surgeries and the use of contact lenses have just started to take root, particularly among the new middle classes. Alcon already generates 25% of its revenue from emerging markets and records double-digit annual growth in such countries, particularly in China, Brazil and Russia.

**High-end positioning**

Alcon is also strongly positioned in the contact lens market, ranked number two globally. In particular it dominates the high-end lens segment, thanks to its water gradient range named Dailies Total 1. But this positioning is also Alcon’s main weakness. Its competitors Johnson & Johnson, CooperVision and Bausch & Lomb all have cheaper products that work better for the mass market. “To address this vulnerability, Alcon recently launched a cheaper water gradient lens called Precision 1, which should help the company regain market share,” says Daniel Bucht from Vontobel.

**“As the population gets older, demand for cataract surgeries will increase significantly”**

Sibylle Bibo Schicho, analyst at Zurich Cantonal Bank.

**“A SOLID INVESTMENT IN THE MEDIUM TERM”**

In 2019, Alcon saw its sales increase 5% to reach $7.36 billion. The ophthalmic surgery sector did particularly well, growing by 7% to reach $2.2 billion. The implants sector saw even higher growth at 9%. “Implants have the most significant growth potential for Alcon, due in particular to the performance of the PanOptix implant in the US market,” says Scott Bardo, an analyst at Berenberg. Alcon’s margins are also expected to improve.

In 2019, its margins were at 17.2%, but the company hopes to reach 20%-25% by 2023. Bardo believes that the Swiss company, whose shares he recommends purchasing, is a good medium-term investment due to its dominant market position in the eye health market and the strength of its brand, which is synonymous with quality. But Alcon needs to continue to innovate in order not to lose any ground to its rivals such as Carl Zeiss, Abbott and Bausch Health in the surgical sector and Johnson & Johnson and CooperVision for contact lenses.
Business trips in jeopardy

Already under fire as a result of corporate sustainability policies, certain types of business trips will not survive the coronavirus crisis.

BY ANGÉLIQUE MOUNIER-KUHN

Business trips have long been associated with the idea of escape, a chance to get away from the daily grind, pressure from management and family obligations, and an opportunity to enjoy crisp white sheets at an expensive hotel after a business class flight. But the reality of business trips isn’t what it once was. Called upon by shareholders and clients to reduce their environmental footprint, an increasing number of companies have revised their travel policies in recent years to adapt to the climate crisis.

Now, the COVID-19 pandemic could be a fatal blow to business trips and other roadshows. Following the emergence of the virus in Asia and its spread around the world, business travel quickly disappeared: “Business travel has become the latest casualty of the coronavirus pandemic, coming to a halt across the globe,” lamented the Global Travel Business Association (GTBA) in early April. According to this international lobbying group, companies worldwide suspended all business trips and international borders were closed, which resulted in a loss of $122.5 billion per month for the tertiary sector.

“The crisis resulted in a major acceleration of companies using digital tools. That will certainly have long-term effects,” says Jonathan Normand, executive director at B Lab Switzerland, which runs a certification process for businesses that meet the highest standards of social and environmental performance. “Any company that hadn’t yet experimented with long-distance collaboration was forced to change. In addition to teleconferencing, companies discovered very effective online collaboration tools, such as Miro and Jumbo, which give employees new ways to collaborate with their ecosystem,” adds Normand. Two years ago, Normand himself decided that he would systematically refuse all requests to attend international conferences: “I always suggest that conference organisers find people locally who can say the same thing I would.”

According to the expert on innovation in society and governance, rethinking the added value of business travel — one of the main sources of a company’s carbon emissions — and choosing digital alternatives instead is just “common sense”. Especially since the current economic slump means that companies are reviewing their bottom line: as they look to cut costs, travel is often a very significant expense in the tertiary sector.

RETHINKING PRACTICES

But this advocacy for remote work has its opponents, particularly in the finance industry. “Business trips are an integral part of a Wealth Management career: our entire business is based on trust, and meeting with clients in person is necessary,” says Bernard Schuster, head of group communications at Unié Bank Privée (UBP). Forced to cancel all international travel and require almost all of its employees to work from home in March, the investment bank had to start teleworking overnight. Even after just a few weeks, the experience has already caused many to rethink how business will be conducted after the crisis. “We need to prioritise travel that has the purpose of growing business or making decisions. Physical presence is important during project launch meetings, but once the roadmap, roles and responsibilities are clear, it’s very easy to work remotely,” said Schuster.

As an example of this evolution in progress, UBP organised its first virtual team-building session in April with its teams in Asia: “We were supposed to do a flashmob. I was standing up, clapping my hands with colleagues in Hong Kong and Singapore. It was a lot of fun and it really helped us establish a team dynamic, even though everyone was in their own homes,” says Schuster.

"Any company that hadn’t yet experimented with long-distance collaboration was forced to change" — Jonathan Normand, executive director at B Lab Switzerland

THE FRONT LINE

At the University of Geneva, this period served as a life-size test. With colleagues, conferences and invitations, the academic world traditionally involves a lot of air travel. Announced last year, the new air travel policy at UNIGE was expected to enter into force at the start of the next academic year. The policy includes a 50% reduction in CO₂ emissions from air travel by 2030 (compared to 2019) through increased use of train travel and videoconferencing. The global pandemic accelerated the process. “We skipped right over several steps,” says Fabrice Calame, head of sustainable development goals at the UNIGE Rectorate. This was particularly true for the training step, since everyone had to dive right in, as well as the communication step, which was designed to convince people who were less enthusiastic about the merits of the new policy.

Thus far, feedback on the technological infrastructure the university has invested in has been positive overall. “But it remains to be seen whether this period is enough to establish what will be a fundamental cultural shift,” says Calame. UNIGE staff take nearly 4,000 aeroplane trips per year.
A wave of optimism hits the Swiss stock market

The Swiss Market Index – which represents the top 20 companies in Switzerland by market capitalisation – picked up again after taking a steep nosedive in March. But the Swiss stock market’s flagship index hides a wide range of realities.

BY BERTRAND BEAUTÉ

The Swiss Market Index is not representative of the Swiss stock market, asserts Jérôme Schupp. “If you look at the other SMI companies and more broadly all companies (listed in Switzerland), it’s a different story.”

According to a press release by Swissmem on 26 May, incoming orders for Switzerland’s mechanical and electrical engineering industries (MEM industries) may bottom out. Nearly three-quarters of subcontractors in the semiconductor sector – a market that marches to its own cyclical tune and seems fairly immune to the crisis (see our report on p. 30).

Nevertheless, it’s not going to be all roses from here on out. “We jumped from extreme pessimism to a bit too much optimism,” Schupp adds. “The markets view the pandemic as a temporary crisis that will subsequently give way to a strong recovery. But we’re only at the beginning of the difficult times.”

Manufacturing is paying a steep price over coronavirus. “In the second quarter, we expect ABB’s operations to be significantly challenged by a sharp drop in demand due to lockdowns in many parts of the world,” warned Björn Rosengren, CEO of ABB, during the presentation of the company’s Q1 earnings on 28 April.

This industrial robot specialist isn’t the only one in hot water. Building materials leader LafargeHolcim has had to shut down construction sites, while sanitary products specialist Geberit and adhesive and sealant manufacturer Sika have also closed operations.

Outside of the SMI, “some Swiss manufacturers have the misfortune of being heavily geared towards the automotive sector,” says Eleanor Taylor Jolidon, co-head Swiss and global equity portfolio management at UBP. “The crisis may last quite a while for them because I doubt that people’s first impulse after lockdown ends will be to buy a car.” The pandemic will likely have a long-term impact on companies that are highly dependent on automakers, such as Tomos and Autoneum. According to a press release by Swissmem on 26 May, incoming orders for Switzerland’s mechanical and electrical engineering industries (MEM industries) may bottom out.

Nearly three-quarters of MEM companies (72%) expect losses or insufficient margins in 2020. Not only that, but considering the time it will take for their clients to start investing again, a revrieve isn’t likely to be on the cards before summer 2021.

“Swiss manufacturers will survive because they are managed well. But they won’t come out unscathed and there will be lay-offs in the machine-tool industry,” forecasts Jérôme Schupp, financial analyst at Prime Partners. At the other end of the spectrum, however, some companies should weather the storm quite well. Such is the case for VAT Group, INFICON and the Comet Group, three winners as a result of the crisis across every segment. Investors need to focus on companies that create value.”

The SMI regained its lustre after a rough ride in March. But the Swiss stock market’s flagship index hides a wide range of realities.

The SMI is also distorting market perspective

The SMI is extremely fragile. A lot of people have lost their jobs – nearly 40 million in the US – and I’m not sure that they’ll return to work any time soon. There is currently a great deal of optimism on the markets, but I anticipate corrections with rather painful surprises, followed by more positive moments.”

The current optimism is partly due to the publication of Q1 2020 earnings, which turned out to be better than expected (see the infographic on p. 27). “The markets are very excited,” Jolidon continues. “People saw the Q1 earnings and thought, ‘that’s not so bad after all.’ But the most important figures are those to come, not those already published. Q1 earnings don’t reflect the scope of the crisis because Europe and the US were unaffected by the pandemic for the first three months of the year.”

We won’t see the real impact of the crisis until Q2 earnings come out.”

In a way, the SMI is also distorting market perspective. “The disproportionate weight of Roche, Novartis and Nestlé – the top three SMI stocks, which have also been more resilient to the crisis than the market and have positive outlooks – means this index is not representative of the Swiss stock market,” asserts Schupp. “If you look at the other SMI companies and more broadly all companies listed in Switzerland, it’s a different story.”

Dufry, for example, has been hit hard by the coronavirus pandemic, watching its revenue virtually disappear (-94% in April). On the other end of the spectrum, Logitech has benefited from the lockdown, boosting sales for webcams and video conferencing equipment by 32% and 60% respectively.

