

SWISSQUOTE

FINANCE AND TECHNOLOGY UNPACKED

FASHION

Kids' clothes at grown-up prices

CANNABIS

Riding high in the US market

THE QUESTION

Do we really need CEOs?

DOSSIER

ECONOMIC WARFARE

THE DARK SIDE OF BUSINESS

Espionage, blackmail, online theft...

ISSN 2296-3278

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The invisible war



By Marc Bürki,
CEO of Swissquote

Are companies much more vulnerable than they think? That's one of the key questions we decided to address in this issue of *Swissquote Magazine*. Whether it involves innovative start-ups or powerful multinationals, economic warfare is quietly growing more intense on all fronts. It's driven by cutthroat competition at the international level, greater mobility and, most importantly, the formidable arsenal of weapons made possible by new technologies.

Nowadays, there seems to be an almost unlimited range of offensive **tools** available to the enemy. They include classic James Bond-style espionage, where cutting-edge cyberwar techniques are used, including legal techniques such as the systematic and thorough analysis of free-access data.

The issue has become so serious that the Swiss authorities are getting worried and have issued a number of awareness-raising documents over the past few months. For instance, the Swiss Federal Intelligence Service produced a twenty-minute film last summer entitled *En ligne de mire* (*In the*

line of fire), which can be viewed on the internet. The film was inspired by real events and tells the story of an R&D director at a Swiss manufacturing company who falls victim to a cleverly orchestrated scheme. It serves as a reminder that human weaknesses are, and always will be, the easiest to exploit.

But not everyone is a victim when it comes to economic warfare. A number of **security** firms, particularly in the digital sector, actually find such conditions beneficial to their business. This well-established market is attractive for investors, but represents just the tip of the iceberg. It doesn't reflect all of the dangers companies face...

Christian Harbulot, director of France's School of Economic Warfare and an expert in economic warfare, goes even further in an interview appearing in this issue. He discusses the importance of cyberwar, comparing it with the planned offensives in politics and law. The picture he paints is rather grim. But you know what they say? All's fair in love and economic war...

Enjoy!

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DOSSIER

ECONOMIC WARFARE

THE DARK SIDE OF BUSINESS

28



SCANS

CANNABIS



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FASHION



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PUBLISHER

Swissquote
 Chemin de la Crétaux 33
 1196 Gland - Suisse
 T. +41 44 825 88 88
 www.swissquote.com
 magazine@swissquote.ch

Manager

Brigitta Cooper

EDITORIAL

Editor-in-chief

Ludovic Chappex

Editorial consultant

Rinny Gremaud

Design director

Natalie Bindelli and Caroline Fischer
 CANA atelier graphique
 Route de Jussy 29 - 1226 Thônex
 www.ateliercana.ch

Editorial staff

Mehdi Atmani, Clément Bürge,
 Rinny Gremaud, Benjamin Keller,
 Sylvain Menétrey, Philipp Müller,
 Geneviève Ruiz, Gaëlle Sinnassamy,
 Armelle Vincent, Julie Zaugg

Layout

Natalie Bindelli, Caroline Fischer,
 Coralie Meder (CANA atelier graphique)

Cover

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Photography

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Ose Ayewoh

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Technicis Finance

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SCANS

insurance

SGS INSPECTS FOOD DNA



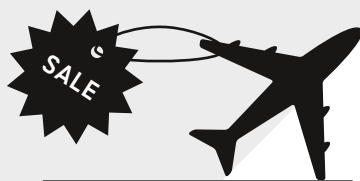
SGS

SGS (Société Générale de Surveillance) acquired 70% of Portugal-based Biopremier, a company specialising in genetic sequencing of food samples. Biopremier developed a programme that can precisely identify the presence of allergens or whether the food was made from meat or vegetable products. Notably, this tool can also detect mislabelled or rotten food. SGS also bought the Ticino-based laboratory C-Labs, whose research on artificial intelligence will be used in these food inspections. — UHN SGSN



“Every large company is on the brink of death at least three times.”

Daniel Ek,
CEO of Spotify



£56

Next summer, travellers will be able to cross the Atlantic for £56 with Norwegian Air. The flight connects Edinburgh with an airport in the New York area. This offer is made possible thanks to the recent acquisition of a new Boeing fleet that is very fuel efficient.

watchmaking

SWATCH WANTS TO OUTDO TESLA

Swatch is working on a prototype for a new battery for electric vehicles under its subsidiary Belenos Clean Power. The cells would be manufactured with a vanadium base, which is a metal, instead of the rare minerals that are typically used. The new batteries would be less expensive to produce, as well as lighter and faster. They weigh a third less and can recharge two times faster than Panasonic batteries, which are used in Tesla vehicles. The innovative batteries will first be tested in drones, scooters and electric bicycles, before being used in vehicles in 2017. Swatch hopes to

make a \$10 billion profit from electric batteries by 2020. — UHRN



SWATCH GROUP



Driverless electric minibuses on demand that you can order from an app? That's Volkswagen's next big plan. Its future ID Buzz (opposite) could be the vehicle to kick off VW's upcoming service called MOIA.

VOLKSWAGEN

*automotive***VW WILL OPERATE A FLEET OF ELECTRIC MINIBUSES**

Volkswagen is betting on mobility of the future with MOIA, an independent subsidiary that will manage a fleet of electric minibuses in several European cities. With an application, users can order one of the buses before heading to the nearest station. The German manufacturer is creating new pros-

pects for its vehicles and anticipates the decline of the traditional model of the individual vehicle. Competitors are on the same wavelength. General Motors has invested \$500 million in the car sharing service Lyft, and Ford has a robo-taxi project in the works.

— VOW, GM, F

*security***DORMAKABA STRENGTHENS ITS US PRESENCE**

Swiss lock manufacturer Dormakaba acquired Stanley Black & Decker's mechanical security activities for \$725 million. The acquisition included the brands BEST and GMT in China, but did not include electronic security systems. The Zurich-based company is now among the top three lock manufacturers in the US and has access to customers of Stanley Black & Decker, which includes several companies. The security activities of the tools specialist generated \$276 million in revenue in 2016.

— DOKA

**RANKING****THE TOP SELLING VIRTUAL REALITY HEADSETS**
(in market share)

1. PLAYSTATION VR BY SONY
30%
2. OCULUS RIFT BY FACEBOOK
11%
3. GOOGLE CARDBOARD
8%
4. GEAR VR BY SAMSUNG
7%
5. VIVE BY HTC
6%

— Source: O1consulting.net

THE FIVE COUNTRIES WITH THE LOWEST UNEMPLOYMENT RATES
(end of 2015)

1. QATAR
0.2%
2. CAMBODIA
0.5%
3. THAILAND
0.65%
4. BELARUS
1%
5. BENIN
1%

— Source: Trading Economics and the World Bank

THE FIVE BIGGEST LITHIUM PRODUCERS
(in metric tonnes per year)

1. AUSTRALIA
13,400
2. CHILE
11,700
3. ARGENTINA
3,800
4. CHINA
2,200
5. ZIMBABWE
900

— Source: United States Geological Survey, 2015



2,300

China is Starbucks' second largest market after the US. Currently, China has 2,300 cafes and is expecting to reach 5,000 by 2021. To adapt to customers who are discovering the cafe culture for the first time, Starbucks has introduced green tea lattes and lotus paste cakes.



Due to the low added value [ed: of components for electric vehicles], production jobs will be lost."

Elmar Degenhart,
CEO of Continental

technology

VIRTUAL REALITY WANTS TO ENTER THE CLASSROOM



Virtual reality could make history and geography classes much more fun.

NetDragon Websoft, a company that manages the primary gaming portal in China, wants to deploy virtual and augmented reality in schools. The technology could help students learn by providing an immersive geographical or historical environment. It could also analyse student behaviour to improve the educational experience.

For example, it could show that students with their heads down are bored. The company, listed on the Hong Kong Exchange, recently acquired Promethean World, a UK-based online education provider. With the acquisition, NetDragon Websoft can now access 1.3 million classrooms using Promethean courses. — 777

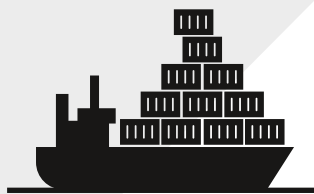
THE FLOP

3D television has lost its appeal

3D television first appeared in 2010 but is no longer popular. Samsung decided not to equip its newest television models with 3D technology. LG, ranked number two worldwide, only offers the 3D option for 20% of its models, compared with 40% in 2015. In the US, flat screens with 3D technology dropped from 23% to 16% between 2012 and 2015. The decline also affects supply. As early as 2012, Canal+ dropped its 3D programming. US sport

channel ESPN and the BBC did the same in 2013. Additionally, the number of films in Blu-ray 3D format are ever decreasing. The technology suffered from the price of the cumbersome equipment needed to view 3D programmes, as well as from the headaches viewers experienced when wearing the special glasses. Now, 3D technology is outpaced by new OLED screens, high-definition technology and virtual reality.

— 005930, 066570



3,800,000

With the acquisition of Hamburg Süd, Maersk will be able to transport 3.8 million containers. The Danish company now holds 18.6% of the global shipping market. Maersk's newest German ally is the seventh largest shipping company in the world and brings expertise in north-south sea routes.



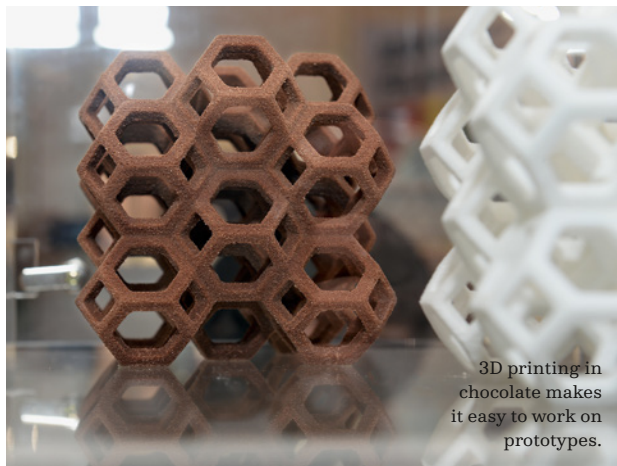
“Leaving London, certainly not.”

Guy de Picciotto,

CEO of UBP, talking about the consequences of Brexit and the presence of the Swiss private bank in the City, in an interview with *Le Temps*.

food

SWISS CHOCOLATIERS USING 3D PRINTERS



3D printing in chocolate makes it easy to work on prototypes.

ROBYN BECK / AFP

Swiss chocolatiers are getting into 3D printing. Nestlé invested in the technology to build prototypes of its newest creations. Barry Callebaut developed chocolate cartridges that can be used in 3D printers made by the Dutch company Byflow. The Zurich-based giant produces a quarter of the world's chocolate and will soon be able to create very elaborate decorations or personalise chocolate for customers. Barry Callebaut is expected to sell this chocolate printing kit to chefs in well-known restaurants by 2018.

— NESN, BARN

KICKSTARTER



ROKBLOK

VINYLS ARE ON THE MOVE

Vinyl is cool again. But in today's mobile era, records are awkward and hard to carry. Pink Donut has taken on this challenge, developing a portable record player dubbed RokBlok. It is a small rectangular block made of bamboo that has a needle, integrated motor and rechargeable battery. RokBlok is placed on a stationary record and rotates around, reading the grooves. Equipped with a mini speaker, RokBlok provides rudimentary sound quality. For better sound quality, it should be used with a Bluetooth portable speaker. RokBlok also has a motion sensor, so that listeners can stop the device with just a wave of their hand.

AMOUNT RAISED
\$294,869

AVAILABLE BY
SEPTEMBER 2017

SCANS

*industry***ABB TRAVELS
TO THE ARCTIC CIRCLE**

Melting ice caps in the North Pole, as a result of climate change, have opened up new sea routes. Commercial ships were the first to take advantage, but cruise ships are also sailing to the region, offering trips to the Arctic Circle. Swiss company ABB developed a special motor built of reinforced steel, making it possible for ships to sail in waters full of ice. It will be fitted on the five new mega yachts being built for Crystal Cruises and Star Cruises, owned by the Malaysian group Genting.

— ABB, GENTING

*drinks***VIETNAM PRIVATISES ITS BEER**

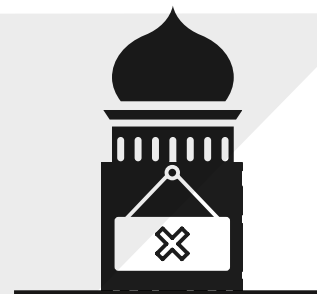
Vietnam drinks the most beer of all Asian countries. It drank more than three billion litres of beer in 2015. The Vietnamese beer market is dominated by two state companies – Sabeco and Habeco – which produce the Saigon and Hanoi brands and generate 62% of all beer sales in the country. Looking to bring in revenue and

revitalise the economy, the Vietnamese government decided to privatise its beer companies. It will sell 90% of Sabeco for \$1.8 billion and 82% of Habeco for \$400 million. Several buyers are interested, including Heineken, who already holds 17% of the Vietnamese market, as well as Carlsberg, Sapporo and ThaiBev. — HEIA



Beer Festival in Hanoi, 7 December 2014. More than 3 billion litres of beer are drunk every year in Vietnam.

HOANG DINH NAM / AFP

**97**

Russia closed 97 banks in 2016. Over the last three years, Moscow only shut down 300. Most of them were deemed financially unstable or non-compliant with money laundering regulations.



ABB will supply the propulsion systems on the future mega-yachts operated by the Crystal Cruises and Star Cruises lines.

ABB



“Our business thrives on free and open global trade. And it definitely creates US manufacturing jobs.”

Dennis Muilenburg,
CEO of Boeing, on protectionist policies proposed by Donald Trump

energy

BAKER HUGHES IS GAINING POWER

Baker Hughes is merging with the oil and gas division of General Electric. The transaction will create an oil services giant worth \$32 billion. It will be the only company that is able to provide solutions in exploring, extracting and selling fossil fuels. It provides significant competition for the other players in this market, especially Schlumberger and Halliburton. The new company, based in Houston and London, expects synergy effects that could save \$1.6 billion by 2020.

— BHI, GE

pharma

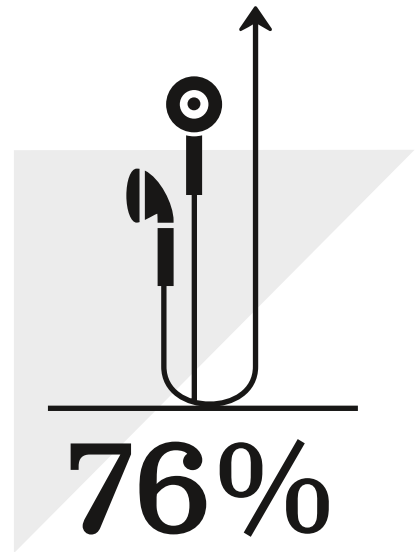
ROCHE MAKES STRIDES AGAINST HAEMOPHILIA



Roche

A new molecule tested by Roche showed promising results. Emicizumab, a treatment for haemophilia A, can reduce and even stop bleeding completely when administered as a preventative treatment or as a replacement for another medication. This treatment could potentially become a key drug and could generate turnover of approximately \$5 billion. Haemophilia A is a disease affecting 320,000 people in the world. The market is currently dominated by Novo Nordisk and Shire.

— RD, NOVOD, SHP



In the US, music streaming increased by 76% in 2016. For the first time, it outranked MP3 files for listening to music. 431 billion songs were streamed last year on platforms such as Spotify, Apple Music and Google Play.

SCANS



“We’re serious about creating fully self-driving cars that can help millions of people, and to do that we have to oversee both the self-driving software and the self-driving hardware.”

John Krafcik,

CEO of Waymo, Google’s self-driving vehicle branch



-9%

Worldwide production of farmed salmon fell 9% because of a sea lice epidemic in Norway and Scotland and a toxic algae invasion in Chile. With demand up 25% during that time, the price of salmon reached 80 Norwegian kroner (approx. 9 CHF) per kilogram in January 2017, a record high.

automotive

TOYOTA AND DAIHATSU INVEST IN A LOW COST MINI CAR

YOSHIKAZU TSUNO / AFP

Akio Toyoda wants to double his market share in India by 2025 (Tokyo, 29 June 2016).



Toyota and its subsidiary Daihatsu will develop a low-cost mini car designed for emerging markets. The Japanese company, whose first entry-level vehicle, Etios, was released in 2010, is targeting the new middle classes in Asia and Africa. In 2016, 19 million cars were sold in these regions and this figure is

expected to reach 30 million by 2023. In particular, Toyota wants to double its market share in India to reach 10% by 2025. It is up against competitors Suzuki, Hyundai and Honda, however, who are already well established in the country.

— TOM

IPO

DIGITAL BEAUTY BRINGS IN \$629 MILLION

Meitu, the Chinese digital beauty company, went public on the Hong Kong Exchange, where it raised \$629 million. Estimated at \$4.6 billion, Meitu is known for its eponymous selfie application, as well as Meipai and BeautyPlus, applications that automatically retouch selfies. Lengthening legs, perfecting a silhouette and instantly applying makeup are some of the automatic features available in the Meitu app, which

has 456 million users, mostly in China. BeautyPlus has begun to make strides in Japan, India and Indonesia. To reach Western users, the company will have to develop new features, such as making the face more suntanned. The company’s main hurdle will be to grow revenue generated by adverts, e-commerce and the sale of virtual stickers. Today, 95% of its income comes from sales on smartphones. — 1357



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IN WINTER
TOURISM
SINCE 1864



TRENDS



the figure

EMMA WALMSLEY



the country

IRAN

The new market

For more than 30 years, Iran's economy was under economic sanctions imposed after the Islamic Revolution in 1979 and more recently because of its nuclear programme. But since the sanctions were relaxed in January 2016, the country is opening up to foreign investment. European companies have been the first to make moves. Airbus signed an agreement to sell 100 aeroplanes to Iran Air,

a transaction valued at \$10 billion. Total obtained the rights to the South Pars gas field. The deal is worth \$4.8 billion. The Dutch-British company Royal Dutch Shell followed, signing an exploratory agreement for two oil fields that could hold 8.2 million barrels. The US was not far behind: Boeing signed a \$16.6 billion agreement with Tehran. Eighty long-haul aircraft are to be delivered by 2018.

Population
82.8 million

GDP per capita
\$4,907

Growth
0.5%

Main industries in the economy
oil and gas, agriculture

The most powerful woman in the FTSE 100

Emma Walmsley will be the head of GlaxoSmithKline (GSK) in April 2017. Walmsley is from the UK, 47 years old and has four children. She joined the British pharma giant in 2017, after spending 17 years at L'Oréal. At L'Oréal, she held several marketing positions and was head of the French company's "consumer goods"

department in China for three years. At GSK, she managed the consumer products department, which generates 25% of the company's revenue and includes non-prescription products, such as the painkiller Panadol and Sensodyne toothpaste. There were frequent rumours that this department would branch out on its own, but now that Emma Walmsley will be CEO, a separation seems less likely.

