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Bulletin

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Privacy

The Balancing Act Between Security and Freedom



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Contributors to this issue:

1 – Wolf Lotter

A journalist and author with Austrian roots, Lotter has long grappled with the intersections between economic, political and social questions. His essay pursues the dilemma of how much we want to share and how much we want to keep private these days. *Page 6*

2 – Helene Laube

A journalist living in San Francisco since 2000, Laube cofounded the Financial Times Deutschland and worked as its Silicon Valley correspondent. In this issue, she writes about one of the fastest growing markets in the IT sector: online security. *Page 26*

3 – Iris Kuhn-Spogat

An experienced economic journalist, Kuhn-Spogat, 52, has contributed to a variety of publications including Bilanz, Handelszeitung and Women in Business. As the mother of two teenagers and as a woman who by her own account has been permanently online since 1997, she was the ideal author for a piece on young people's apparently cavalier attitude about how they handle their online privacy. *Page 48*

4 – Christian Heinrich

A medical doctor and regular contributor to Zeit, Heinrich was incredibly fascinated with the profile of Sophia Genetics, a startup in Saint-Sulpice. The company combines artistic intelligence, Big Data and personalized healthcare, and is being treated as Switzerland's next "unicorn" — a startup valued at over one billion dollars. *Page 66*

Michael Wolf created the cover. An award-winning German photographer (his accolades include two World Press Photo Awards, among others), Wolf grew up mostly in the US and Canada. He now lives in Hong Kong. Wolf has published 13 books of his photographs.

It's About Us

Why do we need privacy? We've known since the Enlightenment that we need privacy and the private sphere to protect our freedom. But what happens when something else could guarantee freedom? That would make the private sphere superfluous.

Julie E. Cohen, an American legal scholar, was the first to propose this scenario. She argues that privacy serves solely to protect us as the subject. We cannot develop without the shelter of privacy, and we would lose our capacity for self-reflection and, eventually, our identity. We are indivisible from the shelter of privacy.

Cohen and many other thinkers have been highly engaged with questions of privacy lately. Former Data Protection Commissioner Hanspeter Thür is also concerned: "In the digital age, there is no such thing as harmless data. People are far too oblivious of this." (page 38) But it's not so simple, as Thür knows all too well.

People are relatively willing to share their data these days, because they get something in return. If you take part in a loyalty program, you can trade the points you collect for rewards; if you use a modern chat service, you can communicate much more easily with your friends; once you experience the advantages of a cloud solution, it's nearly impossible to go back.

The introductory essay (page 6) grapples with this modern balancing act between privacy and openness, and the tension becomes visible in the astounding stocktaking of the Internet of Things (page 32).

Iris Bohnet, a Swiss Harvard professor and member of the Board of Directors of Credit Suisse, approaches this topic from a different angle. As she says, "Trust is the key to the private sphere" (page 20). Fredy Hasenmaile, a real estate expert at Credit Suisse, explains why the desire to possess your own four walls is a primal human need and why homeowners are happier citizens (page 62).

And there's some good news: In a major report on young people, experts are seeing evidence that the students in the study know how to protect themselves in the digital world.

It's the adults who have some catching up to do.

Happy reading!

Your editorial team

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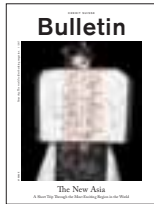


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Bulletin "The New Asia," 1/2017

The Oldest and the Best

The latest issue of Bulletin is excellent in every respect. I'm especially well able to assess the articles relating to China, as I led the Swiss Industrial Technology Exhibition in Beijing in August 1974. Bulletin is not only the oldest Swiss banking publication; it also continues to be the best.

Hans J. Halbheer, Zollikerberg

India Making Significant Progress

I would like to disagree with Parag Khanna on one point. Khanna states that India is poor and chaotic. That may seem to be the case from a superficial perspective, but today most Indians can determine their own daily lives. One must also take the size of the country into consideration; as well as the deeply entrenched belief in democracy (as rudimentary as this may come across to outsiders), and the enormous population with various languages, cultures, ethnic and religious roots. With good political leadership, India will continue to make great strides to the benefit of all segments of its society.

Phiroze M. Daruwala, Mumbai, India

Great Interest

I've been reading Bulletin for over a year now and appreciate its informative and analytical articles. I read the Asia-themed issue with great interest, especially the article about India.

R. D. N. Rao, Hyderabad, India

Surprisingly Multifaceted

I never cease to be amazed by the variety of topics and reports that are of great interest to me, even at over 90 years old.

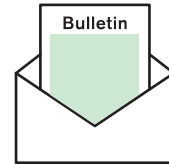
Werner Karth-Weiss, Basel

Doing Business by Telex

Upon reading the articles about Asia, I realized how greatly the Asian business world has changed. I can scarcely believe how I used to run my Asian import business when I see how things are managed today. I used to have to do everything by Telex. Faxing was first possible at the start of the eighties, and cell phones in the early nineties. Even the trips to Asia were much more arduous. The flight times were longer and the tickets cost double what they do now.

Andreas Bähler, Wichtrach

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Our Commitment to Lower Youth Unemployment.

Through the initiative to tackle youth unemployment, Credit Suisse has been committed to improving the opportunities for career starters in Switzerland since 2010. More than 8,800 young adults have already received assistance from our partner organizations and from the bank. Since April 1, 2015, these services have been supported by the legally autonomous "Check Your Chance" association and managed sustainably by the partner organizations.

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*How much intimacy do we need?
How public should our lives be?*
To answer those questions, we
need to balance the competing
demands of security, convenience
and freedom, a calculation that
will differ from one situation to
another.

By Wolf Lotter

A Balance

There is no better way to gauge the spirit of the times than to look at the bestseller lists. George Orwell, who died in 1950, painted a dismal vision of the future in his novel “Nineteen Eighty-Four,” which began to reappear on the bestseller lists just a few months ago. The novel is a work of world literature, one that is often quoted and purchased, but rarely read. It would be a shame if that were the case again this time. We have a lot to learn from Orwell, who was a staunch defender of personal freedom and a fierce opponent of totalitarianism in any form. (If you’d prefer to skip ahead, you can find a summary of “Nineteen Eighty-Four” and six other dystopian works on page 58.)

ing Act

In “Nineteen Eighty-Four,” an ordinary man named Winston Smith is caught up in the gears of a dehumanizing society that, for its part, believes itself to be good. In the world of Big Brother, everything is regulated and monitored. Privacy no longer exists, not even in the most intimate of spaces: one’s own home. Television sets function as surveillance devices – a sign of a world without hope. Even more than torture, murder and an endless stream of lies masquerading as truth, this hopelessness is at the core of George Orwell’s novel.

Like those who are purchasing “Nineteen Eighty-Four” today, we know that when the headlines are dominated by insecurity, terror, upheaval and talk of a new world order, there will be increasingly loud calls for security, stability and control. Privacy and individuality are losing ground. Security comes at the cost of the power to make our own decisions.

The Right to Privacy in Our Own Homes

When we lament that the private sphere is disappearing, are our fears overblown? Or are we going too far in our quest for absolute security? Isn’t it true that we have more freedom than any previous generation? And when people complain on Facebook about the loss of privacy, aren’t they the same ones who, a few minutes later, post a photo of their dinner online? Privacy always has two sides, contradictory elements that challenge one another.

The private sphere is one of the greatest achievements of the modern age and a fundamental human right. Individual rights would be unthinkable without it. It forms the basis for autonomous action.

Privacy, freedom and property are closely intertwined; indeed, one may be the necessary condition for another. Since the 17th century, people have proclaimed that “my home is my castle,” meaning that the private sphere and private property are to be respected by the government – and that people have a right to protect them against the power of the state.

The private sphere implies a right to live as we please within our own four walls (as long as we follow the law) – whether other people, or the state, or our boss like it or not, and even if others may view our lifestyles as “immoral,” “socially unacceptable” or “politically incorrect.”

Promoting the Happiness of the Individual

The private sphere means freedom. The perennial question is this: How much freedom do we need? Or perhaps more aptly: How much freedom will “others” allow us to have? Is freedom something we choose, or is it granted to us from above – by the state, other people, a leader, a priest or another authority? This is a question people have been asking since ancient times. Almost always, authorities will point to the “common good” as they take steps to limit privacy or property rights (sometimes it’s a matter of security, a topic we will return to later on).

One reason why the Middle Ages was such a dark time is that there was no place for the individual. Privacy was considered sinful. It was only later that the world gradually brightened. The Enlightenment was an attempt, one that continues today, to find the right balance between the public and the private. How much freedom do we need, and how important is the role of society? And what is the ideal combination of privacy and security?

The 17th-century British philosopher John Locke sought to reconcile the opposing forces of the private and public spheres. A good government actively supports the self-determination of each individual. It imposes limits only when people’s life, happiness and advancement are threatened, for example in times of emergency or war. Otherwise, the job of the state is very simple: to do everything in its power for the benefit of the individual. The public sphere serves to promote the happiness of each person.

This paves the way for social contracts, constitutions, property guarantees, laws and revolution. But none of this would work without a recognition of the need for constant negotiation between the private and public spheres. That, in turn, requires >

A Balance

clear rules and legal certainty, but also trust that each side means well in its dealings with the other.

This is not to suggest that people can just do whatever they want. But the state and society – the public sphere – should refrain from interfering more than absolutely necessary in a person's private affairs. The private sphere can never be large enough.

Instead of a Better Life, a More Comfortable Lifestyle

We need to remember, however, that the private sphere alone is not enough. During the Biedermeier era, in the first half of the 19th century, the private sphere was the focus of people's lives. Living under constant surveillance in Prince Metternich's police state, they withdrew from a dangerous outside world. They were free to furnish their homes however they liked; rather than enjoying a better life, they lived in more pleasant surroundings. Indeed, a comfortable home is not unimportant; it is a fundamental right. But a person who is satisfied merely to live in pleasant surroundings turns into a conventional, stodgy "Biedermeier," someone who might subscribe to the sentiment expressed in "Thoughts Are Free," by the German poet Hoffmann von Fallersleben: "I think what I will/And what makes me happy/But always in private/And only as is proper."

We need to remember that a private sphere that allows us no voice is a prison. Does this mean that "the personal is political" – and thus also public – as the young people of the late 1960s insisted? Toward the end of the 1980s, American trend researcher Faith Popcorn coined the term "cocooning" to refer to the desire to retreat into one's home and withdraw from the world. Many in the influential generation that came of age in the 1960s criticized that trend. They demanded that every individual be held accountable. Once again, that view is being expressed by the extreme left and right.

Clearly there are those who fail to understand what an open society means. An open society appreciates the fact that there is a line between the private and the public, and that its citizens take full advantage of their freedom. It embraces their diversity. None of us can develop to our full potential if Big Brother is always watching to make sure that we are following the rules. It makes no difference whether the authorities are "well-meaning" or motivated solely by a desire for power. Privacy is a fundamental right, and it also implies the right to be left alone.

That right may mean equipping public spaces with video cameras to prevent assaults and reduce crime. Gathering data on airline passengers, which makes profiling possible, means collect-

ing information about the behavior of millions of innocent people. But it is also an important tool in fighting terrorism. Gathering such data for no reason would constitute an abuse of power, as would continuing to do so after the danger had long passed. When might that be? It's hard to say. The private sphere is a fixed quantity, but its limits fluctuate, depending on the situation.

We as Humans Decide

New technologies present a similar case. Computers and automation can do much to liberate us from brain-numbing work, but they also open the door to unprecedented control and manipulation. Smartphones and tablets can be useful and entertaining, and they allow us to be much more mobile. But they can identify a user's location, and their data can be misused to harm their owners.

Granted, eliminating cash might prevent some crimes. But do we want to allow the state to take total control of our property? Freedom that does not include a right to material self-determination – and that's what private property really means – is a farce. Who can guarantee a right to private property once it has been taken away? Do we want a "pocket-money" society, one in which workers are granted no more than a pittance at the whim of the politically powerful? That is, on balance, a greater danger than the one we are seeking to eliminate.

Self-driving vehicles may prevent accidents. However, the system takes control of the car in congested areas, transforming the driver into a mere passenger. That's okay if it's what the driver in-

tends. It's not okay if we no longer have the option of turning off the autopilot. Human beings think. Human beings are at the wheel. And if not, it must be their decision.

The Key: Personal Responsibility and Critical Thinking

To preserve freedom, we need to be aware of both opportunities and dangers – and we need to make decisions. No one can relieve us of that responsibility. These decisions are not easy, and they never will be – because nothing is certain, although technology would sometimes have us believe that certainty is possible. The truth is that technology can only help us act on decisions we have already made. If we don't want to lose some of our freedom, we must accept that fact.

The key to a balance between the private sphere and the need for security lies in personal responsibility and critical, independent thinking. That's why it is so important to learn – and teach – self-confidence and the ability to make decisions. A society of risk-conscious, fearful citizens who expect the state to provide for their every need cannot remain productive. This is not the recipe for a functioning state, nor for successful business.

Respect for the private sphere of our clients and for citizens in general is one of the most important prerequisites for business in the 21st century. You have to think of others if you want to do something

positive for yourself. You need empathy – or, as the philosopher Hannah Arendt so brilliantly put it, “representative thinking.”

This is a moral imperative for our times, and can help us reconcile our own interests with those of others. As Arendt observed in her book “Truth and Politics,” we need to take into account the standpoint of others, without abandoning our own identity, and then form our own opinions.

Consideration – respect, in other words – is what maintains a balance between the private sphere and the demands of security. □

A society of fearful citizens who expect the state to provide for their every need cannot remain productive.

Enforcing Act

Wolf Lotter co-founded and writes for the business journal brand eins. The industry publication Wirtschaftsjournalist recently named him the 2016 “Business Journalist of the Year” in the category of economic policy and society.

What should be public and what should remain private is a cultural question, if nothing else. A photographic trip around the world – and beyond – to get a glimpse into the private spheres of a wide variety of people and places.

A man in a dark suit and glasses stands in a large room, looking at a massive wall of surveillance screens. The screens display various types of footage: some show cityscapes and buildings, others show industrial sites with cranes, and some show smaller, more detailed views of specific areas. The man is standing on a carpeted floor, and the overall atmosphere is one of surveillance and data collection.

Private, Semi-Private



The Perfect City

SONGDO CITY, SOUTH KOREA

Near the capital city of Seoul, a business district that originated on a drawing board is growing. This meticulously planned urban world will be built by the year 2020 on land that was reclaimed from mudflats, with space for 70,000 residents and jobs for 340,000 people. The city of the future is green: Parks dominate half of the surface area. It is smart: Energy and resource consumption is drastically reduced through sensors and a comprehensive network. And the entire system is monitored as well: All the cameras, chips and sensors capture every step of the city's residents for the purpose of optimizing energy consumption.

Alone Among Many

JAPAN

3.1 billion passengers use the Tokyo subway every year, making it the world's most heavily used underground transportation system. Every day around 8 million Japanese people ride to work in close quarters. Spiegel magazine called it the "crumple zone of capitalism": On the subway, individuals become a single transported mass. There are special subway cars for women, the only place where they can evade the unavoidable physical contact with male passengers – if any seats are available.

Temporary Home

MONGOLIA

The Dukha people are Mongolian reindeer herders who live a nomadic life. But they cannot take that for granted. From the 1980s until the end of the Mongolian People's Republic, the Dukha were forced by the communist regime to settle in two collectives. After the collapse of the Soviet Union, they once again moved out into the taiga, or boreal forests. About 40 nomadic families currently live there today. The photo shows a mobile settlement in Zuun Taiga, which is located about 17 kilometers from the Russian border.







Alone in the Universe

INTERNATIONAL SPACE STATION ISS

Italian astronaut Samantha Cristoforetti works for the European Space Agency (ESA) and is the first Italian woman in outer space. Her workplace is the ISS – International Space Station – where her area to rest and relax is about the size of a telephone booth. The ISS Futura mission where this photo was taken ran from November 23, 2014 to June 11, 2015.

Quiet, Please

HI-RES! AGENCY, BERLIN-NEUKÖLLN

What looks like an enigmatic art installation in this photo in fact serves a very simple and practical purpose: At the Hi-ReS! digital agency, located in Berlin-Neukölln with 80 employees, people retreat into these black boxes for phone conversations, where they can speak without any distractions. The modern office design is also award-winning – and the company is still hiring.







The Island of the Blessed

SANTA CRUZ DEL ISLOTE, COLUMBIA

The most densely populated island in the world is only about 1.2 hectares in size and is completely developed. The man-made island lies around 20 kilometers northwest of the Colombian coast and has room for 1,200 people in about 100 buildings. There is no doctor, no consistent drinking water supply and just one generator, which does not always run. When asked by a reporter what makes the island so livable despite all this, one resident replied: “There is no violence here. We don’t need police, we all know each other and enjoy life.”

Co-op Housing for Young Entrepreneurs

EMBASSY NETWORK, SAN FRANCISCO

One might get the impression that the living room shown here is that of a somewhat untraditional American family. In fact, this is an unusual residential co-op. Founders of startup companies and people from the tech world live together in The Embassy in San Francisco. Thirteen people under one roof seek to share space and life and try out new ways of living.



Escaping

WOODEN BOAT OFF THE LIBYAN COAST

Around 700 migrants were traveling in two wooden boats in the summer of 2005 when they were picked up by the Doctors Without Borders (MSF) organization. These refugees were saved, but more than 5,000 drowned last year in the Mediterranean. The boats are overcrowded and barely seaworthy, and conflicts continually arise between the different groups of refugees, with sometimes deadly consequences.