För Eleanor Taylor Jolidon, that’s why the current crisis calls for highly active management. “Don’t think in terms of indices like the SMI or even in terms of sectors,” she emphasises. “There are winners and losers as a result of the crisis across every segment. Investors need to focus on companies that create value.”
Unsurprisingly, the pharmaceutical industry performs rather well in a health crisis. "But not all performances are created equal," says Eleanor Taylor Jolidon, co-head Swiss and global equity portfolio management at Union Bancaire Privée (UBP). "Roche is in a better position than Novartis, for example." One reason for this is that Roche’s diagnostics expertise is critical in the fight against COVID-19. It can also rely on Actemra – a drug in its portfolio used by patients suffering from serious pulmonary complications. Novartis, on the other hand, owns very few molecules that are effective against coronavirus, except for the highly controversial hydroxychloroquine, of which the Basel-based group is one of the manufacturers.

Beyond these two companies, Lonza partnered up with US biotech firm Moderna Therapeutics at the end of May to help develop a vaccine against COVID-19. If they succeed, the Swiss drug manufacturer - whose Q1 revenue gained over 74% compared to 2019 - could become a major player in the production of the long-awaited vaccine. Givaudan is also doing relatively well. The Geneva-based aroma and perfume specialist saw its (luxury) perfume division impacted and switched gears, altering its production capacity to manufacture sanitising gel. For agrifood giant Nestlé, the company benefited in Q1 from stockpiling purchases by customers on lockdown.

It’s common knowledge that during a crisis, temporary workers are the first to find themselves in line for unemployment. And temporary-staffing giant Adecco is right with them. In Q1, the Zurich-based company recorded losses of €348 million versus profit of €133 million last year. "With April revenues down around 40% year-on-year, we expect Q2 to be a challenging quarter," admitted Adecco CEO Alain Dehaze in a press release.

For Geneva-based certification group SGS, the situation is more difficult to gauge. On the one hand, the company wasn’t the least bit spared by the recession, but on the other, it is launching profitable new services like on-site verification testing for disinfection and face-mask compliance certification.

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The Basel group Roche has developed a diagnostic test for COVID-19 called "v-Tac".
The industry has had dazzling results. UBS and Credit Suisse saw profits skyrocket in Q1 versus 2019, up 40% and 75% respectively. Both banks benefited from increased customer activity in wealth management and investment banking at the beginning of the year. But the circumstances still call for caution. “During recessions, payment defaults soar. That’s what happened in 2008,” recalls Jérôme Schupp, financial analyst at Prime Partners. “Lockdown measures obviously led to heightened demand for digital services, particularly owing to the massive increase in telework, but the telecoms market is saturated in Switzerland and Swisscom’s growth potential is therefore limited.” That’s why it’s better to examine cases outside of the SMI, such as Logitech, which is benefitting greatly from the pandemic. The IT accessories company posted revenue of $709.2 million in Q1, up 14% year-on-year. Profits shot up five-fold. Software companies such as Crealogix and Temenos may also get a boost from the crisis.

**DIGITAL WINS BIG**

**Swisscom**

For Swisscom, the only telecoms company listed on the SMI, the pandemic has been smooth sailing. “But Swisscom’s growth is incidental,” says Jérôme Schupp, financial analyst at Prime Partners. “Lockdown measures will be strapped with payouts linked to the pandemic. In Q1, Swiss Re reported net losses of $225 million compared with $429 million in profits the previous year. The two extremes illustrate the scope of the impact of coronavirus on the reinsurance company’s business. And it would seem that the worst is yet to come. The postponement of the Tokyo 2020 Olympics could cost Swiss Re $250 million. In a press release published on 14 May, Zurich Insurance announced it had already paid out $280 million in P&C claims related to the pandemic. The bill could reach a total of $750 million over 2020 as a whole, an estimate that remains very uncertain, according to the group.”

**BANKS AND INSURANCE COMPANIES REMAIN CAUTIOUS**

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In a stet im Wandel begriffenen Welt setzen wir auf solide Megatrends wie die digitale Wirtschaft, disruptive Technologien, die Mobilität der Zukunft, Smart Cities und auf die Generation der Millennials, deren Kaufverhalten die Welt verändern wird.

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As more and more objects become equipped with electronic chips, the industry looks to a promising future, in spite of the coronavirus.

BY BERTRAND BEAUTÉ AND LUDOVIC CHAPPEX

Dossier prepared by:
Bertrand Beauté,
Ludovic Chappex
and Julie Zaugg

THE CHIP INVASION

They are everywhere: in our homes, our cars, at work and even soon under our skin. What are “they”, you ask? Electronic chips, of course. First invented in the 1950s, they have gradually taken over the planet and have now become omnipresent in all of the devices we use every day. Since 2017, more than 1,000 billion chips are produced each year in fabrication plants – gigantic factories that make semiconductors for all the tech companies, such as Apple, Huawei, Nvidia and Qualcomm. And the takeover has just begun: “The fundamental trend for the next 10 years is more and more semiconductors,” said Hugo Paternoster, an industry expert at AlphaValue. “Volumes will increase as smart objects, including cars, become more available to a wider range of consumers.”

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38. Infographic: the value chain of microprocessors
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62. China dreams of becoming a semiconductor giant
While waiting for this prosperous future, the semiconductor market is experiencing a difficult period. Before the coronavirus crisis even began, the market had experienced a disappointing 2019, with a drop in sales of 12.8% over one year, to $409 billion. A loss of this magnitude hasn’t been recorded in 10 years. “The macroeconomic situation was complicated in 2019, with slowed growth in China, the US-China trade war and sluggish smartphone sales,” said Frédéric Yoboué, industry analyst for the Bryan, Garnier & Co. investment bank. “Prices dropped even more significantly given that chip manufacturers invested heavily in 2017, when the price of semiconductors skyrocketed. When demand flipped in late 2018, manufacturers had far too many chips in stock and surplus production capacities, which led to a very sharp price drop.”

For everyone in the industry, 2020 was supposed to be a year of recovery. In December 2019, World Semiconductor Trade Statistics (WSTS) predicted 5.9% growth for this year and 6.3% in 2021. But COVID-19 now overshadows these rosy outlooks. In a study published in April, consulting firm McKinsey now estimates that semiconductor trade will drop by between 5% and 15% in 2020, by between 30% and 45% in the second quarter. Here again, the company is expecting the worst, predicting a drop of between 14% and 23% of its revenue in Q2 compared to 2019.

THE CLOUD BLESSED BY THE PANDEMIC

However, not all companies are affected by the virus in the same way. Far from it, in fact. Some companies even seem to be benefiting from the crisis, such as those that equip cloud computing giants. “With the boom in homeworking, streaming platforms, e-commerce sites and all the dematerialised services, companies in the cloud computing space need to increase the capacities of their data centres,” said Julien Leegenhoek, tech stock analyst at Union Bancaire Privée.

On 20 March, e-commerce giant Alibaba announced that it would be investing $28 billion in its cloud infrastructure over the next three years. The Chinese group justified its decision with the boom in homeworking since the start of the COVID-19 pandemic, which has led to a sharp increase in demand for dematerialised services. This is a godsend for memory manufacturers, such as Korean companies SK Hynix and Samsung Electronics, as well as semiconductor manufacturers (Intel, AMD). SK Hynix, for example, announced a 6% increase in revenue in Q1, reaching €5.4 billion.

Non-stop sales growth

Democratisation of technological objects has led to a continuous increase in the semiconductor industry’s revenue – a sector that is going from strength to strength.

* An optimistic semiconductor revenue forecast, with fourth quarter global economic recovery.
Other cloud giants (such as Amazon Web Services, Google and Microsoft) are in the same situation as Alibaba. “We just experienced two years’ worth of digital transformation in two months,” said Satya Nadella, CEO of Microsoft, on 29 April. In Q1, Microsoft’s “intelligent cloud” activity, which includes its Azure platform for businesses, increased by 27% over one year, reaching $12.3 billion.

5G AND AUTONOMOUS VEHICLES
In the longer term, when the economy picks up again semiconductor sales are expected to generally recover. “The roll-out of 5G will drive the industry upwards,” said Yobou. “Consumers will want to buy mobiles that are compatible with this new mobile network, which is ideal for semiconductor companies which make nearly 30% of their revenue from mobile phone brands.” This is especially true as 5G smartphones will require chips with higher added value and are therefore more expensive.

The other domain that is quite appealing to the semiconductor industry is cars, which in recent years have become quite reliant on electronic chips. Everything uses microprocessors now: from connecting the screens inside the vehicle to optimising battery consumption. “In 2019, the average value of chips used inside a car was $370 in a combustion model, compared to $820 for its 100% electric counterpart.”

“Cars will go electric, and eventually autonomous, which is undoubtedly excellent news for the semiconductor industry,” said Julien Leegenhoek, CEO of Microsoft, on 29 April. In Q1, Microsoft’s “intelligent cloud” activity, which includes its Azure platform for businesses, increased by 27% over one year, reaching $12.3 billion.

US company Nvidia, which specialises in graphic processing units (GPUs), seems to be the best positioned to take advantage of this growing market, almost by chance. In fact, the company hadn’t particularly focused on AI. But in 2009, researchers at Stanford University had the idea to use GPUs for machine learning – a part of AI rather than Intel processors (central processing units or CPUs). The result was quite successful.

Since then, the GPUs from Nvidia and its competitor AMD have been leaders in AI – an industry in which processors must handle large quantities of data. Moreover, Nvidia no longer calls its GPUs “Graphic Processing Units”, but rather “General Processing Units”. This marketing tactic indicates that GPUs can now do everything and will eventually replace CPUs definitively.

Except that things aren’t quite so simple. Initially developed to display video games, GPUs are imperfect champions of artificial intelligence, and many players are trying to develop new chip architectures specifically designed for AI technology. And it is not the only one. Amazon and Facebook are also working on microprocessors dedicated specifically to machine learning, as are many startups. All hope to dethrone the traditional players.

To not get left behind, the traditional companies are willing to wield their chequebooks: in March 2019, Nvidia spent $6.9 billion to acquire Israeli start-up Mellanox Technologies. Intel, the leader in microprocessors, acquired Israeli start-up Habana Labs for $2 billion in December 2019. Habana Labs is barely three years old, but is already well positioned in the promising market of electronic chips optimised for artificial intelligence.
NO FACTORIES, BUT PLENTY OF IDEAS

With the notable exception of Intel, the big electronic chip companies don’t have production facilities. This “fabless” business model allows them to focus solely on R&D.