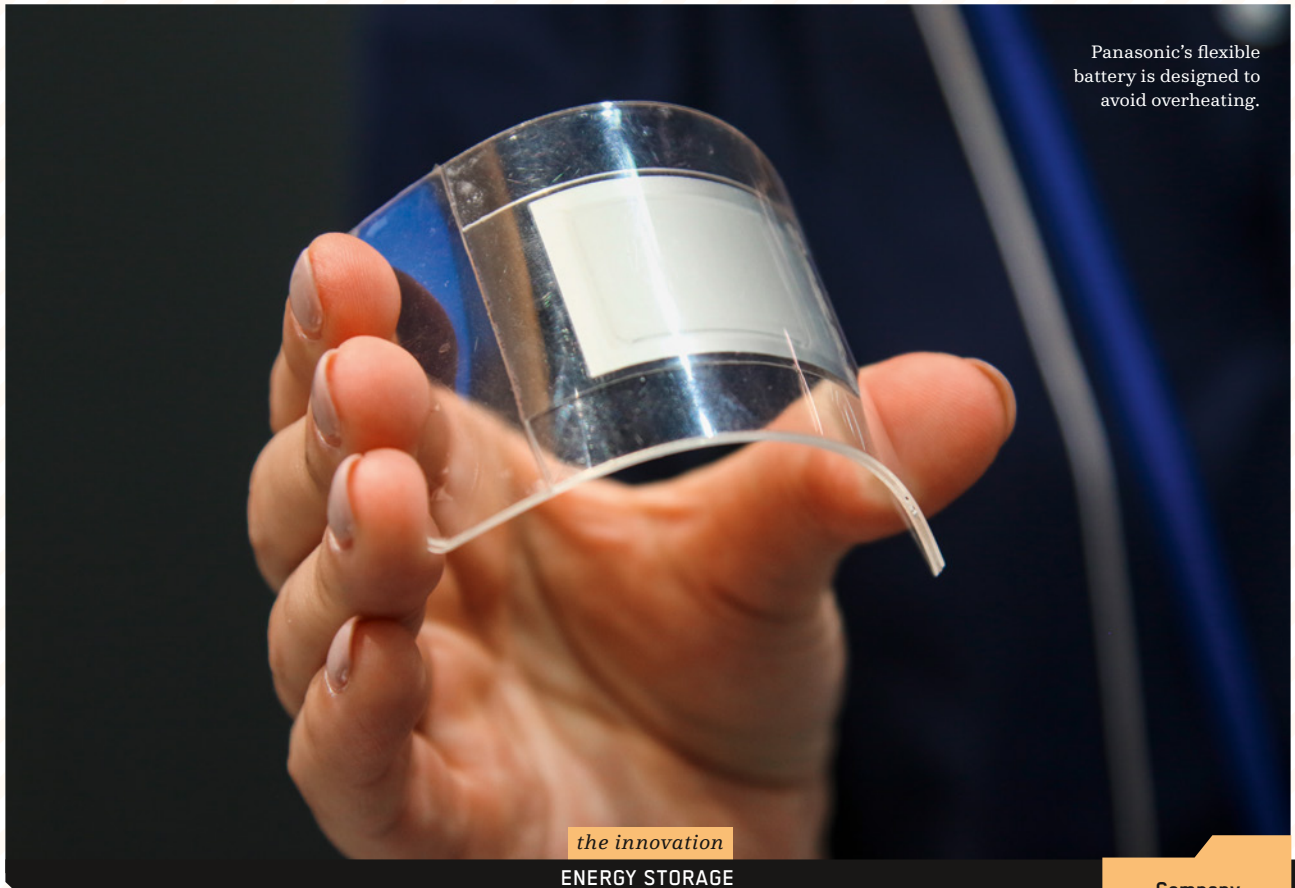
Position
CEO of
GlaxoSmithKline

Age
47

Nationality
British

Panasonic's flexible battery is designed to avoid overheating.

CHRISTOPH DERNBACH / NEWSCOM



the innovation

ENERGY STORAGE

Company
Panasonic

Launch
2017

Estimated cost
undisclosed

A flexible battery for smart clothing

Panasonic is currently developing a new lithium-ion flexible battery. Only 0.55 mm thick, the battery can be twisted and bent to a 25 degree angle without losing its charge, unlike batteries currently used in smartphones. Thanks to this innovative feature, the battery can be integrated into smart clothing or other wearable electronic devices. It is also safer than traditional batteries – for example, the

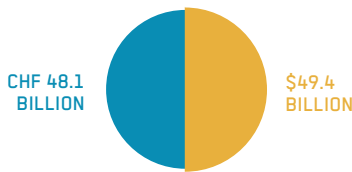
ones that caught fire in the Samsung Galaxy Note 7 and were taken off the market. Indeed, lithium ions tend to build up in a corner of the battery and subsequently explode when they are exposed to oxygen bubbles that the device generates when it is overcharged. Conversely, the flexible Panasonic battery has a laminated internal and external structure and the charge is spread equally over

the surface of the battery, which prevents overheating. At the moment, Panasonic's flexible batteries can only hold anywhere from 17.5 to 60 mAh of energy (comparatively, an iPhone 7 can hold 1,960 mAh), but the company is working on expanding the battery's capacities. — 6752

THE MATCH

ROCHE
VS
NOVARTIS

TURNOVER
(2015)



MARKET
CAPITALISATION



OPERATIONAL MARGIN
(2015)



ONCOLOGY REVENUE
(2015)



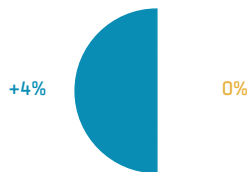
FREE CASH FLOW
(2015)



R&D SPENDING
(2015)



GROWTH
(FIRST NINE MONTHS OF 2016)



PIPELINE VALUE
(UNTIL 2022)



BEST-SELLERS 2015

MABTHERA/RITUXAN
CANCER TREATMENT
(CHF 7 BILLION)



GLIVEC
CANCER TREATMENT
(\$4.7 BILLION)

BY BENJAMIN KELLER

Will Roche dethrone Novartis in pharma? Evaluate Pharma thinks so. With currently the third highest turnover in global prescription sales, Roche will be the leading company in the sector in 2022, according to the US consulting firm. Revenue is expected to hit \$52.6 billion, which is \$100 million more than Novartis.

US-based Pfizer will come in at number three (\$49.1 billion). Roche, which is preparing to lose its patents for three key drugs, can count on its innovations for growth. The company has the best pipeline of products in the industry and will remain the biggest investor in R&D (\$9.9 billion in 2022). It has several blockbuster products in the works

such as Tecentriq, an antibody to fight bladder cancer. The leading company in cancer treatments, Roche is hoping to catch up in immuno-oncology, a lucrative field dominated by companies Bristol-Myers Squibb and Merck. In this segment, Novartis is still several steps behind its local rival.

— RO — NOV

Sources: financial reports, Bloomberg Markets, Evaluate Pharma

CHALLENGE EVERYTHING



GENEVA MONTRES PRESTIGE INTERLAKEN KIRCHHOFER HAUTE HORLOGERIE
LAUSANNE OURANOS LUGANO LES AMBASSADEURS LUZERN LES AMBASSADEURS
ST MORITZ LA SERLAS ZUG FINERY'S ZURICH LES AMBASSADEURS

THE HYDRO
MECHANICAL
HOROLOGISTS

HYT

HYTWATCHES.COM



With Dottikon ES' cutting-edge infrastructure, chemical ingredients can be mass-produced by the tonne.

Markus Blocher's winning bet

In 2005, Dottikon ES broke away from EMS-Chemie. After 10 difficult years, the former TNT manufacturer now specialises in hazardous chemical reactions and is wildly successful.

BY RINNY GREMAUD

Seen from above, the location looks like a hamlet, tucked away in a draughtboard of farmland where train tracks run along the western border. To the north lies a little wood and to the east is a river, as well as fields, forests and other natural barriers that provide protection for the location. Inside are 600,000 square metres of small industrial buildings, silos and metal cylinders of all shapes and sizes in clusters and lines, linked together by kilometres of pipes. One construction site will be new production infrastructure, while another will be an administrative building. Blending into the green Aargau landscape and hidden away from the public, Dottikon Exclusive Synthesis is thriving.

In this case, “thriving” should not be taken lightly. With a 56% increase in its net turnover in the first quarter of 2016/2017 (reaching 67.6 million Swiss francs) and an EBITDA margin of 30% over the same period, this small cap has attracted investors easily. When they learn that the company has no debt, just invested 130 million Swiss francs to increase its production capacity (hence the construction sites), and is expected to increase its workforce (495 as of 31 March, 2016) by 10% in the first three months of 2017, investors are even more intrigued.

A UNIQUE BUSINESS MODEL

Both on the stock market and in the countryside, the company led by Markus Blocher (son of Christoph) seems determined to remain in the shadows. Is this simply collateral damage from a family name that attracts curiosity? Or an entrepre-

neurial strategy that shies away from market short-termism? With only 10% of shares on the market, the company keeps investors well at a distance, only communicating with them the minimum amount required as a listed company.

With only 10% of shares on the market, the company keeps investors well at a distance

So what does Dottikon ES do, exactly? And who holds the other 90% of its shares? As a pharmaceutical partner, Dottikon specialises in high-risk chemical reactions. It experiments with unstable molecules and other reactive substances at very low temperatures or under very high pressure. This work requires specialised knowledge and cutting-edge equipment, as well as mastery of challenging safety protocols. Dottikon’s business model is unparalleled in Switzerland.

“The majority of Dottikon’s work consists of manufacturing active pharmaceutical ingredients and other chemical ingredients that require potentially hazardous experiments,” explained Marc Possa, partner at VV Vermögensverwaltung in Zug. The small- and mid-caps expert has carefully followed the company since it went public in 2005. “Its USP [unique selling proposition] is providing knowledge and safe industrial capabilities to turn risky lab experiments into production on a multi-tonne scale.” ▶

NUMBERS

50

Number of new positions created in the first quarter of 2017

130

million Swiss francs

Amount of investments made between 2016 and 2017

67.6

million Swiss francs

Net turnover in the first half of 2016/2017

56%

Increase in net turnover in the first half of 2016/2017

30.1%

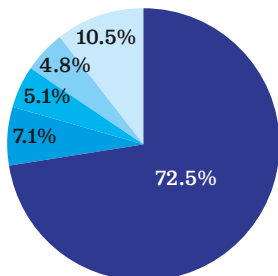
EBITDA margin in the first half of 2016/2017

90%

Percentage of revenue dependent on the pharmaceutical industry

STABLE OWNERSHIP

- Markus Blocher
- Peter Grogg
- Miriam Blocher
- UBS Investment funds
- Free float



(as of 31 March 2016)

A FORMER TNT FACTORY

This unique industrial skill – experimenting with dangerous ingredients on a large scale – stems from the history of the company, which goes back more than 100 years when it was Schweizerische Sprengstoff-Fabrik, or “Swiss explosives factory”. SSF manufactured TNT and other explosives, and therefore was naturally successful during the two world wars. The company then moved on to other dangerous chemical experiments with mixed success. Though accustomed to accidents that regularly killed its teams (in 1927, 1956, 1964, etc.), the factory was completely destroyed in 1969 by one of the largest explosions in Swiss history that killed 18 people and wounded around 40. Newspaper archives claimed the mushroom cloud rivalled that of the atom bomb, creating a crater 40 metres in diameter and damaging 1,300 buildings in the area. The detonation was heard as far as Aarau, 20 km away.

In 1987, Christoph Blocher bought SSF to turn it into a subsidiary of EMS-Chemie. Under Blocher, the company had mixed business success, as well as a few quarrels with local environmental groups over

incinerating toxic waste. In the early 2000s, the subsidiary struggled to integrate with the rest of the group and was restructured.

SUCCESS 10 YEARS IN THE MAKING

Markus Blocher came into the picture in 2003. After receiving his PhD in chemistry from ETHZ and a two-year stint at McKinsey, the younger brother of Magdalena Martullo-Blocher and the only Blocher son joined the family business as the head of EMS-Dottikon. In 2005, the subsidiary broke away from its parent company and went public. Afterwards, Markus Blocher exchanged shares with his three sisters and became the majority shareholder of his company. Freed from the family business and no longer beholden to anyone, Markus Blocher set about making his company a success against all odds. At the time, analysts didn’t think much of this small company specialised in an industry that was already at overcapacity. After going public, the price of Dottikon shares kept falling.

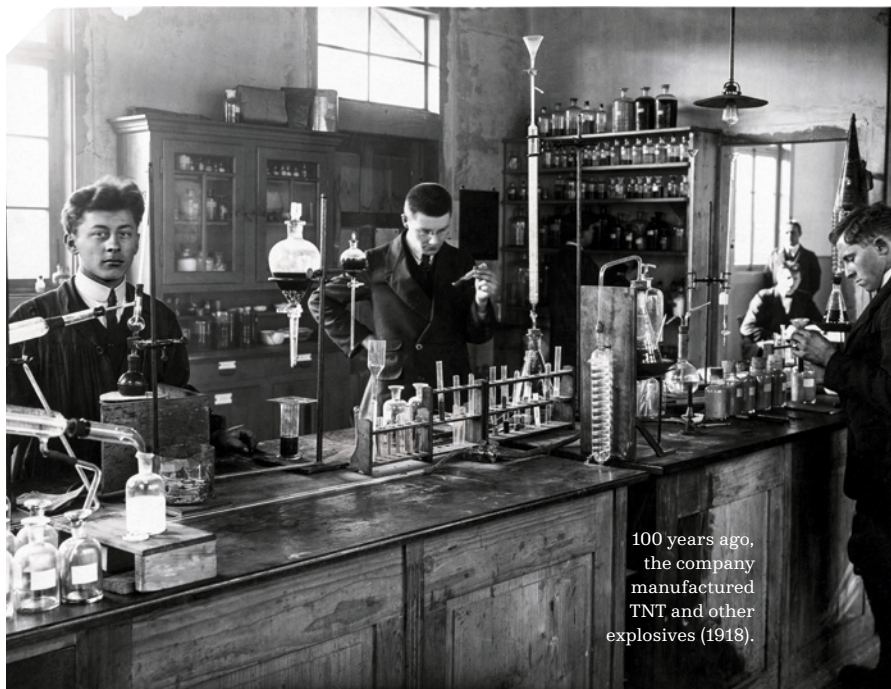
It took 10 years for Markus Blocher to be successful. Between 2005 and

2013, the company lost 40 million Swiss francs, reaching a record low during the 2010/2011 financial year. Dottikon was in the red for four consecutive years, but finally became profitable again in the 2014/2015 financial year.

“The company is not in debt and takes pride in the fact that it is growing without help from banks.”

RELYING ON RESEARCH

“In those difficult years, Markus Blocher regularly increased his stake by purchasing shares,” said Marc Possa. “In March 2016, he held a 72.5% stake in the company. Since the other shareholders had always been stable, Blocher was able to implement a long-term strategy based on research and development, away from the pressures of the financial market. Indeed, 15% of employees have a PhD in chemis-



100 years ago, the company manufactured TNT and other explosives (1918).

DOTTIKON ES

try. Now, as before, the company is not in debt and takes pride in the fact that it is growing without help from banks.”

At a time when pharmaceutical partners are benefitting from a swing in the market (read the analyst’s opinion), Dottikon’s competitiveness and intact investment ability makes it one of the most well-positioned players in the industry. And if its growth prospects are true and the company has invested even more, Markus Blocher would not rule out reducing his stake in the company to finance the investments, according to a 2016 article in *Basler Zeitung* (a newspaper owned by the Blocher family – see p. 22).

HUMAN AND VETERINARY MEDICINE

It remains to be seen what the concrete purpose is of Dottikon’s risky experiments, produced on a multi-tonne scale for its clients. “The only example we give is active molecules in medicine to fight cardiovascular diseases,” said a company spokesperson. “By looking at our website, you can figure out our experiments based on the information we provide on certain processes.” This is assuming you have a PhD in chemistry, of course. “For the other experiments, we can’t provide more details, because the elements we’re manufacturing are protected under patents. Generally, they involve medications that are very useful in human and veterinary medicine, particularly in oncology and immunology.”

This answer is valid for the 90% of its turnover that comes from the pharmaceutical industry. Seven percent of sales come from chemical specialties used in the electronics, polymer, agro-chemistry and cosmetics industries. Another three percent comes from eliminating toxic materials generated by the company. The majority of Dottikon ES’s clients are in Europe (65%) and the United States (30%). ▷



DOTTIKON ES

When the company wasn’t doing well, Markus Blocher, son of the former federal councillor of the Swiss People’s Party, increased his capital share by buying back shares.

ANALYST OPINION

“PHARMA PARTNERS BENEFIT FROM SUSTAINABLE TRENDS”

With a free float of only around 10%, Dottikon does not make it easy for investors looking to benefit from growth. “Its current market value, close to 585 million Swiss francs, is less than one might expect from a company that had such good prospects,” said Michael Nawrath, analyst at Zürcher Kantonalbank. “This is due to technical aspects, among other things. With such a limited free float, the trading volumes in its shares are very low. And what investors fear the most with this type of illiquid position is not being able to sell when they want and at the price they would like.”

However, for investors looking for a medium- or long-term position, Dottikon still has an excellent profile, according to Nawrath. “The company’s net

increase profits this year are not the result of an accounting coincidence, but rather a fundamental trend in the pharma and biotech industries. While big companies are looking to tighten their activity around their core businesses, specialised subcontractors such as Dottikon and Bachem will see their sales grow sustainably.”

Indeed, these two companies just announced at the end of 2016 that they will collaborate closely on a peptide production project. “With only three major players, the peptides market is now a relatively stable niche in the pharma industry, sheltered from a sudden collapse or future concentrations.” Nawrath concludes that Dottikon, alongside Bachem, is in an excellent position to benefit from the upcoming growth.

PARTNERING WITH BACHEM

In October 2016, the company made its partnership with Bachem official via a press release. Bachem's founder, Peter Grogg, already held a 7.1% stake in Dottikon ES (see p. 20). The agreement with the world leader in peptides placed Markus Blocher in a good position on the supply chain that manufactured medicine to fight cancer, neurodegenerative diseases and metabolic disorders such as

diabetes. With an ageing population comes many sustainably lucrative prospects. According to an analysis conducted by Zürcher Kantonalbank, which is very optimistic about the future of Bachem, global peptides sales are expected to triple by 2025.

"Directors of small companies need to be far more opportunistic than their multinational counterparts,"

said Marc Possa. "In big companies, executives spend most of their careers trying not to make mistakes. In SMEs, if CEOs don't take risks, their companies are doomed. This is why small caps post annual yields that are 5% higher than blue chips."

From January to December 2016, the price of one Dottikon share went from 200 to 463 Swiss francs. ▲

— DESN

FAMILY AFFAIRS



Christoph Blocher
76 years

Son of a pastor and seventh child out of eleven, Christoph Blocher trained to be a farmer but then studied law at the University of Zurich. Upon receiving his PhD, he joined the legal department at EMS-Chemie and then ran the department. After the death of its founder in 1979, the company was struggling. Blocher purchased EMS-Chemie in 1983 and was CEO until 2003, when he was voted into the Swiss Federal Council. At that time, he sold his entire holdings to his children. After his ousting from the Federal Council in 2007, Blocher founded the investment company Robinvest, which he manages jointly with his youngest daughter.



Magdalena Martullo-Blocher
47 years

After receiving her degree from the University of St. Gallen, Magdalena Blocher began her career at Johnson & Johnson and Rivella before joining EMS-Chemie in 2001. When her father was elected to the Federal Council, she took on the management responsibilities of the family business in January 2004. She is married to Roberto Martullo and they are both active members of the Swiss People's Party. They have three children. With her sister Rahel, Magdalena holds a majority share of 60.8% in EMS-Chemie via the company Emesta.



Markus Blocher
45 years

After receiving his PhD in chemistry from ETHZ, Markus Blocher worked for McKinsey for two years before joining EMS-Chemie in 2003. He is head of the subsidiary EMS-Dottikon, which went public in 2005. Exchanging shares with his sisters demonstrated his desire to keep his distance from the family business dynamics. He currently holds a 72.5% stake in Dottikon ES. He is married, has seven children and is not a member of the Swiss People's Party.



Miriam Baumann-Blocher
41 years

After receiving a degree in food engineering from ETH, Miriam Blocher worked for Zile Bonbons and then Thurella. As the only child who did not collaborate with her father, Miriam sold the majority of her EMS-Chemie shares in 2007 in order to purchase Lächerli Huus, an unlisted company, of which she is the successful CEO. She holds an 8.9% stake in EMS-Chemie and a 5.1% stake in Dottikon ES. She is married to Matthias Baumann, CEO of Pfister stores, and they have one child.