“Trust is the key to the private sphere”

Iris Bohnet, a Swiss-born professor at Harvard University, argues against relying on intuition, explains how to conduct a job interview and warns of the dangers of social media.

By Mandana Razavi and Simon Brunner (interview) and Yves Bachmann (photography)



Ms. Bohnet, let me start with a simple question: What drives people?

You may not mean that seriously, but there is in fact a short answer to your question: passion.

Is it that simple?

I might also have said “a thirst for knowledge” or “the meaning of life.” But passion goes deeper. It is what impels us to work, love, go jogging in the morning, buy flowers, do our best in the workplace –

but it also motivates us to put up with an unpleasant job so that we can feed our families, or to survive incarceration.

You have a degree in economics.

Yes. So did you expect me to say that money is what drives people?

Perhaps, or more generally that we are motivated by a desire to maximize utility.

Status, income, wealth, power – all of these things are external influences. But

what truly drives us is not these things, but factors within ourselves. Passion is a good shorthand term for these internal forces, which might also be referred to as intrinsic motivation.

Your research examines trust from the perspective of behavioral economics.

What does trust have to do with the private sphere?

The better I know someone, the more I’m able to trust him or her. And the better >



“Trust leads to greater efficiency”: Behavioral economist Bohnet.

I know someone, the more inclined
I am to let that person get close to me.
The key to the private sphere is trust.

*There's a saying that trust is good,
but control is better.*

Granted, a great deal can be achieved
through control. But it comes at a
high price. If you check the ticket of
everyone on the subway, fare evasion
will no longer be a problem – but is that
an efficient approach?

*Kenneth J. Arrow, the recently deceased
Nobel Laureate in economics, once said,
“It saves a lot of trouble to have a fair degree
of reliance on other people's word.”
Political scientist Francis Fukuyama argues
that trust is a significant factor in a country's
or company's prosperity. Do you agree?*

I went shopping recently, and when it
came time to pay I discovered that
I had forgotten my wallet. I asked the
customer in line behind me if he would
lend me the amount I needed – and
he agreed, giving me the money along
with his name and address. That saved

me the trouble of going home and coming
back again. Along with my check, I
sent him a box of chocolates – as interest,
you might say. Trust clearly increases
efficiency; it makes the pie larger.

*Reputation is also a factor in determining
whether you trust someone.*

Sometimes your own opinion is less
important than what others think.
That is the power of reputation. And that
power is increasing as technology
advances. We look at the reviews before
making a purchase. Amazon, Ricardo
and TripAdvisor have made it easier to
navigate the world and led to an
increased focus on the customer. But
as with progress of any kind, there
are certain dangers.

A stream of unrestricted commentary?

I've recently found myself thinking about
Heinrich Böll's novel “The Lost Honor
of Katharina Blum.” Because of her
friendship with a criminal, an innocent
woman is publicly vilified and driven
to actions that end in tragedy. Böll's novel

Iris Bohnet, 51, was born
in Lucerne. She is a behavioral
economist and professor at
Harvard's Kennedy School, as
well as the director of its
Women and Public Policy
program. She is also a member
of the Board of Directors
of Credit Suisse and author of
“What Works – Gender Equality
by Design,” a much-discussed
book that is to be published in
German by C.H. Beck in the
fall of 2017. Iris Bohnet is married
to attorney Michael Zürcher.
They have two sons.

is an indictment of the tabloid media – and that’s nothing compared with social media. How can we possibly determine whether all the things we read there are true? It’s no wonder that we’re living in an era of “fake news.” Protecting privacy is more crucial than ever before.

Is trust becoming more important?

Its significance is changing. There is a fundamental need for trust when information is distributed asymmetrically. If everyone knows the same things, trust is unnecessary. In the world of finance, for example, recent technologies have led to greater transparency and more information sharing. With an iPad, it’s possible to help determine your investment strategy and review it on a regular basis. When you meet with a client advisor, you have all of the data and can simulate various scenarios. Clients now have more information. But the situations they

It would have to be quite certain.

Maybe 75 percent?

So you see, your risk aversion is lower than your betrayal aversion, by 20 percentage points. That’s true of most people. We simply don’t like being cheated.

You also point out that there are significant cultural differences in how people respond to betrayal.

Let’s say I run a gallery, and you have purchased a painting from me for 1,000 Swiss francs, but you haven’t picked it up yet. Now another customer comes in who is even more enthralled with the picture, and she offers me 2,000 francs. In the United States, it is quite possible that I will sell the picture to her and refund your 1,000 francs, giving you a little extra as compensation. After all, I have caused you minor emotional damage. This is called “efficient breach.” The idea is that we should break contracts when it’s

What cultures are you referring to?

Conducting our experiments all over the world, we found that in many Middle Eastern countries, trust is created by eliminating as many instances of breach of contract as possible. In that region, betrayal has a significant moral component. You also lose face if you’re cheated, since it suggests that you haven’t done enough to make sure that the person you were dealing with was trustworthy. Punishments are correspondingly draconian.

What countries are at the opposite end of the spectrum?

At the extreme end is China, where we found the lowest level of betrayal aversion. It was also very low in Brazil. In those countries, the levels of risk and betrayal aversion are practically identical. Trusting someone is viewed as similar to gambling. Sometimes it works out, sometimes it doesn’t.

Recently you have been looking more closely at intuition and how it leads us astray.

But isn’t it that famous “sixth sense” what makes us human?

A great deal of research has shown that intuition is deceptive, as it’s based on prejudices and stereotypes. Particularly when making major decisions, such as hiring someone, you want to be sure that you’re choosing the very best candidate.

And you’re saying that means that you should ignore your intuition?

Yes. Intuition isn’t the best source of guidance when assessing a job applicant’s performance and skills. If you know the age of a job candidate, or that she has two children or graduated from a specific university, that triggers certain associations that may not be accurate. Here’s a question for you: When you think about people who live in Florida, what image comes to mind?

Retirees who want to enjoy the sunshine.

But the truth is that 84 percent of the population of Florida is under the age of 65, which is only slightly lower than the percentage for the United States as a whole. So while Florida’s population is slightly older than the national average, there is no reason to assume that just because an applicant is from Florida, that person is older. This is a classic case >

Granted, a great deal can be achieved
through control.
But it comes at a high price.

face have become more confusing and complex, and they have more providers to choose from. As a result, trust and expertise have once again become enormously important.

Some of your research has shown how sensitive people are to an abuse of trust, a phenomenon you call betrayal aversion.

Is that comparable to risk aversion?

No. Let me give you an example that illustrates the difference. Let’s say you go to a casino and play a game that offers you the chance to double your stakes. How high does the probability of winning have to be for you to decide to play?

If the odds are slightly better than one in two, we’re in.

Okay, so about 55 percent. Now suppose that a colleague you don’t know very well asks to borrow some money – saying that he’ll pay back double that amount at the end of the week. For you to agree to lend him the money, how high would the likelihood of repayment have to be?

efficient to do so, but we should also compensate the person who has lost out.

That would be unthinkable in Switzerland. Here the system relies on the presumption that a handshake is binding.

Correct. The Swiss system is based on the legal principle of “pacta sunt servanda”: Agreements must be kept. In this case, therefore, it is very likely that I would have to give the painting to the first buyer.

From a moral perspective, this seems right.

Yes, but the American system, too, promotes trust. You will be compensated if an agreement is broken. And the system doesn’t discriminate as much. You don’t have to think about whether you can trust someone or not, since the system ensures that the costs of a breach of contract are very low. It’s much like how insurance works. In countries where it is considered extremely important not to be cheated, on the other hand, you do business only with people you can absolutely trust – your family or clan.

of bias, a common phenomenon that we focus on in behavioral economics.

What should you base your hiring decisions on, if not on your intuition?

We know from numerous studies what works and what doesn't. First, you need to advertise the position in a way that appeals to the right candidates – that's not a simple matter, but algorithms can help find language that is free of unintentional bias. Resumes should be anonymous; they should not include the candidate's name or address – nor, of course, a photograph. Our research has demonstrated that such information is not helpful. In fact, it leads us astray.

What about the job interview itself?

We know more about job candidates than ever before. Yet we continue to conduct unstructured interviews, where interviewers are at the mercy of their prejudices. Google has conducted studies to determine the optimal number

of interviews. That's correct. Intuition is like a rule of thumb – it helps us get through the day efficiently. But like all such rules, it's sometimes wrong. When you're making an important decision, do you really want to rely on a system that has been shown to be error-prone, especially when there are better options?

You're trying to eliminate the role of prejudices as much as possible.

But the world is moving in a different direction.

Yes, unfortunately. Historically, people have retreated in times of rapid change and uncertainty. That is what we're experiencing right now. We're seeing a retreat in favor of our own nation, our own skin color, our own gender, our own political party. Many Western countries have experienced growth at the expense of the lower middle class, and we're now paying the price. The gap between rich and poor has widened, and for the first time not all of society's winners are white

responsive to the people. There is a widening gap between the political sphere and the people in many countries – but not in Switzerland. Although some would disagree, I see no indication that there is an isolated “political class” in Switzerland.

Finally, a personal question: How did you make what I presume was the most important personnel decision of your life – “recruiting” your husband?

(She laughs.) Okay, you've caught me there – it wasn't a very systematic process. I simply fell in love with him. But before we got married, we had some matter-of-fact and not particularly romantic discussions about the important things in life: Do we want children? Do we want careers, and how much do we want to work? We didn't sign our marriage contract until we had reached agreement on all of those questions. I would encourage every couple to do the same. □

There is a widening gap between
the political sphere and the people in many
countries – but not in Switzerland.

of interviewers – four – and to find out which questions actually predict future success in the company. That's the power of big data. It's also important to ask candidates to solve problems that have something to do with the job they are applying for. Such tests are a much better predictor of future success than interviews.

You say that you shouldn't base your decision on whether or not you find someone sympathetic. Why is that?

In recruiting a new employee, our aim should not be to duplicate ourselves. After all, diverse teams have a higher level of what we refer to as “collective intelligence.” Hiring someone you like often means hiring a clone of yourself.

Not all prejudices are false; for example, the average person in Switzerland is probably more punctual than the average person in India.

men. Some of that group are now rejecting the establishment and the advance of globalization.

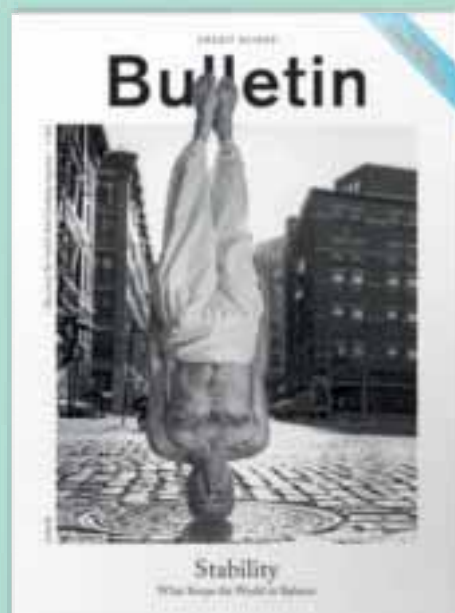
Some are also lashing out against people like you – a member of the elite, a professor who argues using facts and figures.

Yes, trust in the so-called elites is declining. I found it very shocking that prejudices were expressed so casually during the American presidential campaign. Only a few years ago an open display of racism would have been unthinkable.

The situation is somewhat different in Switzerland. According to Credit Suisse's Worry Barometer, the Swiss government continues to enjoy very high levels of trust, higher than the governments of other countries. Why is that?

I think it has something to do with direct democracy. Our political system is very

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A Secure Business?

Each year, cybercriminals cause hundreds of millions of dollars in losses. In most cases, the attackers are engaging in industrial espionage. Online security is one of the fastest growing markets in the IT sector.

By Helene Laube

I

t was one of the largest data thefts in history. Hackers penetrated the servers of internet company Yahoo! and stole the information of at least 500 million customers: encrypted passwords, email addresses and personal information such as dates of birth and phone numbers. The hackers also gained access to millions of user accounts and used the stolen information to send spam and steal credit and gift card information.

The Silicon Valley company only publicized the attack, which occurred at the end of 2014, in September 2016. It did not provide details because the FBI was investigating the incident. This spring, the US Department of Justice revealed a diplomatic bombshell: It announced charges in the Yahoo! case against four people – including two employees of the FSB, Russia's spy service, which the Department of Justice alleged had directed a comprehensive "criminal conspiracy." The complaint charges that the stolen information was used to spy on employees of foreign governments, executives at banks and other organizations, and journalists.

In an increasingly digital and interconnected world, the risk of cyberattacks is on the rise. According to the Identity Theft

Resource Center, a nonprofit organization, 2016 was a record-breaking year: In the US alone, there were official reports of 1,093 data breaches – more than twice as many just five years ago (see chart). According to security analysis company Risk Based Security, billions of records were stolen during these breaches.

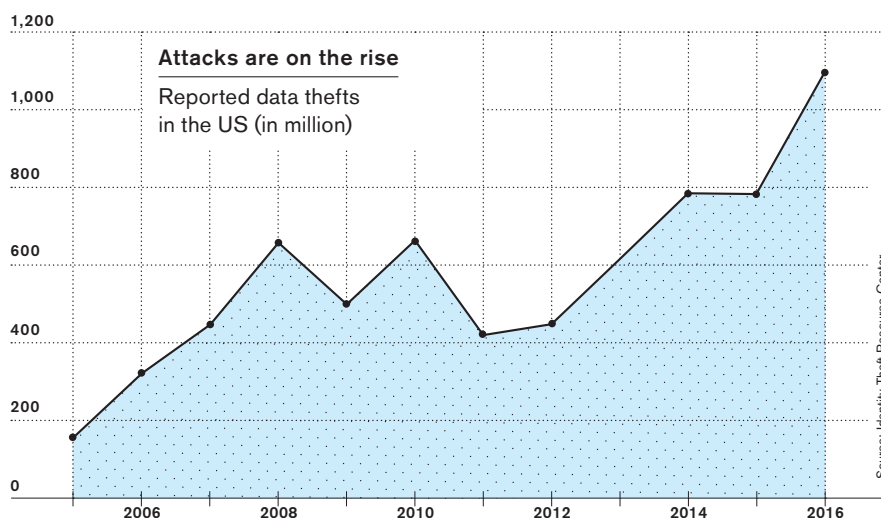
Everyone Is a Target

The economic damage caused by cybercrime and the cybertheft of intellectual property is enormous. The Center for Strategic and International Studies, a non-partisan think tank in Washington, puts the figure at 450 to 600 billion US dollars annually. The financial and emotional damage that ever more people suf-

fer because they have been hacked and lost their privacy is incalculable.

Digital attacks target everyone and everything: from individuals, their computers, mobile phones, networked homes and cars, to organizations and companies, as well as crucial infrastructure and governments. Most attacks, according to various surveys, target money and engage in industrial espionage.

Powerful cyberespionage organizations, which are not infrequently backed by governments, attack other governments, military installations, infrastructure and companies worldwide. Valuable economic, research and development expertise is stolen. Hackers even managed to crack the computer systems of the EU Commission





Most attacks involve industrial espionage (photo: interior of a data farm).

and the central bank of Bangladesh – from which they stole more than 80 million dollars.

Security Is Good and Expensive

The fast-rising number of targets as a result of increasing networking has led to a boom for providers of cybersecurity. “Security is one of the fastest growing markets in the IT sector, and it will continue to grow,” says Michael Diamond, an analyst at market researcher NPD. Corporate spending on cybersecurity is growing twice as fast as overall IT spending and will amount to more than 100 billion dollars by 2020, predicts US market research company IDC.

Most of the money spent by companies and governments goes toward security services, especially managed security services. With managed security services, an

external service provider assumes responsibility for protecting and monitoring a company’s entire IT infrastructure.

The second largest area is security software, which mainly involves investments in the security of end devices and identity and access management.

The third largest area is security hardware, which primarily profits from the purchase of “unified threat management systems.” These are devices that combine various tasks, such as firewalls, VPN gateways, virus and spam protection, authentication and a system for detecting attacks, in a single platform.

It is not surprising that cybersecurity is now one of the most popular areas of activity for venture capitalists in Silicon Valley. They invested 3.1 billion dollars in 279 cybersecurity startups last year, accord-

ing to CB Insights, a market research company. This is four times as much as in 2010.

The Risks Posed by Baby Monitors

The Internet of Things (IoT; see page 32) poses a particularly high risk. The majority of IoT devices – from web cameras to baby monitors to televisions – are sold without extensive security features. This makes it easy for attackers to hack them without the knowledge of their owners and turn them into a centrally controlled network made up of millions of devices. Hackers use these so-called botnets – a group of computers that has been infected with malware – to attack and paralyze their victims’ servers.

The most prominent botnet attack to date occurred last October. The websites of internet giants such as Amazon, Netflix, PayPal and dozens of other popular >



Entrance to a bunker in Amsteg (Uri), Switzerland, that is used for data storage.

The consequences of an attack can be significant. One-third of companies that experienced a data breach in 2016 reported a drop in sales, clients and business opportunities of at least 20 percent. This figure was reported in the latest Annual Cybersecurity Report published by network equipment provider Cisco.