BY BERTRAND BEAUTE

In 2015, history was made in the semiconductor world. IBM sold all its microchip production sites to US company GlobalFoundries. It was the end of an era. Created in 1911, Big Blue was an iconic player in the industry. But after being shaken up by newcomers, the venerable US company had to change its strategy, selling off a struggling business that recorded a $700 million loss in 2013.

However, IBM hasn’t left semiconductors completely behind. The giant continues to develop its own chips, particularly its Power processors and concentrate solely on research and development, while simultaneously forsaking completely behind. The giant continues to develop its own chips, particularly its Power processors and concentrate solely on research and development, while simultaneously abandoning its production facilities to foundries, which now include Apple, Samsung, and Nvidia.

“Most companies around the world know for their microchips, with the notable exception of Intel, are fabless,” points out Frédéric Yoboué, a semiconductor analyst at Bryan, Garnier & Co. “These companies delegate production to foundries and concentrate on the design and architecture of the chips themselves. This separation of tasks is due to the exorbitant cost of production factories for microchips. In addition, given the recurrence of investments, enormous volumes are needed to make them profitable.” For example, the Taiwanese foundry TSMC, which alone produces more than half of all chips in the world, spent $17 billion on its latest production facility.

Free from these gigantic investments, chip designers can concentrate solely on research and development, while simultaneously benefiting from the best production technologies. AMD is an excellent example of this strategy. In the early 2010s, the US graphics card specialist was struggling after several years in the red. AMD decided to sell off its production facilities, which would become GlobalFoundries, and go fabless. Since then, AMD has been winning market share in the domain of PC and server microprocessors, thanks to TSMC’s production technologies, which are considered the best in the world.

Another advantage of the fabless model is that new players – i.e. start-ups that don’t have the funds to build factories – can emerge and disrupt the semiconductor market.

UK start-up ARM did exactly that. “ARM is one of the best companies I know of,” said Julien Leegenhoek, tech stock analyst at Union Bancaire Privé (UBP). “In just a few years, it has become the R&D office for the entire semiconductor industry.” ARM was founded in Cambridge in 1990 when the UK manufacturer, Acorn was designing ARM1, a simple, inexpensive processor for computers designed to be used in British schools.

At the same time, its main competitor in this industry, Intel, which produces all its chips internally, is struggling to overcome challenges at its production facilities. While TSMC will launch mass production of 5 nm chips in April 2020, Intel will only be able to produce its first 7 nm products in 2021. At a conference in March, George Davis, CFO of Intel, admitted that his company was two years behind the competition.

Since the company was unable to finance factories, it sold the result of its R&D under licence. In the 1990s, the ARM architecture was particularly interesting to Texas Instruments, which at the time was designing chips for Nokia mobile phones. This partnership was the start of something good.

In the years that followed, the UK company filed many patents and claimed intellectual property on all processors designed for the ARM architecture – which is used in the iPhone 11 (see infographic on p. 38). “More than 80% of smartphones sold worldwide currently run on ARM architecture,” said Leegenhoek. This piqued the interest of Softbank, which acquired the company in 2016 for $31 billion. Since the acquisition, ARM is trying to diversify by developing chips for connected devices as well as artificial intelligence servers. And it’s doing it all without factories.
HOW ARE CHIPS MADE?

Many companies are involved in manufacturing processors. Here, a case study with Apple’s A13 Bionic chip, used in the iPhone 11.

THE VALUE CHAIN OF OTHER PROCESSORS

ARCHITECTURE
The architecture of the chip is designed and patented by British company ARM.

DESIGN
Apple designs the chip. That includes defining the instructions that the chip will be able to execute and specifying the systems on the chip (SoC).

MANUFACTURING
The Taiwanese foundry TSMC produces the A13 Bionic chip.

REACHING THE CONSUMER
The chip is sent to China where iPhones are assembled, and the mobile phones are then sold around the world.

THE DIFFERENT TYPES OF COMPANIES INVOLVED

Foundries
They manufacture chips for a variety of clients. The main foundries are TSMC, UMC (both in Taiwan) and GlobalFoundries (in the US).

Fabless companies
These companies don’t have factories and focus on designing chips. Production is delegated to foundries. Some fabless companies include Nvidia, Apple and AMD.

Integrated manufacturers
They control the entire production chain, right down to the final products. The main integrated manufacturer of processors is US company Intel.
The semiconductor industry can be divided into four categories: companies that design chips, companies that make chips, companies that make the machines that make chips, and smaller companies that supply the critical parts for these machines. Comet Group falls under the latter group, an ultra-specialised sector worth an estimated $12 billion. The head of the Swiss group (read the company feature on p. 42) since June 2019, Heinz Kundert granted us an interview. He explained the developments of an industry in which his company plays a decisive role.

In June 2019, René Lenggenhager stepped down from his position as CEO of Comet Group for personal reasons, and was quickly replaced by Heinz Kundert, chairman of the board of directors. It would be difficult to find a more experienced person to fill the role of interim CEO of the Fribourg group. Not many people around the world truly know the semiconductor industry from the inside out.

Swiss native Heinz Kundert, aged 68, spent 10 years as vice president of the international semiconductor association (SEMI International), based in the United States, but he has also successfully led many groups in the industry, including Swiss companies Unaxis (now named OC Oerlikon) and more recently VAT Group, a Swiss family business that he guided to become a stock market success story from 2015 to 2018. He remains on the board of directors of VAT Group.

With his extensive practical experience, this mechanical engineer has understandably won over analysts, who commend his pragmatism and track record at the head of VAT. During his time as interim CEO of Comet over the past year, he has led quite significant strategic reorganisations, as he has aimed to refocus the company towards its key areas of business, primarily semiconductors. The ebeam division (non-contact sterilisation systems), which had been in the red since the beginning, was let go. Kundert will cede his interim CEO position on 1 October of this year, at the latest, to British-American Kevin Crofton, while remaining chairman of Comet’s board of directors.

In the next five years, what will be the most promising avenues for the semiconductor industry? The biggest trend is the expansion of data centres, which store and process a huge amount of data in the cloud, and which can be accessed in a few milliseconds. We can add to the list the Internet of Things, 5G, automotive electrification and...
### Comet Group: The Essential Subcontractor

Fribourg-based company Comet is known for its x-ray systems, usually used by automobile and aeronautics groups to test materials, as well as in airports for inspection purposes. But the public knows less about the Swiss firm’s products designed for semiconductor manufacturers. This division, named Plasma Control Technologies, actually makes up most of Comet’s revenue. And the trend is likely to continue, with Comet estimating that this industry will represent 70% of its revenue by 2025.

Alongside products with obscure names such as RF generators and vacuum capacitors, Comet components are an essential part of the silicon chips found in our computers and smartphones. In practice, Comet supplies these components to a handful of companies (Lam Research, Applied Materials).

These companies then build the machines that the primary manufacturers (Intel, Samsung, GlobalFoundries and TSMC) use to create their chips. Comet is therefore one of the first steps in the subcontracting chain that supplies the very concentrated semiconductor industry (see the portrait gallery in this dossier on p. 44 to 52).

And the Swiss company excels in more than just its specialised field, says Robin Seydoux, analyst at Research Partners: “Comet controls a significant share of the market for vacuum capacitors and x-ray tubes, and demand for its products continues to grow. It’s going to launch a new radiofrequency generator that could result in Japanese giant Tokyo Electron becoming one of its clients, alongside American groups Lam Research and Applied Materials (ed. note: these three companies alone account for approximately 80% of the market share in this industry).”

This optimistic outlook is shared by Michael Firth, analyst at Vontobel: “Comet is clearly the global leader in its field. The products it offers to its clients are ever more complementary and integrated, and the new feedback loop measuring systems make Comet products even more attractive.”

Boasting a very full order book despite the uncertainties of COVID-19, Comet can capitalise on the industry’s upwards trend over the medium to long term, according to analysts. A good example is the foundry TSMC, which will invest more than $10 billion into its factories in 2020. Alongside the semiconductor industry, the Fribourg company is also banking on its x-ray division, a specialty of which includes reliability testing of parts and materials.

Comet has production sites in Europe, China, the United States and, as of this year, Malaysia. It generated a profit of CHF 12 million Swiss francs during the 2019 financial year, and its EBITDA margin reached 10.8%. Most analysts recommend purchasing shares.

**Why is going from the prototype stage to large-scale commercialisation so complex?**

It’s a long process. In our case, it takes seven years before a new product goes into production, and that is the result of a close collaboration between companies. It is not possible to simply offer our clients new technology that has not been jointly developed with them.

**What are the most striking innovations when it comes to production?**

Currently, NANG 3D technology, which stacks transistors to increase their storage capacity, is very popular. This technology was invented by Toshiba in 1986 but has only been used commercially since 2015. So you see it took nearly 30 years for this technology to become a real market. Our products are used to manufacture this type of chip. Another trend in the industry is miniaturisation production tools. It’s a way for us to improve profitability; doing better with less parts results in more compact machines. At Lam Research, which is one of our clients, the newest generation of machines is 50% smaller than the previous generation.

**In recent months, you’ve simplified the organisation and objectives of your company considerably. Why is that?**

The ebeam division was the result of a joint development with a client (ed. note: Tetra Pak) that began in 2005. It is a very expensive technology that is difficult to build, and 15 years later, we simply offered our clients new technology that has not been jointly developed with them.

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The semiconductor market is primarily dominated by US companies such as Intel, AMD and Nvidia. But lesser-known players from Europe and Asia want to shake up the established order. We feature some of the best.

Nvidia, video game champion

After reaching a record high of $315 in February, the share price of graphics chip specialist Nvidia dropped to under $200 in mid-March as a result of the coronavirus crisis. Unfortunately for investors looking for a good deal, shares have already returned to the top, trading at around $350 at the beginning of June, which is higher than before the pandemic. The US company seems rather well immunised against the coronavirus.

Nvidia generates more than 50% of its revenue from the video game market, an industry that’s booming during quarantine.