Rahel Blocher
40 years

The youngest Blocher daughter is also an alumna of the University of St. Gallen. She began her career at Clariant as an auditor and then became the CFO of Elma. When her father founded Robinvest in 2008, she became the CEO. In 2010, Robinvest purchased shares in *Basler Zeitung*. While she refuses to comment publicly, the media believes Rahel is her father's puppet. With her sister Magdalena, the two are majority stakeholders in EMS-Chemie via Emesta, holding 60.8% of shares.

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GENEVE

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THE AMERICAN BRAND SINCE 1851

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P A R I S

MIDO
SWISS WATCHES SINCE 1918

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New Retro

THE QUESTION

Can a company get by without a CEO?

In March 2017, Richard Lepeu, CEO of Richemont, will retire and no one will replace him. At the end of 2016, the company announced they are doing away with the position entirely. It is also reorganising the managerial structure of the company and massively reducing the number of employees. At a time when the luxury sector and watch industry are struggling, can Richemont save money by not having a CEO?



“Yes, but it is not a long-term solution”

“Richemont is an interesting case. Johann Rupert, former CEO, current Chairman of the Board of Directors and majority shareholder, has always acted as if he was the CEO. Eliminating the position only formalises Rupert’s controlling role in the business.

At the same time, the significant management restructuring clearly demonstrates the desire for a generational shift. Directors of the most important departments are now all under the age of 50. Additionally, new cross-disciplinary management positions are opening up, which is a sign that there will be more synergy in the group. I think that this new structure is actually better than it was before. Richemont can make do without a CEO as long as Johann Rupert is Chairman. But I doubt it will last more than five years.”



RENÉ WEBER
Luxury and watch industry analyst at Vontobel



“Yes, but it’s outdated”

“The answer is yes, but it’s an outdated solution. Other companies similar to Richemont have Chairmen who are also CEOs, such as LVMH and Kering. The risk of not having a CEO is that companies lose the big picture and collaborate less. I’m not saying that this is Richemont’s strategy, of course, but giving brands lots of autonomy makes it clear which ones stand out from the rest. This can then be the first step towards selling some brands.

Richemont’s situation also seems to stem from a failed succession. The current CFO Gary Saage, who seemed to be the replacement for Richard Lepeu, is retiring at the same time. This is a sign that the position is quite difficult to fill. The CEO of Richemont is caught between an imposing Chairman and brand directors with strong personalities. According to Johann Rupert, the role of CEO is first and foremost to ‘manage egos’.”



ANAND NARASIMHAN
Leadership professor at IMD



“It depends on the Chairman”

“It depends on who is the Chairman of the board. Johann Rupert has always been the strongman of the company and has always played a significant role in the business. Richard Lepeu’s position was eliminated, but in reality, the operational management was already largely delegated to three solid directors: Cyrille Vigneron, CEO of Cartier, Georges Kern, current CEO of IWC, who will take over the entire watch business, and Jérôme Lambert, CEO of Montblanc, who will also expand his responsibilities to everything besides watches and jewellery. From an operational standpoint, it’s not really necessary to have a CEO.

I suspect, however, that Johann Rupert is laying the groundwork for his son to become the non-executive Chairman of the group. And in that case, the position of CEO will become necessary again.”



JON COX
Watch industry analyst at Kepler Cheuvreux

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DOSSIER

ECONOMIC WARFARE

THE DARK SIDE OF BUSINESS

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- 52 Economic war for the motherland

Large companies are ramping up efforts to weaken their competition, but doing so in increasingly subtle ways.

BY LUDOVIC CHAPPEX

Is it possible to compile a well-researched report on economic warfare without falling back on clichés and conspiracy theories? How can we distinguish between fantastical methods and tactics that large companies use all the time? One thing is certain: any article that could provide a neat, definitive response to these questions is definitely confidential. Despite the fact that multinationals exist in an environment of perpetual economic warfare, the rare official sources on these topics provide only a few statistics on cybercrime. This is not surprising, as not a single player in this war – neither companies nor governments – has an objective interest in unveiling its practices. This is the theory of French economist Christian Harbulot, director of the School of Economic Warfare in Paris, who was kind enough to grant us an interview in this issue (see p. 48). ▶

Dossier prepared by Mehdi Atmani, Clément Bürge, Ludovic Chappex, Rinny Gremaud and Julie Zaugg

By compiling material from experts – often former military personnel or secret service agents – and diving into the available literature, it is nevertheless possible to piece together the main aspects of economic warfare. First, traditional economic warfare, as in industrial espionage or setting up microphones, if that still exists, is progressively moving towards a tenacious war for information, based on meticulous analysis of data and numbers.

The economic intelligence industry most often consists of small, unlisted companies that specialise in gathering compromising information. London-based Hakluyt & Company and New York-based Veracity are two companies that provide personalised consulting services to big corporations. The industry is made up of financial analysts and lawyers who are constantly on the lookout for even the smallest legal and financial irregularities from their competitors.

THE UNITED STATES HAS THE REPUTATION OF GUARDING ITS INTERESTS VERY EFFECTIVELY, OFTEN INVOKING LEGAL ACTION

“Information is the new oil,” said Alain Mermoud, managing director and co-founder of the information portal “Swiss-Intelligence.info”. In today’s digital era, being able to obtain and spread the right information is a key advantage in economic warfare. It has become far less risky and more profitable for companies to obtain this information legally.” Furthermore, many experts believe

that if economic warfare between companies continues to intensify due to ever-increasing international competition and the abundance of available data, obtaining data illegally will be less common.

Morally questionable practices still abound, however, with many “grey areas”: for example, some companies conduct fake hiring interviews, where the only goal is to obtain valuable information about a competitor, rather than to hire the candidate. This is a common practice, as it is easy to hide.

Companies don’t always act on their own, however; countries often defend their strategic economic sectors (see p. 52). This is nothing new. The United States, in particular, has the reputation of guarding its interests very effectively, often invoking legal action. The recent Volkswagen emissions scandal is a prime example, according to Mermoud: “Volkswagen made a serious mistake when they cheated emissions controls. I’m not excusing them. But it is clear that the United States wanted to capitalise on an opportunity and hit Volkswagen hard.” A report (“Les dessous de l’affaire Volkswagen”) published last year by the School of Economic Warfare supports this theory. According to the authors, there is evidence that suggests that Volkswagen’s scandal was “designed to be an informational attack” from the United States.

What about digital crimes, data stealing and other digital espionage? While it is difficult to determine exactly how significant a role these play in economic warfare, digital threats are without a doubt a lucrative business for listed companies that deal with digital security. We discuss these companies in this dossier (p. 40). ◀

TEN TOOLS OF ECONOMIC WARFARE

When it comes to competition warfare, companies can choose from a vast array of methods. An overview of the arsenal available.

BY MEHDI ATMANI, CLÉMENT BÜRGE, RINNY GREMAUD AND JULIE ZAUGG
ILLUSTRATIONS: LAURENT CILLUFFO

1 OLD-FASHIONED STEALING

Li-Li was 22 when she was arrested in April 2005. The Chinese college student had recently begun her trainee programme with the French automotive equipment manufacturer Valeo. She used that opportunity to steal hundreds of computer files containing confidential data. Investigators found encrypted messages from China at her home, along with six computers and two ultra-powerful hard drives.

That is far from an isolated case. One Sunday in September 2011, an employee from the Convertteam plant, a French subsidiary of General Electric, caught Mr Dai, a Chinese trainee, taking photographs from every angle of a prototype for a high-speed boat engine. The 45-year-old reel operator from the province of Shandong had come to spend three months with the French marine

equipment supplier. The next day, he was questioned and deported to his country.

These are examples of the “Chinese trainee” technique, a textbook case for industrial espionage. These days, companies are concerned – and rightly so – about the danger of their IT systems being hacked. But physical data theft remains a reality and a significant threat. “Factory visits offer an opportune setting for this,” says Edward M. Roche, the author of several books on industrial espionage. “A well-informed observer could, for example, take note of the temperature and pressure level used to produce computer chips by simply walking by the machines used to manufacture them.” A French company had the formula for a patented liquid stolen by a member of a Chinese delegation, who

dipped his necktie in it, according to a leaked report from the intelligence agency.

Some companies do not hesitate to bring in private detectives. In the late 1990s, Nestlé hired Beckett Brown International to obtain information about the new products and financial earnings of Mars. The agency sent one of its men, disguised as a cleaning employee, to work at the American conglomerate. The Swiss multinational was able to gather phone-call logs, bank statements, pay slips and information on employee travel.

In 2001, Procter & Gamble hired men to go through the rubbish of its competitor Unilever to find out about its plans to develop new shampoos. They gathered nearly 80 pages of confidential documents.

DIGITAL BREAK-INS

The modern way of stealing sensitive information has its own acronym: APT, which stands for Advanced Persistent Threat. “An APT requires a high degree of dissimulation over a long period,” says Pascal Junod, a cryptography expert and professor at the School of Business and Engineering Vaud (HEIG-VD). This type of attack is designed to install custom malware on one or more computers with code written to perform tasks over long periods under maximum secrecy.

That way, data can be stolen over the course of several months, even years, without being detected. “Hacking is discovered after 260 days on average,” says Alexandre Vautravers, a Swiss security expert.

That is what happened to RUAG, the wholly government-owned Swiss weapons manufacturing giant (see p. 45). The report was released in May 2016 and suggested that malicious code had been operating in RUAG’s computer system since at least September 2014 to steal sensitive information. What information? “We don’t know exactly,” a RUAG spokesperson still says today. Furthermore, “We only know that 20 gigabytes of data were stolen, and that the information did not jeopardise national security.”

What about its business operations? The type of code used seems to point to Russia. But the investigation, which is still going on today, will probably never reveal whether the stolen data could be used by a competitor. The hackers involved

in these incidents are almost never identified, and it’s even rarer to find out who they are working for. Hacking in industrial espionage and economic war has developed too recently for much documented information to be available. It is different from IT sabotage, such as DDoS (distributed denial of service) attacks, stealing passwords and credit card numbers or simply stealing money – all spectacular operations that often catch the most media attention.

“EIGHTY PERCENT OF COMPUTER ATTACKS INVOLVE SOCIAL ENGINEERING.”

Experts agree, however, that installing spyware on a competitor’s system really does happen. It requires careful planning and significant financial resources, suggesting that it is used by government-owned firms or major industrial groups. How often these attacks occur is hard to estimate. And there’s a reason for that. “It is definitely not in a company’s interest to announce that it has been the victim of a cyberattack,” Junod says. “These problems are solved one-on-one.”

But one thing is sure. “Eighty percent of computer attacks involve social engineering,” says Junod. The weak point in any computer system is the humans who use it.

HUMAN WEAKNESS

Anti-espionage experts never cease to reiterate that employees are a company's most vulnerable point. Targeting them is one of the most effective ways of gathering economic intelligence. Various tactics are used to approach them, including reserving a plane ticket next to the person they want to get to talk, going to the same conferences or inviting the person to talk at an event. "Many techniques are available to make someone comfortable and get them to express themselves," says Alain Mermoud, an economic intelligence researcher and co-founder of the Swiss website *Swiss-intelligence.info*. "Such as asking someone how they're doing, giving compliments or using reassur-

ing body language." The target would not even realise that he or she is about to betray the company.

"Some employees are not aware of the value of the information they know," says Nicolas Moinet, a professor at the Management School of Poitiers who has recently published a book on the issue. "A technical staff member doesn't realise that he or she shouldn't disclose financial information about the company, and vice versa."

Attackers can also play on the frustrations of their target. "An unhappy employee tends to talk too much," Mermoud says. Gillette bitterly exper-

rienced this first-hand in 1998, when an engineer from Wright Industries, a firm that was developing its next generation of razors, left slamming the door behind him after an argument with his boss. To get revenge, the disgruntled employee sent drawings of the new device to all of Gillette's competitors: Warner-Lambert, Bic and American Safety Razor.

Money also tends to get tongues wagging. Between 2010 and 2012, Yong Pang, an engineer at Dyson, was given more than £11,500 by the company's competitor Bosch for information on super-powerful motors used in the British appliance manufacturer's hair dryers and vacuum cleaners. Sometimes information can be worth much more. Between 1989 and 1997, an employee from Avery Dennison, an American firm that makes adhesive products, received more than \$150,000 from the Taiwan-based group Four Pillars for a few manufacturing secrets.

Occasionally people play simultaneously on several levels. Walter Liew, a Chinese businessman, kept contact with Tim Spitler, a former engineer at DuPont, for nearly 15 years to cull the manufacturing secret for titanium dioxide, a compound used to create the colour white. Between 1997 and 2011, Liew helped pay for the funeral of Spitler's daughter and gave him \$15,000. Liew would send a gift basket every Christmas. And he knew how to play to the DuPont employee, who was bitter about all the job losses due to his former employer's business strategy in the 1990s.





“USING SEX TO OBTAIN INFORMATION IS A CLASSIC TECHNIQUE.”

4 CRIME AND BLACKMAIL

When the gentle method doesn't work, one can always try tougher tactics. “They spot an employee that has the information they need and dig into that person's past or private life to find vulnerabilities they can exploit,” Edward M. Roche says. “Then they threaten to reveal these secrets to their employer or loved ones if the person doesn't cooperate.”

Employees can sometimes even be pushed to commit crimes. A 2010 report from the French intelligence services explained how a researcher from a large pharmaceutical company

was invited to a dinner party and seduced by a young Chinese woman. The next day, after she showed him the video of their night together that she had taken without his knowledge, he promptly handed over all the information she demanded from him. “Using sex to obtain information is a classic technique,” says a Swiss intelligence specialist.

This form of blackmail sometimes reaches peaks of perversity. Mr Roche refers to the case of a Chinese engineer working in the United States who was contacted by the intelligence

services of his home country to gain confidential information about his work. He refused to deliver it. A few months later, he found out that his brother, who had a mental disability and was living in China a few hundred kilometres from his mother, had been moved close to her home. When the Chinese spies came back to see him, he gave them everything. “The message was clear. If he didn't comply, his brother would once again be moved to the other side of the country, and he couldn't bring himself to subject his mother to that,” the expert says.

FAKE JOBS AND CALLS FOR BIDS

Economic war is waged based on a pile of lies, big and small. “Fake invitations to tender are one of the most effective tactics to gather information about competitors’ offers and prices,” says Eric Denécé, director of the French Center for Intelligence Studies. “They issue an invitation to tender, study the proposals, ask for more details and end up not ordering.” This method also has the advantage of eliminating competitors. “When they’re busy responding to an invitation to tender, they don’t do anything else,” the expert says.

DURING THE INTERVIEW, CANDIDATES ARE ASKED TO GIVE DETAILS ABOUT THE MAIN PROJECTS THEY’VE COMPLETED FOR COMPETITORS

In 2008, the French company ECA Robotics was contacted by the Chinese firm Shenzhen Zhong Zhen Tong, which enticed the European manufacturer with a contract to buy a hundred parts of its robot Inbot. The machines cost €20,000 apiece. But it first wanted to buy one to test, the Asian company said. That first order was honoured, then no news. Two years later, the Shenzhen-based firm came out with its own robot, peculiarly similar to the one designed by ECA Robotics. This technique, as old as time itself, was not invented by the Chinese. In the early 1960s, the US group Douglas Aircraft issued a request for tenders to produce a medium-range aircraft. One of the

applicants, the French company Sud Aviation, had recently developed the Caravelle, the world’s first medium-range jet airliner. Douglas Aircraft ended up deciding to produce its own plane internally. “Shortly afterwards,” Nicolas Moinet says, “the DC-9 hit the market, featuring devious similarities to the Caravelle.”

Fake recruitment scams are another way of gleaning information on competitor practices. “A job opening is advertised, and 30 or so candidates are interviewed,” Denécé says. During the interview, candidates are asked to give details about the main projects they’ve completed for competitors, and in the end, no one is hired.” In the interview setting, they let down their guard and try to appeal to the future employer by revealing loads of information about their achievements.

In Switzerland, this method can be seen in the finance industry. “Companies find out about the number of people working at the desks of other banks and how many assets they have under management,” Alain Mermoud says. And if they happen to meet a real gem in the course of these fake interviews, there’s no reason not to hire the individual. In the 2000s, two former managers at Starwood were hired by Hilton. They took with them more than 100,000 pages of confidential documents on a concept developed by their former employer for its new W hotel chain. Hilton in turn launched its own chain of lifestyle hotels, Denizen, in 2009. But Starwood did not let it go and filed a suit against Hilton, which had to halt its project and pay \$75 million to Starwood. In addition, Starwood was awarded \$75 million in hotel-management-contracts.

KNOW THY ENEMY

Economic war also involves surveillance and analysis of the many sources available in the public domain. This “white information” is legal and freely accessible. When sources require the payment of a fee, the information gathered is called grey intelligence.

“Imagine that we’re working for a pharmaceutical group,” says Albert Pélissier, who heads the economic intelligence firm Pélissier & Partners in French-speaking Switzerland. “We examine the patents issued in our area, list the legal standards, keep an eye on what is being said at conferences and trade shows, read scientific publications and track competitors’ offers and prices.” That helps a company fare better against the competition and quietly identify potential acquisitions and new applications for its products.

Methods have also been developed that use big data. “There are a number of specialised online databases, such as LexisNexis, which pools legal information, and Factiva, which aggregates content from media sources worldwide,” says Alain Mermoud. Most countries have a trade register listing the companies created within their borders. The World Health Organization (WHO) has a portal with access to information on all the clinical trials being conducted in the medical field.

“The invisible web can also be searched for content that traditional search engines such as Google can’t index, by using advanced search functions or data mining software,” says Anne-Marie Libmann, who heads the French intelligence firm FLA Consultants. Journal archives, RSS feeds and social media are other ways of picking up useful information.

“THE INVISIBLE WEB CAN ALSO BE SEARCHED FOR CONTENT THAT TRADITIONAL SEARCH ENGINES CAN’T INDEX.”



SLEEPER CELLS

Gaining an edge over a competitor is a long-haul effort. Chi Mak was a Chinese national and naturalised American citizen who had been working for Power Paragon, a company in the defence industry, for more than 20 years. “He’d been there forever,” Edward M. Roche says. “He was friends with the company’s CEO. They used to go on family picnics together.” But for all those years, he’d been working for the Chinese intelligence services as an inside informant that could be activated at any time. Mak was caught in 2004, when he tried to exfiltrate to China three CD-ROMs containing information on a new silent-running propulsion system for submarines.

That is no one-off incident. In 2015, the US Department of Justice indict-

ed six Chinese citizens who had tried to steal patented technology from the computer chip manufacturers Avago Technologies and Skyworks Solutions to use them in China. But two of the men had been long-term employees of the companies targeted. These inside spies are very good at going unnoticed.

Huang Yusheng was one of the most respected employees at Serenex, a small pharmaceutical company based in North Carolina. He developed cancer-fighting treatments. It came as quite a surprise to the company when the management found out in 2007 that a patent application had been filed with the WHO and China for a drug that was nearly identical to the one Yusheng was working on. The application was filed by a friend, Zhang Tongxiang.

IT'S ALL LEGAL

**A COUNTRY'S
LEGISLATION
CAN ALSO BE
USED AS AN
OFFENSIVE
WEAPON**

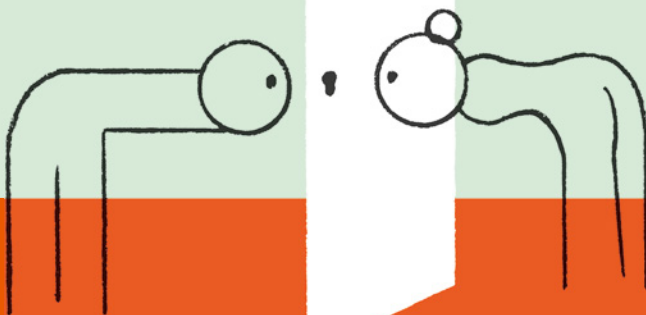
Economic war does not always deal in secrets and bribes. Some battles are fought out in the open. “Chinese law requires companies that want to invest in the country to engage in technology transfer,” Edward M. Roche says. “They have to train local engineers, supply processes and build local factories.” Kawasaki, the inventor of the Shinkansen, paid steeply for it. Under a 2004 agreement signed with its Chinese counterpart CSR Sifang, the Japanese group provided technology used to build China’s own high-speed train, virtually a carbon copy of the Shinkansen.