Ninety-five percent of all successful attacks against companies can be traced back to human error, according to research. Some of the most common errors include sending emails with sensitive documents to the wrong recipients and opening emails infected with malware. Company IT departments setting up common user names and passwords also ranks near the top of the list. Spending vast sums on cybersecurity is of little use against such actions. For this reason, the National Cyber Security Alliance, an association of US IT companies and the US Department of Home-

One of the most common errors is sending emails with sensitive documents to the wrong recipients.

companies, including Airbnb, The New York Times and Twitter, were unavailable for hours following a botnet attack that paralyzed the servers of one of the network service providers used by these companies. Experts believe that the attack was used to test a cyberweapon.

Attackers Are Gearing Up As Well

Despite the enormous range of products and services to protect data, systems, infrastructure, accounts and privacy, the internet is not necessarily more secure. While the number of security products and services is growing, the attackers are constantly developing new techniques as well. Not only is the arsenal available to cyberattackers becoming more sophisticated, but it is also easier than ever to obtain the weapons for all sorts of attacks. Cybergangs buy tools, information, services and advice on the darknet, a section of the internet popular with criminals that can only be accessed with special software.

This shadowy area of the internet is also used to offer pilfered information for sale. For example, the login credentials for 70,000 accounts were stolen from hacked servers and offered for sale in a Russian-language underground marketplace last year. It was possible to buy the access details to the government network of an EU member state for just six US dollars.

Despite spending enormous sums of money on cyberdefense, many companies and authorities are not sufficiently prepared for cyberattacks and give too little priority to the battle against cybercrime. In a 2016 study commissioned by Nasdaq and US security company Tanium, more than 90 percent of managers surveyed admitted that they were incapable of understanding a security report. Furthermore, they said that their company was not prepared for a major attack. And this despite the fact that nine out of ten companies have been the target of a major cyberattack over the past five years.

land Security, urgently advise more employee training: “The best security technology in the world won’t help if employees do not understand their role and responsibility in protecting sensitive data and corporate resources.” □

Helene Laube is a freelance journalist in San Francisco. She was a founding member of Financial Times Deutschland and its longtime Silicon Valley correspondent.

Interview

“People are the biggest security risk”

By Simon Brunner

Mr. Schmidt, EY's Global Information Security Survey was published last year for the 19th time. What threats do companies face?

Targeted cyberattacks have risen sharply over the last few years, and they will continue to increase. Digitalization is opening up new attack opportunities in every industry. The greatest threat facing banks comes from organized crime because significant financial resources, motivation and time are required to target an individual institution. The preparations alone for such an attack can take months or even years. Attacks directed against the bank's clients using so-called e-banking Trojans, for example, can be perpetrated by individuals or small groups. These attacks are generally less sophisticated and typically result in smaller losses.

You use the term “cyber resilience” to measure the ability of companies to defend against or respond to attacks. How do financial institutions fare in this regard?

Banks, particularly in Switzerland, have a higher level of security compared to other industries. However, the intensity and sophistication of attacks have increased sharply in recent years. Until a few months ago, most measures aimed to defend against cyber risks. Greater investments are now being made in recognizing and responding to attacks – in the financial sector as well. All of these points need to be taken into account and addressed in order to achieve a good level of cyber resilience.

Are companies doing enough?

For the past three years or so, many larger companies have viewed cyber risks as the top business risk. The issue is certainly now being addressed at the Executive Board and Board of Directors level. However, the budget for cybersecurity is in most cases still well under 10 percent of total IT spending, although it is on the rise.

Where is there still need for further progress?

Above all, in the ability to recognize serious attacks in a timely manner and respond to them with targeted measures.

Doing so also requires having internal and external communication plans in the event of a successful attack.

How has the regulatory landscape changed?

Particularly in the banking environment, regulators around the world have defined additional data and cybersecurity requirements in recent years. FINMA, the Swiss regulator, has done so as well. An updated circular defining new requirements for dealing with cyber risks will come into effect in mid-2017.

What is the weak link in IT – people or machines?

People are still the greatest security risk. Successful cyberattacks on companies are usually the result of an error by clients or employees.



Tom Schmidt, 44, is a partner at the management consulting firm EY (Ernst & Young AG) and heads cyber security and information security in Switzerland. He also teaches these subjects at the University of Lucerne.

The Company Is a Family Affair

They seldom make headlines, and yet they employ four out of every ten workers in Switzerland: Family firms are a pillar of the Swiss economy.

By Sara Carnazzi Weber



Looking in vain: Many Swiss family businesses lack a successor.

The business section of most newspapers rarely reports on their doings. They communicate little about themselves, and few researchers explore them. They are family firms.

What sets them apart? How many of them are there, even? And how do they manage succession? A large-scale study conducted by Credit Suisse and the Center for Family Business at the University of St. Gallen recently investigated family firms, focusing on succession – an issue that is particularly important for such businesses and one that often turns out to be complicated.

More than 99 percent of all Swiss companies are categorized as small and medium-sized enterprises (SMEs). Of these, three out of four describe themselves as family firms, that is, wholly owned by the founding family. This amounts to about 375,000 family businesses in Switzerland, employing 1.6 million people, or 41 percent of the Swiss labor force. Clearly, family firms are important to the Swiss economy. Worldwide, they are estimated to constitute 60 to 90 percent of all companies.

One interesting fact is that the “owner family” is rather narrowly defined. In

most cases, the owners are a married couple, parents and their children, or siblings. The extended family is involved in only 10 percent of the companies.

Lack of Interest from the Next Generation

The earlier the founding year, the higher is the proportion of family businesses among SMEs. Are family firms no longer in tune with the times? Not necessarily; it could also reflect a pattern in the life cycle of the companies. Many business founders do not regard their companies as family-owned; often, this perception develops only when

their offspring join the company. Furthermore, the founders of non-family firms consider it less important to transfer their enterprise as an existing company (see below). In other words, as the founding generation gradually withdraws and the second generation comes along, the proportion of family-owned businesses automatically increases.

But another finding strengthens the hypothesis that family businesses are becoming less popular. Growth industries such as the healthcare, corporate service and IT sectors include significantly fewer family firms.

If this trend continues, a further decline in the share of family firms can certainly be expected. However, this does not necessarily mean that the business world will become less “private.” Rather, it is far more likely to also reflect a trend toward a society of multiple options. Thus, it is hardly surprising that one reason for a business to be transferred outside of the family is that the next generation is not interested in taking over. Under certain circumstances, the potential successors may want to leave the private sphere of the family and pursue a career elsewhere.

Greater Participation by Women

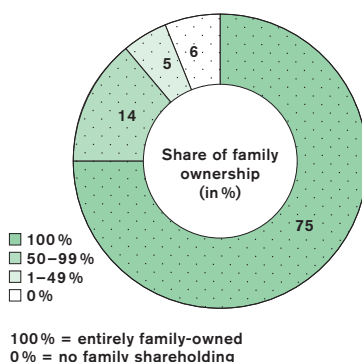
As mentioned above, 75 percent of SMEs are family businesses. But the families control the company mainly by participation in ownership; only 55 percent of companies have a member of the owner family in every senior management position, and only 48 percent of SME boards of directors consist entirely of family members.

Across all SMEs, 80 percent of owners are also engaged in the management. Conversely, members of the management board own an average 77 percent of the company's shares. The board of directors does not limit its activity to its role as a governing body either. On average, 65 percent of managing directors are also actively involved in the company's operations. Overall, there is no clear separation between ownership, management and the board of directors. This is the case even though good governance guidelines recommend separating the performance of these functions.

Women are clearly underrepresented on SME management boards (23 percent), but as family members their managerial roles significantly improve: 80 percent of female board members are part of the owner family.

Who owns the companies

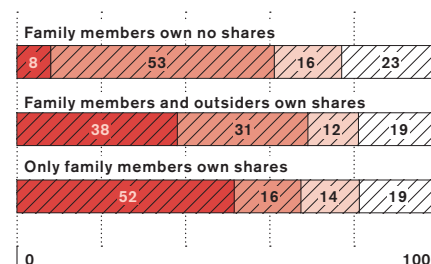
Three out of four SMEs in Switzerland are entirely owned by the founding family.



Who should take over?

When the company is family-owned, family solutions are preferred.

■ FBO ■ MBO ■ MBI □ Sale



Source for both figures: Credit Suisse Succession Survey 2016

The Question of Succession

Finally, family circumstances strongly influence the arrangements for corporate succession. Here, the terminology draws a distinction among four types of transfer:

- *FBO*: family buy-out, transfer to other family members
- *MBO*: management buy-out, transfer to senior executives
- *MBI*: management buy-in, transfer to persons outside the company
- Sale to another company or to a private equity firm

In 53 percent of cases, SMEs without family ownership expect the future transfer to be an MBO. This drops to only 31 percent when ownership includes some family members, and to 16 percent if all the owners are family members.

On the other hand, if the company is entirely family-owned, the owners prefer an FBO in 52 percent of cases, that is, transfer to other family members. Understandably, the desire to keep the company in the family is greatest if the owners include parents with children. Sibling relationships among the owners also intensify the effort to ensure future control within the family. Although a slight trend away from family-owned businesses can be detected, the need to keep the company within the close family circle remains strong.

However, these results do not reflect the succession strategies actually implemented, but rather the wishes and plans of the current managing directors. The ac-

tual outcomes often differ. Interestingly, more transfers occurred within the family than had been planned (figures rounded): 46 percent versus 41 percent. Perhaps the owners would have liked to place the company outside the family, but found no buyer. Employees took over the company (MBO) in 25 percent of cases – exactly the share the owners wanted. Transfer to people outside the company (MBI) occurred in 30 percent of cases, 13 percent more than wanted. □

Sara Carnazzi Weber is head of Swiss Sector and Regional Analysis at Credit Suisse.

The study “Challenge: Changing Generations” is available for download at <https://publications.credit-suisse.com> (> Corporates & Institutions > Studies and Analyses)

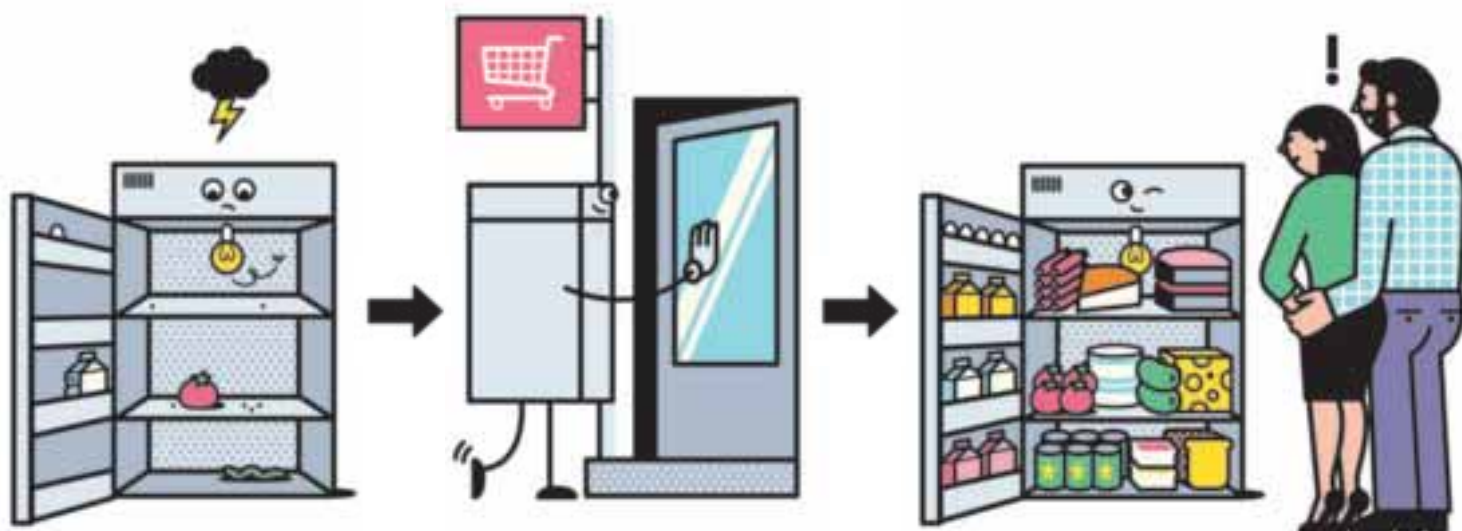
The World's New Nervous System

The Internet of Things can and will link every detail of our work and private lives – from office printers to ATM machines to toy dolls.

The good: greater comfort and more business opportunities. The bad: even more holes punched in our privacy.

By Steffan Heuer (text) and Rami Niemi (illustrations)

Melding the digital and physical worlds:
The refrigerator stays stocked, thanks to sensors, online shopping and robot delivery.

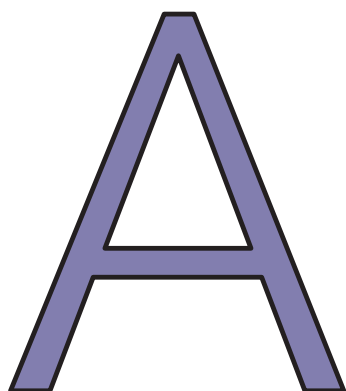


ago and dropped it off with a neighbor. Another ping right before bedtime: The cell phone is complaining because Bluetooth is off and an app has lost connection to the tracker on the key ring. “Last known location 10 minutes ago: home address.”

For millions of people in rich industrial nations, these scenes are already a normal part of their everyday lives to some extent. Devices that are constantly connected to the internet – from smartphones to fitness trackers, household devices to light fixtures and heaters – are servants that are available at any time and able to communicate.

The Internet of Things, or IoT for short, is melding the digital world with the physical world. It pays attention to our every step, listens and even answers questions, carrying out tasks ranging from the simple to semi-complex.

There are currently up to 18 billion devices and machines worldwide that are intelligently networked in this way. Experts predict that this will rise to 30 billion devices by 2020. The estimates vary depending on whether these experts include smartphones, tablets and traditional computers with the numbers of sensors in companies, networked TVs and wearables like the Apple Watch and Fitbit.



typical Friday afternoon in the year 2017: “Siri, send a text to my wife.” “Okay, what do you want to say to her?” asks the iPhone in reply. “That I’ll be home 15 minutes late.” “Here is your message. Should I send it?” “Yes.” “Okay, done.”

A half hour later at home. “Alexa, turn on the light in the dining room.” “Sure,” says a voice from the speaker on top of the dresser. “Alexa, please put milk, eggs and bread on the shopping list.” “Okay, done.” “What will the weather be like tomorrow?” “The weekend should be sunny with high temperatures around 18°C.” “Thank you. Remind me to call Peter in 20 minutes.” “In 20 minutes – I’ll do it.”

Two messages come in just a little later. The camera at the office entrance detected motion, although no one should be there at this time of day. “Do you want to see the live feed?” No, click to dismiss the message. The second one explains why the alarm was triggered: A courier service attempted to deliver a package three minutes



he economic effects are immense. The McKinsey Global Institute predicts that IoT applications could generate between 4 and 11 trillion US dollars in added economic value over the next 10 years.

Since just about everything can be connected to the internet with very little cost and effort these days, modern information technology is in the process of covering the entire world with a digital nervous system. Dog collars and office swivel chairs can access the enormous computing power and endless memory of the cloud just as easily as manufacturing plants and shipping containers at a port facility do. With this leverage, the IoT will fundamentally change our work and private lives, mobility, consumption and even such human-dependent fields as education and medicine. At the same time, it raises questions about appropriate data protection, respecting privacy and the creeping disen-

franchisement of the individual. And the IoT often revolves around collecting and aggregating user data and recognizing new patterns (keyword: Big Data). The practical consequences can be observed in a growing number of households. “Intelligent” speakers like the Amazon Echo or Google Home answer questions and place orders. Bluetooth labels from Tile or TrackR help people find wallets and valuables. Wristbands chart our sleep patterns, crib sensors monitor our little ones, security systems around the house check whether the person at the door is familiar or a stranger. Sensors in the car calculate rates for insurance policies depending on driving distances and behavior. Drones have become so sophisticated that they use facial recognition to recognize their owners and follow them like a loyal dog.



nyone who goes shopping encounters the IoT at every turn as well. ATM machines and banking apps log their customers in with facial recognition or an iris scan. Businesses pursue their customers and even passersby outside the store windows using beacons that make unsolicited contact with mobile phones to provide special offers. Supermarkets are experimenting with dynamic price tags that change depending upon the time of day and person standing in front of them. Almost all packaging contains small RFID labels that can be followed throughout the entire supply chain via electromagnetic waves. Businesses can illuminate or heat individual corridors or even workstations in their buildings as soon as sensors report the presence of employees. Access to the cloud also enables complex machines like elevators, production lines or aircraft engines to be networked to detect breakdowns or glitches and prevent expensive maintenance work. New office furniture can even “see” whether someone is sitting at the computer and for how long. It can trigger a warning message on the monitor that Employee X should stand up for a while to prevent back pain.

Ultimately, the physical and digital worlds are merging into a new totality – and people do not even need to join the

Continued on page 36 >

THE INTERNET OF THINGS IN EVERYDAY LIFE

BODY



From our pulse to blood pressure to healthy sleep: Networked gadgets can measure and evaluate our vital signs, send data to our mobile phone or share it with our doctor.

➕ Learning more about yourself and detecting illnesses early as a quantified self.

➖ Among other things, health data can add stress and can quickly end up in the wrong hands.



ON THE MOVE

HOUSEHOLD



Setting a timer while cooking despite dirty hands or selecting a playlist – no problem with digital assistants.

Technology finds lost objects quickly and children can talk with their toys.

➕ More convenience in every situation.