Beyond the video game market, Nvidia is diversifying even further and pursuing various markets such as data centres, supercalculators, autonomous vehicles and artificial intelligence. In December, the company unveiled its new Drive AGX Orin chip designed for autonomous vehicles. A few months earlier, the US company acquired Israeli start-up Mellanox, which specialises in multicore chips, AI and data centres, for $6.9 billion.

As a fabless company, Nvidia has TSMC make most of its chips and as a result benefits from the Taiwanese manufacturer’s technological advance (see also p. 50). The two companies are currently developing 5 nm GPUs, according to Taiwanese daily DigiTimes. This is a natural evolution, since the Nvidia 7 nm graphics cards will be released in 2020.
Intel, the upset king

And the king reclaims its crown. US giant Intel, which reigned over the chip market from 1992 to 2016, returned to its number one spot atop the semiconductor market in 2019 ahead of Samsung. However, all is not well. In a letter dated 31 March addressed to employees, Intel CEO Bob Swan expressed his disappointment: “We need to ensure that we exceed our customers’ expectations and deliver what they need when they need it. Sometimes we failed to do that last year, and that was unacceptable.”

It seems as though Intel has lost ground in the PC and server processor sector, the very industry for which it is renowned. With $72 billion in revenue in 2019, up 1.7% over one year, Intel is still doing well. But it is seems that the US champion is becoming increasingly outdated. In July 2019, the company definitively left the smartphone market. Despite the billions invested over 15 years, Intel never succeeded in breaking into the industry. It’s a stringing loss at a time where mobile phones are cutting into sales numbers for computer manufacturers, which are Intel’s main clients.

But more importantly, it seems as though Intel has lost ground in the PC and server processor sector, the very industry for which it is renowned. While Intel began producing 10 nm semiconductors in March, manufacturers Samsung and TSMC (which produce chips for Intel’s competitors AMD, Nvidia and Qualcomm) began producing 5 nm chips in 2020. Intel will not be able to reach a similar performance until 2022 or 2023. Even Apple, Intel’s long-time client, has turned away. According to Bloomberg reports published on 23 April, Apple will no longer use Intel CPUs in its computers starting in 2021. Rumour has it that Apple will now use AMD processors or its own chips developed using ARM architecture and manufactured by TSMC.

As a result, according to Bob Swan, the PC-focused company must begin an urgent transformation to become more diversified. In 2019, the company generated 52% of its revenue from PCs and 33% from data centres, but only 6% came from memories, 5% from the Internet of Things and 1% from the automotive sector.

Bloomberg reports published on 23 April, Apple will no longer use Intel CPUs in its computers starting in 2021. Rumour has it that Apple will now use AMD processors or its own chips developed using ARM architecture and manufactured by TSMC.

While Intel manufactures its own products, AMD is happy to simply develop its products, as a fabless company. AMD remains in good shape because the California firm is gaining more and more market share from its rivals as a result of its more powerful products (see the November 2019 edition of Swissquote Magazine). In August 2019 for example, AMD launched the second generation of its Epyc processors for data centres, which are based on 7 nm process technology, whereas competing products from Intel will only move to 10 nm chips in 2020. As a result, AMD was able to sell its Epyc processors to the Microsoft and Amazon Web Services data centres.

To deliver such performance, AMD relies heavily on its partnership with TSMC. While Intel manufactures its own products, AMD is happy to simply develop its products as a fabless company. Production is handled by two manufacturers: US company GlobalFoundries for chips exceeding 7 nm and Taiwanese group TSMC for more powerful products. As a very important client for TSMC, AMD has access to the manufacturer’s latest innovations. The California company is expected to be one of the first in the world to benefit from the 5 nm etching in 2021, right after Apple and its A14 Bionic chip that will be used in the iPhone 12 model expected in late 2020.

AMD, the feared challenger
STMicro, European patriot

Created from the 1987 merger of Italian group SGS and French company Thomson Semiconducteurs, STMicroelectronics opened its headquarters in Plan-les-Ouates, Switzerland, but under Dutch law. A truly European venture. Jean-Marc Chéry defends the company’s European roots: “Europe must not lose the chip battle,” said the STMicro CEO in 2018 in an interview with French daily newspaper Le Figaro. “Keeping this industry and its expertise on our soil is very important.”

Ranked the European leader of the semiconductor industry in 2019, STMicroelectronics, which develops and manufactures its own chips, has a few tricks up its sleeve to compete with the US and Asia. The company has a diversified portfolio with business activity in the automotive sector, smartphones and industry. Its biggest client is none other than Apple, whose iPhones are equipped with several key components from STMicro.

“Europe must not lose the chip battle. Keeping this industry and its expertise on our soil is very important,” Jean-Marc Chéry, CEO of STMicroelectronics.

In the automotive sector, the European company is focused on producing silicon carbide chips. Compared to traditional silicon which most electronic chips are made from, silicon carbide is used to make components that allow the battery to last longer. These silicon carbide parts can prolong the range of electric and hybrid vehicles. One of the first clients using this technology is US car manufacturer Tesla. Quite a big name.

Alas, the coronavirus crisis has significantly affected the smartphone and automotive industries. In Q1 2020, STMicro generated $2.53 billion in revenue, which is below its predictions of around $2.36 billion, and the company is predicting that Q2 will be even worse.

Infineon, the automotive specialist

Infineon chose a bad time to make the largest acquisition in its history. On 16 April, the German manufacturer (which etches its own chips) announced in the middle of a pandemic that it would acquire US-based Cypress for $9 billion. With this transaction, the Munich industrial company (the result of Siemens selling off its microprocessor business in 1999), has become the largest supplier of automotive chips in the world, ahead of Dutch group NXP and Japanese company Renesas, according to IHS Markit.

“Infineon is well-positioned to benefit from the promising automotive sector, which is progressively interested in electronic chips as a result of the increased automation of vehicles and electric motors,” said Hugues Paternoster, an analyst specialising in semiconductors at AlphaValue. But the current context is hurting the German company, as the car industry is among the major victims of the COVID-19 crisis. Ratings agency Moody’s predicts that this market will decline in 2020 by 21% in Europe, 15% in the United States and 10% in China. This will seriously impact Infineon’s profits, as the company made nearly 45% of its revenue from the automotive industry before the merger.

For instance, the company supplies chips that control the battery of the Tesla Model 3.

On paper, the portfolios of the two companies seem very complementary in terms of the automotive sector. Infineon is an expert in powerful electronic components, which regulate the energy consumption of industrial machines and cars. For instance, the company supplies chips that control the battery of the Tesla Model 3. While Cypress is known for its Wi-Fi and Bluetooth components that are used in Nintedo’s Switch console, as well as infotainment systems in models from Audi, BMW, Mercedes-Benz, Porsche and Tesla.

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In the automotive sector, Infineon supplies chips that control the battery of the Tesla Model 3.
TSMC, the unknown giant

Despite a global slowdown due to the coronavirus, Taiwanese giant TSMC is still generating staggering profits, almost as though there was no crisis. On 16 April, the company announced that its Q1 2020 revenue was up 42%, reaching $10.3 billion, and profits increased 90%, compared to the same period last year. While the name TSMC (Taiwan Semiconductor Manufacturing Company) isn’t very well-known, its products are nevertheless used in most electronic devices, including tablets, smartphones and cars. In fact, TSMC is the largest semiconductor manufacturer in the world: more than 50% of all electronic chips produced in the world come from TSMC factories.

But proceed with caution: TSMC doesn’t sell anything to the general public and doesn’t invent anything. As a manufacturer, it is happy to produce chips for other companies, most often fabless companies that don’t have their own factories, such as Apple, AMD, Huawei, Broadcom, Qualcomm and Nvidia.

TSMC widely dominates its industry because its fabrication plants are so productive. The Taiwanese company currently produces 7 nm chips and will soon move to a 5 nm version. Comparatively, Intel’s US factories can only produce 10 nm chips.

For Q2 2020, TSMC expects revenue between $10.1 and $10.4 billion, compared to $10.31 billion in Q1 2019. Of course, the smartphone industry, which makes up 50% of its revenue, will decrease in 2020. But this fall will likely be compensated by the deployment of 5G networks, which include many electronic components, as well as by the growth in the cloud computing industry.

TSMC currently produces 7 nm chips and will soon move to a 5 nm version. Comparatively, Intel’s US factories can only produce 10 nm chips.
The race to miniaturise electronic components is facing physical and economic roadblocks. In order to increase their power, chips need to be completely reinvented in a historic industrial breakthrough.

By Bertrand Beuté

What will chips of the future look like?

To multiply the number and processing power of these small components on a given surface area, the preferred solution was always to reduce the size of the transistors. The first microprocessor, sold by Intel in 1971, held 2,300 transistors that were each 10 micrometres (µm) wide, or 0.001 millimetres. Current generations, such as the Apple A13 Bionic used in the iPhone 11, hold more than 40 billion 7 nm transistors (see infographic on p. 55). As production costs skyrocket, it becomes difficult to push chips even further.

Rock’s Law, which states that the price of semiconductor factories doubles every four years, is in the running to replace Moore’s Law. And the result is that one by one, industrial players are quitting the race towards miniaturisation. In 2018, US company Globalfoundries, which produces chips for AMD and IBM, and Taiwanese firm UMC, which produces chips for Qualcomm, Infineon and MediaTek, gave up the fight, stopping development of 7 nm products. IBM, which sold its production business to Globalfoundries in 2015, Toshiba, and Sony also gave up. As a result, only three companies in the world remain in the running: Intel, Samsung and TSMC. Only the last two will be able to break the 5 nm barrier this year, as Intel is nearly two years behind (see also p. 4). Compared to the 7 nm process, 5 nm technology reduces energy consumption by 20% while increasing performance by 30%, according to Samsung.

One by one, industrial players are quitting the race towards miniaturisation

In this context, “following Moore’s Law is no longer possible,” said Jensen Huang, CEO and co-founder of Nvidia, at the 2019 Consumer Electronics Show (CES) in Las Vegas. Of course, this isn’t the first time that the famous law has been declared finished. Others, such as David Ku, CFO of MediaTek, prefer to call it a slowdown rather than a death. But the meaning is the same. Moore’s Law states that the number of transistors etched into a standard chip doubles every year at equal cost. This is no longer the case.