In the same vein, several years after Airbus opened its A320 assembly line in Tianjin in 2008, China announced that it was developing a new wholly Chinese-owned plane. The Comac C919, which was scheduled to take its first flight in 2016, looks a lot like the A320.

But that’s not an exclusively Chinese technique. “In the 1980s, Brazil led a similar policy, requiring companies that wanted to move into its huge market to produce locally, with Brazilian employees and components,” Roche explains. The nation was able to develop an IT industry, which was largely inspired by the R&D of the American groups active in Brazil.

A country’s legislation can also be used as an offensive weapon. “The Americans use their anti-corruption laws to target French industries competing with their own, such as oil, defence and finance,” Eric Denécé says. He believes that the decisions to fine French bank BNP Paribas \$8.9 billion for conducting business with Iran and to so vehemently go after Swiss banks accused of tax evasion were made to protect national interests.

Another example is the stinging attack by the US Justice Department against Alstom, which was slapped with a \$772 million fine in 2014 for corruption in Indonesia, Saudi Arabia and Egypt. Some think the whole case was intended to weaken the French engineering group. “That opened up the opportunity for its buyout by General Electric in 2015,” Denécé says. Several experts think that, at \$10 billion, the French leader was sold for far less than it is worth.



SHHH, SOMEONE'S LISTENING

And then of course, there is listening. A classic. Planting bugs in company meeting rooms, “listening in” on airport Wi-Fi networks, spending time in VIP lounges and keeping your ears open. “You can pick up all sorts of useful information by regularly travelling first class between Paris and London,” says an intelligence professional. But these methods are time-consuming and not necessarily all that effective, which often causes experts to disregard them. “These techniques exist, but they’re old-fashioned,” Alain Mermoud says. “The easiest way to gather information these days is through open sources on the internet and social media.”

But as far as listening goes, the government has some of the most powerful systems, and these are sometimes used by large national companies. These methods were well known even before the recent revelations made by Edward Snowden. Long before it was revealed that the NSA systematically intercepted in-flight calls made from Air France planes, there was the “Echelon” affair.

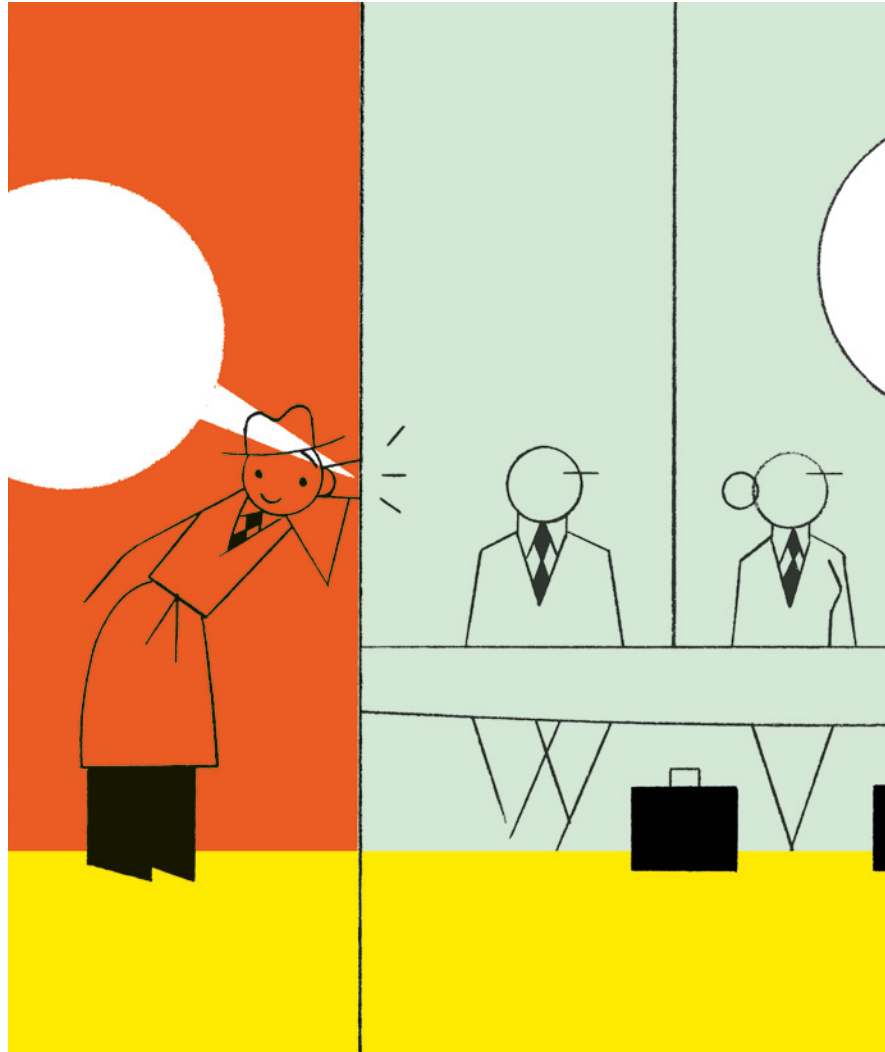
Back in 2000, the European Union was shocked to find out about this vast electronic surveillance network developed in 1947 to spy on Soviet military targets. Echelon eventually started being used to eavesdrop on private, commercial and non-military communications. No concrete evidence has ever proved that Echelon was used for industrial espionage.

But in an interview with the French newspaper *Le Figaro* for a piece on the scandal, James Woolsey, a former CIA director, believed that the United States was, so to speak,

forced to resort to this form of industrial espionage, because the Europeans freely and willingly hand out bribes to win contracts. What works for war also works for economic war.

And he basically admitted that the European aircraft manufacturer Airbus, for example, lost a contract in Saudi Arabia to the American McDonnell Douglas, because of the

information picked up by “Echelon”. More recently, the scandal involving Volkswagen’s rigged engines in the United States could involve the same methods, Alain Mermoud suggests. “When you look at the mechanisms at work behind the scandal, you see a whole range of factors showing that the attacks against VW were put together by the US to boost its own auto industry.”



10

BAD REPUTATION

Battles are also won by weakening one's opponent. "Rumours and negative information are spread about a competitor to eliminate it from an invitation to tender or a contract by hurting its credibility," Eric Denécé says.

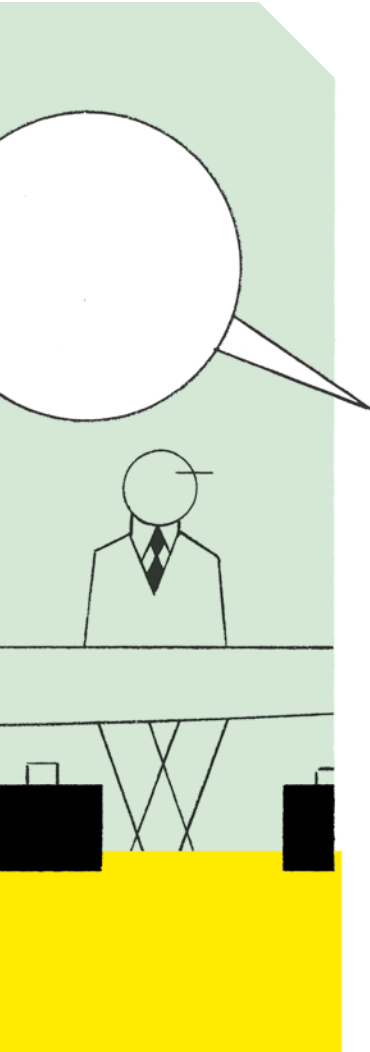
THESE DESTABILISATION TACTICS CAN ALSO BE USED TO MAKE COMPETITORS LOSE MONEY

In August 2016, the French group DCNS, in which Thales owns a stake, was victim to a terrible leak. A total of 22,000 pages of confidential information about submarines it was building for India were handed over to the Australian press. By raising doubts as to the safety of its installations, the incident compromised the French company's position at a time when it was negotiating a \$50 billion contract with Australia for 12 next-generation submarines.

These destabilisation tactics can also be used to make competitors lose money. Denécé believes that the information released in 1990 about traces of benzene found in bottles of Perrier water is no coincidence. "Perrier had to recall millions of bottles. And two years later, Nestlé bought the company for a very attractive price," he says. Vinci also fell victim to a hoax, with a fake press release published in November announcing that the French construction company had dismissed its CFO for serious accounting irregularities. "Vinci's share plunged by more than 18%," Nicolas Moinet says.

But how can you spread a rumour without getting caught? "They often go through an intermediary," Alain Mermoud says. "The information can be given to a journalist, a consumer-rights organisation or an NGO to raise awareness about a scandal." They serve as a sounding board.

An extreme example is going so far as funding a study aimed at discrediting a competitor's products. Or setting up an NGO to condemn their practices. ▽



THE BOOMING BUSINESS OF SECURITY

The cybersecurity market could be worth as much as \$170 billion a year by 2020, according to the market research firm Markets and Markets. Physical security is expected to be worth around \$105 billion. An overview of industry players, from traditional giants to the new protectors of the cyber world.

BY MEHDI ATMANI AND RINNY GREMAUD



Protectas is the company's Swiss subsidiary.

SECURITAS AB THE SWEDISH SURVEILLANCE GIANT

Founded in 1934 by Erik Philip-Sörensen, Securitas AB is the world leader in private security.

It provides human and remote surveillance and investigation services, as well as airport and corporate security. "The security industry has undergone a profound transition because of technology, which is now ever-present," says Héléne Coumes, analyst at Alpha Value. "This means that Securitas does less on-site surveillance and provides more mobile services,

remote surveillance and electronic solutions. And at the very end of the value chain, it provides more predictive security and big data for sophisticated analyses."

The Swedish company is active in 53 countries after acquiring several private security companies. In the US, Securitas AB purchased the Pinkerton National Detective Agency in 2003, the largest private detective agency in the country. In Switzerland, Securitas AB owns Protectas. But don't confuse it with Securitas AG, an independent family business based in Zollikofen that is also in the security industry.

HEADQUARTERS
STOCKHOLM (SE)

FOUNDED
1934

CEO
ALF GÖRANSSON

EMPLOYEES
330,000

2015 TURNOVER
€8.8 BILLION

SECU-B



The US Democratic party was the target of Russian hacking.

CROWDSTRIKE

THE CYBER-INVESTIGATOR

Though hackers are very hard to catch, a few exceptional cases have led to charges. Often, it is CrowdStrike leading the investigation. In addition to providing security for private networks, the California company provides proactive services and intervenes after a security breach to find the source.

CrowdStrike helped uncover several hacker networks working for China and Russia,

including Energetic Bear. It also traced the 2014 Sony Pictures hacking to North Korea. At the end of 2016, it was called upon to help investigate the Democratic National Committee email leak during Hillary Clinton's presidential campaign.

Financed by large investment funds, including \$100 million from Google Capital, CrowdStrike is a "unicorn" – that is, an unlisted company valued at over \$1 billion.

HEADQUARTERS
IRVINE (US)

FOUNDED
2011

CEO
GEORGE KURTZ

EMPLOYEES
160

TURNOVER
NOT MADE PUBLIC

NOT LISTED

PALO ALTO NETWORKS

UPCOMING DECELERATION

The Santa Clara-based company developed a new firewall technology that secures all of a company's internet access points, whether on computers or mobile phones. Palo Alto Networks' security systems also protect cloud and SaaS applications. Palo Alto Networks provides security for some of the largest companies in the world, as well as several US government agencies.

It went public in 2012 and is considered one of the most promising cybersecurity companies, even though it has yet to turn a profit. After a 2016 financial year in which its turnover increased 49% year-on-year, the company expects its growth rate to slow in 2017 along with the rest of the industry.

Its CEO Mark McLaughlin is one of the five highest-paid CEOs in the United States. He sold his stock options for \$130 million at the end of 2016, raising doubts about his loyalty.

HEADQUARTERS
SANTA CLARA (US)

FOUNDED
2005

CEO
MARK MCLAUGHLIN

EMPLOYEES
3,795

2015 TURNOVER
\$1.4 BILLION

— PANW

AS WELL AS...

IBM SECURITY

IBM Security is the most promising cybersecurity subsidiary of the US group. It provides a large range of services and products for individuals and private companies, including monitoring and strategic consulting, network management software and security and anti-virus software.

— IBM

HEADQUARTERS: CAMBRIDGE (US)

EMPLOYEES: 8,000

2015 TURNOVER: \$2 BILLION

CHECK POINT SOFTWARE

Network and data security, firewalls, security software...Israel-based Check Point Software Technologies is the leading provider of VPN solutions and also provides strategic monitoring. It was Check Point Software that uncovered the 2016 hack of one million Google accounts. — CHKP

HEADQUARTERS: TEL-AVIV (IL)

EMPLOYEES: 3,898

2015 TURNOVER: \$1.6 BILLION

ROOT9B

While this company is rather unknown to the general public, it is greatly appreciated by the US government. Root9B provides threat monitoring, operational support and cyber-strategy consulting to fight hacking that could threaten US political and trade issues.

— RTNB

HEADQUARTERS: COLORADO SPRINGS (US)

EMPLOYEES: 224

2015 TURNOVER: \$29.4 MILLION

FORTINET

Fortinet could pose a real threat to IBM and Symantec. According to the firm Technology Business Research (TBR), the US company could be poised to be number two in the cybersecurity market with its security solutions (firewalls, anti-virus, web filters) for networks and computers.

— FTNT

HEADQUARTERS: SUNNYVALE (US)

EMPLOYEES: 4,018

2015 TURNOVER: \$1 BILLION

BAE SYSTEMS

BAE systems is the third-largest global security company in the defence industry. The UK arms manufacturer has also entered the cybersecurity market and provides strategic consulting for network security for the UK army industry.

— BA

HEADQUARTERS: FARNBOROUGH (UK)

EMPLOYEES: 82,500

2015 TURNOVER: \$22.8 BILLION

FIREEYE

FireEye specialises in detecting cyber threats and providing security analysis for private companies and individuals, particularly Apple OS X users. The US company is also expanding into consulting.

— FEYE

HEADQUARTERS: MILPITAS (US)

EMPLOYEES: 3,100

2015 TURNOVER: \$623 MILLION

SYMANTEC

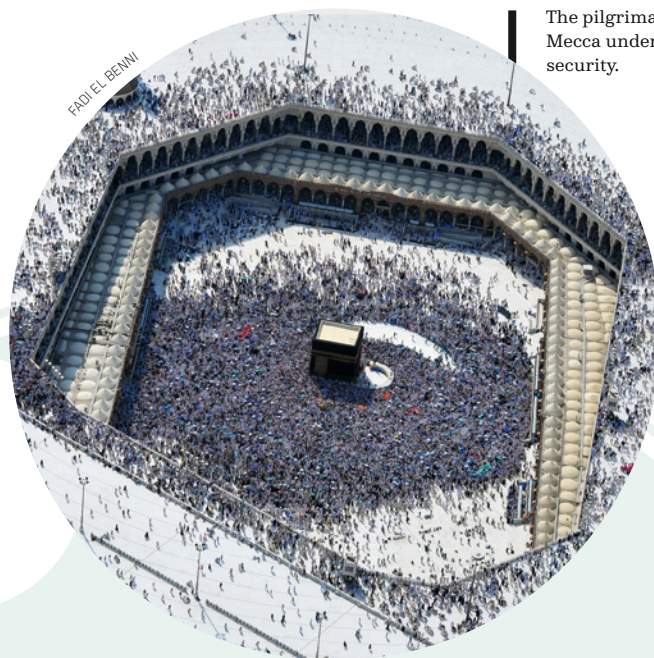
This company is hard to avoid. With its range of Norton anti-virus solutions for Windows PCs, US-based Symantec has become a global leader in information security software. It separated its storage and security business lines in 2014.

— SYMC

HEADQUARTERS: MOUNTAIN VIEW (US)

EMPLOYEES: 11,000

2015 TURNOVER: \$3.6 BILLION



The pilgrimage to Mecca under high security.

THALES**ON EVERY LINE OF DEFENCE**

Like most of the companies in the traditional defence industry, Thales has been developing its physical and IT security business lines for many years. It is involved in extremely varied fields, such as: security for big events like the G20 or the pilgrimage to Mecca; airport security in Dubai and Doha, among other cities; oil infrastructure protection for Saudi Aramco in Saudi Arabia and Lukoil in Iraq; urban video surveillance systems, with 15,000 cameras in Mexico; and many others.

The French government holds a 25.9% stake in the company, and Dassault Aviation holds a 24.8% stake. The French flagship of armament, aeronautics and transportation is also a world leader in secure bank transactions and a European leader in cybersecurity, with 1,500 employees specifically dedicated to the latter.

Additionally, at the end of 2016, Thales announced a partnership with SES to enter the already highly competitive market of satellite telecommunications in airplanes. With 50 operational satellites, the company also offers air travellers high-speed internet connection. A majority of analysts recommends to retain shares.

HEADQUARTERS
PARIS (FR)

FOUNDED
1893

CEO
PATRICE CAINE

EMPLOYEES
62,194

2015 TURNOVER
€14.1 BILLION

— HO

AXIS COMMUNICATIONS EUROPEAN VIDEO SURVEILLANCE

Axis Communications made physical security its industrial priority by developing video-surveillance products for public and private companies. Founded in 1984 by Mikael Karlsson, Keith Bloodworth and Martin Gren, the Swedish company provides video protection for cities, public spaces and corporate buildings. Despite the fact that

the global surveillance market is dominated by Chinese companies, Axis is number two in the industry among specialised companies, single-handedly holding close to 5% of the global market.

In 2015, Japanese giant Canon bought Axis for \$2.8 billion. “The wager paid off,” said Kazuyoshi Saito, analyst at Iwai Cosmo Securities. “The transaction made it possible for both companies to invest in new markets.”

HEADQUARTERS
LUND (SE)

FOUNDED
1984

CEO
RAY MAURITSSON

EMPLOYEES
2,139

2015 TURNOVER
€690 MILLION

— AXIS

CISCO SYSTEMS A CHANGE FROM HARDWARE

Originally, Cisco Systems produced only network and telecommunications materials (routers, ethernet, etc.). But since 2000, the company has progressively refocused on network security, particularly for CERN and Deutsche Bank. It also works with Apple’s iOS connectivity. The refocusing strategy is financed by purchasing small companies in the industry, such as CloudLock, OpenDNS and Lancope.

In August 2016, Cisco announced it was laying off 5,500 employees

worldwide, or 7% of its workforce. The decision was motivated by the need to “refocus its skill set” to prepare for “a more software-based future,” according to the technological giant, who recently made huge investments in the Internet of Things and cloud computing. Cisco purchased AppDynamics for 3.7 billion dollars in late January. Most analysts advise to keep, or even purchase the stock.

Chuck Robbins laid off 7% of his employees.

HEADQUARTERS
SAN JOSÉ (US)

FOUNDED
1984

CEO
CHUCK ROBBINS

EMPLOYEES
73,711

2016 TURNOVER
\$49.2 BILLION

— CISCO



SOPHOS

Marketing anti-virus software to private individuals, UK-based Sophos aims to compete with its US rivals on the security software market. It is also expanding into encryption solutions for computers and servers. —✓ SOPH

HEADQUARTERS: ABINGDON (UK)

EMPLOYEES: 2,900

2015 TURNOVER: \$478.2 MILLION

CYBERARK

CyberArk is an Israeli company specialising in security and management of applications and highly sensitive data (patents, sales data). The company provides solutions for financial companies as well as industrial energy companies. —✓ CYBR

HEADQUARTERS: PETAH TIKVA (IL)

EMPLOYEES: 644

2015 TURNOVER: \$160.8 MILLION

KASPERSKY LAB

The Moscow-based company provides network security and cyberstrategy consulting, as well as anti-virus solutions. Kaspersky Lab investigated Stuxnet and exposed Equation Group, a hacker network possibly linked to the NSA. At the end of 2016, the company unveiled its first secure operating system.