➖ Tech giants like Amazon or Google are always listening in.



WORKPLACE

Thanks to sensors and software, companies know who is where and for how long. The data helps to improve office planning and meet the requirements of people with special needs. + Better opportunities for development and fair evaluations for employees. - More data creates more opportunities for misuse.



Every car can become a robot with augmented reality navigation retrofitting; drones deliver packages. Safe drivers can prove it. And a camera drone follows along faithfully on a stroll. The dog will never get lost again, thanks to its smart collar. + Better efficiency in logistics, better traffic safety. - Government agencies and data brokers can follow us closely.



RETAIL



How shopping will work in the future: withdraw money via an iris scan, open the door for the delivery drone and receive a special offer on your mobile phone as you pass by. Fully networked businesses distribute individualized offers to every customer. + Special offers suited to the person, time and place. - The transparent consumer who can be manipulated.

constant ongoing conversation – for example, when a traffic signal communicates with vehicles waiting at a red light to display on the dashboard how many seconds until the light will turn green.

“Every part of our environment will be integrated into digital communication sooner or later. We haven’t even scratched the surface of the IoT phenomenon yet,” says Andy Meadows, a tech entrepreneur in Austin, Texas who runs one of the largest services for automatically shortening internet addresses. “A lot is happening, but it will take five to ten years to really break through to the broad masses.”

Meadows’ company BudURL is something of a fully automated tour guide through the Internet of Things. Regardless of whether a terribly long web address needs to be cut down to a catchy short form so it fits in a tweet or if someone passes by a beacon or scans the QR code on the package and then gets a personalized message sent to their mobile phone depending on location, date and time – it’s always about connecting objects with each other or bringing people into a conversation.

W

hich should make us stop and think: The majority of IoT applications are frighteningly unprotected with regard to handling confidential user data and protecting it from hackers. Most consumers bring new technology into their home carelessly without thinking about microphones, cameras and databases in the cloud that are being fed. TV manufacturers Samsung and Vizio had to admit that their smart TVs not only answer verbal commands, they also record their users’ entertainment selections and send them on to web services for evaluation.

This massive spying doesn’t stop at our children’s doors, either. In February, the German Federal Network Agency banned the networked “My Friend Cayla” doll, which is equipped with a microphone and speaker, due to a surveillance risk. According to the regulatory agency, the doll can be hacked, allowing for conversations of children and other people to be recorded and transmitted without the parents’ knowledge. This threatens people’s right to privacy.

A robot is the epitome of the Internet of Things – just with arms, legs or wheels.

Attacks on IoT devices usually do not focus on monitoring a specific person or a certain child’s room. The greater danger lies in recruiting thousands or millions of these devices without the knowledge or consent of their owners for a major attack (see p. 26) or using them as a foothold to penetrate a company’s network.

T

here are no limits to the imagination because the internet itself has (almost) no limits. A harmless fitness tracker of a single employee that is linked with the company network can become the weak point of an entire firm. Hacking the infotainment system in a single vehicle can lead to thieves gaining access to the entire fleet’s computer network. And an infusion pump at a patient’s bed that is infected with malware can enable blackmailers to paralyze the IT system of an entire hospital.

“The genie is out of the bottle. Billions of unsecured devices are already in circulation and hackers have already found out how to exploit them,” summarizes Rick Kam, President of ID Experts, a security consulting firm in Portland, Oregon. Even if a growing number of companies protect their IoT devices with protocols and passwords, the problem will likely get worse in the near future – not because the number of IoT devices and user data is growing continually, but because it is dealing with much more than just sensors or entertainment electronics for the home.

Experts have found the same serious security gaps in robots as well. “In the near future, robots will be everywhere – as children’s toys or a companion for seniors, as a customer consultant in retail and as a nurse, factory worker and even in military or police settings,” predict researchers at IOActive, which recently put robots from seven leading manufacturers under the microscope. A robot is the epitome of the In-

ternet of Things – just with arms, legs or wheels. “When people are able to hack a robot,” warn the experts, “we will be exposed to dangers that we cannot even imagine today.”

That will apply even more to the IoT of tomorrow, which will make possible applications that were previously only found in science fiction films: everything from using our thoughts as remote controls to implants that turn people into true cyborgs – half human, half machine. Despite massive concerns that IoT technology on and in our bodies could be misused by companies and criminals, many experiments



are already under way that will anchor the internet to every millimeter of our lives. In addition to contact lenses that measure the wearer's glucose level or Snapchat's video glasses that stream what people are seeing to friends in 10-second bites, pioneers are already experimenting with electronic implants. The London-based company Cyborg Nest is selling a compass sensor called North Sense that is implanted in a person's chest and always vibrates when they look to the north. According to the company, around 1,000 people have ordered the sensor.

A

head brace from Emotiv in San Francisco enables people, after a bit of training, to control objects and software with their thoughts. Electrodes like those used in an

electroencephalogram (EEG) measure the electrical currents in the brain and can interpret them as commands. People can already operate networked objects in this manner – to steer a drone, open a door or move objects on a monitor, for example. Researchers are already experimenting in using these impulses to read the thoughts and intentions of people.

Emotiv founder Tan Le anticipates that these seemingly fantastic remote controls will soon be the new standard for the IoT world. "In 50 years, control elements on devices will disappear or be built into our bodies. Then we will be able to control the world around us with our thoughts or feelings. Houses will adapt to us when we approach them. Teachers will see which students in their class have understood the lesson."

Although IT networking and measuring of humans is the core business of Emotiv, even Tan Le warns of the unintended consequences from networking ev-

everything: "I'm not sure that I want to give a computer access to all my thoughts and feelings," she says. And after a short pause she adds: "People should always have a switch to turn things off." □

Steffan Heuer is a technology journalist and a US correspondent for the business magazine brand eins. He lives in San Francisco.



Technology in the body:
In the IoT world of
the future, teachers will
know which students
have understood the
lesson.

“Privacy is non-negotiable”

He was Switzerland’s Commissioner for Data Protection. He took on Google, and won. He was spied upon for years by the State Protection Agency. Hanspeter Thür knows what he is talking about when he says, “Thoughts are no longer free.”

By Daniel Ammann and Simon Brunner (interview) and Cyrill Matter (photos)

Hanspeter Thür, 68, was Switzerland’s Commissioner for Data Protection from 2001 to 2005, after representing the Green Party in the Swiss National Council for 12 years. Thür became internationally known when his agency sued Google in the Swiss Federal Supreme Court. The court ruled that Google must completely obscure faces and license plates on its online Street View service. Thür now has his own law practice and is a candidate for the Aarau city council (canton of Aargau) this autumn. He is married, with one adult daughter and two grandchildren.

Mr. Thür, we’d like to show you a photograph. Do you recognize this athletic man on a bicycle?

That’s me. Nice picture, right? It was taken last year, just as I reached the top of the Albula Pass. A friend took it as a sort of victory shot.

We downloaded it from your WhatsApp account. Just a year ago, you said that as a matter of principle, you don’t use that chat service. What happened?

There you see the power of facts. I have relatives living in South Africa, Australia, California and Switzerland. A nephew suggested that we set up a family chat so we could stay in touch on a regular basis. This is actually practical. With many such services nowadays, you have to ask yourself two main questions: How great is the benefit? How much of my privacy must I surrender? In the case of WhatsApp, I let down my guard for family reasons.

We’re a little disappointed that even a staunch defender of privacy has given in. WhatsApp delivers certain user data to Facebook, its parent company, including your cellphone number.

In my defense, I have to say that when the general conditions and terms were changed, I immediately informed my community and showed people how to change their privacy settings to keep WhatsApp from passing along certain user data to Facebook.

In broader terms:

Why is privacy worth protecting?

It is a fundament of freedom, an element of human dignity. It enables us to make our most personal decisions with autonomy. This is why secret ballots are crucial for fair elections. A free state protects a personal sphere that is nobody’s business but mine and that maybe even my closest friends don’t know about. >





Those who want to do
away with cash are
seeking total control of
the citizen.

A state structure that cannot or will not guarantee this is at least tending in the direction of authoritarianism. The protection of privacy is one of the non-negotiable principles of a free and democratic state.

Where is privacy most threatened?

The technological revolution carries incredible potential for capturing, evaluating and using personal data. Imagine this: The amount of personal data that is digitally collected doubles each year. Ten years ago, I still believed that nobody could even process so much data, much less use it. I was wrong. Today, it's literally possible to find the needle in the haystack.

We provide our data voluntarily and receive something in return. What's so bad

about that? After all, we're responsible citizens.

As long as we live in a functioning democracy, this may have no consequences. But even a basic democratic order is not set in stone, not even that of Switzerland. And we are currently seeing evidence that the trend is not toward liberalism and democracy, but rather toward authoritarianism – we can see this in the West as well as the East.

Aren't you somewhat lapsing into alarmism?

There's this lovely old folk song: "Thoughts Are Free." Today, we must say: Thoughts are no longer free. And if thoughts are no longer free, this cuts to the core of a liberal state. For the first time in human history, someone can peer into our heads. With our internet searches and

online shopping, our likes and tweets, we expose not only our habits, but also our feelings and thoughts, which can be collected, analyzed and interpreted. Entire business models are based on this, from social networks to customer loyalty programs. This data yields a personality profile that reveals in detail our preferences, our thoughts including our political views, our daily routine, possibly even health aspects.

So what do we have to fear?

In the digital age, there is no such thing as harmless data, something that people are far too oblivious about. Life insurance companies in the United States are already examining data from online profiles to gauge the lifestyle and life expectancy of their customers, and they turn away

customers with no presence on social networks because their risk profile cannot be determined. And we have just learned that people entering the United States may soon have to disclose their phone contacts and social networking passwords. And this is just the beginning. Facebook has only existed since 2004, Twitter since 2006 and Instagram since 2010.

The standard argument is “If you have nothing to hide, you have nothing to fear.” My response is always this: Do you want everything that happens in your private life to become public? That argument assumes that a person who claims a right to privacy is doing something that is prohibited or reprehensible. From such a perspective, nothing is private any more. I find it outrageous that people nowadays have to defend themselves for not sharing something with everyone. This is exactly what bothers me the most about social media: The standard settings are such that very little of my profile is private. But it should be exactly the opposite. The providers must be required by law to comply.

Do we have to protect people from themselves?

No, but we must make it possible for them to exercise their rights. After all, technology is advancing so rapidly that most people simply cannot keep up. Therefore, we need a better statutory framework. The problem, of course, is that an individual can hardly compete against the state or against companies like Facebook or Google. Therefore, an authority such as the Data Protection Commission must fight to represent these interests, as I did because of Google Street View.

During the 1970s and 1980s, you were spied upon by Switzerland’s State Protection Agency. What was that like?

I was blacklisted. People were assigned to monitor me personally. That is a nightmarish thought. I don’t want to trivialize it, but what those people found out about me is nothing compared to the information that is now available via social media.

After each terrorist attack, the calls become louder that we need to monitor potentially dangerous people even more closely.

I understand that in times of uncertainty, people ask whether it is possible to do more. Of course there is a need for surveillance by the police and intelligence agencies. But we must not succumb to the illusion that we could solve the problem if only we did enough eavesdropping, tailing and wiretapping. Even with seamless surveillance, you can’t keep someone from barreling into a crowd with a car, for example, as we saw in Stockholm, London or Berlin.

How do we find the balance between safety and freedom?

As a society, we have to keep negotiating this again and again. In a functioning state, people can agree on a balance. Perhaps this needs to be adjusted again later; it’s a process. But it’s very clear to me that we cannot sacrifice certain principles of the rule of law to an obsession with security.

Where do you draw the line?

Even now, big data analytics make it possible to create personality profiles that indicate which individuals are likely to commit crimes. What do we do when an algorithm calculates a probability of 80 percent or even 90 percent? That’s where I draw the line. We cannot arrest people without well-founded suspicions, or lock them away virtually indefinitely without a court decision.

We’d like to give you a few more keywords and ask for your comments.

Go ahead.

Cash?

Without cash, there can be no privacy. Those who want to do away with cash – and more and more governments are tending in that direction – are seeking total control of the citizen. The state wants to know in detail what I spend my money on. Many people fail to see this connection. Giving up cash also has a great deal to do with giving up liberties. Responsible citizens must be free to determine how they invest their money, how they spend it or whom they support with it – and the state should not be watching them.

Banking confidentiality?

I have always vigorously defended it. How I organize my finances is part of my

private domain. Nobody needs to know what kind of resources I have and what I do with them. But someone who takes advantage of this secrecy, for example to evade taxes, forfeits this protection. Unfortunately, some banks have turned banking secrecy into tax evasion as a business model. Freedom cannot be used to shield a crime.

Automatic exchange of information?

I can live with that to a certain degree, as long as constitutional principles are upheld. But I have major problems with it if it includes states that do not function according to democratic principles. An automatic exchange of information with Russia, for example, is unacceptable to me.

Have we already lost the battle for privacy?

No, but we find ourselves at a critical juncture. Ultimately, people’s indifference is also a danger. If we want to salvage privacy, we cannot avoid personal responsibility. We must be more alert as citizens, we must inform ourselves more fully, and we must develop a critical awareness. □

Tough Times for Star Chasers

The paparazzi business model is in trouble. Celebrities now voluntarily post photos of themselves online. One of the most well-known celebrity photographers in Los Angeles waxes nostalgic about the good old days.

By Beatrice Schlag

Nearly ten years ago, paparazzo Rick Mendoza landed in the gossip column himself for a few days after pop star Britney Spears ran over his foot in Beverly Hills. The image of the paparazzo lying on the ground, camera in hand, and a frightened Britney Spears at the wheel of her car was seen around the world.

Rick Mendoza, who has spent 14 years as a celebrity photographer and is one of the most experienced paparazzi in Hollywood, doesn't like to talk about the incident. "There was a group of photographers waiting for Britney in front of a doctor's office. She came out and got in her car. I was standing right next to her. She couldn't back out because a woman in a car was blocking her. Britney tried to turn, and when she did, she ran over my foot." But, Mendoza says, the accident doesn't tell the true story about him and Britney.

The real story is better. Even if you only read the gossip columns occasionally, you'll recall that Britney Spears acted very strangely after separating from her husband Kevin Federline in 2007. She struck the car of a member of the paparazzi with her umbrella, had her head shaved bald late at night in a no-name beauty parlor, and drove around town in her SUV with her baby in her lap. There was speculation in the media that she was having a nervous breakdown. "Many people thought that Britney wasn't very smart," says Mendoza. "But she was in full control of her image." At the time, she was in a battle with Federline for money and custody of their children, didn't have a new album, wasn't on tour. She easily could have fallen off the map."

Britney Spears hired a group of paparazzi, including Mendoza, to follow her around the clock and feed stories to the media. "We kept it up until the questions surrounding the children and finances were cleared up. Federline knew it was all a show. But he kept silent. It was all about the money.

I know how the system works. I'm part of the Hollywood hype machine. Britney's next album, 'Circus,' was a huge success."

Public anger at paparazzi reached a highpoint with the accidental death of Princess Diana and businessman Dodi Al-Fayed in Paris. Lost in the uproar over Diana's death as she was being chased by the paparazzi is the fact that the princess was a master media manipulator who willingly appeared in front of the cameras when it served her interests. The photographer who took the photos of Diana two days before her death, relaxed and tanned with Dodi on his yacht, was hired by the princess. She wanted to give the royal family a slap in the face by presenting herself as the lover of a wealthy Muslim.



"We're the ideal whipping boys": Rick Mendoza has worked as a celebrity photographer for 14 years.



New hairstyle, new hair color, new tattoo? Anything new means higher fees. Pictured: paparazzi in front of a nightclub in Los Angeles.

For those new to the world of gossip, celebrities on luxury yachts are only photographed by paparazzi outside of the harbor when they want to be. The paparazzi and their agencies do not have sufficient resources to rent boats to chase celebrities out into the open water, when they might not even come up on deck for days at a time.

The symbiosis between stars and the paparazzi is sometimes surprisingly obvious. In 2005, the entire media world chuckled when it saw the images of Angelina Jolie, her adopted son Maddox and Brad Pitt together for the first time after his separation from Jennifer Aniston, which were taken during a stroll on Diani Beach in Kenya. Paparazzi do not hang around on African beaches by chance. The photos were posed. As a new adoptive mother and committed activist, Angelina Jolie urgently needed to present a more serious image to the public after her wild years with Billy Bob Thornton.

Higher Fees for Anything New

Not all, but many paparazzi photographs are based on what are known in the industry as assignments: information from someone directly associated with the celebrity him- or herself regarding when and where the star will appear. When Victoria Beckham still

lived in Los Angeles, certain photo agencies received almost daily faxes regarding her day-to-day schedule.

Specialties, as they are called, are even more lucrative. These are targeted requests from PR agents who hope to put their clients, who may have fallen out of the limelight somewhat, back in the headlines through photos that look like snapshots. These clients often live outside the “thirty-mile zone”: the hunting ground of Los Angeles-based paparazzi is located in the thirty-mile radius around the headquarters of gossip website TMZ.com in West Hollywood. This zone encompasses all major studios as well as wealthy neighborhoods such as Beverly Hills, Malibu and Los Feliz, where most celebrities live.