In other words, the semiconductor industry is using rays of light to etch circuits that are printed on silicon wafers—a process called lithography. With its EUV process, which began large-scale production in 2019, ASML was able to significantly reduce the wavelength of the ray, or the fineness of the line, therefore progressing from ultraviolet to extreme ultraviolet.

Taiwanese manufacturer TSMC’s ability to launch 5-nanometre chips in 2020— for comparison, a single hair is between 50,000 and 100,000 nm wide—is in part thanks to EUV machines. But ASML didn’t need EUV technology to stand out. The company has an 85% market share with its less advanced lithography machines and already supplies these machines to all of the large chip makers. And ASML claims it is the only company on the market with an EUV process.

“ASML is quite simply the most important company in the world and no one knows about it,” effused Julien Leegenhoek, tech stock analyst at Union Bancaire Privée. “If ASML stops, the world will stop. There will be no more chips.” Hugo Paternoster, an analyst that specialises in semiconductors at AlphaValue, agrees: “ASML is a company that really shouldn’t be overlooked. It already has a virtual monopoly on the classic lithography market, and every manufacturer on the planet, if it doesn’t want to fall behind, will need to buy EUV machines.” But these giants—four metres high and eight metres long, weighing 180,000 kilos—don’t come cheap: €120 million per unit. Moreover, the business is cyclical, as the semiconductor industry is impacted by the semiconductor factories that are holding back progress. “If ASML stops, the world will stop,” says Mihai Adrian Ionescu, a professor at the Nanoelectronic Devices Laboratory at the Ecole polytechnique fédérale de Lausanne (EPFL).

Miniaturisation is up against three obstacles. First: a physical limitation. The size of transistors—a type of switch that transforms an electric current into binary impulses—is getting dangerously close to the size of an atom at 5 nm, the smallest transistors currently available are only the length of a few dozen silicon atoms laid end to end. And yet at the atomic level, the quantum laws governing the infinitely small replace the laws of traditional physics and disrupt the functioning of the chip.

Second, a thermal issue. Billions of transistors stacked on each chip result in increasingly untenable thermal output. Third, economics. Moore’s Law allowed for a significant democratisation of electronic devices, because the power of semiconductors increased at a constant price. But now, the cost per mm2 is increasing faster than the chip’s power as a result of the technology’s growing complexity.

H ere lies Moore’s Law. As manufacturers try to produce ever-smaller electronic components, the semiconductor industry is reaching a limit. “We may be able to reduce the size by another few nanometres, but we can’t go much further than that. We only have 10 or 15 years left maximum with the current model,” says Mihai Adrian Ionescu, a professor at the Nano-electronic Devices Laboratory at the Ecole polytechnique fédérale de Lausanne (EPFL).

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The race to miniaturise electronic components is facing physical and economic roadblocks. In order to increase their power, chips need to be completely reinvented in a historic industrial breakthrough.
“There’s a real debate in the industry about whether or not to continue miniaturisation,” says Julien Leegenhoek, a tech stock analyst at Union Bancaire Privée (UBP). “Some companies, which seem to be behind, are highlighting the fact that they’re developing new higher-performance architectures. Other companies, however, are still trying to miniaturise.” According to their roadmap, TSMC and Samsung hope to begin producing 3 nm chips in 2022. And after that? Intel is hoping to reach 1.4 nm by 2029, but technological breakthroughs would need to occur in order for that to be possible. And an ever-increasing number of companies in the industry believe a rethink of the entire electronics process is more credible.

As of March 2016, the International Technology Roadmap for Semiconductors (ITRS), which sets objectives for the entire industry, declared the end of Moore’s Law and launched a new approach called “More than Moore.” Gone is the age when miniaturisation and increased performance were the only goal. Now there are new targets, such as changing the architecture of chips and adapting their capacities to each use case.

“We’re living through a fascinating time. For decades, engineers focused solely on improving a technology that dated back to the 1950s,” says Ionescu from EPFL. “Now they are developing new architectures. Electronics still has a promising future, but it has become an open field once again, one in which everything needs to be created from scratch. When it comes to traditional chips, the United States dominates the processor market and Asia rules the memory market. The paradigm shift that we’re living through is a golden opportunity for Europe to become a leader in the electronics of the future.” To achieve that goal, several approaches have emerged, but none have won a general consensus within the industry. We take a closer look at them.

TOWARDS THE INFINITELY SMALL

Semiconductor etching has improved spectacularly over the last few decades. As a result, a given surface can now hold many more transistors than it did in the past. The degree of precision has improved by a factor of 1,500 since the invention of the first microprocessor, the Intel 4004, launched in 1971. While improvements have now become much more modest, the process size of an AMD Ryzen 7 processor, designed for office PCs and laptops, is now at 7 nm, which is 50 times smaller than that of the Intel Pentium II, which launched in 1997.

0.001 millimetre (nm) = 1 micrometre (μm) = 1,000 nanometre (nm)

The graph’s curve is shown in logarithmic scale.
Components, Stacked Hundreds High

Traditionally, chips were constructed as flat surfaces and transistors would be placed on top. To continue to increase the density of the transistors, manufacturers had the idea of building layers of transistors vertically, like floors of a skyscraper. The memory chip industry was the first to try this approach. In 2013, Samsung was the first manufacturer to produce NAND 3D flash chips, named Vertical NAND, by piling 24 layers of transistors on top of each other. Seven years on, products from the Korean conglomerate and its competitor SK Hynix now have 128 layers, allowing storage capacity of 1,000 gigabits. And SK Hynix doesn’t plan to stop there: it’s already working on the next generation with 176 layers. But what works for memory chips isn’t necessarily possible for microprocessors.

“The big problem is heat dispersion,” says Mihai Adrian Ionescu, a professor at EPFL. “Memory only consumes electrical current when data is being read from or written to the chip. So heat is produced only sporadically, and it’s not that much. Microprocessors, on the other hand, generate a lot of heat.”

Intel seems to have found a way around that. Its Lakefield microprocessor, of which a prototype was presented in 2019, has five cores with a 10 nm process: one core is used for increased performance while the others are energy-saving. This is the first microprocessor of its kind in the world, and its Pohoiki Springs platform, built in March 2020, for example, Intel announced that it had completed its Pohoiki Springs platform, built from 768 Lohi neuromorphic chips, which imitates the functioning of 100 million neurons – the equivalent of the brain of a small rodent. According to Intel, the system consumes less than 500 watts of energy, where-as a standard office computer uses approximately 200 watts per hour.

For example, AlphaGo, Google’s AI that crushed all the top Go champions in 2017, consumes ten thousand times more energy than a human does when playing the same board game, according to the CNRS. The reason is the separation of the memory and processing cores. To solve this problem, the industry is trying to produce artificial neurons where each has its own memory and computing system. Electronics giants are keenly aware of current systems’ limitations, and IBM, Intel, Qualcomm and Samsung are looking to develop their own neuromorphic chip. In March 2020, for example, Intel announced that it had completed its Pohoiki Springs platform, built in two and a half days with a traditional supercomputer. It only took three minutes and twenty seconds for Google’s quantum processor to solve an extremely complex calculation, whereas it would have taken the most advanced computers currently available 10,000 years to do so. Was it a marketing ploy? IBM quickly countered the article, putting Google’s advance into perspective. In a note published on its blog, Big Blue said it successfully completed the calculation in question in only two and a half days with a traditional computer. This back-and-forth is proof that the quantum computer war is well under way. All the big names, such as IBM, Google and Intel, are working on this technology, which was long confined to the depths of research labs.

Imagined in the early 1980s by Richard Feynman, winner of the Nobel Prize for Physics, quantum computers will revolutionise computing. In regular chips, information is encoded in the form of bits that take one of two values – 0 or 1 – based on whether or not there is an electric current passing through a transistor. Conversely, quantum bits (qubits) can take both 0 and 1 simultaneously. It is due to this strange property that quantum computers are incredibly fast, feverishly working to solve problems that take traditional computers 100 million years. For example, AlphaGo, Google’s AI that crushed all the top Go champions in 2017, consumes ten thousand times more energy than a human does when playing the same board game, according to the CNRS. The reason is the separation of the memory and processing cores. To solve this problem, the industry is trying to produce artificial neurons where each has its own memory and computing system. Electronics giants are keenly aware of current systems’ limitations, and IBM, Intel, Qualcomm and Samsung are looking to develop their own neuromorphic chip. In March 2020, for example, Intel announced that it had completed its Pohoiki Springs platform, built from 768 Lohi neuromorphic chips, which imitates the functioning of 100 million neurons – the equivalent of the brain of a small rodent. According to Intel, the system consumes less than 500 watts of energy, whereas a standard office computer uses approximately 200 watts per hour.

For example, AlphaGo, Google’s AI that crushed all the top Go champions in 2017, consumes ten thousand times more energy than a human does when playing the same board game, according to the CNRS. The reason is the separation of the memory and processing cores. To solve this problem, the industry is trying to produce artificial neurons where each has its own memory and computing system. Electronics giants are keenly aware of current systems’ limitations, and IBM, Intel, Qualcomm and Samsung are looking to develop their own neuromorphic chip. In March 2020, for example, Intel announced that it had completed its Pohoiki Springs platform, built from 768 Lohi neuromorphic chips, which imitates the functioning of 100 million neurons – the equivalent of the brain of a small rodent. According to Intel, the system consumes less than 500 watts of energy, whereas a standard office computer uses approximately 200 watts per hour.