HEADQUARTERS: MOSCOW (RU)

EMPLOYEES: 3,600

2015 TURNOVER: \$619 MILLION

SECUREWORKS

Founded in 1998, SecureWorks develops security solutions for the cloud based on artificial intelligence. In April 2016, the Dell subsidiary had a failed IPO, putting a damper on the entire cybersecurity industry. —✓ SCWX

HEADQUARTERS: ATLANTA (US)

EMPLOYEES: 2,047

2015 TURNOVER: \$339.5 MILLION

PALANTIR

Founded in 2004 – in part funded by the CIA – Palantir is one of Silicon Valley's largest companies, but also one of its most discreet. It provides management and data filtering tools (for Big Data) to the US Department of Defence and intelligence agencies, as well as finance and healthcare companies.

HEADQUARTERS: PALO ALTO (US)

EMPLOYEES: 2,000

2015 TURNOVER: \$1.7 BILLION

TANIUM**GOING PUBLIC SHORTLY**

Founded in 2007 by David Hindawi and his son Orion, Tanium develops security solutions against viruses and peer-to-peer hacking. Some of its clients include eight of the 10 largest global banks and several commercial giants such as Wal-Mart and Home Depot, as well as government agencies and intelligence services in the US, the UK and Australia. For 2016, Tanium's turnover is expected to reach \$270 million.

Serial entrepreneur David Hindawi founded network management company BigFix in 1997, among other companies. It was sold to IBM for \$400 million in 2010. Today, Hindawi and his son are majority shareholders in Tanium, which is estimated at \$3.5 billion.

Despite stock market conditions that are unfavourable to cybersecurity players, the California company is planning an IPO, which could take place in 2017.

HEADQUARTERS
EMERYVILLE (US)

FOUNDED
2007

CEO
ORION HINDAWI

EMPLOYEES
400

2015 TURNOVER
\$200 MILLION

NOT LISTED



Orion Hindawi, a second-generation entrepreneur.



THE SWISS SAFE IN FOUR PORTRAITS

Security companies are thriving in Switzerland, with some help from the Swiss reputation for secrecy.

BY MEHDI ATMANI AND RINNY GREMAUD

RUAG

HEAVY ARTILLERY

The humiliating cyberattack against RUAG that lasted at least two years and which it did not discover until May 2016 actually had a positive impact. The company realised that cybersecurity is an area worth investing in.

Until now, the Swiss ammunition and military equipment manufacturer and strategic supplier for the Swiss national army had only a small unit focusing on cybersecurity. "As of January 2017, the entity will be expanded into its own business unit, and we'll invest several tens of millions of Swiss francs to develop the business over the next three to five years," the company spokesperson says. RUAG aims to become the leading cybersecurity partner for European armed forces, authorities and operators of critical infrastructures.

RUAG will be doing quite a bit of soul-searching in 2017. The company is wholly owned by the Swiss Confederation and could be partially or entirely privatised. "We are discussing the company's future with our partners in Parliament and with RUAG and plan to present

the outcome of these talks to the Swiss Federal Council in the first quarter of 2017," says a spokesperson for the Federal Department of Defence, Civil Protection and Sport.

Partial or total privatisation could be a way for RUAG to raise the capital necessary to achieve its new goals. "In cybersecurity, the 'cost of admission', or investment needed to gain credibility in the industry, is two or three times higher than that for military equipment," says Alexandre Vautravers, an expert in security issues.

Privatising could also help clarify the group's position with its foreign customers. "Our partnership with the Swiss national army requires us to give it priority," the RUAG spokesperson says. "Which, in a crisis situation, is to the detriment of our other customers." This close relationship with the Confederation also means that RUAG has to conform to Switzerland's political positioning. And that sometimes prevents it from doing business.



The cockpit of a Super Puma TH06, upgraded by RUAG Aviation.

HEADQUARTERS
BERN (CH)

FOUNDED
1998

CEO
URS BREITMEIER

EMPLOYEES
8,163

2015 TURNOVER
1.7 BILLION
SWISS FRANCS

NOT LISTED

WISEKEY**PROMISES, PROMISES...**

Is WISEKey a visionary company held back by a totally clueless Swiss market? Or is it the venture of a man who makes lots of promises but has trouble keeping them? The answer to that question remains up in the air. In the meantime, its founder Carlos Moreira still manages to find investors, boasting of the merits of the “Swiss digital safe”, despite the serious doubts raised after its IPO flop in late March 2016.

WISEKey claims to be the “world leader” in security systems for the Internet of Things. That’s what would justify the huge losses amassed over the past 15 to 20 years (\$113 million between 1999 and 2014). WISEKey lost 7 million Swiss francs in 2015.

“Nobody’s making money in this business,” Carlos Moreira told the press, before assuring them that 2016 would be the year

of turnaround. At the time this magazine went to press, its earnings for the year ended 31 December 2016 were not available.

WISEKey’s initial public offering on the SIX Swiss Exchange on 31 March 2016 will live on in history as an attempted clever manoeuvre that ended in failure. The share was initially expected to trade at 15 Swiss francs, but with no book building and a listing prospectus released the same day – a prospectus containing “substantial doubts” as to the company’s viability, issued by the account auditor BDO – it plunged to 5.5 Swiss francs in a single day and to 3.3 Swiss francs over the next few months. No big deal though – over the summer, WISEKey raised a further 5.4 million Swiss francs through a convertible bond issue.

Carlos Moreira, a former head of IT security at the United Nations in Geneva, is a man who knows



CHRISTIAN BEUTLER

Carlos Moreira,
founder and CEO
of WISEKey.

about networks. Or networking. In 1999, he founded both WISEKey and the International for Organization Secure Electronic Transactions (OISTE), an NGO affiliated with the UN. To this day, these organisations share the same post box in Geneva. Moreira is also closely involved with the World Economic Forum, where he makes regular appearances as a cybersecurity expert. His A-list customers include Hublot, Bulgari, SAP, Samsung, Microsoft and Mastercard.

In 2016, the Zug-based firm established a number of business partnerships and joint ventures. Between November 2016 and January 2017 alone, it announced three new joint ventures – in Argentina, India and China – a takeover in Bermuda, a partnership in Italy and its involvement with a joint blockchain project between China and Switzerland. Carlos Moreira also continues to mention the prospect of a future listing on the Nasdaq.

HEADQUARTERS
GENEVA (CH)**FOUNDED**
1999**CEO**
CARLOS MOREIRA**EMPLOYEES**
140**2015 TURNOVER**
\$2.3 MILLION

WIHN

HEADQUARTERS
CHESEAUX-SUR-
LAUSANNE (CH) AND
PHOENIX (US)**FOUNDED**
1951**CEO**
ANDRÉ KUDELSKI**EMPLOYEES**
3,459**2015 TURNOVER**
950.8 MILLION SWISS
FRANCS

KUD

KUDELSKI**THE AMERICAN DREAM**

Kudelski is taking strategic steps into the cybersecurity market. After appointing a new director to head its Kudelski Security division in 2015, the Swiss group acquired Milestone Systems, an American company that sells systems security software and provides implementation solutions, in May 2016. This move was not made to bring Kudelski technological know-how, but a portfolio of customers for which it hopes it can

CRYPTO**DISCRETION AND MYSTERY**

Crypto's story begins in Sweden before World War II. Boris Hagelin invested in Cryptoteknik AB, a company specialised in communications encryption that was going bankrupt. In 1952, he transferred the business to the Canton of Zug, Switzerland. Crypto's success during the Cold War made it the world's top manufacturer of encryption machines used by embassies and government departments.

But the British Public Records Office revealed that Crypto's business dealings were not as neutral as they appeared. In 1956, the company entered into an agreement with the American and British national intelligence agencies to sell its customers machines "fitted" with a Trojan horse that allowed British and American spies and their allies to decipher messages sent by their enemies. Allies, including West Germany through its national champion Siemens, benefitted tremendously from Crypto's

rigged machines. Archives released from the United States national intelligence agency indicate that Siemens gave Crypto considerable technical and financial support in exchange for that privilege. So how is the company faring these days? Following its smooth transition to digital technology, the "national champion of encryption" produces security devices for radio communications and internal and external networks. Crypto also develops encryption solutions for banks and now has subsidiaries in Côte d'Ivoire, Abu Dhabi, Argentina, Malaysia and Oman. But where its capital comes from remains one of its best kept secrets.

HEADQUARTERS
STEINHAUSEN (CH)

FOUNDED
1952

CEO
GIULIANO OTTH

EMPLOYEES
250

TURNOVER
UNKNOWN

NOT LISTED

eventually provide its own solutions. The group, based in Cheseaux-sur-Lausanne, also announced in 2016 that it was setting up a second headquarters in Phoenix, Arizona. That is a way of bringing the company closer to its main customers in digital television. And of seizing growth opportunities in the cybersecurity market. "Global investments in cybersecurity are estimated at 200 billion per year between now

and 2020. More than half of that money will be spent in the United States," says André Kudelski. But this partial relocation will also switch the group's books to dollars as of 2017 to offset the negative impact of the strong Swiss franc on its earnings.



Stefan Kudelski, the company's founder who passed away in 2013, revolutionised sound recording.

"Kudelski is still a marginal figure in the enormous market of cybersecurity," says Michael Foeth, an analyst at Vontobel.

"The group hopes to make more than 200 million Swiss francs on this market between now and 2020, but that will contribute to less than 20% of its profits."

INTERVIEW

“EUROPE NEEDS TO WAKE UP”

The French expert Christian Harbulot criticises company executives for their poor understanding of economic war.

BY LUDDOVIC CHAPPEX

From reading the countless articles on the challenges, you'd think that business organisations view cybersecurity and industrial espionage as their main security threats. The director of the Economic Warfare School in Paris, Christian Harbulot, is not of that opinion. He believes there is an all-around, extremely poor understanding of these issues, even among business leaders and government officials, and condemns their lack of any relevant strategy. Interview.

It's hard to estimate the extent to which companies engage in economic war. Why are there so few sources of information on the subject?

That's definitely one of the most opaque areas of society today. It's because no one wants to reveal their strategy, for tactical reasons. Attackers don't talk. But neither do victims. So there are no statistics and academic researchers don't have any archives to work with. For example, you won't find any trace of a written proposal from a con-

sulting firm detailing an economic war operation for a client. And you can imagine that the British and Americans – true masters in the art of economic war – are not going to, for the purpose of academic research, lay out what is involved in an economic offensive, how they operate to protect their interests, what their modes of action are, etc. None of that is included in the available literature. What you can see is what they want you to see.

But statistics are published on cybersecurity. Cases of industrial espionage are sometimes brought out in the open...

I can guarantee you that there's no real point in espionage anymore, compared with other much more compelling goals in terms of influence and potential gains. Espionage has long been practised in the pharmaceutical industry due to the significant cost of research and time required to produce results. In that kind of situation, economic espionage plays a crucial role and saves time. But things have changed

somewhat, even in the pharmaceutical industry. Now the price of drugs has become more of a strategic priority for pharmaceutical groups. I'm amazed to see how much the media focuses exclusively on cyberwarfare and espionage, the only areas where open sources are available. But that's just part of the issue. For example, the attempts to destabilise Swiss banks have nothing to do with espionage or cybercrime.

“THE UNITED STATES WILL TRY TO CONTROL GLOBAL TRADE BY FLEXING ITS INFLUENCE OVER STANDARDS.”

What are the most commonly used tools in economic war?

The real question that companies and governments ask is how profitable will my action be in

ROCK STAR OF ECONOMIC INTELLIGENCE

Christian Harbulot is currently the director of the Economic Warfare School in Paris, which he founded in 1997. The 64-year old Frenchman is one of today's top experts in economic warfare and has written several leading books on the topic. He is a professor, member or speaker with a number of major institutions, including ESSEC, École des Mines de Paris and Institut des Hautes Études de la Défense Nationale (Institute of Advanced Studies in National Defence). He also heads the consulting firm specialised in influence communication, Spin Partners. In the 1990s, Mr Harbulot worked as an economic intelligence advisor for the French government and as a director with the Défense conseil international (DCI) group.

One noteworthy fact is that, in his youth as a fervent Maoist supporter, he rallied with the Noyaux armés pour l'autonomie populaire (NAPAP), a militant activist cell that claimed responsibility for a number of attacks and an assassination. That chapter in his life landed him 11 months in prison in 1978, after which he was freed and two cases were dismissed.



relation to the outlay and risk? For example, the United States will try to control global trade by flexing its influence over standards. They manipulate legal aspects to put pressure on companies and increase their market share. That strategy can bring enormous financial gains. Look at the \$9 billion fine paid by BNP Paribas, accused by the United States in 2015 of violating sanctions against Cuba, Iran, Sudan and Libya. The approach is the same in every country that wants to protect its political interests (see article p. 52). Take the example of how France closed off its postal services mar-

ket for small parcels to get around European deregulation and prevent La Poste from being destabilised by its competitors. And you won't find any official letters or documents that report what happened. But it did. Damaging a competitor's reputation is another one of the most common destabilisation techniques.

Can you provide a recent textbook case?

A classic example is the multinational Suez [Editor's note: the world's second-largest water management group after Veolia], which dropped out of the bidding to build

the giant Belo Monte Dam in Brazil. It all started with a small Brazilian NGO, which had been paid to launch a smear campaign against Suez and its involvement in this project. Then a much larger NGO took over and brought media coverage to the case. In the end, the French group withdrew from the process out of fear that the publicity would have an overly negative impact on its image. And that project was estimated at \$10 billion! That gives you an idea of the tremendous implications at stake in economic war. Again, in this case, it probably had nothing to do with espionage or cybercrime. ▶

What makes you minimise the extent and importance of economic cyberwar?

I fully agree that there's a problem with corporate governance, with company executives who are often between 50 and 70 years old and no longer totally up to date on these issues. But if large groups were truly losing tons of money due to cyberwar, do you think they'd remain organised as imperfectly as they are today? Company executives aren't irresponsible people! But for now, I've observed that within big firms, at least in France, the head of IT security is never on the executive committee. In the company hierarchy, at most he's a senior manager or senior technician. No French industrial group has a centralised structure that covers both tangible and intangible threats. Skills are distributed at unequal levels within an organisation. There's no

one boss who oversees everything. I therefore deduce that the losses sustained due to failures in IT security are deemed acceptable.

“THE HEALTH CARE INDUSTRY FACES HUGE RISKS.”

Which companies are on the front lines in economic war? Are arms and energy the strategic industries that are still under the biggest threat?

The situation is changing. As a consultant, I've noted that attacks have become more severe in many

industries. Economic warfare is intensifying and spreading to economic sectors that didn't used to be concerned by the problem. The health care industry in the broadest sense, given its importance in our society and the large number of people involved, faces huge risks. It's no longer just about advanced research on new drugs. Battles are also fought in various sectors ranging from luxury goods to toys and sports competitions. Farming and the food industry are becoming sensitive areas. In France, it goes as far as threatening the survival of one of the country's vital economic sectors.

Can major multinationals act independently or do they most often have government support when it comes to fighting economic war?

Governments are not necessarily involved. In fact, companies some-

LUCAS JACKSON / REUTERS



The look of dismay on the face of BNP Paribas's general counsel, Georges Dirani, as he arrived in court in New York on 9 July 2014. The French bank, caught by the US authorities, was forced to pay a \$8.9 billion fine for violating sanctions against several countries.

times don't want the government meddling in their business, or the government is simply not concerned enough about their situation. For example, in France the government is not accustomed to dealing with economic war in many major industries. Most of the time, offensive – or defensive – campaigns are led by companies under the political radar. That's the case in biotechnology, an industry where the stakes are high. Due to the way its health care system is organised, the French government currently can't wage an economic war in this industry.

Why don't firms ever go public saying that they are victims of economic war?

Companies mainly fear that they will damage their image by expressing their weakness. It's an unwritten law that applies everywhere. This is also true for SMEs.

A small company that sees three or four of its managers leave to work for a competitor, taking the customer portfolio with them, generally won't report it. The boss doesn't want to look like an idiot. I don't know of any country where companies are encouraged to report the economic attacks they suffer.

Are there multinationals known for being aggressive in economic war?

Indeed, some firms are more on the attack than others and even go as far as employing illegal tactics. In the industrial world, it's well known. But there's obviously no official public ranking. Let's just say that there are companies that are better organised than others. And the rest of them often don't have any other choice, because they have to fight to survive amid fierce competition. They can suffer attacks from powerful governments, other companies or civil society, for valid reasons or not. To my knowledge, only one professor from ESCP, Daniel Rouach, has taken the risk of publishing a book that includes a ranking of companies with a reputation for being aggressive [Editor's note: *La veille technologique et l'intelligence économique*, Que sais-je? Collection, 2010]. He named about 10 companies, including Nestlé and Siemens.

Are the methods used in economic war getting more or less illegal?

I think the proportion of illegal methods is shrinking. That's due to the tools available in today's information society. There are so many legal ways of attacking competitors that it's often not wise, in terms of profitability, for companies to take unnecessary risks. In the intangible world (digital economy, internet), economic war often involves capturing flows and using them to get the most profit out of them.

Can industrial secrets, in a world where goods manufacturing is increasingly globalised, still be kept today?

It's obviously more complicated, due to the flow of information. Take the example of Swiss watchmaking. Companies make it a priority to protect their know-how. The danger is that engineers often don't ask themselves the basic questions about the commercial value of information. They focus on innovation without realising how serious it can be to lose sensitive data. The number one challenge is to raise individuals' awareness about the risk involved in the flow of information. In industries where production is massively delocalised with very short research cycles, a company's strength lies in its ability to be organised and waste as little time as possible.

Where do you place European countries on the chessboard of global economic war?

You have to understand that the global market doesn't work the same way everywhere. A country such as South Korea is very open about engaging in economic war, while the concept isn't even taught here. Engineering and business schools hardly give any importance to these topics. But a CEO without the slightest inkling as to what economic war involves will be a bad decision maker. What's even more serious is that in a country such as France, the subject isn't even included in political studies anymore. So no one is ever responsible for it. That's a big problem, because in the United States, Russia, China, India and South Korea, these issues are taken seriously. Europe needs to wake up. Economic war isn't something you can delegate to someone else. We've been so used to functioning by game rules set by the United States that we think that sustaining a few losses – taken as collateral damage – simply comes with the territory. The re-emergence of economic nationalism could force us to change our model. ▽



ECONOMIC WAR FOR THE MOTHERLAND

Many governments play an active role in gathering information for their domestic companies. These practices have underpinned much of China's economic growth and the development of the Russian arms industry.

BY CLÉMENT BURGE, RINNY GREMAUD AND JULIE ZAUGG

Some governments view industrial espionage as a patriotic duty. "They see it as a way of circumventing the traditionally drawn-out process of R&D to gain technology that will support their country's economic growth," says Nigel Inkster, who formerly served in the British Secret Intelligence Service and now works for the International Institute for Strategic Studies, a London-based think tank. This viewpoint predominates in China and Russia, countries eager to catch up industrially with their Western counterparts.

In France, the United States, United Kingdom, Japan and South Korea, industrial espionage is seen more as a way of laying the groundwork for their economic powerhouses. Prior to large-scale international invitations to tender, intelligence services play their part by providing them with information to give them a competitive edge.

These practices primarily concern industries that are state-owned or considered strategically important, such as arms, energy, nuclear power and transportation.

CHINA



SPYING FOR ONE'S COUNTRY

China turned industrial espionage into a state-run system. In 1986, Deng Xiaoping launched his 863 Programme to upgrade the country's industrial fabric, targeting what were considered strategic industries. "China was behind and wanted to catch up to the West as fast as possible," says Nigel Inkster. This intelligence programme saved the country millions in R&D spending.