When they do not have assignments or specialties, the paparazzi resort to “doorstepping”: Photographers set up in front of the mansions of celebrities such as Kim Kardashian, Hollywood’s current best-selling gossip icon, at six in the morning and wait for them to leave the house. Or they wait in front of the gyms and yoga studios where reality stars work out. The paparazzi know these locations well; they take a few shots and then follow the departing celebrities in the hope that they’ll stop at a Starbucks or luxury boutique, making for more interesting photos. That’s when their adrenaline really starts to pump, says Rick Mendoza, >

because every detail pays: clothes, sunglasses, purse, shoes – it's all material for the fashion pages. New hairstyle, new hair color, new tattoo? Anything new means higher fees.

Does Mendoza understand sometimes why his profession is hated by celebrities? "Don't believe them when they complain about us," he says calmly. "Stars can't complain about intrusive fans, including autograph-seekers and people snapping photos with their smartphones. But we're the ideal whipping boys. If they really want to get away from us, all they have to do is move to another city. But if photographers stayed away, there go their careers." Mendoza says that stars absolutely have a right to privacy, "but only within their own four walls. These people have chosen a career that makes them public figures once they leave their homes. It was their choice."

Up until two years ago, Rick Mendoza did not work on assignments or specialties, he did not engage in doorstepping, and he rarely stalked celebrities at LAX, the Los Angeles airport. He only practiced the highest paparazzi art form: capturing exclusive images or videos that he alone had and could sell for the highest prices. For example, he shot the photo of Zsa Zsa Gabor being transported to the hospital in an ambulance. It was the last photo published of her before her death and it brought him 65,000 US dollars, "not in the US, but in Hungary, Austria and Germany, where she was still famous. We have long worked in other markets in addition to the US." And business is booming. Demand for celebrity news on the internet, in the press and on TV is constantly on the rise.

However, times are much tougher for the Hollywood paparazzi. This is not only because nowadays everyone whips out their mobile phone when they unexpectedly run into a celebrity. In theory there are millions of so-called "waparazzi," after Wireless Application Protocol (WAP), the technology that provides smartphones with access to the internet. There are also now agencies for photos where non-professionals can offer their images for sale. But non-professionals don't usually have these agencies' numbers when they unexpectedly spot Jennifer Aniston in Sunset Plaza.

So Mendoza's problem is not the waparazzi either. He says that non-professionals don't stand a chance against the speed with which professionals can load their images onto a computer, add text and send them to an agency. Around half an hour after Mendoza has taken a photo, his agency sends it out worldwide in a group email with titles such as "New photo of XY without a wedding ring!"

Twitter, Instagram and Snapchat Are the Competition

The competition that paparazzi now face comes not so much from amateur photos, but rather from celebrities themselves, who are increasingly managing their photos on social media themselves in an effort to control their image. Before photos of female celebrities with slightly rounded bellies can give rise to rumors that they are pregnant, many stars announce that they're expecting by posting selfies on Twitter, Instagram or Snapchat. Others take photos of their new engagement ring before wearing it in public for the first time.

But the main reason why LA paparazzi earn little more than an average income nowadays is the economic crisis that began in 2008. The circulation of gossip magazines, such as *People*, *Us Weekly*, *In Touch* and *OK!*, competition among which had driven up the fees for paparazzi photos, has fallen and ad

"If they really want to get away from us, all they have to do is move to another city."

revenue has plummeted. These magazines have been replaced online by countless gossip websites and celebrity blogs, which only pay paparazzi – if they pay them at all – fees in the double digit range.

The Good Old Days Are Over

Agencies have merged or gone under, or they offer celebrity photos as part of a monthly subscription. California strengthened its paparazzi laws in 2013 in order to better protect the children of celebrities. The fines for photographers who come so close to the children of celebrities that they could be charged with "harassment" are draconian. No one knows exactly what harassment is in this context. Does it include simply calling the child by name?

And then, says Rick Mendoza, there's a problem that was just as unforeseeable as the financial crisis: The "thirty-mile zone" is now very well-behaved. Just a few years ago, the number of paparazzi in LA was estimated to be nearly 500. He thinks there are barely a hundred today. His best years, says Mendoza, were the ones with the "wild young women": Britney, Lindsay, Paris – always out, always in a party mood, usually not totally sober and with smeared makeup. Those photos sold well.

Nowadays, celebrities party in their mansions, and they are very well-behaved in public. So now Rick does assignments and specialties and waits in front of Kim Kardashian's mansion in the hope that she will have her young son on her arm when she appears. This is because mother-baby photos are in demand. A photo of Kim with her child can command a thousand dollars. If she kisses him – voluntarily of course, and without being shouted at – it could be worth ten thousand. □

Beatrice Schlag is a freelance journalist in Zurich and Los Angeles.

NEED- TO- KNOW (OR NOT)



In 1946, the US FBI already had approximately 100 million fingerprints on file.

You won't be using these facts and figures much in your job, but they could be helpful during your next (private) dinner conversation about digital and analog life.

By Mathias Plüss and Matt Blease (illustrations)

WHAT A "LIKE" REVEALS

Facebook knows us better than our friends and family. According to researchers at Cambridge University, a good algorithm can decipher our personality based on Facebook likes. After analyzing just **ten likes**, the computer is better at predicting things about a person than the Facebook user's work colleagues, after **70 likes** it's better than friends, after **150 likes** better than parents or siblings, and after **300 likes** better than their partner.



CODE LANGUAGE ROMANSH

The Navajo language is so complex that the US military employed Navajo soldiers as radio operators during World War II. Unlike typical encryptions, this "code" was never broken. Switzerland also has a secret language of its own: During the Cold War, Bern is said to have sometimes communicated with its embassy in Moscow in Romansh.

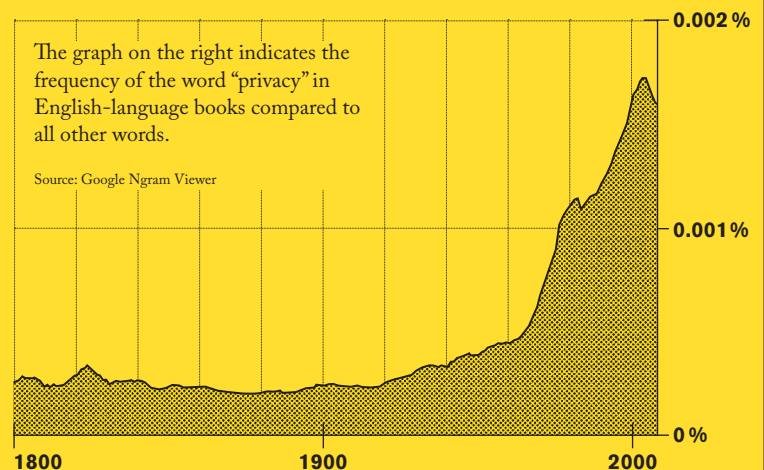
Internet celebrities often reach a broader audience than traditional media. They generate clicks putting their private lives and their hobbies on display – and earn a fortune doing so.



KAYLA ITSINES (26, AU)
The fitness instructor originally worked with older women; her famous BBG (Bikini Body Guide) targets "normal" women who have busy schedules. The many before-and-after photos say:
You can do it too!
@6.7m ▶ 11.5m 📺 18.2m

PRIVACY IS BOOMING

Use of the English word "privacy" has more than sextupled since 1900.



Thirty percent of people have never backed up their data.



NOTE TO SELF: NO SPYING

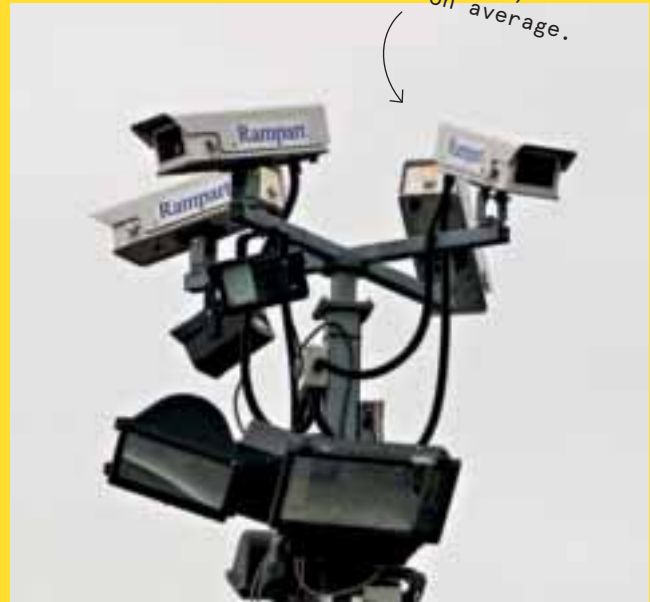
The webcam is a favorite entry point for hackers. Someone who hacks into the camera on a laptop or PC can easily observe the owner. The best defense against this is as simple as it is effective: Stick a Post-It note over the camera lens. Even Facebook CEO Mark Zuckerberg and FBI director James Comey use this old-school method. More importantly, however, you should always be sure to regularly update your operating system and antivirus programs to the newest, and therefore most secure, versions.

THE SELF-UNLOCKING CAR

Keyless entry systems, which automatically unlock the car via radio transmission as you approach it, have a serious downside: They are relatively easy to hack. Thieves just have to be near the owners as they walk away from the car. These hackers can then amplify the signal that the key is transmitting to unlock the car, even from a distance. The necessary equipment can be bought online for 35,000 euros.



In the UK, every resident is captured by seventy cameras a day, on average.



UNHACK-ABLE: PAPER

If you want to be absolutely secure, switch to analog. For certain sensitive documents, the Russian intelligence service no longer uses digital archiving at all. Instead, they use paper only, drafting the documents by hand or with mechanical typewriters.

HACKABLE: SKATEBOARD

Things that have been proved to be vulnerable to hacking include: baby monitors, remote-controlled weapons, electronic door locks, low-flying satellites, heaters, air traffic control systems, traffic lights, power grids, defibrillators, garage door openers, digital cameras, airport scanners, nuclear power plants, drones, prison doors, fighter jets and electric skateboards.



THE MOST COMMON PASSWORDS OF 2016

An analysis of over ten million passwords from data leaks has shown that half of all users rely on one of the 25 most common passwords, and nearly one in six only uses the most common one of all: 123456.

Switzerland:

1. 123456
2. 12345
3. 123456789
4. 12345678
5. 1234
6. 212121
7. soleil
8. 111111
9. hallo
10. juventus

Germany:

1. 123456
2. 123456789
3. 12345
4. hallo
5. 1234
6. passwort
7. 12345678
8. hallo123
9. schalke04
10. 1234567

Worldwide:

1. 123456
2. 123456789
3. qwerty
4. 12345678
5. 111111
6. 1234567890
7. 1234567
8. password
9. 123123
10. 987654321

Sources: Hasso-Plattner Institute, University of Potsdam, The Most Common Passwords of 2016, Keeper Security

2



LACI GREEN (28, US)

The daughter of a Mormon and an Iranian immigrant, Laci Green has been chatting about sex education on YouTube for over a decade. Green, who describes herself as pansexual and is working towards a doctorate in public health, wants to dispel the taboos surrounding sex.

141m

3



RUBÉN DOBLAS GUNDERSEN (27, ES)

Gundersen reviews the latest video games on his YouTube channel under the pseudonym “El Rubius.” Three years ago, the internet celebrity published a quiz book (“El libro Troll,” or “The Troll Book”) which took bestseller lists in his native Spain by storm. **▶ 5.236bn**

4



LILLY «SUPERWOMAN» SINGH (28, CAN)

YouTube has created a veritable army of stand-up comedians. Singh, who earned 7.5 million dollars with her videos last year, is one of the most successful. **▶ 1.837bn**

5



ELISE ANDREW (28, UK)
Her “I fucking love science” page has twice as many Facebook followers as the New York Times. Andrew wants to make science accessible. One recent post was about a very loud species of shrimp that is named after Pink Floyd. **f 26m**

WHEN THE PRINTER SINGS

Hacking can also be done acoustically. Today it is possible to 1) use printer sounds to reconstruct the text being printed, 2) discern what someone is writing based on the sounds of the keyboard, and 3) read sensitive data and passwords from the sounds made by a hard drive.



QUIZ

Seven questions to test your own security knowledge.

1 Which of these historical spy instruments actually existed?

- a — Listening equipment made from clay pots connected with strings (Romans)
- b — Pigeons with cameras strapped to them (World War I)
- c — Mini submarines in sewage pipes (World War II)
- d — Rats wearing microphones (Cold War)

2 Which of the following passwords is extremely insecure?

- a — afmr/_-mhq
- b — ,-.nswrgol
- c — xcvbnm,.
- d — gs-lb/sy,k

3 What item was recently officially declared a “hidden surveillance device” by German authorities and must be destroyed by its owners?

- a — Cayla baby monitor from the UK
- b — Robear caregiving robot from Japan
- c — Motorola Babycontrol MBP35 baby monitor from the US
- d — Spriak SP-LI-86I disco light from China

4 How many points on a person’s movement pattern are needed to pick them out of a crowd of one and a half million people?

- a — 4
- b — 40
- c — 400
- d — 4000

5 What famous US figure was the victim of a hacking attack on his pacemaker?

- a — Investor George Soros
- b — Former President George H.W.Bush
- c — Former Vice President Dick Cheney
- d — Vice President William Walden on “Homeland”

6 How many files on people and organizations did the Swiss state collect up to 1990?

- a — 9,000
- b — 90,000
- c — 900,000
- d — 9,000,000

7 How can you protect your car keys from being hacked (see left)?

- a — Park your car in an underground garage
- b — Wrap the key in aluminum foil
- c — Leave the car’s trunk open a crack
- d — Place the key in the refrigerator

Answers: 1b / 2c (the bottom row of letters on the keyboard) / 3a / 4a / 5d / 6c / 7b and d (aluminum foil and refrigerators shield the signal that the key transmits)



They Know What They're Doing

Simon

Cyrill



Young people and digital media are a phenomenon that parents find disconcerting and that keep an army of (adult) specialists on their toes. But young people themselves know quite well how to protect their privacy – it's the adults who have some catching up to do.

By Iris Kuhn-Spogat (article) and Anne Morgenstern (photos)

Sina



Simon, 17, apprentice

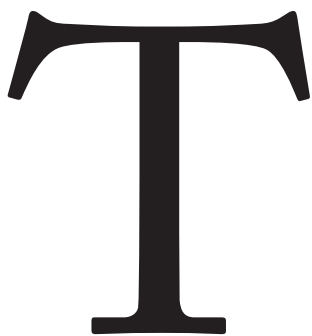
“I have different spheres of privacy. Nothing from my own private and family life goes online. With my friends, I am active mostly on WhatsApp, Instagram and Snapchat, but I don’t share much there either. I would say that at most, about five percent of what I post is about my personal life. I post pictures on Snapchat now and then that I would never post on Instagram, and I am glad that they disappear. On Instagram, I paint a picture of myself without really showing very much about me personally. People can see that I can do a back flip from a standing start, but that’s about it.”

Cyrill, 18, apprentice

“I only share what’s private to me with a few people directly, if at all. I hardly ever upload personal pictures, I just take pictures of things that I see and like. I’ve had my conflicts with my parents over my cell phone. They say it gives me ideas and makes me lazy about other things. Probably true in some ways. There are no complaints at the moment; I spend a lot of time in our workshop figuring out what I can do with the machines standing around there. Right now I am working on a few knives and a hat stand.”

Sina, 17, high school student

“My father is on Instagram, too. I don’t follow him, and he doesn’t follow me. It was just obvious, we didn’t have to talk about it, and I appreciate that. I have protected all my accounts; I decide who I add and who I don’t. I do not accept followers that I don’t know at all, and I only follow people who I know personally in some way. That’s how I keep my private life private online, too. Sometimes you have to dig pretty deep, though, to find the settings you can use to protect yourself.”



The question “What does privacy mean to you and how do you protect it?” immediately elicits another question: “Offline or online?” It’s Friday afternoon at the Wettingen cantonal school. In room 210, Philippe Wampfler is teaching an advanced study course called Digital Society and Its Media, also known as DSM. It was introduced in the summer of 2015 because, according to the official description, “The

possibilities of digitalization have fundamentally changed the way humans communicate with one another.” Its declared goal is to help young people to recognize, to reflect on, and to “gear themselves to the world of the 21st century.”

However, it’s not unusual for Wampfler, an oft-quoted DSM expert, to experience the opposite. His students often open his eyes. For example, once when he want-

ed to talk with the class about the statement made by a photo of two young women and a young man. “For me, it was clear that it was about the relationship of the man with one of the two women,” says the teacher. His students all saw it differently. For them, it was clear that the picture is a message from the three to people who don’t like them. That message: “Everything is completely different than you think, >

you can't tear us apart." Wampfler learned that, "There are hidden levels of meaning that I as an adult don't recognize, but that young people certainly do."

Young people and digital media are a phenomenon that connects youth, disconcerts their parents, keeps an army of adult experts on their toes and can send corporate marketing departments into despair. They ask, speculate, measure, research and write studies, theses, newspaper articles, blogs, presentations and guidelines. For every theory, there is a study to support it. Often they seize upon assumptions and fears that are making the rounds, and the results become grist for the mills of people who are already concerned. In fact, many dangers do lurk in the online world. Bullying, stress, difficulties falling asleep, sleep deprivation, depression, addiction and abuse – all are threats when digital media control young people instead of young people controlling digital media.