But don’t expect to have one in your home. In order to function, quantum chips need to be kept at extremely cold temperatures close to absolute zero (-273°C). “We imagine that quantum computers will remain in the cloud and there will be a sort of quantum internet available so that everyone can benefit from this extra-thick ‘cloud computing power,’” says Ionescu, a professor at EPFL. “But we’re still very far from that. We still need at least 20 or 30 years of research.”
Artificial intelligence is a gold mine for the semiconductor industry. According to consultancy firm IHS Markit, the sector will triple in size over the next six years to reach $128.9 billion in 2025, compared to $42.8 billion in 2019. Thus far, the market is primarily split between two players: Intel and Nvidia. But these two companies are being increasingly challenged by other established ones such as AMD, as well as by a swarm of start-ups that have innovative technologies of their own. One of the newcomers up against the American old guard is French start-up Kalray, which is making bold moves. After 10 years of research and development, in 2020, the company is beginning production of its Coolidge processor, designed for smart data centres and the next generation of vehicles. We interview Kalray’s CEO, Éric Baissus.

French pioneer Kalray develops smart processors for data centres and autonomous vehicles. We interview its CEO, Éric Baissus.

By Bertrand Beauté

"AI NEEDS SMART CHIPS"

A self-driving car produces a gigabyte (GB) of data per second that needs to be analysed very quickly. For small companies like ours, the fabless model is a considerable advantage. We can rapidly generate revenue without a massive investment in production tools. Currently, our chips are produced by TSMC, which is the largest chip manufacturer in the world, but we could also turn to Samsung or GlobalFoundries. There are also initiatives to develop production capacities in Europe and we’re actively participating in those.

You are developing “smart” chips. How are those different from chips that are already on the market?

Smart systems need to process a massive amount of data in order to make critical decisions in real time. A self-driving car, for example, produces a gigabyte (GB) of data per second that needs to be analysed very quickly in order to decide what to do next, such as accelerate, turn or brake. But current artificial intelligence algorithms use a lot of energy and computer processors aren’t built to process such a large amount of information so quickly. So there’s a real demand for smart chips that are truly built for the demands of AI, meaning they are both very powerful and energy-efficient.

Kalray is one of the pioneers in this field. For more than 10 years, we’ve been developing a new type of chip, a Massively Parallel Processor Array (MPPA). This technology is called “manycore”, our Coolidge processor, which we are currently rolling out to our clients, has 80 cores which can process 25,000 billion operations per second, with an energy consumption of only 5 to 25 watts (which ranks it at the same performance level as the Jetson Xavier processor from Nvidia, which is a leader in the field). As a comparison, a desktop computer has four cores and consumes about 100 watts of energy. With our product, we are targeting two markets: smart data centres and the next generations of vehicles, particularly smart vehicles.

Why would you increase the number of cores in a processor?

It’s a bit like putting multiple engines in a car. Fifteen years ago, semiconductor manufacturers only looked at the clock frequency, that is, the speed at which the engine runs. But they reached a limit: beyond 3.5 to 4 GHz, processors overheated. To solve this problem, manufacturers reworked the architecture of their chips to accommodate several cores, allowing each core to run at a lower frequency. The latest smartphones,
for example, contain up to eight cores. But there’s a glass ceiling in the industry; besides Nvidia, not many companies know how to manufacture products that can have up to 50 cores. At Kalray, we have exceeded that limit.

Who are your competitors?
Mainly the traditional companies in the semiconductor industry. For data centres, it’s US companies Broadcom and Intel, as well as Israeli group Mellanox, which was acquired in 2019 by Nvidia for $6.9 billion. For cars, we’re an alternative to Nvidia, which is the market leader when it comes to artificial intelligence used in vehicles.

Kalray chips are stuck using a 16 nm process, whereas your competitors and Nvidia are already at 7 nm. Isn’t that an issue?
There is a movement in the industry towards increasingly smaller transistors, because that improves performance. As a result, 7 nm chips are 30-35% more powerful than 16 nm chips, with 25% less energy consumption. We’re also following the miniaturisation movement, but we’re not in the first wave. Our 7 nm processes will be available in 18 months. This delay allows us to use proven technologies that are less expensive. In terms of the performance difference, our nanocore technology makes up for it.

The automotive sector is particularly affected by the pandemic. Does that call your forecasts into question?
Yes, it would call your forecasts into question. There is a movement in the automotive sector towards increasing small transistors, because that improves performance. As a result, 7 nm chips are 30-35% more powerful than 16 nm chips, with 25% less energy consumption. We’re also following the miniaturisation movement, but we’re not in the first wave. Our 7 nm processes will be available in 18 months. This delay allows us to use proven technologies that are less expensive. In terms of the performance difference, our nanocore technology makes up for it.

And what about data centres?
With the massive adoption of rapid storage memories, data centres will have an absolutely enormous need for computing power and artificial intelligence over the next few years. It’s a new market that is beginning to emerge and will take off, generating approximately €1 billion in 2022. Our goal is to become an industry leader, with a market share of 10% in 2022, meaning €100 million in revenue. We’re already working with server manufacturers such as Taiwanese company Wistron, which is one of the largest producers in the world, as well as French company 2CRSi.

In February, the European Union presented a white paper with recommendations to preserve its sovereignty regarding artificial intelligence. Why is that important?
In the future, many critical systems will be based on artificial intelligence – self-driving cars, of course, but also defence and nuclear power plants. It’s an extremely sensitive area because AI makes decisions for you. So what happens if a supplier country, for example, no longer wants to sell its technologies to another country? All of that country’s strategic activities will be impacted. So it’s critical that the European Union maintains its sovereignty in terms of artificial intelligence.

On 2 April, in the middle of the pandemic, French group NXP invested in Kalray. Did you need liquidity to make it through the crisis?
Having a significant cash flow is obviously positive, and it provides security in these unstable times. But our financial situation didn’t require it. The investment from the NXP group, which is now a shareholder alongside other large companies such as the Renault-Nissan-Mitsubishi Alliance and the Safran Group, proves that NXP is very interested in our processors.

For us, in terms of credibility, it’s a major announcement when a company that’s been known for years in the automotive chip field, with €8.8 billion in revenue, invests in your company, that means your technology really is relevant. It’s also important for our business, because in partnership with NXP, we’re going to develop a shared solution to deploy our technology in the automotive market.

With NXP’s investment, Kalray is now valued at approximately €80 million. In your opinion, is that a fair price for the company?
This valuation was calculated using the average share price in the days leading up to the transaction. Without offering too many thoughts on the development of our valuation, I of course believe that in the medium-term, Kalray could be worth much more if we achieve our ambition of becoming the global leader in processors for new smart storage servers.
China Dreams of Becoming a Semiconductor Giant

Still feeling the sting of US sanctions, Beijing has set its sights on developing its own electronic chip industry. This daunting and costly endeavour is now starting to produce results.

BY JULIE ZAUGG IN HONG KONG

China may have become the world’s factory for new technology, but the country is still struggling to make a name for itself in one sector: electronic chips. “Only 16% of semiconductors used in China are produced domestically,” says Piero Scaruffi, a Silicon Valley historian. “The rest is imported.” In 2018, this dependence cost China $312 billion.

Beijing has wanted to balance that trade deficit for a long time. “Developing a domestic chip industry has been one of the Chinese government’s priorities for at least a decade,” says Len Jelinek, a semiconductor expert with the consulting firm Omdia. In 2014, Beijing set up a $150 billion fund to invest in the semiconductor industry. The Made in China 2025 Plan launched in 2015 established specific targets: under the plan, the country would produce 40% of its chips by 2020 and 70% by 2025.

But the real turning point came on 16 April 2018. On that day, the United States banned American companies from selling their chips to ZTE, one of China’s leading telecommunications groups, which is accused of exporting hardware to Iran. Heavily reliant on US-made computer chips, ZTE suddenly found itself in a chokehold. “That’s when Chinese companies became aware that their access to US technology could be cut off with a snap of the fingers, particularly regarding semiconductors,” says Jeffrey Towson, an American expert on Chinese technology. “That realisation convinced the Chinese government to develop its own semiconductor manufacturing chain to reduce its reliance on the United States.”

Chinese strategy is focused on two main pillars. First, it aims to create national champions from the private sector by offering subsidies, tax rebates and low-interest loans.

National efforts became even more urgent in 2019 when Washington stiffened its sanctions, banning US companies from selling their products to dozens of Chinese firms, including the tech giant Huawei. Economic disaster began to loom, as chips are essential in order to produce Huawei smartphones, IT servers and electric cars, which China mass produces. The next step came in October 2019, when China created another $29 billion fund devoted to semiconductors.

This move has brought several promising firms to the fore, such as SMIC, HiSilicon (a Huawei subsidiary) and the Yangtze Memory Technologies group (see features on p. 44 and onwards). Alibaba, Tencent and the Gree group, the world’s largest air conditioning manufacturer, have also assembled in-house initiatives to produce semiconductors.

In October 2019, China created another $29 billion fund devoted to semiconductors.

At the end of 2019, the Shanghai-based firm Wingtech Technology bought the Dutch semiconductor manufacturer Nexperia. Before that, in 2018, the Beijing conglomerate Tsinghua Unigroup bought the French chip component producer Linxens. Beijing also managed to attract Korean groups Samsung and SK Hynix, US companies Intel and Global Foundries, and Taiwanese firms TSMC and UMC. All have set up joint ventures or opened plants in China.

Thanks to this massive investment, China is starting to catch up with its American competitors. “In terms of chip design, China is only 12 months behind,” says Malcolm Penn, who heads the consulting firm Future Horizons. HiSilicon’s Kirin chips, which now feature in some Huawei smartphones, are some of the best around. Alibaba also unveiled its Hanguang 800 chip in September 2019. The test platform MLPerf, known for its objective industry benchmarks, says the
Hangang 800 outperforms Intel and Nvidia products. Although China has begun designing chips to rival US products, they cannot yet be manufactured in the country. For example, the Hangang 800 chip is built by the Taiwanese foundry TSMC, which produces almost 50% of the chips ordered worldwide, including for Apple and Huawei.

In comparison, SMIC, China’s largest semiconductor maker, has only recently begun manufacturing 14-nanometre chips, while TSMC has launched production of 5-nanometre chips. “SMIC’s semiconductors are always several generations behind those produced by TSMC, with much lower production volumes on top of it,” said Jen-Wu from the consultancy Gmdia points out.

Jeffrey Towson agrees: “Developing a state-of-the-art plant is extraordinarily expensive and requires technical expertise that China doesn’t have.” SMIC’s latest production plant cost $17 billion.