The government's five-year plans show where China has set its priorities. "A few years ago, the development of a third-generation nuclear power plant was included in the plan," says Bryce Boland, head of Asia-Pacific for FireEye. "Shortly afterwards, the most cutting-edge US companies in the industry started experiencing attacks from hackers based in China." The automotive industry, steel, aviation, high-speed trains, smartphones and financial services are popular targets for Chinese spies.

The hackers often work as part of special divisions within the military. One of them, Unit 61398, operates out of a building located in central Shanghai. Mandiant, a subsidiary of FireEye, alleged in a 2013 report that Unit 61398 had stolen hundreds of terabytes of data from more than 140 companies. The US went on to indict five of its members, of which a certain UglyGorilla, in 2014. Their victims included the nuclear energy group Westinghouse, the solar power solutions produc-

er SolarWorld, the steel and aluminium giants US Steel and Alcoa and the metal components supplier Allegheny Technologies.

Chinese industrial espionage mainly involves information theft. But it goes beyond that. "The government forces many students and academics living abroad, along with members of its diaspora, to provide secret information about their host country," Inkster says. To pressure them to co-operate, Beijing has no qualms about threatening their family members still living in China. The practice is so widespread that these agents even have a name in Chinese: "chen di yu", or fish at the bottom of the ocean.

tailoring the oil reserves of Exxon Mobil, Royal Dutch Shell and BP. But things have started to change. In 2015, President Barack Obama and his Chinese counterpart Xi Jinping signed an agreement to ban economic espionage between the two countries. "That has reduced the number of hacking attacks in the United States coming from China," Boland says. "Attacks seem to have moved to neighbouring countries such as Japan and South Korea, which have technological expertise that China would like to acquire." Nowadays, government spies also operate in Saudi Arabia, Brazil and Mongolia, where China imports oil, food and copper, respectively. ▷

“THE GOVERNMENT FORCES MANY STUDENTS AND ACADEMICS LIVING ABROAD, ALONG WITH MEMBERS OF ITS DIASPORA, TO PROVIDE SECRET INFORMATION ABOUT THEIR HOST COUNTRY.”

Chinese spies have brought home numerous trophies, including methods developed by Boeing to calculate the robustness of military aircraft, miniature nuclear warheads, computer chip manufacturing processes, plans to build an LCD screen plant for Samsung and land surveys de-

FRANCE



STATE AND COMPANIES IN THE SAME FIGHT

France only began looking into industrial espionage about 15 years ago. What set it off was when, in the early 2000s, the country lost one of its industrial leaders, the aluminium giant Pechiney, which was sold to Canadian group Alcan. Jean-Pierre Raffarin, France's prime minister at the time, launched an official policy

a former French intelligence agent who heads the European Strategic Intelligence and Security Center (ESISC) in Brussels. He remembers when American business travellers were advised not to fly business class on Air France, because the seats were fitted with systems that could listen in on them.

“THEY WANTED TO USE HIM TO CONVINCE THE INDIANS TO BUY FRENCH MILITARY EQUIPMENT, BUT HE GOT CAUGHT AND WAS HANGED.”

to gather economic intelligence. “Those are some of France's Colbertist or protectionist measures to defend its national champions,” says Alain Mermoud, economic intelligence researcher and co-founder of *Swiss-intelligence.info*. “Let's not forget some of these firms, especially those in defence or aerospace, are strategically 'too big to fail'. The government cannot afford to let them sink. Too many jobs are at risk.”

The government set up units in its intelligence services in charge of gathering economic information. “The Directorate General for External Security (Direction générale de la Sécurité extérieure, or DGSE) now has telephone and communication interception capabilities that rival those of the NSA in the US,” says Claude Moniquet,

The country's leading companies were also encouraged to set up economic intelligence departments. “It's all very open in France,” says Edward M. Roche, who has published several books on industrial espionage. “There's even an Economic Warfare School in Paris.”

The DGSE has also gained extensive expertise in the art of recruiting informants within foreign governments. “In India, French intelligence services recruited a high official and close government advisor,” Moniquet says. “They wanted to use him to convince the Indians to buy French military equipment, but he got caught and was hanged.” Similarly, France maintains close ties with elites in its former African colonies, whose policy frequently is in favour of French economic interests.

RUSSIA

NATIONAL HACKING

In Russia, the tradition of economic intelligence goes back to the Cold War. “Every year, the Soviets would draw up a list of materials and processes that it wanted to acquire, and at the end of the year, the KGB would assess the information gathered,” says Claude Moniquet of ESISC. Emphasis was on arms and aerospace. And, naturally, the prime target was the United States.

After the Cold War, Moscow shifted its focus to acquiring technology to help the country catch up industrially. But unlike China, Russia does not make industrial espionage a national affair. “It is delegated to criminal units that operate more or less closely with the government,” says economic intelligence researcher Alain Mermoud.

Their attacks often aim to weaken rivals of the country's national champions in oil and gas, the main source of revenue for the country. In 2014, Symantec (see p. 42) announced that well-resourced cybercriminals seemingly working typical office hours had planted malware programmes at companies in the energy sector as far back as 2011. This campaign, called “Dragonfly” (or “Energetic Bear”), targeted electricity generation companies, electric grid and oil pipeline operators and other strategic infrastructure in the United States, Spain, Poland, France, Germany, Italy and Turkey. In 2014, Norway confirmed



that it had been victim to cyberattacks aimed at gathering information about its oil reserves.

UNLIKE CHINA, RUSSIA DOES NOT MAKE INDUSTRIAL ESPIONAGE A NATIONAL AFFAIR

Russian spies have not completely given up their business in military secrets. The British company BAE Systems and Swiss group RUAG, both arms manufacturers, suffered breaches in 2014 and 2016. And both suspect Moscow was behind it.

Russia also continues to apply espionage techniques inherited from the Cold War. In 2015, the United States arrested Evgeny Buryakov, a New York-based employee of Vnesheconombank. Buryakov used the job as a cover to recruit people from American companies to work as sources for Russian secret service. Russia was mainly interested in gathering information about renewable energy, high-frequency trading, ETFs and robot trading.

ISRAEL



START-UPS AND MILITARY SERVICE

The idea that the Jewish state, surrounded by hostile Arab neighbours, can only count on itself is part of the Israeli national mindset. That explains why the country has one of the world's most powerful intelligence agencies, the Mossad, and a state-of-the-art arms industry. To give itself the best chances of survival, Israel does not hesitate to spy on other nations. Even its allies.

"Americans are the main target," Inkster says. "Israel is keenly interested in gaining expertise on their most sophisticated military technology, such as 'bunker buster' bombs, which can be used to destroy bunkers." Some components of the Israeli atomic bomb were developed based on American technology.

"There are very close ties between the Israeli economic fabric and the intelligence services, owing to the mandatory military service," says Alexandre Vautravers, a Swiss security expert. "Israelis have to do three years of military service, which naturally creates a special relationship between civilians and the army." The expert also believes that the impressive vitality of the Israeli tech start-ups is due to its close relations with the country's security apparatus. ▶

"THERE ARE VERY CLOSE TIES BETWEEN THE ISRAELI ECONOMIC FABRIC AND THE INTELLIGENCE SERVICES, OWING TO THE MANDATORY MILITARY SERVICE."

Behind China and Russia, Israel has "the third most aggressive intelligence service", as put by the NSA documents released by Edward Snowden. Classified reports of discussions held in the US Congress condemn Israel's espionage practices as part of visits by business delegations or when signing joint arms agreements.

UNITED STATES

THE ALL-HEARING EARS



Officially, the US government does not engage in industrial espionage. The Economic Espionage Act of 1996 clearly bans it. “But in actual fact, intelligence services are very active in gathering information about business negotiations and international contracts that could benefit American companies,” Nigel Inkster points out.

Edward Snowden, the former NSA computer expert-turned-whistle-blower, played an important role in exposing the methods used by the CIA to help out national companies. The CIA’s systematic listening in on underwater cables and satellite communication not only targets both friendly and enemy political elites but also, and especially, economic elites.

“SOME COMPANIES BASED IN SILICON VALLEY HAVE ALSO BEEN USED AS INSTRUMENTS TO OBTAIN INFORMATION ON THE FOREIGN PARTNERS.”

Le Monde published new information revealed by Snowden in December 2016 suggesting that the NSA, working with British intelligence, used the ever-growing in-flight mobile phone services offered by airlines to gather huge amounts of information. Since as far back as 2005, all voice communication, data, metadata and content of calls

made on board commercial aircraft has been tapped by those large American ears.

Was it to fight terrorism? Given that in-flight mobile phone services were originally only available in first class, most of the information gathered was probably relatively useless to homeland security. But it’s an economic gold mine.

This NSA mission gets the least attention because “it is led under the cover of government intelligence and national security,” says Alain Mermoud. But it could be the most important, because it justifies the resources these agencies have access to.

“Some companies based in Silicon Valley have also been used as instruments to obtain information on the foreign partners or academic spheres they interact with,” Claude Moniquet says. For example, the cybersecurity company Palantir Technologies (see p. 44) was founded in 2004 with an initial share capital of \$2 million from In-Q-Tel, the investment arm of the CIA.

“These methods reached a peak while Bill Clinton was in office,” the former French intelligence agent says. “He’d actually set up a war room dedicated to economic intelligence.” But they’ve slowed down since the 9/11 terrorist attacks. “The resources for economic intelligence services were redirected to fighting terrorism.”

WHAT ABOUT SWITZERLAND?

Here in our little country, the roles of intelligence agencies and the business world are completely reversed. To stay informed and defend their economic interests, Swiss multinationals fare quite well without government services. And there’s a good reason: they have far more money to work with.

“THE COMPANIES WANTED TO CLEARLY SEPARATE THEIR BUSINESS FROM THE ACTIVITIES OF GOVERNMENT AGENCIES.”

“Large Swiss companies had regular consultation meetings with Swiss national security agencies until the 1980s,” Vautravers says. “They discussed espionage and intelligence, among other things. But the companies always came to the same conclusions. First, they wanted to clearly separate their business from the activities of government agencies. Furthermore, they did not see any need for help from public institutions, because they could afford to hire private, more advanced intelligence services.”

And things even worked in the opposite direction. The militia army provided economic and security intelligence expertise gained from the private sector that could be reported to government agencies. ▲

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Cannabis in America: capitalism in full swing

Within the next 10 years, the marijuana market in the United States could be worth \$50 billion. Until federal legislation that would allow large manufacturers into the marijuana arena is passed, small pot businesses are taking advantage of this auspicious period of limbo to grow and prosper.

BY SYLVAIN MENÉTRY

America is an incredible country. After leading anti-drug campaigns that were spectacular in terms of both cost and ineffectiveness, and after filling its prisons with small-time dealers, the United States is now setting up one of the world's largest free markets for marijuana. Legal weed goes for \$4 to \$8 per gram in Denver, but has about 10 times more THC than the grass smoked by our hippie ancestors.

In Colorado, where the sale of recreational marijuana has been legal since 2014, everyone has a smile on their face. No major increase in public health issues, safety or criminality has come about as a result. Six hundred marijuana dispensaries have since sprung up throughout the state, pulling in about \$1 billion in 2015. The state coffers have

reaped \$135 million in additional tax revenue. And the labour and tourism markets are thriving, too, thank you very much.

Colorado has raised \$135 million in additional tax revenue

22 MILLION CONSUMERS

These positive results have certainly influenced the choice made by the citizens of Maine, Massachusetts, Nevada and most notably California – the nation's largest market with its 39 million inhabitants – to vote in favour of legalising recreational marijuana use on 8 November 2016. In doing so, they have sided with

Colorado, Alaska, Oregon, Washington and the District of Columbia, which have all passed similar measures.

The legal medicinal use of cannabis is also growing. Florida, Arkansas and North Dakota are among the 29 states that allow the restricted use of marijuana for people with a medical certificate. The North American cannabis market for adults totalled some \$6.7 billion in 2016 nationwide, rising 30% from the previous year, according to the Californian investor network The Arcview Group, which funds this industry. But Ackrell Capital, a private bank based in San Francisco, expects the market to grow to \$50 billion within the next 10 years to serve around 30 million regular consumers. In the bank's U.S. Cannabis Investment Report 2016, analysts predict that prohibition will end across the country by 2020.

RACISTS SMOKE TOO

The election of Donald Trump to the Oval Office has thickened the cloud of uncertainty that still hangs over this touchy issue. Although the President has expressed that he is in favour of the therapeutic use of cannabis and suggested that he does not want to interfere in the internal affairs of each state, he did pick the fervent opponent of marijuana legalisation, Jeff Sessions, a Republican senator from Alabama, to be the country's next Attorney General. The politician took a beating after his cruel "joke", in which he said he thought that the Ku Klux Klan was "OK until I found out they smoked pot".

As the head of the Drug Enforcement Administration, Mr Sessions could crack down on cannabis-related businesses even if they comply with the laws of their state. "It would be political suicide for Donald Trump to come out against a set of initiatives which are very popular even among his supporters," says Troy Dayton, co-founder of The Arcview Group. Surveys have shown that the legalisation of cannabis is supported by a majority of Americans and transcends political party lines.

IN THE SHADOWS OF BIG BUSINESS

This shaky legal framework, which is expected to last, presents adventurous small businesses with an auspicious period of limbo to grow in the shadows of corporate America. As federal law prohibits marijuana, companies operating nationwide could face sanctions if they venture into this market. "The rules of capitalism generally work in favour of large companies over smaller businesses. But the opposite is happening in the cannabis industry. Big business either cannot or does not want to get into the market for now," Dayton says. In his opinion, a number of multinationals from sectors as diverse as agribusiness, logistics, retail, pharmaceuticals and even alcoholic beverage manu-

facturing are just waiting for the end of prohibition to split entire swathes of the market among themselves.

But some of these companies are not rejoicing about the wave of legalisation. The financial services firm Cowen has reported a drop in beer consumption in states where marijuana has been legalised, especially in Denver (Colorado), where it has sunk 6.4% in 2016. "Sales of craft beer have fallen, but it is mainly industrial brewers such as Anheuser-Busch and MillerCoors that have suffered most from cannabis competition," says Vivien Azer, an expert on the tobacco, alcohol and cannabis industries at Cowen.

PHARMA PROTECTING ITS INTERESTS

The growing use of marijuana for medicinal purposes, mainly as a painkiller, could have a negative impact on the sales of analgesics and other drugs. Florida, a state with a high population of seniors who take medication, will serve as an indicator for these potential changes in consumption habits.

As proof of the conflicting interests in the industry, GW Pharmaceuticals, a British laboratory listed on the Nasdaq, advocates legalisation, because the firm sells a cannabis-based drug that relieves muscle spasms in patients with multiple sclerosis. At the other end of the spectrum is the American firm Insys Therapeutics, also listed on the Nasdaq, which donated \$500,000 to the anti-legalisation campaign in Arizona. Insys claimed the contribution was intended to protect the health of children but was more likely given because it develops an anti-cancer drug made with synthetic THC.

DOG-SMOKE-DOG WORLD

Pressed for time, recreational pot desperados are scrambling to reach a critical size before federal law changes. One example is Pete

Williams, co-founder of Medicine Man, the largest marijuana grower in Colorado with a revenue of more than \$800,000. He worked in the construction industry before borrowing money from his mother to start his own business. And also, Peter Knobel, who now heads the upscale retailer Native Roots and first made his money as a property developer in the Rocky Mountains. In an interview with the French business newspaper *Les Echos*, Jeremy Bamford, the founder of PotGuide, a website that aims to become the TripAdvisor of marijuana, noted that, "Independent stores started by amateurs who had been >

NUMBERS

\$6.7 billion

2016 revenue

60%

Percentage of the population in favour of legalising marijuana

22 million

Estimated number of consumers in 2024

\$50 billion

Estimated revenue in 2029



Dallas Imbimbo and Nick Kovacevich co-founded Kush Bottles in 2010.

KUSH BOTTLES

KUSH BOTTLES, THE PUBLICLY TRADED ANCILLARY COMPANY

With mini-sized packaging in silicone, glass or metal used to hold cannabis edibles, concentrates and flowers, dozens of vape pens, pipes, grinders and child-resistant barrier bags, Kush Bottles offers a vast catalogue including several hundred supplies and packaging options for cannabis consumption.

The company, named after a weed strain from Afghanistan that is highly popular with West Coast rappers, launched its IPO in January 2016. “We made that decision because we are confident that cannabis will become a big market, and we want to be sure to obtain enough capital to expand. It was also a way of getting people more familiar with the company and establishing a positive image in the eyes of the public,” says Nick Kovacevich, CEO and co-founder of Kush.

CLEAN BUSINESS

Kush Bottles employs some 40 people across its headquarters in Santa Ana, California and

its locations in Woodinville, Washington, and Denver, Colorado. The B2B distributor founded in 2010 did not really start taking off until four years later. “Despite demand for our products, when we started out, we suffered from the same secrecy that our customers had been forced to operate in. Federal agents were raiding California dispensaries. They would close down, and the rotation in our customer base became too high. It wasn’t until Colorado legalised cannabis for adults that federal agents stopped intervening,” Kovacevich says.

With revenue of \$1.8 million in 2014, which climbed to \$4 million in 2015 and reached \$8 million in 2016, the company is on a high-growth curve. The professionalisation of the industry and the efforts to be viewed as a clean business have driven retailers to enhance the presentation of their products. They choose the custom packaging available from Kush Bottles over standard company packaging.

WAITING FOR DEMOCRATS

The company maintains close relations with its customers through its local offices. “We often pay cash in our industry because our customers can’t always make electronic payments. With our local offices, we can also keep up with changes in regulations, which all vary from state to state.” The legalisation of marijuana in California and Massachusetts, a state that borders New York, suggests brisk growth for the company. Meanwhile, Kush plans to set up operations in Canada and Puerto Rico and acquire a few other companies.

“We hope to generate revenue of \$100 million by 2020, when a Democratic administration could be back in the White House and legalise cannabis at the federal level.” Kush Bottles will no longer be a small-time operator compared with the large corporations that will be rushing to make a profit from green gold and its ancillary services.

growing weed in their basement were quickly snapped up by bigger companies.”

Now, these hardier entrepreneurs still have to overcome the hurdles of federal prohibition. For example, they cannot borrow from banks, or often even open accounts for their company. Credit card companies such as Visa are reluctant to supply them with card terminals. So customers have to pay in cash, like on the black market.

ANCILLARY SERVICES ARE BOOMING

These torments are something that providers of ancillary services, a rapidly growing business, do not have to deal with. Online community platforms such as WeedMaps (the “Yelp” of cannabis), the social networking website MassRoots (the “Facebook” of marijuana) and PotGuide (mentioned above) are flourishing in California and

Colorado. Flowhub, a Denver-based start-up founded by Kyle Sherman, developed a software programme in 2015 for inventory management and product traceability from seed to sale. Cannasure provides business insurance services for cannabis growers, while Growcentia produces fertiliser for marijuana plants.

“These companies have no restrictions on their development, as they don’t violate any federal laws, and provide essential services in an industry that desperately lacks them,” Dayton says. The Arcview Group has financed some of these start-ups, injecting \$86 million into 133 companies since the network was founded in 2010. Reluctant just five years ago, billionaires and top executives at big-name companies are now clambering over each other to finance these pure American seedlings.

This layer of successful businesses could rapidly start exporting its products. Canada, Colombia, Australia and

Spain are likely to be next countries to legalise cannabis.

Billionaires and top executives at big-name companies are now clambering over each other to finance these seedlings

Mr Dayton takes it as a given that they will adopt the free, American-style market rather than the protectionist market model from Uruguay. The country was the first to legalise the consumption of soft drugs, but the government controls distribution in pharmacies. “Eventually, instead of exporting a disastrous war on drugs, the United States will be exporting products made with marijuana,” predicts the founder of Arcview. ▽



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OK



In the United States, university libraries have more than tripled their spending on subscriptions in the past 20 years.

SCIENTIFIC PUBLISHING: A PARASITIC INDUSTRY

A handful of large companies dominate the academic publishing market and are making big profits. Researchers want to topple the oligopoly and take back control over their work.