However, there is some good news: Knowledge and the balance of power are constantly shifting in favor of young users. "They are becoming more and more proficient at handling digital media," reports Gregor Waller, co-director of the Media Psychology department of the ZHAW (Zurich University of Applied Sciences), which every two years, together with Swisscom, conducts the James study, which surveys 12- to 19-year-olds on their use of media and their leisure activities. "And today they are already doing things just as well as or better than adults." With that, he confirms the assumption of three US scientists, Alexis Hiniker, Sarita

Y. Schoenebeck and Julie A. Kientz of the University of Washington and the University of Michigan, who recently wanted to find out what rules families made for using technology and how the new generation got along with those rules. They heard some surprising things. For example, when asked an open-ended question, 20 percent of the children surveyed complained that their parents posted pictures of them without asking beforehand. The majority of fathers and mothers who were present didn't see any problem with that at all. "Are young people now more sensitive about data and privacy than adults?" these researchers ask. Yes, they are.

Privacy Does Not Come Easily

Back at Wettingen cantonal school, Wampfler asks, "What are some areas of privacy offline?" He gets answers such as, "My room," "My makeup," "Me in the bathroom," "What I wear," "Who I go out with," "What I spend my pocket money on." Similarly, private spheres mean spheres of refuge and places where they can be themselves. They protect such areas with clear statements like, "Nobody can come into my room," "That's none of your business," or "Leave me alone," and with the expectation that these boundaries will be respected. And if not? The whole class laughs when someone makes a fist and nods as someone else says they'd be seriously pissed. That's understandable. After all, young people's private spheres are not usually given to them; instead they must first fight for and then defend them.

And in virtual social frameworks? A study by the Pew Research Center and

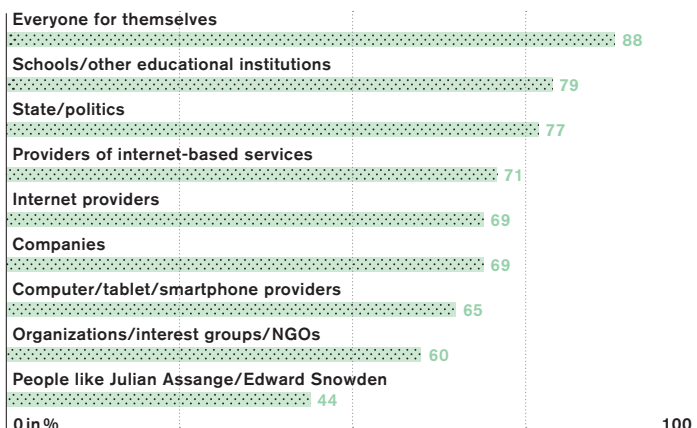
Simona, 15, secondary school student

"A classmate posted naked pictures of herself that got passed around. It was a nightmare for her and it was a huge deal, a policeman even came to the classroom. He advised us not to post anything you wouldn't want published in a newspaper. I think that's a good rule of thumb. Besides, only people who I have selected can see my posts. On Snapchat, there aren't any adults in that category. First of all, because most of what I post there is completely unimportant. Second, because adults just take certain things differently than people my own age."

Young people know: they are responsible for protecting themselves when they're online

Young people were asked: "How important are the following elements in protecting individuals and their personal data?" Answers of "very important" and "somewhat important"; those surveyed were between 16 and 25 years of age. N = approx. 1,000.

Source:
Credit Suisse
Youth Barometer
2016





Simona



Abhash

Abhash, 17, high school student

“Of course my parents are interested in what I’m doing, with whom and where. They ask, I tell them – there’s trust there. Social media isn’t an issue at home; I would be quite open if my parents ever wanted to take a look. Anything I have to hide, I certainly don’t post online. For me, social media platforms are a stage. I show a side of myself there that doesn’t have much to do with my normal student life. I love taking pictures and my account is public, so people who share my interests can find my pictures.”

Harvard University reveals that young women in particular handle private information quite consciously and are by no means as naïve as adults often assume. In Wampfler’s class of 17-year-olds, there are two camps. The one group protects their accounts, keeping them private, and only those who request and are approved gain access to them. The other group posts publicly, but only photos that everyone can and should see. Everyone in the room worries about their privacy.

Who Is Responsible? I Am!

These attitudes put Wampfler’s class above the Swiss average, which isn’t surprising. The fact that education is also effective in the realm of social media has been scientifically proven. The value of protecting privacy has established itself in young minds, however, completely independent of their schooling. According to the James study (a survey of youth, activities and media taken in Switzerland), 940 of the 1,000 young people between 12 and 19 surveyed are registered on at least one social network, while three-quarters of them use privacy settings to protect their profile. The 2016 Credit Suisse Youth Barometer confirms the impression that young people know quite well what they are doing. Eighty-eight percent of 16- to 25-year-olds stated that they are responsible for protecting themselves on the internet (see figure on page 52).

“It’s an enormous step,” says Waller. “The carelessness of teenagers on Facebook in the 2000s, which is often still assumed to be the case, is gone.” Incidentally, that applies to their interest in Facebook as a communication platform as well. Facebook is out. “I have an account, but I don’t use it,” says one student. Another reports, “I’m only on Facebook because that’s the only place I hear about certain events.” Young people hardly communicate with each other at all on that platform, not only here at the Wettingen cantonal school but worldwide. According to Statista, as of the end of January, 52.8 percent of Facebook users were between 25 and 34 years of age, while 13- to 17-year-olds accounted for only 5.9 percent.

According to the Youth Barometer as well, Facebook is no longer in, but it has found a new reason for being – forty-seven percent use it as a news source. In that capacity, the social network has already surpassed radio (42 percent) and paid newspapers (17 percent).

The fall of Facebook began the moment mothers and godparents started sending friend requests, says Allan Guggenbühl, a Zurich-based adolescent psychologist. Instead of making connections, they set off the exodus of the younger generation.

Snap: Too Complicated for Parents

They fled to Snapchat, for one. Here, snapshots can be sent to selected and confirmed friends. They’re only visible for a few seconds and then they disappear completely. This app, with such a different way of functioning than others, is difficult for adults to use, making it a playground primarily for people under 25. The influx has been enormous. By the end of 2016, 158 million users had signed on to the app, which was founded in Los Angeles in 2011. Why the hype? “If there is one fear involved in using the internet, it’s that your own digital traces will not disappear,” says Michael In Albon, a youth media protection officer with Swisscom.

According to the Credit Suisse Youth Barometer, 52 percent of 16- to 25-year-olds in Switzerland use the communication service, which went public at the beginning of March and was immediately valued at 33 billion US dollars. But posts are not completely safe on Snapchat either. Users can take screenshots, which can be archived or circulated. That is considered a no-no, however. “Screenshots are a breach of trust,” says Waller. “Anyone who abuses them won’t get any more snaps.”

Applications like Snapchat drive a wedge, also known as generational conflict, between adolescents and their eternally youthful parents and cause tension. These are normal, desirable and even necessary “for young people to find their own identity,” says psychologist Allan Guggenbühl. And digital expert Philippe Wampfler sees it much the same way. “Young people do not use the internet differently because they grew up as digital natives but because, given their age, they have to establish their own network of relationships.”

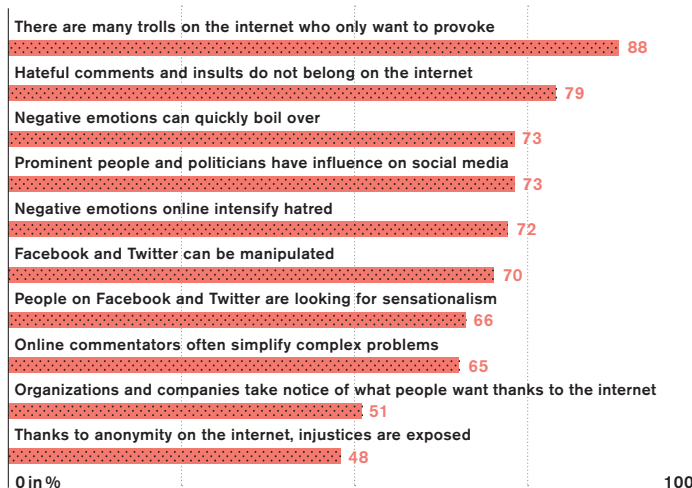
The goal is to achieve more distance from adults, and the measuring stick is the smartphone, that multi-functional communications center. According to the James study, 99 percent of Swiss young people have one.

These devices, like the apps, are not technology primarily targeted for these teenagers but rather a part of their >

Young people have a realistic view of online comments

Young people were asked whether or not they agreed with different statements that were presented to them. Answers of “agree completely” or “agree somewhat”; those asked were between 16 and 25 years of age. N = approx. 1,000.

Source:
Credit Suisse
Youth Barometer
2016



popular culture, their present world. And it is a world of images. Pictures have become a central means of communication and young people are playing a pioneering role in this development. Their demands for material are high, and they put a lot of thought and energy into them. “Being in a swimming pool in a bikini is totally different than posting a picture of yourself in a bikini in the pool on Instagram,” says one of Wampfler’s female students. Her peers see it the same way. The group also agrees on how to handle pictures that include friends: Ask first, then post.

These young people are also well aware of the fact that not everything on the internet is true. They seem quite capable of evaluating online comments. Eighty-eight percent know that there are trolls on the internet, according to the Credit Suisse Youth Barometer (see figure above).

Parents Excluded

So everything’s great, everything’s under control? “It’s unbelievable how much time you can spend on Instagram and the like,” one student reports. “It’s just gotten to be too much for me, I’m still on it but only when I want to be.” Another explained that he had deleted his old account, which had hundreds of followers waiting for news from him, and opened a new one, “with barely 50 followers, totally stress-free and relaxed.”

Instagram, owned by Facebook since 2012, is a large stage for self-representation, with clear production rules. It’s all about beauty. Photos that are uploaded there must be perfect, “likes” are the cur-

rency, caution is the insurance policy and the private sphere is the bank vault. Media psychologist Waller knows about these unwritten laws. For instance, on Instagram, never post anything when you’re under the influence or while you’re out – wait until the morning after, if at all.

Real world, virtual world – for most young people there is only one. Online is as real as offline. They are experienced users and astute when it comes to this domain, which they are prepared to share or to stake out, often to the chagrin of their excluded parents. One student explained that, as a rule, she posts pictures on Snapchat for just two seconds, “too short for a screenshot.” And too quick for a parental “Let’s take a look.” The recess bell rings. One last story: It’s about a 15-year-old boy whose parents made it a condition that he download an app with GPS tracking on his mobile phone if he wanted to go out. He accepted the terms, and the GPS app was installed. Since then, he always leaves his smartphone with a friend before he takes off. □

Iris Kuhn-Spogat is a freelance journalist and the mother of two teenagers, with whom she is not “friends” on any social media network.

Deyna, 17, high school student

“I use platforms like Instagram so other people can share in my life. My account is not private. In other words, whoever wants to can look at my pictures. But of course I consider exactly what I post and take into account that, unlike me, a lot of people are pretty uptight. Mostly it’s all about music for me; metal and rock are my passion and I go to concerts and festivals. On Instagram I find people with the same interests all around the world, they find me – and we share these great moments.”

Deyna

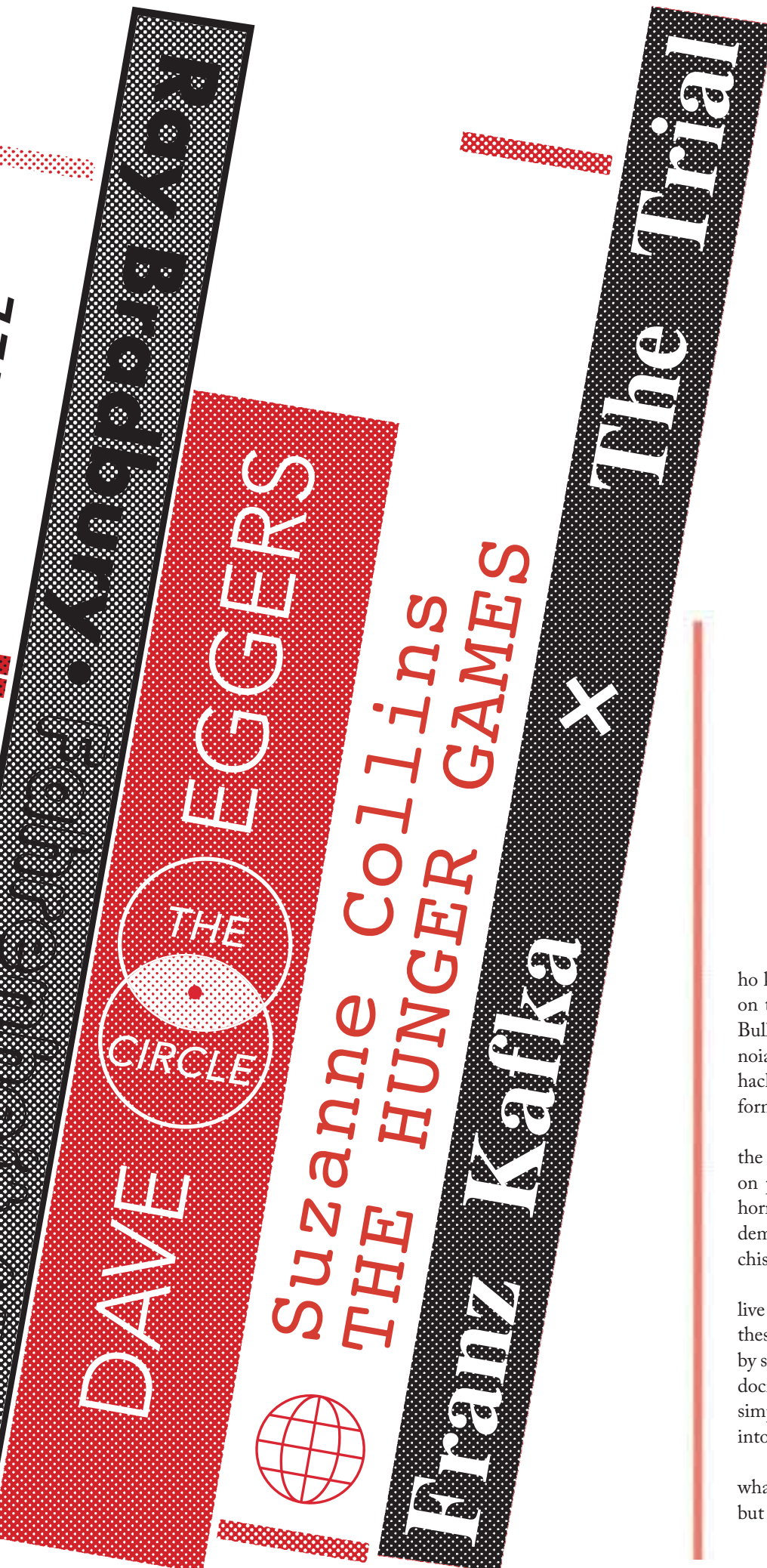


Dark Premonitions

The fear of total surveillance and loss of personal freedom runs deep and has inspired some of the best-known works of world literature.

By Thomas Widmer





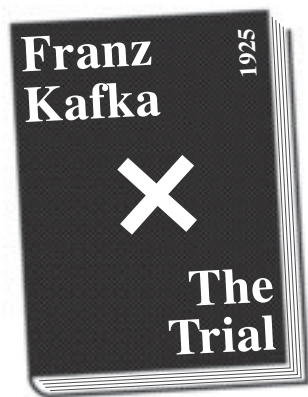
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ho knows, someone may have already read this article on the cloud before it was published in this issue of Bulletin. Our modern life is shot through with paranoia. Secret services eavesdrop on our conversations, hackers breach our computers and social media platforms collect our data.

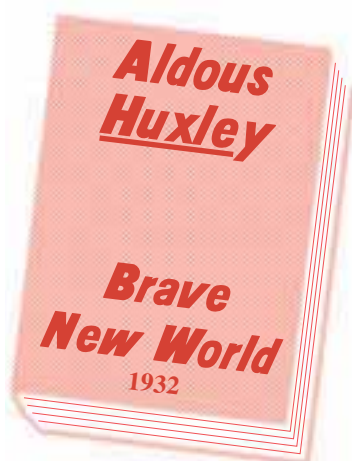
Dystopian novels that portray dark visions of the future often deal in unauthorized encroachments on private life. The genre is fascinating because this horror is genuine. The 20th century provides ample demonstrations of how a dictatorship can disenfranchise the individual.

Novels describe again and again what it is like to live under the tyranny of a dictatorship. However, these dystopias also show how power can be exercised by soft means: Using dulling drugs to keep individuals docile, negating critical thinking via the controlled simplification of language, or transforming citizens into sheep with oppressive harmony.

When we read dystopian novels we recognize what threatens us. These stories may not be beautiful, but they are beneficial nonetheless. >



Josef K. works as a bank clerk, and is essentially a harmless person. On his 30th birthday, two men identifying themselves as “agents” appear at his house. They have come to arrest him. K., free on his own recognizance, desperately tries to find out the charges against him and who the authorities are. Despite his efforts, the court is mysterious and incomprehensible, just like the question of what he could have done. After a year passes, K. is executed “like a dog.” Franz Kafka, a German-speaking author from Prague, was a master of the nebulous. In “The Trial,” one of the most famous novels of all time, he combined modernity’s feelings of guilt and self-doubt with the machinations of a state whose dimensions can no longer be comprehended by the individual.