But price isn’t the only problem. More importantly, China lacks the manufacturers. “The highly complex machines used to produce chips are built by a handful of firms in the United States, the Netherlands and Japan,” says Scaffetti, Silicon Valley historian. And those manufacturers tend to focus on their long-standing customers, like Samsung, TSMC and Qualcomm, which currently dominate their revenue base.

Exacerbating matters, the Trump administration is doing everything it can to make sure China can’t acquire the best machines for its plants. In 2019, it pushed the Dutch group ASML to cancel the sale of one of its photolithography machines to SMIC.

China’s workaround is to invest in the memory chip market, which is more accessible than the processor market. “Memory chips are relatively easy to produce for new players to emerge (see p. 58),” says Towson. “But Beijing has higher ambitions. ‘China wants to lead chip design for artificial intelligence,’ Towson says. ‘Because this is a new area, no major unifying standards have been set.’ This virgin territory is a perfect place for new players to emerge (see p. 58).”

“The debate isn’t about whether China can make chips, it’s about whether China will eventually dominate the chip industry,” Towson adds, “but whether the reversal of fortune will take place in three years or ten.”

Don’t be evil: how big tech betrayed its founding principles — and all of us

By Rana Foroohar

“Don’t be evil”: this saying from Google’s early beginnings promised a radiant future in which technology would inevitably make the world a better, safer and smarter place. Twenty-odd years later, we are now faced with digital surveillance, erasure of private life and the emergence of fake news, and our reality seems quite far from the utopia that was first predicted. Rana Foroohar, an American journalist specialising in new technologies who writes for the Financial Times, describes how we’ve arrived at this point and the ways in which we can still resist.

American oligarchs: the Kushners, the Trumps, and the marriage of money and power

By Andrea Bernstein

In American Oligarchs, investigative journalist Andrea Bernstein delves into the saga of the Trump and Kushner families. Based on hundreds of interviews and more than 100,000 original documents, the author meticulously retraces the recent history of these two families, from their arrival in the United States to their rise to supreme power. A fascinating book that reads like a novel, shedding raw light on the inner workings of this new American oligarchy.
Etsy is the latest Wall Street wonder: part tech stock, part vintage and handmade knick-knacks. Could it be a metaphor for the post-pandemic world? Created in 2005 by amateur cabinetmaker Robert Kalyn and two of his friends in Brooklyn, the e-commerce platform is now home to a community of 2.7 million creatives of all kinds who sell their products, and more than 47 million buyers of handmade or vintage items. Jewellery, accessories, crafts, gift ideas, furniture, clothing – you can find a little bit of everything on Etsy, from the sleekly designed to the unapologetically kitsch. In 2019, the company, which has over 1,200 employees, made sales of $5 billion in gross value of goods, up 26.5% compared to the previous year.

But Etsy, listed on the Nasdaq since 2015, struggled to capture the interest of investors in recent years. After fluctuating, its share price reached its lowest in two years in March, coming in at under $30. But then came an announcement from US President Donald Trump that reversed the trend: since then, Etsy jumped nearly 69% in April, compared to 15.4% for the Nasdaq Composite index, and the homemade craft empire is one of the biggest winners of the COVID-19 crisis.

Most of the United States is under stay-at-home orders and given the soaring unemployment rate, there is hardly a lack of labour. More than 60,000 people answered the call and started up their sewing machines. Etsy quickly reconfigured its search engine to showcase the masks. As a result, Etsy sold more than 12 million handmade masks in April – worth $133 million – and brought in four million new customers. Even better, non-mask sales were up 79%, as the traffic brought in by the masks benefited the rest of the site.

Early fans of the platform often lament that the company, which once promoted friendliness and internal consensus, has lost its soul over the years as CEOs came and went. But on paper, Etsy’s mission remains the same: “Keep commerce human”, which means allowing creatives to profit from their production in a sustainable, responsible way. This is the opposite of the “mass market” approach taken by competitor e-commerce platforms, which have also benefited from the health crisis.

“COVID-19 has transformed adverse conditions into favourable winds for Etsy, and the platform was able to gain new customers and re-engage old ones,” said the analyst, who commends the company for capitalising on this windfall to strengthen its marketing efforts. But it does point out that the macroeconomic slowdown could spread to Etsy sales, as the products sold on the platform are essentially discretionary goods. With the exception of masks, of course.

“The masks are an excellent example of the capacity of this platform and its sellers to meet a demand for necessary equipment, which grows its potential market,” says Tom Forte, an analyst at DA Davidson. According to Forte, who has followed the company for a long time, this “is one of the best achievements in Etsy’s history”. Of course, this now drives up its earnings outlook. In early May, Etsy revised its predictions upwards for Q2, predicting between $310 and $340 million in revenue (an increase of 70%–90% over one year) compared to the $213 million expected by analysts.
Last October, fashion models took to the catwalk of the Hôtel Salomon de Rothschild in the heart of Paris to strut their stuff amid a frenzy of camera flashes. They wore oversized trench coats, luxurious down jackets and sleek schoolgirl dresses. The fashion show, named “China Cool”, was organised by the Chinese e-commerce platform Tmall. The purpose of the event was to present a series of Chinese fashion brands that have become cult-favourites in their home country.

“Made in China” can no longer be associated with cheap, poor-quality products. In recent years, China has seen the emergence of brands that have as much (if not more as far as Chinese consumers are concerned) cachet as their Western inspirers. “It started around a decade ago, with the arrival of Chinese designers who had trained at leading European or American fashion schools, such as Masha Ma and Huishan Zhang,” explains Babette Radclyffe-Thomas, an expert in Chinese fashion. “Then over the past three years, ‘cool’ consumer brands have appeared.”

Some have only just emerged, such as the Perfect Diary cosmetics group founded in 2017. Others are established fashion houses that have skillfully reinvented themselves, an example being the sportswear manufacturer Li-Ning.

These brands have various identities. Fashion labels like Peacebird, Bosideng and Urban Revivo mix the codes of fast fashion, typical of places such as Zara, with traditional Chinese motifs. Meanwhile, Roaringwild, Hi Panda and Wookong, three brands created less than 10 years ago, have taken inspiration from streetwear.

“More recently, we have seen the arrival of names that play on retro imagery, a first in China where people generally look to the future,” says Dao Nguyen, founder of the consulting firm Essenza. This can be seen in Li-Ning’s ‘80s-style trainers, the modernisation of Pechoin cosmetics, White Rabbit candies, and soaps from The Shanghai Soap Co., all brands created before the advent of the People’s Republic of China in 1949.

**Androgynous cosmetics**

In the field of cosmetics, “successful brands have adopted the androgynous codes of the video game and cosplay platform Bilibili, extremely popular among China’s Generation Z”, notes Elijah Whaley, a specialist in Chinese digital marketing at the Park Lu agency. In addition to Perfect Diary, the brands Kaleidos and Hedone are following this aesthetic inspired by the world of manga.

This new Chinese wave came about after a major societal change. “The generation that grew up in the ‘80s and ‘90s, the one that rebuilt the country after the Cultural Revolution and transformed China into the ‘workshop of the world’, is starting to give way to a cohort of younger consumers, who are familiar with global trends and want to see their country stand out on the international scene,” says Nguyen.
This patriotism has completely transformed the perception of the “Made in China” label. “The term is no longer associated with poor-quality or old-fashioned goods, not at all,” notes Janet Tsai, a specialist in Chinese brands at the firm Ogilvy. “Alongside this, Western brands have lost some of their prestige among Chinese consumers.”

Moreover, Chinese brands have the added advantage of having an in-depth knowledge of local trends and preferences. “A Chinese cosmetics brand is not going to market a line of lipsticks with purplish or bluish shades: they simply do not work with Chinese consumers,” notes Babette Radclyffe-Thomas.

Similarly, fashion designers can use the data gathered by e-commerce platforms such as Tmall – which represents their main sales channel – to analyse the products that work best and adapt their next collection accordingly.

Most of these brands have also turned to community marketing, which is very popular with young Chinese consumers. They are present on social networks like WeChat, invest in streaming platforms such as TikTok, and establish partnerships with “influencers” who will promote their products.

Some go even further. “Perfect Diary has created a virtual avatar called Xiao Wanz, which invites consumers to join private chat rooms where they are presented with exclusive products, given make-up tips, and offered special promotions,” explains Whaley. “It is a sort of personalised marketing that guarantees consumer loyalty,” he adds.

“These brands don’t really need to export... the Chinese market is already large enough” Babette Radclyffe-Thomas, expert in Chinese fashion

Expanding to New York and Paris

Although holding a strong position in their domestic market, Chinese brands are struggling to establish themselves abroad, the negative image of “Made in China” proving difficult to shake. This was made clear by the Bosideng clothing company, which ventured to London and New York a few years ago. “Its shops were unsuccessful because Western consumers had not heard of the brand and the French Moncler was already well established on the luxury down jacket market,” says Radclyffe-Thomas. The New York outlet thus closed in 2016.

Li-Ning, on the other hand, is starting to gain attention outside of China, thanks in particular to collaborations with the American basketball player Dwyane Wade and the Berlin design firm Random Identities. Its products are now sold in a handful of specialised outlets in London, New York and Paris.

Meanwhile, Peacebird, Urban Revivo and Perfect Diary are targeting the Asian market, with shops and online sales channels set to open in Singapore, Malaysia, Thailand and South Korea.

However, as Radclyffe-Thomas points out, these brands don’t really need to export: “The Chinese market is already large enough”. According to market research company eMarketer, by 2021, China will have replaced the United States as the largest consumer market in the world, with sales equivalent to $5,800 billion.

BOSIDENG  THE CHINESE MONCLER
Established in 1975, Bosideng was originally a supplier of down jackets for brands like Adidas and North Face. Then, in the early 2010s, the Hong Kong-based brand began to promote its own line of luxury down jackets, even opening outlets in New York and London. In China, it now has the same status as Canada Goose and Moncler, thanks in particular to prestigious collaborations with designers like Tim Coppens and Antonin Tron. For the financial year ending March 2019, the company listed on the Hong Kong Stock Exchange saw its revenue grow by 17% to 12.1 billion yuan ($1.7 billion).