BY BENJAMIN KELLER

“To read this article, you must be a member of the National Academy of Sciences or have an individual subscription.” This is the message I recently received when trying to access a scientific article co-written by a Swiss researcher. The researcher in question ended up sending me the article directly, which is quite a common phenomenon.

In the past, academic publications belonged to small, specialised publishers and articles could be freely read and distributed. Now, the publications have all been privatised by a handful of big players and the market has become very lucrative.

Five companies control more than half of all published articles, according to a 2015 study by the University of Montreal. These companies are: Elsevier, subsidiary of the Dutch-British multinational Relx Group; German publisher Springer Nature; US-based Wiley-Blackwell; British publisher Taylor & Francis; and US publisher Sage. These com-

panies make extraordinary profits, with margins around 40%. The top company, Elsevier, has quadrupled its revenue in 20 years, making more than €2 billion in 2015, for a profit of €760 million.

Publishers were able to raise prices as much as they wanted with no transparency at all, despite the fact that publishing costs have fallen dramatically as a result of digitalisation

These publishers have a dream business model: university researchers, paid by the regional government, send in their articles for free. Then, universities pay to access the journals in which their own researchers are published (see opposite). What's more, publishers >

HOW RESEARCHERS MAKE PUBLISHERS RICH

Here are all the steps to get an article published in a paid journal, using a fictitious example:

Paul, a PhD candidate in biology at the University of Zurich, is researching treatments for the Ebola virus.



A few months after beginning his research, Paul makes an important discovery and wants to publish it.



Paul sends a manuscript of his article to an electronic journal that has a high impact factor (the rank given to each journal to evaluate its renown). By choosing this journal, Paul's article will be cited in several other journals and he will build a strong reputation as a researcher.



The editor takes an interest in Paul's manuscript and anonymously submits it to other researchers for review. This is the peer-review process. The researchers send their comments to the editor, who then sends them to Paul to make the necessary edits. The article can go back and forth between Paul, the editor and the peer reviewers for several months.



The editor finally agrees to publish the article and requires Paul to sign a contract relinquishing his publication rights. This means the article no longer belongs to him and he cannot, for example, publish it on his personal website. Paul is a bit disappointed, but tells himself he has no other choice if he wants to be a successful researcher.



The editor publishes the article in the journal and then sells the access rights, notably to the University of Zurich, where Paul conducts his research, which is financed by the government.



Paul wants everyone to be able to read his article. But for it to be available through open access, he has to pay 2,000 Swiss francs to the editor... His university will cover the fees, but still, Paul thinks the amount is excessive, knowing that he himself was not paid by the editor.



After the article is published, Paul's "h-index" increases. This index measures the productivity and impact of a researcher based on the number of citations received in other publications. Paul is happy, but tells himself that next time, he might send his research to an open access platform.

have obtained an oligopolistic position in the market, after buying thousands of journals beginning in the 1970s and 1980s and creating several new periodicals. In this way, publishers were able to raise prices as much as they wanted with no transparency at all, despite the fact that publishing costs have fallen dramatically as a result of digitalisation.

BOYCOTT

Consequently, library acquisition budgets have skyrocketed. Between 1986 and 2006, US university spending in subscription fees to scientific journals more than tripled, according to the US Association of Research Libraries. It is becoming far too expensive to maintain. Last year, the University of Montreal cancelled 2,116 subscriptions to Springer, keeping only 150. In December, 60 research libraries in Germany decided to boycott Elsevier journals.



“Open access is necessary for scientists to take back control of the publishing chain.”

Martin Vetterli, EPFL president

The situation is no better in Switzerland, where the top universities spent 70 million Swiss francs in subscription fees and publishing house licenses in 2015, according to a report from the Swiss National Science Foundation (SNSF) and swissuniversities. “At the University of Geneva, like at other universities, we have

PEER REVIEW

Peer review is a fundamental step in scientific publishing. Before an article is published in a journal, it is subject to peer review by experts in the same field. The process varies depending on the journal, but generally, articles are reviewed by two or three reviewers, who send their comments to the publisher, who then makes the final decision. The average acceptance rate for an article to be published is 50%.

been dealing with price hikes over the past several years,” said Pedro Nari, resource materials coordinator at the University. “A large part of our budget is now dedicated to paying subscription fees for the four ‘big ones’ [Editor’s note: Elsevier, Springer Nature, Wiley-Blackwell, Taylor & Francis].” These companies own the most important journals, the ones researchers need to have available to maintain their work. These are also the ones in which researchers are published.

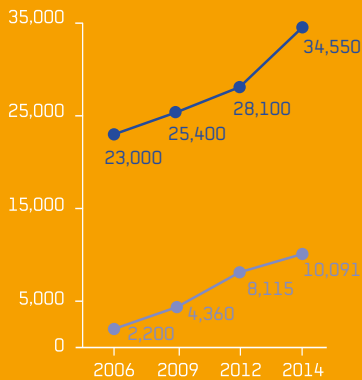
Could Germany’s boycott happen in Switzerland? Nari doesn’t think so, as the University of Geneva is in a tough position. “The journals belonging to these companies are an important resource for a university that wants to be at the forefront of scientific research,” said Nari. Also, with only 10 universities and two federal institutes of technology, Switzerland is not a major player in the industry, unlike Germany. The federal system – where universities depend on the cantons – makes it even more complicated to negotiate with publishers. “Unlike some of our neighbours, we don’t have a National Ministry of Education or Research that could implement a boycott for the entire country and all its universities,” said Nari. ▷

THE SCIENTIFIC PUBLISHING BUSINESS BY THE NUMBERS

THE OPEN ACCESS BREAKTHROUGH

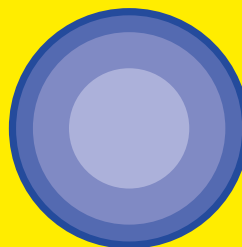
Number of academic journals worldwide

● in the world
● in free access in the world



REVENUE HAS DOUBLED IN 10 YEARS

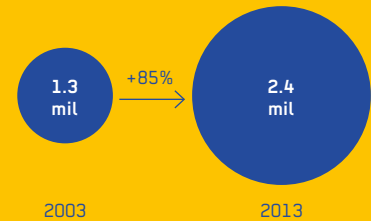
Change in the global market of English academic journals (in billions of dollars)



5 B IN 2004
8 B IN 2008
9.4 B IN 2011
10 B IN 2013

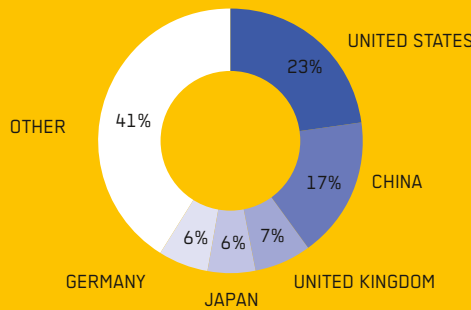
THE NUMBER OF PUBLISHED ARTICLES IS SKYROCKETING

Number of scientific articles published worldwide



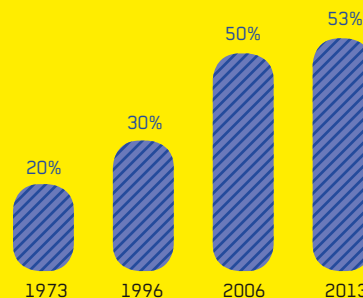
A QUARTER OF ALL ARTICLES ARE PUBLISHED IN THE US

Top five countries publishing the most scientific articles (as a percentage of the global market)



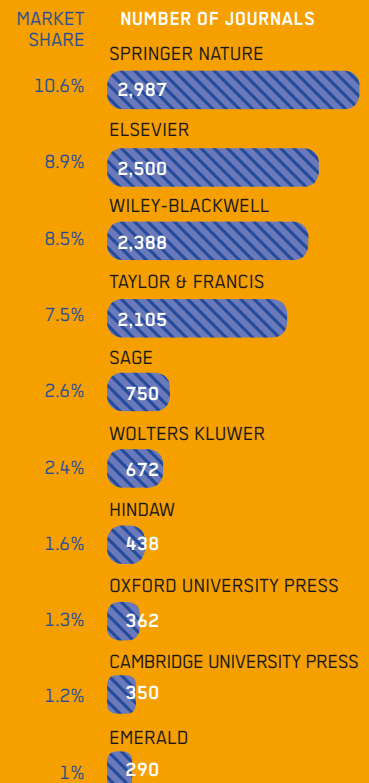
MARKET CONCENTRATION

Evolution of combined market share held by the five main publishers in natural sciences and medicine: Elsevier, Wiley-Blackwell, Springer Nature, The American Chemical Society, Taylor & Francis (as a percentage of all English articles published worldwide)



TOP 10 PUBLISHERS

Main scientific publishers



Sources: STM Report (2006, 2009, 2012, 2015), The Oligopoly of Academic Publishers in the Digital Era (Plos One, 2015), Directory of Open Access Journals.

TOPPLE THE SYSTEM

As a counterpoint to what some unabashedly consider a “racket” of universities and public funds, open access inspires hope and is constantly being imitated. Journals used to be printed, but now the internet makes publishing easy; researchers can publish their articles directly online. Today, more than 10,000 periodicals are open access, which is almost one-third of all existing journals.

“Open access is necessary for scientists to take back control of the publishing chain,” said Martin Vetterli, new president of École Polytechnique Fédérale de Lausanne (EPFL) and former president of the SNSF. Trained as an engineer, Vetterli gives the example of an open access mathematics journal, *Discrete Analysis*. The journal was created by British mathematician Timothy Gowers, who received the Fields medal in 1998, the highest honour a mathematician can receive. *Discrete Analysis* pulls articles from

the arXiv catalogue, a platform where researchers can freely post their work. “Publishing research should be controlled by scientists, not managers,” said Vetterli. Researchers must be patient, according to Vetterli, whose articles have been recognised several times. “When open access came about, I said to myself: ‘We made it!’ But I underestimated the cultural shift that it requires. We can no longer judge researchers solely on whether or not they had five articles published in *Nature* [Editor’s note: one of the most renowned journals].” Another alternative would be for universities to publish their own journals.

Either way, publishing’s winning strategy should still be profitable for a while, according to Emmanuel Carlier, financial analyst at the Dutch bank ING: “We’ve been having these discussions for a long time, and yet a company such as Elsevier is still in business. That said, it will be difficult to maintain the momentum of the past five or ten years.” ▲



This computer whiz entered Stanford University at age 16.

OPEN KNOWLEDGE

AARON SWARTZ: OPEN ACCESS MARTYR

He would have turned 30 on 8 November. American hacktivist Aaron Swartz, who committed suicide on 11 January 2013, is one of the martyrs for open access to knowledge. He committed suicide one month before his trial began in the US for electronic fraud. If convicted, Swartz could have received up to 35 years in prison and a one million dollar fine. He was accused of hacking the digital library JSTOR, making close to 5 million scientific articles freely available to the public. Swartz was an IT child prodigy: at the age of 14, he helped create RSS, a technology that delivers information feeds via the internet. By 16, he was a student at Stanford University in California. His story was the subject of a documentary released in 2014. *The Internet’s Own Boy* is available online free of charge.

ANALYST OPINION

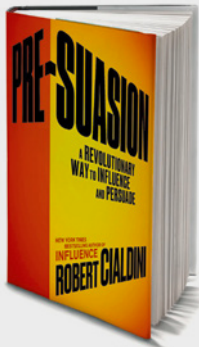
THE TWO GIANTS OUTPERFORM THE MARKET

Despite the revolt against the major scientific publishers, journals owned by the parent companies of the two listed industry giants, Elsevier (Relx Group) and Wiley-Blackwell (John Wiley & Sons), will outperform the market, according to analysts. For Relx Group, revenue from scientific publishing (+2% after nine months in 2016 at constant exchange rates) is not increasing as quickly as its total turnover (+4%).

Elsevier makes up approximately one-third of the British-Dutch company’s business, alongside legal and financial publishing, risk analysis and mana-

gement solutions, and organisation of professional events. The “research” division of John Wiley & Sons, which includes scientific journals, posted 4% growth in the first half of financial year 2017 at a constant exchange rate. This increase is due in part to the acquisition of California-based publishing software company Atypon for \$120 million. Total revenue for the US company was stagnant over six months. Scientific publishing accounts for more than half of its turnover; the rest comes from manufacturing books, tools and solutions for educational, academic and professional use.

TO READ, TO DOWNLOAD



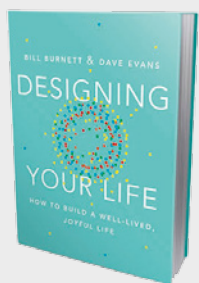
From \$14

PRE-SUASION

By Robert Cialdini (Simon & Schuster, 2016)

GENTLE PERSUASION

Following his previous bestseller, *Influence*, Robert Cialdini integrates the dimension of time into the process of gentle persuasion. In *Pre-suasion*, the author draws on myriad real-life examples and anecdotes to explain how to influence others by first communicating a positive message before they make a decision. It's all in the timing, or "privileged moment for change". You have to "pre-suade" before you can persuade. To achieve that, one of the most effective tools is reciprocity. We are more inclined to agree to do something if we believe that we're helping someone who has helped us or returning a favour.



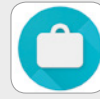
From \$13

DESIGNING YOUR LIFE

By Bill Burnett and Dave Evans (Knopf, 2016)

LIFE IS A PIECE OF ART

We are all capable of designing a fulfilling life for ourselves, as a designer creates an object. That's the message of *Designing Your Life*, the book based on the popular class taught by Bill Burnett and Dave Evans at Stanford University. The authors help readers refocus the "dysfunctional certainties" in their private and professional life. If we sometimes feel pressured to follow a single, set course, it's because we have self-programmed ourselves to do so. But nothing is forcing us. We can always change directions, and this book explains how.



Free

GOOGLE TRIPS

TRAVEL PLANNER

The advantage of this app is that it can be used offline, sparing the expense of international data plans while travelling. Users download their travel information before leaving for their trip. Google Trips acts as a travel guide, now optimised for 200 cities, pointing out the must-see sites and taking care of flight and hotel reservations.



Free

SMARTNEWS

PRESS REVIEW

Online or offline, this app can be used to read news articles, neatly organised into categories (current events, sports, celebrities, tech, etc.). Users choose from a selection of international news agencies, including the BBC, Reuters and Huffington Post. Unlike similar apps, Smartnews lets you read without the distraction of ads.



The "Lite" version is free

SLACK

TEAMWORK

This app is one of the interfaces offered by Slack, the collaborative platform that has set out to revolutionise the way people work together. The app offers public, group and private conversations, communication organised into different "chains", virtual chat rooms and automatic indexing for shared images and files, and it provides access to all the essential functions available on the platform.



Free

WAZE

GETTING ROUND

Waze is a community-based navigation app designed "to outsmart traffic and get everyone the best route". Bought by Google in 2013, the app features maps created by its users, who contribute data both actively and passively. Alerts notify users of road works, accidents, police checks, one-way streets and deviations. The more users on the app within the vicinity, the more reliable it is.

Kids' clothes at grown-up prices

Marc Jacobs, Lanvin and Karl Lagerfeld are all among the high-end brands to have recently come out with children's collections. Is this niche sector of the luxury goods market immune to the recession?

BY GENEVIÈVE RUIZ

In autumn 2015, Karl Lagerfeld launched a line of clothing and accessories for ages 0 to 16 called Karl Lagerfeld Kids. Pier Paolo Righi, the brand director, explained at the time, "It's a unique chance to share our relaxed, iconic and offbeat style with a larger target segment." Two lines are produced a year, along with limited-edition pieces for babies.

In times of recession, parents are more willing to cut spending on things for themselves than on things for their children

The German designer is far from being the first to get into the children's fashion industry. Dior opened its first shop for kids in 1967. But the trend

has picked up since 2009, with big names such as Jean-Paul Gaultier, Hugo Boss, Versace and Marc Jacobs hitting the market. Now, seven years later, most luxury brands have invested in a children's line.

DROP IN THE BIRTH RATE

What makes mini versions of these high-end brands so popular? The analysts we interviewed say they capture a market that is growing at a slightly higher rate than luxury clothing for adults. "The children's clothing segment is estimated to make up as much as 5% of the revenue of major luxury brands, and that figure could grow over the next few years," says Julie Saussier, a luxury goods analyst at Credit Suisse.

The website *Businesscoot* says that the luxury children's clothing

market is worth €4 billion worldwide. It has been growing 3% to 4% a year since 2011. "Children are a new niche in luxury goods," says Scilla Huang Sun, an analyst at Gam. "With the drop in the birth rate and the ageing population, more parents and loved ones are happy to give kids expensive things. The market is highly associated with gift-giving." French research revealed that, when they're born, babies receive an average of about 30 presents. Several experts have pointed out that luxury clothing is also related to sociological shifts within families. "Today, kids are king, and that phenomenon is taken to the extreme in Asia," says Hugues de la Chevasserie, director of Bonpoint. In times of recession, parents are more willing to cut spending on things for themselves than on things for their children."

German designer Karl Lagerfeld is one of the newcomers to the luxury goods market for children.

ADALBERTO ROQUE / AFP



makes 75% of its revenue from exports. Other websites such as *ChildsPlayClothing.co.uk* and *AlexandAlexa.com*, are also thriving. “In the children’s market, online retail is clearly where the growth is,” says Frédéric Godart, a sociologist specialised in fashion and professor at INSEAD business school.

DRESS FOR SHOW

Has the slowdown in the luxury goods industry in 2016 also affected the niche of upscale clothing for children? “The children’s segment essentially follows the main trends in the luxury goods market,” says Scilla Huang Sun. “We’re hoping for low but stable growth over the next few years. The children’s market might even perform slightly better.” The analyst from Gam also points out that, despite the slowdown, the luxury industry continues to generate high cash flow. “Luxury is still the best way to benefit from the growth of the middle classes in emerging countries.”

The analysts we spoke with all agree that the long-term future looks upbeat for children’s high-end clothing – especially as the market appears to be responding to a long-term sociological phenomenon. “People are having children later and therefore have more money when they do have kids,” Godart says. “We’re also seeing that children are once again being used for show, a practice that has been around since before the 20th century. They’re the reflection of the family’s social status, and their clothing must show that.”

The psychologist Philippe Jaffé offers a thought-provoking perspective: “Children are now the reflection of our own narcissism. By dressing them in expensive brands, we think we’re paving the road to success for them.” Does that mean the children’s luxury goods market is a measure of parents’ anxiety? If so, the market can look forward to a bright future... ▲

OUTSOURCING

Producing smaller versions of clothes is no easy task for brands. The process presents a unique set of challenges, from scaling models into 14 different sizes to using materials that are comfortable, easy to wash and that allow for freedom of movement. Children also have their own tastes and preferences, such as drawings of animals. And children’s clothes must meet safety standards that vary from one country to the next. All of that requires advanced expertise and explains why most brands license out the production of their kids’ lines.

The French group Children Worldwide Fashion is one such contractor. With 800 employees and revenue of more than €160 million, Children Worldwide Fashion boasts a customer

portfolio that includes brands such as Hugo Boss, Little Marc Jacobs, Chloé, DKNY...and now Karl Lagerfeld Kids. Other companies, such as Kidiliz Group (formerly Zannier), are also active in the industry.

For the past few years, however, “brands that can afford it, including Burberry and Gucci, are bringing their collections back in-house,” says Nathalie Genty, founder of *Melijoe.com*, a retail website for high-end children’s clothing. “That gives them more control over manufacturing and aesthetic codes.”

As for retailers, online shops are benefitting most from the growth in this niche market. Launched in 2007, *Melijoe.com* now employs 60 people in Paris. The website is translated into five languages and

VIRTUAL REALITY MAKES ITS WAY INTO TRADING

With 360-degree videos and a new mobile app, Swissquote moves into the era of VR. Below, a further explanation of these new projects.



“New technology is part of our DNA”

JAN DE SCHEPPER, HEAD OF MARKETING

Why is Swissquote interested in virtual reality?