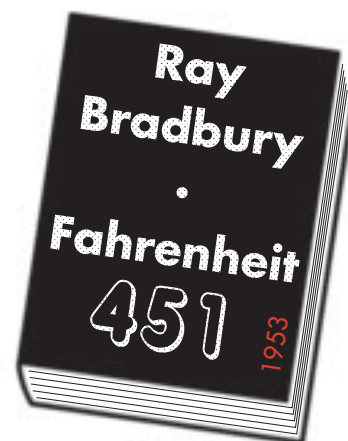
Lenina and Bernard take a holiday to a reservation, where they encounter not only young and beautiful people, but also the sick and the old. Lenina and Bernard are shocked. The story takes place in the distant future, where Alpha-Plus people shape society

as they wish, manipulating embryos to determine the caste of every new person. Overall, most are happy in this “brave new world,” which takes its name from Shakespeare’s “The Tempest”: “O brave new world, that has such people in’t.” For the British author Huxley, oppression does not operate via violence, torture or deprivation. Instead, people consume opiates, copulate freely and are, in a sense, perpetual children. The collective trumps all, while the private is strictly prohibited. Of course, there is trouble brewing in paradise – otherwise, the novel would be as boring as the state where it is set.

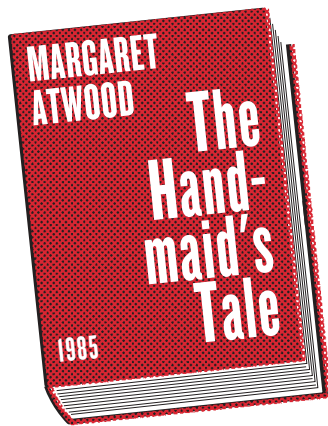


A single party rules a super state, the masses suffer, “Thought Police” monitor everyone, and official propaganda fuels animosity for hidden enemies of the state. People speak “Newspeak,” an artificial, politically controlled language, and, over time, can no longer even think subversive ideas. The state takes root in the mind of the individual. In the midst of the total oppression, a forbidden love blossoms between Winston and Julia, and Winston begins to resist the system. In “Nineteen Eight-Four,” British writer George Orwell wrote one of the

most influential and affecting books of the 20th century. He finished the novel in 1948, transposing the year to 1984 for his horrific vision of the future. It’s unclear whether Orwell coined the term “brainwashing,” but there is no doubt he came up with “Big Brother,” the dictator who is always watching the people and everything they are doing.



Book paper catches fire and burns at 451 degrees Fahrenheit, which is how American writer Ray Bradbury came up with the title for his novel, about a society where firemen don’t put out fires – they start them. The government considers reading a subversive act, because it leads to independent thinking and makes people antisocial. Firemen are constantly deployed to destroy any books that are detected. If the owner of the books goes up in flames with them, that’s just the way it goes. The novel’s protagonist, Guy, is a fireman, who, through his friendship with his young neighbor, Clarisse, learns to appreciate the value of reading. He starts to have a crisis of faith. Bradbury also portrays television extremely critically. In his view television, unlike books, makes consumers lazy and stupid. This modern classic therefore also functions as a work of media criticism.

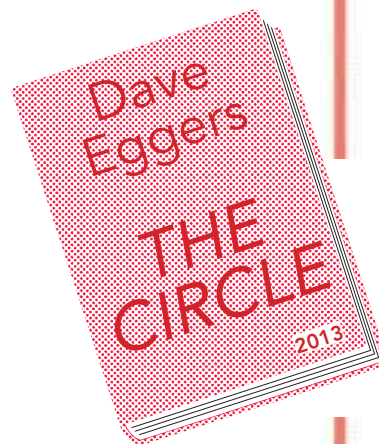


America is in ruins. Nuclear catastrophes have made the majority of survivors infertile. The Christian fundamentalist “Sons of Jacob” have set up a dictatorship in which all women are subservient to men and completely disenfranchised. Offred (literally “Of Fred”) is a handmaid, whose only purpose is to bear children. However, when the “Commander,” in whose house she lives, cannot father children, his wife encourages Offred to meet secretly with the chauffeur. Eventually Offred falls in love with him. Canadian author Margaret Atwood conceptualized a system of oppression where power is exercised directly on the human body – specifically on the bodies of women, who have no voice in the patriarchal state. They are only baby machines.



Suzanne Collins mixes past and future in “The Hunger Games” trilogy. She evokes a future in which America has been largely destroyed by wars and catastrophes, ruled by a dictatorship calling itself “Panem.” The

past comes into play in the reference to ancient Rome, where despots paid for bread (“panem”) and circuses in order to keep the masses down and gain their support. Every year, the twelve districts of Panem must each offer up two children, a boy and a girl, as tributes for the annual “Hunger Games” at the Capitol. In this brutal vision of society, these teenage gladiators battle to the death until only one is left standing. The individual, embodied in fighter (and first-person narrator) Katniss Everdeen, is a plaything for those in power.



“The Circle” immediately brings to mind Facebook. American author Dave Eggers extrapolates the tendencies of social networks into a plausible (if horrifying) near future. What happens when we make ourselves permanently public, share everything, and let the camera capture it all? What then do we have left as people? What do we have left of ourselves? And what becomes of those who do not want to join in? Mae lands a job at the mysterious high-tech company the Circle. The pay is good, and the benefits (such as health coverage for her ailing family) are outstanding. Her coworkers are all satisfied. But things

slowly turn darker for Mae. When she threatens her ex-boyfriend Mercer with a camera-wielding drone, he panics at being filmed and drives off a bridge, killing himself. Mae didn’t want that, and her enthusiasm for the Circle is irrevocably shaken. Hidden in the global company, she discovers the seeds of a plot to destroy it.

Thomas Widmer is an editor at Tages-Anzeiger and author of a number of books. A scholar of Islamic studies and an Arabist, he has also served as a juror for the Ingeborg Bachman Prize, one of the most distinguished awards for German-language literature.

“Today the idea of buying one’s own home is an illusion, even for much of the middle class”



Fredy Hasenmaile, 50, is head of Real Estate Analysis at Credit Suisse and a popular speaker on topics related to real estate. He lives with his wife and two daughters in Zurich-Enge.

Is there anything more personal than one's own home? Credit Suisse expert Fredy Hasenmaile talks about the “pipe dream” of owning property, falling rents, self-driving cars, couples who live in separate apartments, digitalization in the construction industry and his children's inheritance.

By Simon Brunner (interview) and Noë Flum (photo)

T

he desire to own one's own home is profoundly human. Why is that, Mr. Hasenmaile?

Our homes are very important because they are a place where we can retreat from the world. We want to be in charge of the place we call home. In particular, we want to be able to decide when to leave that refuge. Being evicted is just about as traumatic as losing a job.

From an economic perspective, is it rational to want to own a home?

Yes, if you have sufficient income and assets. That allows you to wait out the cyclical fluctuations of the real estate market, and you're able to benefit from increases in the value of your land over time. For most households, home ownership is a concentrated risk that is increased still further by a mortgage. So you need to have reserves.

Singapore provides subsidies for residential property in the belief that homeowners are better citizens, as the country's minister of finance pointed out in Bulletin (1/2014). Do you agree that there are sociopolitical benefits to a high level of home ownership?

Homeowners are happier, at any rate; surveys have shown that to be the case. They also save more and invest their savings in maintaining their property or paying off the mortgage. Both of these things are prudent and ensure that most homeowners have a comfortable financial cushion in their old age.

Switzerland's approach is the opposite of Singapore's. Homeowners are treated less favorably, as the tax burden on their property's imputed rental value is higher than the mortgage tax deduction.

Should the state do more to promote home ownership?

No tax system is universally popular; that would be impossible. But property owners have benefited greatly in recent years from falling interest rates. The unpopular imputed-rental-value provision balances things out somewhat in favor of tenants.

In San Francisco, some apartments are rented through an auction process, while in Stockholm, the real estate market is regulated nearly to death. What approach should Switzerland take?

Regulations and subsidies have serious consequences over both the medium and the long term. The most recent financial crisis began with the real estate crisis in the United States, where property ownership was encouraged so much that people were able to buy a house with practically no equity capital. At the same time, it is acknowledged that legal protection for tenants is very limited. The Swiss system is well balanced, in my view. It has led to a functioning market for both owner-occupied housing and rental properties. Internationally, this is very rare.

But here, too, the market is changing; there are more owners and fewer tenants.

Conditions for home ownership have been very favorable for the past 25 years. In the 1990s, it once again became affordable to own a home, and the use of pension funds for a home purchase has been permitted since 1995. At the same time, interest rates have declined dramatically.

Despite historically low interest rates, you say that the purchase of a home today is a “pipe dream.” Why?

Apartments and houses have become incredibly expensive. For most people, low interest rates are irrelevant because financial institutions have to look at whether you're capable of paying an interest rate of 4.5 or 5 percent – only then will you be granted a loan. Today the idea of purchasing residential property is an illusion even for much of the middle class.

[See Fig. 1, page 65.]

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Is it a problem for society if the average citizen cannot afford to own a home?

From an economic standpoint, it's important to prevent the market from overheating. Real estate crises do a great deal of damage, as Switzerland has learned from its own experience. We're not currently experiencing a real estate bubble, but it's not a good thing that the middle class and mortgage lenders are the ones suffering the disadvantages of regulatory measures. The middle class is unable to buy, while mortgage lenders are providing fewer loans.

Can you answer the perennial question of when interest rates are going to go up again?

For that to happen, there needs to be inflation. Only then will the central banks raise interest rates. Yet digitalization, globalization and the aging of the population are keeping inflation in check, which is why interest rates will remain low for a long time to come. Ultralow interest rates will become less available, but for the foreseeable future I see no prospect of a return to the high interest rates of the past. A side effect of extremely low interest rates is excessive construction. [See Fig. 2.]

If people are interested in long-term investments, should they still consider real estate, or is it better to invest in equities or bonds?

Real estate has outperformed other asset classes for the past 20 years – and with lower levels of risk. But it would be irresponsible to assume that this will continue to be the case in the coming decades. The incredible drop in interest rates fueled real-estate yields, and that's not going to happen again – interest rates can't drop much further into negative territory. There are limits. The picture will very likely be different in 20 years; I can imagine that equities will again rank at the top.

If you still want to purchase real estate, they say you should focus on three things: location, location, location. Is that still true?

In a declining market, that rule of thumb is more relevant than ever. But a more interesting question is this: What constitutes a good location? The answer changes all the time. Proximity to public transportation has become more important in recent years, while online

shopping has made it less crucial to be near retail businesses.

Will self-driving cars change how we view a location's quality?

Absolutely. Today, in many places, accessibility is a limiting factor. That will change dramatically. The locations that will benefit are up to 30 minutes from the city center by car and have no or only suboptimal public transportation.

You predict that over the long term, demand for residential property in Switzerland will collapse. Why?

Demographic factors are enormously important. The effect of the decline in births in the second half of the 1960s, after the introduction of the contraceptive pill, has been largely mitigated by

How have residential models in Switzerland changed over the years?

Today one-person households are most common, making up 35 percent of all households. In 1960 they were the smallest group with only 14 percent.

What happened?

It's quite simple: We became wealthier – so there was less need to compromise. This is reflected in an increasing emphasis on individual fulfillment.

Today many people want to live alone, even when they're in a relationship.

Is that a positive trend?

This phenomenon can be observed among both men and women, and I, personally, find it worrisome. I'm speaking here not as a real estate specialist, but simply as

I find it worrisome that people today want to live alone even when they're in a relationship.

immigration. But while the market is adding 20,000 housing units per year today, that number will drop to below 9,000 between 2030 and 2040, according to our calculations.

The role of home ownership is declining, large amounts of office space are unoccupied, and online businesses are replacing brick-and-mortar stores.

Are any real estate segments booming?

The action is in niche segments: logistics, housing for the elderly, care homes, student dormitories and housing for single people.

And vacation homes? When people were able to build, they did so before the second-home initiative went into effect.

There is now a high level of availability, and prices are low.

That's true. In addition, the Swiss franc is currently strong, and there is some legal uncertainty because of the new regulations. The importance of all of these negative factors will decline over time. So it is, indeed, a good time to buy a vacation home.

a member of society. Living with someone else promotes tolerance and an ability to compromise. In my experience, these social values decline when people have lived alone for a long time. It's really too bad; isn't it precisely through living with someone else that we gain unforgettable experiences? [See Fig. 3.]

What effects does the aging of society have on the real estate market?

In the future, we will need fewer single family dwellings and more homes that accommodate the needs of older people. New residential models are emerging in which older people have only one small private room, while they share some spaces and services with others.

As a tenant, how can I benefit from the highest vacancy rate in years?

There are more and more options to choose from. And tenants now have more bargaining power when dealing with landlords. Rents are no longer continuing to rise; indeed, they may soon go down in some cases.

Fig. 1 — Unaffordable homes

Calculated percentage of gross income of an average household, given the following parameters: 5 % interest, 1 % maintenance, 80 % loan-to-value ratio, amortization to $\frac{2}{3}$ within 15 years.

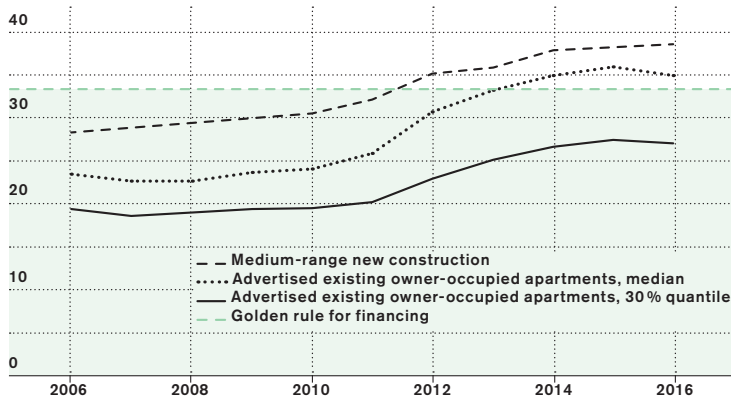


Fig. 2 — Unabated boom in construction: rental apartments

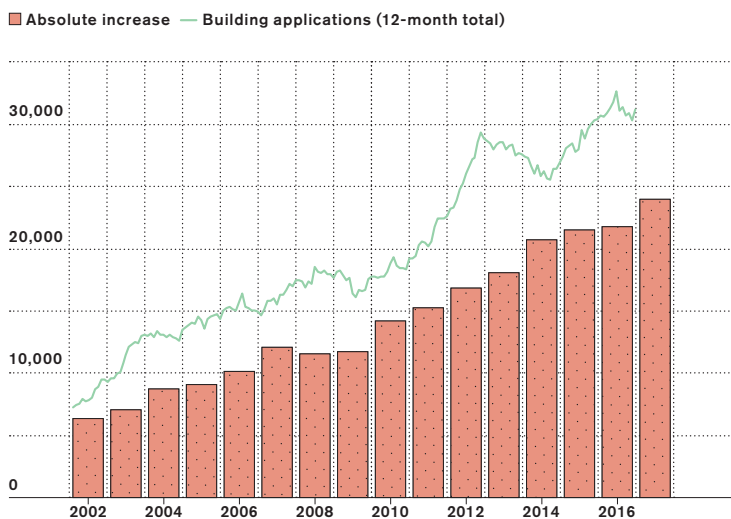
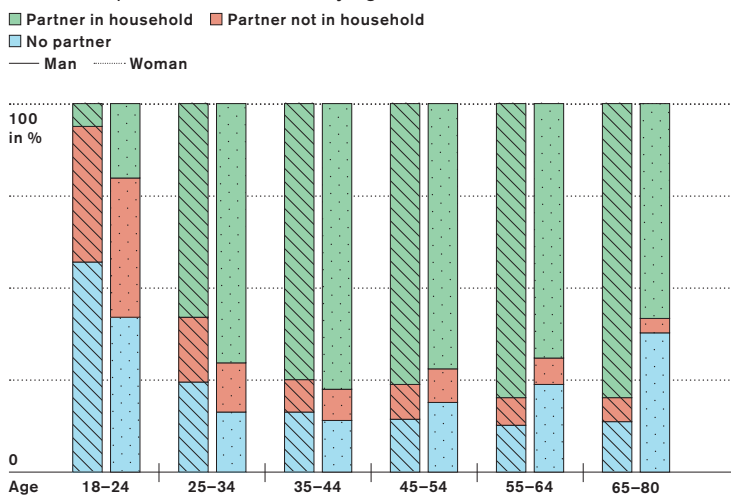


Fig. 3 — Living alone despite being in a relationship:

Relationship status man/woman by age, in %, 2013.



Source of all graphics: Credit Suisse Swiss Real Estate Market 2017

Should I ask my landlord to lower my rent?

Yes, but only if the reference interest rate drops again. If you have a long-standing rental agreement, then you're probably paying less than market price. In that case there's not much room for negotiation.

Vacancy rates for rental properties in large cities have remained low so far.

Will this change?

Even in the city centers, the availability of rental apartments will increase. In a recent survey by the city of Zurich, only a minority of respondents reported having difficulty finding an apartment.

You often talk about a "digital revolution" in construction. What benefits will that bring?

Digital construction allows for incredible increases in efficiency. Over the past few decades, productivity in the construction sector has hardly grown at all, as the heads of major construction companies will tell you. They predict that the cost of construction will drop by 30 percent over the coming decade. Construction is a complex topic that involves numerous parties. Thanks to networking, digitalization is the ideal solution.

What about you? Where do you live?

I attach great importance to a short commute, so I live in the heart of Zurich, an expensive city. I also have children I want to see every day, despite working long hours. We live in a neighborhood where everyone knows everyone else and we all help each other – it's almost like a village. That's worth a lot to me, and it's some compensation for not yet being able to fulfill my desire for a home of our own.