HEADQUARTERS: SHANGHAI
EMPLOYEES: 4,400
2019 REVENUE: 12.1 BN

PEACEBIRD  THE HIPSTER’S FAVOURITE
The Peacebird brand, based in the city of Ningbo, has existed for more than 25 years. Having long been limited to secondary cities in China, it repositioned itself about two years ago to seduce hipsters from the country’s major metropolises, thanks to a series of collaborations with cutting-edge designers. Its latest collection combines futuristic sportswear and pieces inspired by the world of Harry Potter. Listed on the Shanghai Stock Exchange, it saw its sales reach 7.8 billion yuan ($1.1 billion) in 2019, up 3%.

HEADQUARTERS: NINGBO, ZHEJIANG
EMPLOYEES: 14,000
2019 REVENUE: 7.8 BN

LI-NING  THE STAR OF SPORTSWEAR
Named after its founder, a gymnast and Olympic medallist, Li-Ning was created in 1989. “It was long considered a cheap sportswear brand lacking in technology,” notes Dao Nguyen, founder of the consulting firm Essenza. But everything changed in 2017! A high-end division was created and products were sold only in luxury boutiques in China. It later began making appearances at Fashion Weeks and selling its products in trendy shops in the West. In 2019, its revenue increased by 32%, reaching 5.77 billion Hong Kong dollars ($1.79 billion). The brand now enjoys cult popularity thanks to its retro trainers and clothing.

HEADQUARTERS: BEIJING
EMPLOYEES: 3,000
2019 REVENUE: 5.77 BN

RODGEND  THE FASHION DESIGNER
Established in 1943, the brand famous for its iconic milk candies – a brand, a brand founded in 1943, has been successfully updated. Here a store in the city of X’ian, in Shaanxi province (2019).

Milk candies from White Rabbit, a brand, a brand founded in 1943, have been successfully uploaded, here a store in the city of X’an, in Shaanxi province (2019).
Raja Ampat: an underwater technicoloured dream

In need of a far-flung trip? Swissquote Magazine whisks you to the coast Papua, in anticipation of better days.

By Julie Zaugg

Travelling to Raja Ampat is an adventure in itself. To get there, you must first head to Jakarta, the capital of Indonesia. From there, take an aeroplane to Sorong, a small dusty city on the western tip of Papua, one of the wildest provinces in the gigantic archipelago made up of more than 17,000 islands. From there, take a ferry, then switch to a speedboat. The sea travel takes more than four hours in total.
As soon as you arrive in Yeben, a small island of only 1.6 sq. km covered in thick jungle and surrounded by white sand, you will immediately forget any travel fatigue. Palm trees sway gently in the warm, humid breeze. Bright orange hermit crabs crawl slowly along the beach. Birds sing melodious songs from atop the tree canopy. Other than about 10 wooden bungalows along one side of the island, there is no trace of any human presence.

DIVE IN RAJA AMPAT

All hotels have their own dive centres with certified instructors. Most dive sites are less than an hour from the resorts by speedboat. Resorts offer all-inclusive packages which can include 2 to 4 dives per day, one of which may be a night dive. Snorkelling fans are also welcome to join these expeditions. Most of the sites are no deeper than 5 metres, which is perfect for snorkelers. Visibility is excellent – except from June to mid-September when the wind picks up - and the water temperature remains between 28 and 30 degrees all year round.

As soon as you put on a diving mask, you'll see at least four rays. They move in a kind of aerial ballet, moving their large fins along the ocean floor; giant clams, which are fluorescent blue and can grow to almost two metres in size; and tiny pygmy seahorses, which change colour to blend in with their environment.

And of course the majestic manta rays. You can find them on a rocky point, where they clean themselves. Boats are not allowed to dock there, so visitors have to swim a few hundred metres to reach it. As soon as you put a diving mask on, you'll see at least four rays. They move in an aerial ballet, moving their large wings and putting on a show for astonished divers.

Tourism is a recent development. The first hotels began to appear around 2010, following a series of government programmes put in place to train local residents in tourism careers and provide subsidies to families wishing to open homestay accommodation.

But unlike other Indonesian islands popular among travellers, such as Bali or the Gili Islands, there are no nightclubs, restaurants or hotel chains on Raja Ampat. Instead, there are a series of high-end resorts focused on eco-tourism. Built entirely from wood, the resorts do not use PET bottles or plastic cutlery, and have an airy architectural style that makes air conditioning unnecessary. The resorts only serve local food, such as fresh fish and tropical fruit.

These efforts are supported by locals. “At Raja Ampat, fishermen impose Sasi laut, a moratorium of six months from April to September, to allow the fish populations to grow again,” said Huwae. The government has limited the number of visitors to 50,000 per year and have designated areas where fishing is forbidden entirely.

These measures are not just beneficial to nature. For swimmers, floating between fish without any other humans or plastic in the water is a unique experience that has unfortunately become all too rare.
ADD A DASH OF COLOUR TO YOUR PORTFOLIO

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Rainbow Rights Certificate
ISIN: CH0521605466
Symbol: RIGHTQ

swissquote.com/rainbow
CYCLING JERSEYS MADE IN SWITZERLAND

Zug outfitter Qloom has added some fun to its latest collection of cycling clothes, which are both stylish and technical. The close-fit styles are made from light, breathable materials. We particularly like the azure blue short-sleeve Lennox Head jersey, which makes us think of Australia.

qloom.com
CHF 99.-

GREEN SURFING

Based in Montpellier, the start-up Yuyo specialises in environmentally-friendly surfboards that are made on demand. The boards are 3D-printed from plastic waste and layered with non-polluting bio-composite materials. The design and tech specifications can be completely customised.

yuyo.surf
From CHF 874.-

TABLE BARBECUE

Cookut reinvents the art of grilling with its barbecue grill that can be placed directly in the middle of the table. Mobile and compact, it can cook up to 20 sausages, eight skewers or beef ribs, either at home or away, thanks to its convenient carrying case. The grill is easy to use and can be set up in less than 10 minutes. Just pour water in the lower tray and place charcoal in the upper tray.

cookut.com
CHF 105.-

SPORTY ELEGANCE

The third generation of the TAG Heuer Connected watch, the latest from the Swiss watchmaker, is focused on versatility. Inspired by the brand’s classic watches, it combines design with everyday functionality and sport monitoring. Equipped with multiple sensors and an integrated GPS, the watch measures performance during activities such as golf, running, cycling, walking and fitness workouts.

tagheuer.com
From CHF 1,750.-

A SMART GREENHOUSE ON YOUR BALCONY

Grow organic food at home with a smart greenhouse from start-up Myfood. The City model is 3.5 m² and can produce up to 100 kg of fruits and vegetables thanks to an ecosystem that is a mix of permaculture and aquaponics. A dedicated app helps growers monitor the greenhouse from afar and regulate temperature, humidity levels and soil pH.

myfood.eu
From CHF 5,000.-

SWISS QUALITY

Swiss brand Scott, renowned for its mountain bikes, also knows how to design electric ones. Demonstrating this is its new urban model “Silence eRIDE”, in particular the luxurious EVO version equipped with a carbon fork. Very manoeuvrable, with high-performance integrated daytime running lights and capable of going at 45 km/h using its Bosch engine, this bike is attractive in the post-pandemic era.

scott-sports.com/ch
CHF 6,699.-

A SMART GREENHOUSE ON YOUR BALCONY

SWISS QUALITY

Play Like Messi

In partnership with Google and EA Sports, Adidas is launching its GMR connected insole with a chip inside that can be worn in football cleats. The device functions like a tracker and the wearer’s sport performance in real life can be transferred to the video game FIFA Mobile. It records distance travelled, speed, and the number and power of passes and shots.

adidas.ch
CHF 39.95.-

Table Barbecue

In partnership with Google and EA Sports, Adidas is launching its GMR connected insole with a chip inside that can be worn in football cleats. The device functions like a tracker and the wearer’s sport performance in real life can be transferred to the video game FIFA Mobile. It records distance travelled, speed, and the number and power of passes and shots.

adidas.ch
CHF 39.95.-

Sporty Elegance

The third generation of the TAG Heuer Connected watch, the latest from the Swiss watchmaker, is focused on versatility. Inspired by the brand’s classic watches, it combines design with everyday functionality and sport monitoring. Equipped with multiple sensors and an integrated GPS, the watch measures performance during activities such as golf, running, cycling, walking and fitness workouts.

tagheuer.com
From CHF 1,750.-

A SMART GREENHOUSE ON YOUR BALCONY

Grow organic food at home with a smart greenhouse from start-up Myfood. The City model is 3.5 m² and can produce up to 100 kg of fruits and vegetables thanks to an ecosystem that is a mix of permaculture and aquaponics. A dedicated app helps growers monitor the greenhouse from afar and regulate temperature, humidity levels and soil pH.

myfood.eu
From CHF 5,000.-

Swiss Quality

Swiss brand Scott, renowned for its mountain bikes, also knows how to design electric ones. Demonstrating this is its new urban model “Silence eRIDE”, in particular the luxurious EVO version equipped with a carbon fork. Very manoeuvrable, with high-performance integrated daytime running lights and capable of going at 45 km/h using its Bosch engine, this bike is attractive in the post-pandemic era.

scott-sports.com/ch
CHF 6,699.-

A SMART GREENHOUSE ON YOUR BALCONY

Play Like Messi

In partnership with Google and EA Sports, Adidas is launching its GMR connected insole with a chip inside that can be worn in football cleats. The device functions like a tracker and the wearer’s sport performance in real life can be transferred to the video game FIFA Mobile. It records distance travelled, speed, and the number and power of passes and shots.

adidas.ch
CHF 39.95.-

Sporty Elegance

The third generation of the TAG Heuer Connected watch, the latest from the Swiss watchmaker, is focused on versatility. Inspired by the brand’s classic watches, it combines design with everyday functionality and sport monitoring. Equipped with multiple sensors and an integrated GPS, the watch measures performance during activities such as golf, running, cycling, walking and fitness workouts.

tagheuer.com
From CHF 1,750.-
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