The use of new technology is in the company's DNA. We want to embrace these tools as soon as they come out to gain experience, then offer our customers value-added services.

Swissquote will stream 360-degree videos starting this spring. How did that idea come about?

With 360-degree videos, the viewing experience becomes even more interesting because it's more immersive. Viewers really feel they're

part of the story. This technology has been particularly relevant in our partnership with Manchester United. Viewers will be able to enjoy a unique experience.

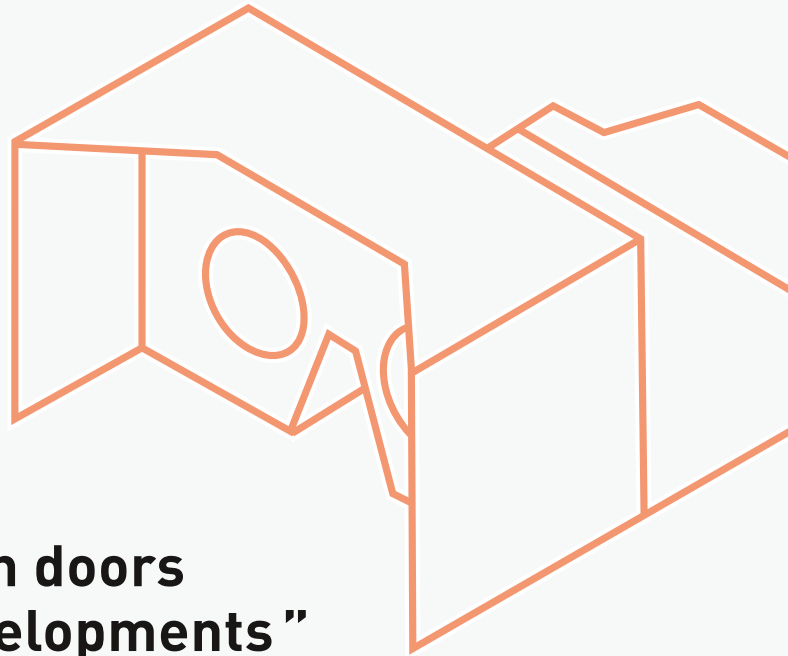
Have you filmed a football match using 360-degree video?

We've decided to draw parallels between trading and football through four videos. By moving their smartphones to the left or right, viewers can explore through the experience as a player from Manchester United or as a trader, respectively. You'll see that football and trading have a

lot in common! You can move about within the videos in a fun new way.

How can we watch these videos?

Simply with a smartphone, tablet or computer. But if you have a virtual reality headset [Editor's note: such as the Oculus Rift or HTC Vive], the immersion will feel even more realistic with a fully 3D display. The video will be available on the distribution channels of Manchester United, the most popular football club on the planet [Editor's note: more than 70 million fans on Facebook] and on Swissquote.com/360.



“VR will open doors to future developments”

ANDRÉ BURRI, HEAD OF MOBILE, WEB AND SOCIAL NETWORK

What is the Trading VR app?

With this app, you can check quote feeds, e.g. the SMI, using virtual reality. By turning their head to the left or right while wearing a virtual reality headset or cardboard viewer, users can see the quotes roll along before their eyes. They can select a quote and move in deeper for more details. Swissquote customers can check their account status this way and even place orders. Nearly everything you can do with our basic app can now be done in VR mode.

What advantage does the customer have in trading this way?

The idea is to simplify transactions as much as possible. With the fast trade concept, you can place orders faster, without an input interface. Customers make their selection by moving their eyes. All they have to do is choose how much to invest. If they haven't already set an amount in their preferences, we suggest a default investment of 5,000 Swiss francs.

How do you think this app will be used by customers?

The Trading VR app primarily highlights how Swissquote is a technology-driven bank. Curious customers will try it out. I don't think that this way of trading will become commonplace, but it opens doors to future developments. Some customers will enjoy the chance to discover something new through an immersive experience.

In your opinion, what are the best tools being developed using the latest technology?

Voice recognition, or being able to ask a machine to place orders, is really revolutionising things. I think that in the very near future, the combination of VR and this rapidly developing technology will bring extremely promising solutions. ▲

Get a Cardboard



The simple but effective cardboard kit turns your smartphone into a virtual reality headset. We have 500 of them to give to our readers. To order a viewer, just email your postal address to cardboard@swissquote.ch. It's first come, first served!

TRAVEL

Luang Prabang: the timeless city

Since the international airport opened, the northern Laotian city has become a favourite destination for travellers seeking the quieter side of Asia.

BY JULIE ZAUGG



At an elephant sanctuary near Luang Prabang, visitors can interact with pachyderms in their natural environment.

As the day breaks, total silence reigns in the heart of Luang Prabang, a city with a population of 56,000 in northern Laos. The first rays of sunlight shine down on a crowd sitting on the pavement. In front of them are huge baskets of woven bamboo filled with a variety of sticky rice that is unique to Laos. They are forming little balls of rice with their fingers.

The monks appear. With their flowing ochre-coloured robes, shaved heads and unflappable expression, they walk one by one before the inhabitants of Luang Prabang, who place little mounds of rice in their silver bowls. That will be their meal for the day. This ancient custom, reflecting the vows of poverty and humility taken by the monks, plays out every morning in the exact same way in the streets of the former royal capital:

On the peninsula separating the Mekong and Nam Khan rivers, Luang Prabang seems to be stuck somewhere outside of time. On either side of the small cobblestone streets stand majestic colonial homes featuring immaculate white columns, large dark-wood porches and red-tile roofs. There are almost no cars or motorcycles. At most, you'll see an occasional auto rickshaw drive by. Or a Lao walking along under an umbrella, the pace slowed by the glaring sun.

"Twenty years ago, we had no modern amenities," says Keomany Vixiane, who was born in Luang Prabang. "No ice cubes, no televisions, no refrigerators." He now manages a hotel. "The city only opened up to tourism about 10 years ago. And as soon as we step outside, people still live as they did in the past – to the rhythm of nature." The French influence,

a heritage from the colonial period which lasted from 1893 to 1953, has endured. "Many older people still speak French, and you can find croissants in most cafés," says Francis Fernandes, another manager at the hotel.

An international airport with service to Singapore, Kuala Lumpur, Hanoi and Bangkok opened in 2012, turning the city into a tourist hub. Today, Luang Prabang attracts travellers looking for a more authentic Asia and who want to avoid the crowds of tourists in Vietnam and Thailand.

Listed as a UNESCO World Heritage Site since 1995, the city was home to the Lao royal family until the communists came to power in 1975. It has preserved its rich history, which can be found throughout the city. ▶

The city has an extraordinary amount of sites protected by UNESCO (Royal Palace Haw Kham, Luang Prabang, 2015).



Cultural and spiritual wealth

The former royal palace **Haw Kham**, built in 1904 for King Sisavang Vong, comprises a long stretch of magnificently decorated rooms. The walls are covered with gildings and scenes etched in Japanese glass. Beautifully preserved colonial-period furniture is displayed next to a golden throne. On the river bank, the **Xiang Thong temple** from the 16th century features a set of pagodas covered in multi-coloured mosaics depicting the tree of

life, elephants and the Buddha. **Mount Phousi** is a 150-metre-tall hill located in the heart of Luang Prabang and home to reclining Buddhas and golden dragons. It offers a spectacular view of the surrounding mountains. The spiral staircase leading to the top opens onto the small **temple of Chamsi**, next to which you can buy offerings of flowers or birds in cages. Buddhists believe that freeing the birds brings good luck.

The real colonial experience

Luang Prabang now offers a number of luxury boutique hotels, including **Satri House**. The hotel features a maze of corridors that lead to small ponds, tiny gardens filled with tropical flowers, alcoves with plush sofas and a pool nestled among the palm trees. This traditional residence has 31 rooms, all decorated with antique furniture. "When the King of Laos was deposed by the communists in 1975, the crown prince fled to France," says Raphael Klein, the manager of Satri House. "This was his house."

The Luang Say Residence is a white mansion surrounded by five pavilions designed in neo-colonial style. In the main building, a bar made in dark wood is reminiscent of the period of gentlemen adventurers. The walls are decorated with rifles, black and white photos and butterflies pinned up in glass cases. A fireplace and shelves filled with travel books add the perfect touch to the setting. "It's an old colonial house, which has been entirely renovated," says Francis Fernandes, the manager, walking along the pool. In the setting sun, the home takes on an emerald green shade with stripes of sparkling gold.

LuangSayResidence.com, +85671260891.

SatriHouse.com, +85671253491.

ISTOCKPHOTO



Laos has some of the most refined cuisine in Southeast Asia (Luang Prabang, 15 May 2015).

DRINKS	
- Big beer Lao:	6.000
- Small beer Lao:	4.000
- Dark beer Lao:	4.000
- Big can beer Lao:	12.000
- CAN beer Lao:	10.000
- CAN Coca cola:	7.000
- CAN Sprite:	7.000
- CAN Schweppes:	8.000
- Santa:	7.000
- psi:	7.000
- er:	7.000
- ater:	5.000



Unforgettable excursions



ISTOCKPHOTO

The Kuang Si waterfalls create exquisite natural pools.

In Laos, elephants are pack animals. They carry wooden logs for logging companies and are exploited to the point of exhaustion. They are also deprived of any contact with other elephants, which makes them anti-social and keeps them from mating. In 2011, French-born Sébastien Duffillot co-founded an **elephant sanctuary** to give some of these pachyderms an environment and living conditions more similar to their natural setting. Visitors can book two-day stays on the edge of

the lagoon to spend time with the elephants. You can watch them bathe and, from a footbridge hanging from the trees, observe how they relearn herd behaviour. You can also meet the younger baby elephants at the centre. At the end of the day, you can follow them for a few hundred metres before they disappear into the jungle for the night.

The **Kuang Si Falls** form a tiered series of cascades that pour into pools in limestone rock, giving the waters

their turquoise hue. The falls can be reached from behind, after travelling through Hmong villages, a valley of rice and coriander fields and, finally, a bit of jungle. Steps run from the top of the falls and lead to the first of these natural pools, into which thunders a huge column of white water. It makes for an unforgettable swim.

ElephantConservationCenter.com,
+8562096590665.
GreenDiscoveryLaos.com,
+85671212093.



Subtle and explosive flavours



Laotian cuisine is one of the most refined styles of cooking in southeast Asia. Fresh and simple ingredients such as buffalo meat, Mekong river fish and green papaya are blended with spices that make them explode with flavour, such as lemongrass, padaek (sauce made with fermented fish), galangal, lemon basil and hot peppers.

At **Manda de Laos**, customers dine by candlelight under a huge red tent on the edge of a pond covered with water lilies. Crispy duck

with tamarind, whole fish wrapped in aromatic herbs, larb (spicy beef salad) and coconut crème brûlée. **Tamarind**, located along the river, offers cooking classes and an authentic menu. **Elephant**, **Blue Lagoon** (run by a Swiss native) and **Couleur Café** are three places where you can eat in a gorgeous setting. ▽

MandaDeLaos.com, +85671253923. TamarindLaos.com,
+85671213128. Elephant-restau.com, +85671252482.
Blue-lagoon-restaurant.com, +8562059252525.
[Couleur Café](http://CouleurCafé), +85671254694.



CARS

These SUVs stay in shape

REPUTATION AND SPORTINESS ON THE RISE

BY PHILIPP MÜLLER

AUDI Q5 2.0 TDI QUATTRO S TRONIC, A SERIOUS CONTENDER



MOTOR: 4 CYLINDERS, TURBODIESEL,
1,968 CM³
POWER: 190 HP AT 3,800 RPM
0 TO 100 KM/H: 7.9 SECONDS
STARTING PRICE: CHF 54,650

Flooded with trendy all-terrain models, the automobile market has seen it all. First the Maserati Levante, then the Bentley Bentayga, and now the newest models: SUVs from Lamborghini and Rolls-Royce. This is also the case for other brands, including the new Alfa Romeo Stelvio and the Jaguar

F-Pace, competing with the Porsche Macan and Mercedes GLC, as well as the second-generation Audi Q5 unveiled this fall. Though the Audi brand evokes less superiority than Alfa – the lines of the Stelvio have incidentally already inspired Moto Guzzi – Audi's mid-size SUV still has strong brand recognition, beginning in 2008 and sustained over the years with the hybrid model and the sporty SQ5. The new Q5 doesn't boast major stylistic innovations, but its technological aspects are flawless: head-up display, road sign recognition, air suspension systems, digital display

cluster, power liftgate and more. Audi has thought of everything, as well as averaging a few extensions to the starting price. The selective catalytic reduction should make drivers forget all about past diesel decontamination setbacks. Despite its slightly larger size (3 cm longer at 466 cm) and weight that is still significant after skimming (90 kg less at 1,850 kg), fuel consumption is listed as 5.2 l/100 km, according to specs. Another attractive feature is the 610 l boot space (50 l more). The Q5 could be the epitome of Audi's range... ▾



JAGUAR F-PACE, ON THE LOOKOUT

Large for a mid-size SUV (4.73 m), the F-Pace appeals to all with its balanced style, generous interior volume, full range of motors and 380 hp V6 petrol compressor engine (S). Starting at CHF 57,500.



ALFA ROMEO STELVIO, WINNER

Unveiled in November at the LA Auto Show, the Stelvio (4.68 m) embodies the expansion ambitions of the Italian brand. Its dynamic features are promising and make the Stelvio a pleasure to drive, especially with the 510 hp V6 2.9 biturbo engine (QV). Starting at CHF 64,900 (First Edition Model).

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 Swissquote



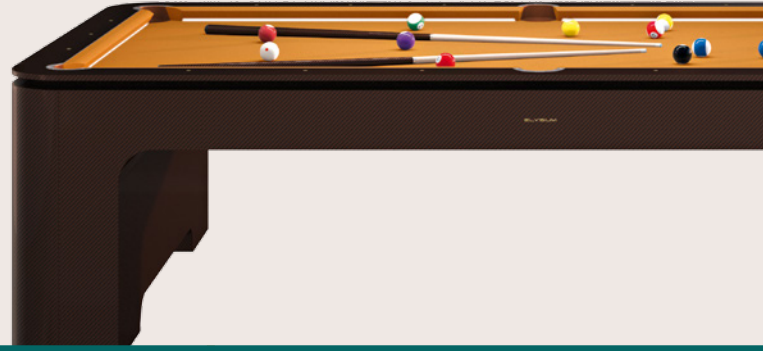
BOUTIQUE

MORE THAN JUST A POOL TABLE

The Elysium pool table, tailor-made by Spanish start-up IXO, is a bit like the Rolls-Royce of pool. The table is equipped with sensors, optical detectors, a touch screen and even 4K cameras to record plays. With this super smart table, players enjoy a precise, smooth and sensual playing experience while simultaneously improving their technique.

www.ixocarbon.com

Starting at CHF 175,000.-



EXTREME DRONE

Leading leisure drone manufacturer DJI has just revealed its latest model: Inspire 2. Designed for image professionals as well as fans of high-tech toys, Inspire 2 is compatible with Zenmuse X4S and X5S cameras. It can reach a top speed of 108 km/h, accelerating from 0 to 80 km/h in 4 seconds. It can fly for 27 minutes at an altitude of 5,000 m and in temperatures as low as -20° C.

www.dji.com

CHF 3,672.-

A CLASSIC, REVISITED

Don't change a winning team: Australian designer Marc Newson has returned to Atmos, the iconic clock from Jaeger-LeCoultre that is entirely handcrafted and assembled. The clock's virtually perpetual mechanical movement is classified as Jaeger-LeCoultre calibre 568 and the completely transparent case is crafted from Baccarat crystal.

www.jaeger-lecoultre.com

CHF 27,500.-



TRAVEL SMART

With the Bluesmart suitcase, travellers can lock their bag remotely via a smartphone or smart watch. A GPS chip can locate the suitcase anywhere in the world, and a digital scale checks the weight of the suitcase in the app. The suitcase also has an emergency battery to recharge mobile devices. A must-buy for travelling with peace of mind.

www.bluesmart.com

CHF 485.-



INDOOR GARDEN

Developed by French start-up Prêt à pousser, Lilo is an indoor vegetable garden designed by urban gardeners. It has a lighting system that reproduces the day/night light cycle and three pots filled with water hold capsules pre-seeded with herbs. The smart version of Lilo sends alerts and personalized tips to your smartphone.

www.pretapousser.fr

CHF 130.-



BIOMETRIC T-SHIRT

Canadian brand Hexoskin has already outfitted astronauts and their new target is athletes. The Hexoskin biometric t-shirt monitors vital signs during exercise, including recovery heart rate, heart rate variability, respiratory rate, ventilation per minute and speed. The sensors record more than 42,000 data points per minute, making the t-shirt a wearable lab.

www.hexoskin.com

CHF 485.-



A COACH IN YOUR GLASSES

Power output, heart rate, speed, pace, time, stride and distance: Oakley has partnered with Intel to design smart glasses that analyse data in real time and provide personalised encouragement during exercise. The virtual coaching system is voice-activated so users can make adjustments to their movements right away.

www.oakley.com

CHF 500.-



ANDREAS SCHÖNENBERGER
 CEO OF THE MOBILE PHONE
 PROVIDER SALT
 BORN 26 JUNE 1965 IN ZÜRICH

ASTRONAUT, TORTOISE AND BICYCLE



Andreas Schönenberger is considered one of the pioneers of the digital industry in Switzerland. Before becoming CEO of Salt in 2016, the Zurich resident was Country Manager for Google Switzerland and Vice President of the US consulting firm Monitor Group. He also served on many boards, including Mobilezone and Publigroupe, and founded smama, the Swiss mobile association. Schönenberger has a PhD in theoretical physics from the Ecole polytechnique fédérale de Zurich (EPFZ) and an MBA from London Business School. Salt was acquired by Orange at the end of 2014 by French entrepreneur Xavier Niel and has since implemented an assertive strategy with low-cost plans. Salt's workforce decreased from 1,700 to around 700 since 2002.

IF YOU COULD CHOOSE ANOTHER CAREER, WHAT WOULD IT BE ?

I'd be an astronaut to discover new worlds.

IS THERE A PLACE THAT HAS HAD AN IMPACT ON YOU ? IF SO, WHY ?

Chernogolovka, Russia. I went to a summer school for theoretical physics there. It's hard to believe that aerospace and atomic technologies were developed there.

WHAT MOVIE WOULD YOU LIVE IN ?

The Hitchhiker's Guide to the Galaxy, from the novel by Douglas Adams. A supercomputer tries to produce the question to which the answer is 42.

WHAT HAS INSPIRED YOU RECENTLY ?

I'm fascinated by artificial intelligence, which is the next step in the evolution of human societies.

WHAT IS YOUR SECRET HOBBY ?

Even though I like driving, I love mountain biking. It requires endurance and concentration.

WHAT WAS A KEY PART OF YOUR CHILDHOOD ?

Team sports : motivation and team spirit are crucial for success.

HOW WOULD YOU DESCRIBE THE IDEAL WOMAN ?

A good sparring partner.

HOW ABOUT THE IDEAL MAN ?

He can laugh at himself and is aware of his strengths and weaknesses.

WHAT IS YOUR IDEAL ANIMAL ?

The tortoise, because it has survived all the changes on Earth for more than 200 million years. It can also live to be 250 years old, which demonstrates its endurance and ability to adapt.

WHAT SONG DESCRIBES YOU ?

We Are the Champions, by Queen. They were my first concert.

TELL US ABOUT A CRAZY THING YOU'VE DONE RECENTLY ?

I went cycling in nearly zero-degree weather without the correct footwear.

IF YOU WON 5,000 SWISS FRANCS ON THE STOCK MARKET, WHAT WOULD YOU DO WITH THE MONEY ?

I would put it back into the stock market.

DO YOU HAVE A BOOK RECOMMENDATION FOR US ?

Germany 2064, by Martin Walker. It's a well-written science fiction novel that describes a possible future [Editor's note: the novel depicts high-tech cities where bionic humans and robots live, as well as regions where humans reject technological progress]. ▲




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