Would you rather leave a house or a large amount of money to your children?

If my children have the necessary financial expertise and a great deal of discipline, then money, because it offers a lot of flexibility. If not, a house is ten times better. □

"Swiss Real Estate Market 2017:

Tenants Wanted" is the most recent real estate study published by Credit Suisse. It can be found online at www.credit-suisse.com/immobilienstudie

The Story of a Revolution

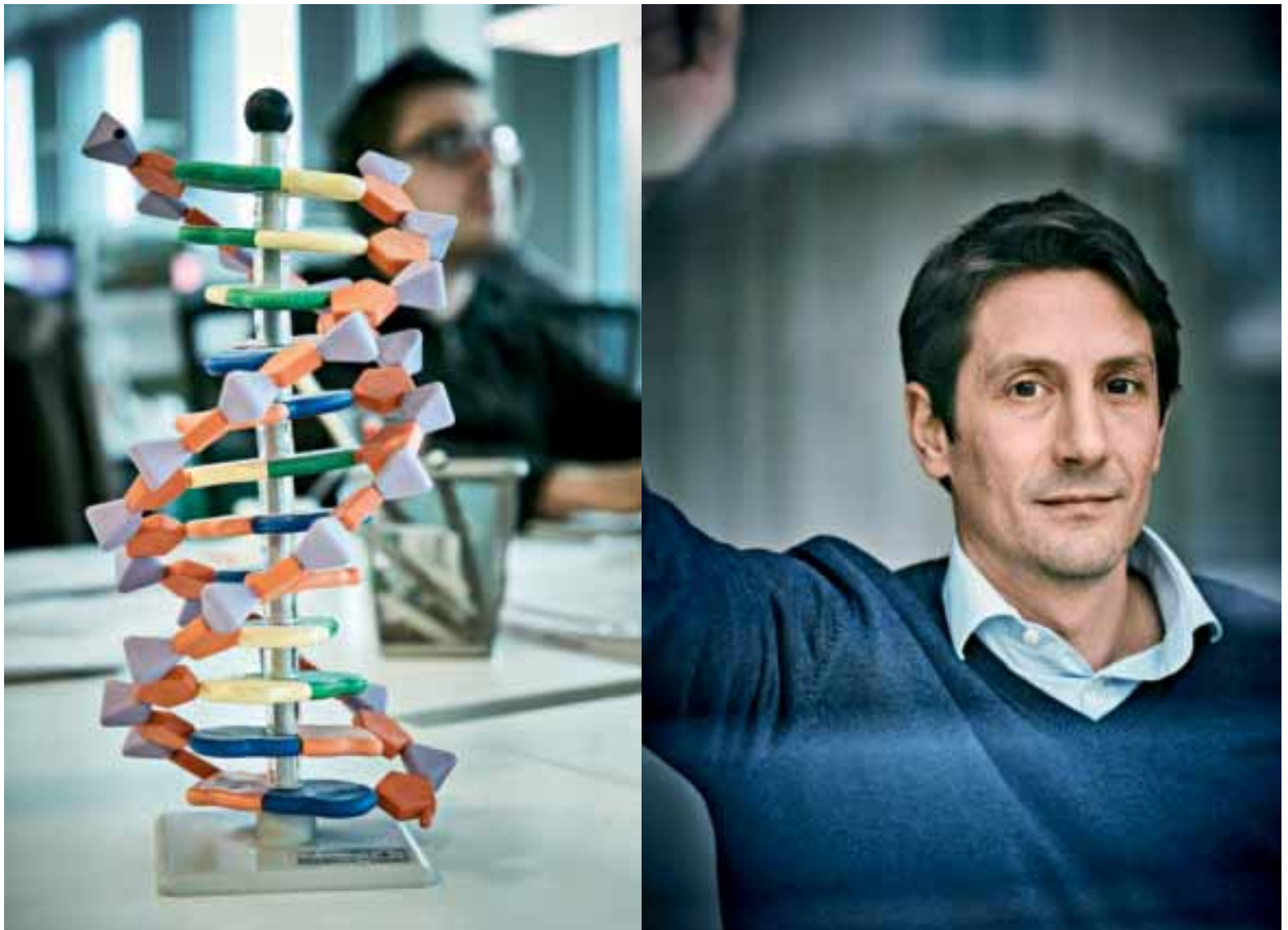
Artificial intelligence is learning to decode the very essence of human biology: the genome.

A Swiss startup from the Lake Geneva region is leading the way with advances that are already benefitting patients all over the world.

By Christian Heinrich

This is the story of a revolution. It begins with a startup in the Swiss town of Lausanne, at the Swiss Federal Institute of Technology Lausanne (EPFL), and results in the development of an indispensable technology to help clinicians in hospitals around the globe understand – and treat – patients and their illnesses in an entirely new way.

But let's start with an experiment. Why, dear reader, are you able to understand these first few sentences even as you are reading them, without thinking much about it? One thing is certain: You're not comparing them with every other sentence you have read in your life. Theoretically that might be possible, but it would be an



Genetic analysis helps doctors research the causes of disease, which leads to better treatments: Sophia Genetics CEO Jurgi Camblong.

extraordinarily laborious process. As human beings, we've internalized the grammatical rules, which, in a certain sense, frame every sentence we have ever heard as the embodiment of the rules themselves.

Until recently, computers were incapable of that kind of achievement. They were able to compare huge amounts of data and look for similarities, and they could perform more complicated calculations than any human being. But they were just following directions. It is only recently that the virtually unimaginable has become possible: Computers are now able to learn. The term "deep learning" refers to a program's ability to alter its own code when certain data is fed into it. Deep learning has already led to remarkable advances in picture and voice recognition. But in medicine the effects are already truly revolutionary.

As is so often the case, the company that is blazing the trail is not an industry giant, but a startup: Sophia Genetics. "At first what we had to offer to hospitals was very simple," says Jurgi Camblong, a molecular biology expert with dark brown hair, an intense gaze and a French accent. Camblong is the CEO and co-founder of Sophia Genetics. The company made hospitals an offer: "Let us analyze your patients' genomic profiles, and we will turn it into actionable information to guide your diagnostic and therapeutic decisions." That was the beginning of Sophia Genetics. The company consciously decided to work with clinicians rather than directly with patients. "After all, we're talking about genomic data here, which should be managed by experts," says Camblong.

Nutrition or Genes?

The simplicity and clinical benefits of Sophia Genetics made it immediately attractive to hospitals. Clinicians take a sample – often just of blood – from their patients. In a laboratory, the DNA is sequenced and translated into digital information that is then sent to "SOPHiA," the artificial intelligence developed by the company. A few hours later, Sophia Genetics sends out the results in the form of a genomic variant report. This reveals to the physician the extent to which the patient is predisposed to develop a hereditary disease.

Physicians have their patients' genome analyzed for a variety of reasons. High blood cholesterol levels, for example, may be caused by a high-fat diet or by a

genetic predisposition, and SOPHiA makes it possible to rule out the latter. This is useful for physicians, since knowing the causes of illnesses allows them to treat their patients more effectively.

In the case of patients suffering from cancer, SOPHiA analyzes their genomic profile starting from a tumor biopsy. This can help identify the best treatment options, save patients valuable time – and potentially save their lives.

The first step for Camblong and his team was to feed SOPHiA – not with sentences, but with patients' genomic data. The goal was to allow the technology to learn

Hospitals don't share patients' names with us; we are only given an order number and the parameters.

the vocabulary and grammar of the connections between genes and health. In the spring of 2017, Sophia Genetics announced that it had analyzed the genomic profiles of 100,000 patients around the world. While many players in the market, both large and small, are merely talking about it, Sophia Genetics is actually making the genomic revolution available to a wider range of people.

SOPHiA has analyzed far more genomic profiles than other types of technologies, giving it a solid competitive advantage over rivals like IBM's Watson. When it comes to artificial intelligence, the more input it receives, the smarter it becomes.

SOPHiA is producing increasingly detailed and comprehensive results. It is now being used by more than 270 hospitals in 47 countries, and several thousand analyses are run each month.

What is unique about this model and learning feature is that every patient benefits from the previous analyses performed. When SOPHiA analyzes the genomic profile of a patient in Singapore, the outcome will later inform the analysis of another patient in Munich. Jurgi Camblong describes this process as the "democratization of data-driven medicine."

Key Sectors for the Future

Investors soon came on board to support the company's vision. In 2012, Sophia Genetics was awarded a prize in the highly-regarded "venture" startup competition in

Switzerland, and since then the company has received 30 million US dollars in several financing rounds. But according to Jurgi Camblong, this should just be the beginning. According to the online magazine "Tech Crunch," Sophia Genetics has the potential to become the next unicorn (a startup with a market value of more than a billion dollars) in Switzerland for it covers all key areas of the future: personalized medicine, artificial intelligence, big data.

How secure is the data? Jurgi Camblong's response is reassuring: "Hospitals don't share patients' names with us; we are

given only an order number and the clinical parameters." But the hospital has the names, and it links them to the analysis results. As per the latest EU regulations, Sophia Genetics only processes the data if the hospital controls it. □

Christian Heinrich is a physician and freelance journalist. He writes frequently for *Die Zeit* and *Geo*.

Credit Suisse is a supporter of the "venture" startup competition, which is celebrating its 20th anniversary this year.

In 2012, Sophia Genetics placed second in the competition's "Business Plan" category.





Please Do Not Disturb

In the animal world,
the need to stay
out of sight manifests
itself in a variety
of ways, whether it
be the badger in
big cities, the snow
leopard in
the Himalayas, or the
deep-sea dwelling
coelacanth, long
believed to be extinct.

By Herbert Cerutti

I

n 2010, English film scholar and university lecturer Brett Mills made headlines around the world with his analysis of the BBC's animal documentaries. He does not oppose such films in principle, he wrote in his study, as they do help to inform viewers about various environmental and conservation issues. However, all too often, criticized Mills, the filmmakers violate the animals' dignity, such as when filming private moments like birth or sexual intercourse: "It might at first seem odd to claim that animals might have a right to privacy. The question constantly posed by wildlife documentaries is how animals should be filmed. They never ask whether animals should be filmed at all."

It used to be that animals were simply objects that humans could do with what they pleased. Yet even before Mills' analysis, the rights and ethics in dealing with animals were already being debated. The assertions of privacy could well be a projection of humans' own feelings. Animals possess a natural need to feel secure when resting or consuming prey, for example, which is why they seek out spots that are safe from enemies as well as from nature's hazards. So if animals seek "privacy" for sex or giving birth, it's hardly out of shame. Rather, it's an expression of their own protective instincts, since the animal is vulnerable during such activities. Pet owners can attest to just how unimportant their animals' privacy can be when their charges "shamelessly" mate in familiar surroundings.

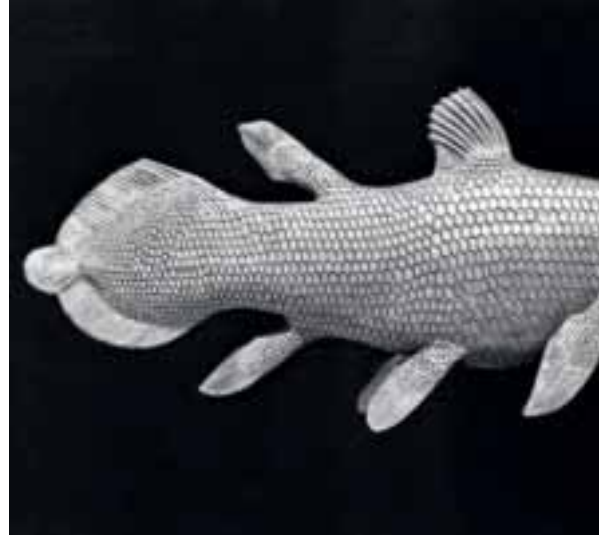
Bold Foxes, Shy Badgers

The importance of an undisturbed habitat is dependent on the physical strength of a species. The Alpine ibex, for example, does not think twice about lying right in the middle of our hiking trail, while the shy deer must always be on guard for enemies and flees like a shot at every sound.



Even wild animals in large cities show a range of needs when it comes to security. In recent years, the once-shy fox has gone from forest dweller to a rather bold scavenger in residential areas, plundering garbage bags and compost piles on its nightly excursions. When daybreak comes and the fox disappears, the undergrowth near a public swimming pool or a hideout on a factory roof proves sufficient replacement for its den. Zurich is now home to a thousand foxes, with twice as many living in Berlin. And the metropolis of London may be the wild fox capital, with more than 10,000 foxes.

Badgers increasingly prefer to live near urban areas as well. Yet hardly anyone notices their presence, since the badger sticks to the safety of its underground burrows during the day. On its nightly feeding tours, it seeks out beetles and worms, wasp nests, berries and fallen fruit, but has little appetite for the detritus of civilization. That's why badgers avoid the city center and reside in the woods outside of town or in a forest near a cemetery or a villa. Around 160 badgers now live in the Zurich urban area, and several hundred in Berlin. For London, estimates indicate a growing population of 1,500 to 2,000 badgers. In that large city as well, the badger only leaves the safety of its underground home by night – from dens located in the vast grounds of the Royal



Botanic Gardens in southwest London or in Greenwich Park to the southeast.

A Hermit High in the Mountains

A secluded habitat can also offer protection and privacy. The snow leopard lives in the mountains of Central Asia, which stretch from Mongolia, Tibet and Nepal to Pakistan and Kazakhstan. In summer, the big cat climbs to an altitude of over 6,000 meters, while avoiding severe winters in lower-lying woods. The snow leopard is definitely a loner. It often must prowl its barren mountain habitat for days before spotting an ibex or blue sheep. Such meager feeding opportunities necessitate a hunting range of hundreds of square kilometers. This hermit has similar challenges



Fox, coelacanth (left page), snow leopard and badger (right page): Some animals live unobserved by humans, while others skillfully exploit our presence. Privacy in such cases means above all a natural need for security.



when finding a breeding partner during mating season. The potential mates attempt to locate each other with scent-marking and wailing mating calls across the bleak vastness.

Its solitary existence has made the snow leopard a creature of great mystery. Zoologist George Schaller shot the first decent photos of the legendary “spirit of the mountain” only in 1970, at an altitude of 4,000 meters in the mountains of Pakistan. The snow leopard might live a highly secluded life, but human greed nevertheless tracks it down. Despite government protections, poaching continues, since the cat’s magnificent coat fetches well over 10,000 US dollars on the black market. The alleged healing power of its bones

makes the animal appealing for Chinese medicine as well. Increasingly, an overall decline in high mountain prey – not least due to poaching – has forced these feline predators to set upon domestic sheep or goats, so herders too are now hunting down the snow leopards. Today, only a few thousand snow leopards live in the wild, with around 600 more in captivity.

The Living Fossil

In an almost unbelievable story, a deep-sea fish was able to outsmart extinction by living extremely modestly. Fossils showed that the coelacanth lived during the Devonian Period, 400 million years ago. Coelacanths were among the most common fish at the time, with around 30 different species. Yet none of the many fossil finds are less than 70 million years old, which led biologists to conclude that the coelacanth must have gone extinct even before the dinosaurs.

On December 22, 1938, however, a fortuitous discovery threw all scholarly knowledge out the window. At the mouth of the Chalumna River off the eastern coast of South Africa, a strange specimen landed in a fishing net: a steel-blue fish with a pair of paddle-like fins on both chest and belly. This one-and-a-half-meter-long creature from the deep soon perished on deck, but the captain delivered his find to Marjorie Courtenay-Latimer, curator of the local natural history museum. Since she couldn’t classify the animal, she sent a sketch to J. L. B. Smith, a leading fish expert. “If I’d met a dinosaur in the street I wouldn’t have been more astonished,” said Smith later. The scientist immediately recognized that here before him was the supposedly long-extinct coelacanth. In honor of the curator and the spot where it was

found, he dubbed the newly discovered species *Latimeria chalumnae*. The announcement of this “living fossil” was a huge sensation. Hans Fricke of the Max Planck Institute for Behavioral Physiology captured the first living coelacanths on film in the Comoros Islands in 1987.

Since then, researchers have been able to document the behavior of *Latimeria* around the lava caves in this Indian Ocean archipelago, at a depth of about 200 meters. The giant fish hides in caves during the day, remaining nearly motionless. But at night, it emerges to hunt at depths of up to 500 meters. It lets itself be carried along by the currents, its fins stretching out like airfoils. When the fish does actively swim, it paddles with its right pectoral fin and left pelvic fin in sync and then with the left pectoral and right pelvic fins. However, if any prey appears before the *Latimeria*’s snout, it can accelerate to around 50 kilometers an hour in a half second.

Remaining so inert while using only short sprints for hunting saves valuable energy, and this frugality likely allowed the coelacanth to survive in its desolate deep-sea habitat. In 1997, a second species was discovered off the Indonesian island of Sulawesi – the Manado coelacanth. But the coelacanth’s modest lifestyle and discretion mean we will probably never discover all its hiding places in the deep ocean, and their privacy will continue undisturbed. □

Herbert Cerutti is an experimental physicist and has received numerous awards for his work as a science writer. He lives in Maseltrangen (St.Gallen).



Private Conversation

Does the art of conversation still exist? Even at a rendezvous under the table you're never completely alone.

By Sarah Mazzetti



Sarah Mazzetti is an illustrator from Bologna. Her work has appeared in such publications as The New Yorker, The New York Times and Die Zeit. Sarah Mazzetti has received various awards and teaches at the Istituto Europeo di Design (IED) in Milan.

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