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FT

THE FIFTY LEADING BUSINESS PIONEERS

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FOREWORD

To select the top 50 business pioneers of all time, from all around the world, was a Herculean task.

Our judges had to decide whether to recognise the person who first had an idea or the one who made a business out of exploiting it.

Another difficulty was how we treated political visionaries who created the business climate that enabled innovation to thrive.

You can see our answers to these questions in the pages of this special report. Michael Skapinker, the associate editor at the FT who chaired our distinguished judging panel, explains on page 6 how the judges agonised over how to refine a long list inspired by hundreds of nominations from our readers and journalists around the world. But making fine judgments lies at the heart of FT journalism.

This magazine, which is accompanied by online articles and videos examining specific themes, follows the success of The Fifty Ideas That Shaped Business Today (ft.com/50ideas). Then, as on this occasion, we grouped the 50 by sector, from technology to finance. Who was left off our list is also telling. The introduction to each section, by an FT specialist writer, examines the circumstances in which pioneers either succeeded in leaving their mark on history or narrowly failed to do so.

The list of 50 is dominated by men, and by Americans and western Europeans. The judges tried to be as inclusive as possible. They were also determined that every individual should earn his or her place purely on merit. Articles on the dominance of the western business model (page 8), and on the role of women (page 54), explain how rapidly the landscape is changing.

Our selection represents a snapshot at a point in time. In a year or two, the individuals identified by the judges as people to watch (see page 58) might make the final cut. And other pioneers might also stake their claim to be included on the list.

We at the FT will continue to throw a spotlight on such individuals — and we welcome your contribution to a continuing debate.

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Join a twitter chat with FT experts on what makes a business pioneer today, March 31, at 12.00 GMT

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INTRODUCTION

BEING A BUSINESS CREATOR RATHER THAN MERELY A DISCOVERER WAS THE KEY TO MAKING THE LIST, WRITES **MICHAEL SKAPINKER**

How do we define a business pioneer? This was the first question the six judges — three Financial Times columnists and three outside specialists (see page 58) — had to settle, before we began sifting the suggestions from FT readers and journalists.

Were inventors and discoverers business pioneers? Should we regard Alexander Fleming as a pioneer because his discovery of penicillin led to the development of the worldwide business of antibiotics? What of Tim Berners-Lee, inventor of the worldwide web?

What about reforming Chinese leader Deng Xiaoping? As one of our China correspondents said: "He was not a business person himself, but there wouldn't be any Chinese business people without him."

And what about business school professors who changed the way top executives think about business? Should Michael Porter of Harvard Business School be on the list?

The judges said "no" to all three questions. Business pioneers, we felt, should have created a business. That led to some quick decisions. Thomas Edison, a prolific inventor whose company grew into General Electric, clearly belonged on the list.

Others followed. John D Rockefeller was a central figure in the creation of the oil business. Cecil Rhodes was a creator of the South African mining industry. John Pierpont Morgan was clearly a banking pioneer. Mayer Rothschild, whose sons spread out across Europe, was a pioneer of international banking. Thomas Cook created the modern tourism industry.

The judges had little difficulty selecting more recent business leaders who had upended old ways of operating and created new businesses. Michael Bloomberg and Rupert Murdoch were in that category. So was Formula One supremo Bernie Ecclestone. Sir Richard Branson got the nod because of the way he had stamped his personal brand on a series of businesses, from music to airlines to financial services.

After that, our discussion became more complex. What were we to do about pioneers who worked in collaboration? Should they occupy two places on the list or share one? They should share one, the judges concluded. So Sergey Brin and Larry Page, co-founders of Google, share a place. So do Eiji Toyoda and Taiichi Ohno, co-creators of the "Toyota Way", with its elimination of waste and use of just-in-time production methods.

Thomas Watson Sr and Lou Gerstner presented a different problem. They led IBM in different eras: Watson built the company in the first half of the 20th century; Gerstner turned it around in the 1990s. Surely each was entitled to his own place? No, the judges said. They were both IBM pioneers and should be linked in our list. None of the judges contested Walt Disney's right to be considered a leading business pioneer, but some argued strongly that Roy, Walt's older brother, was the financial manager who made Walt's creative genius possible. They, too, share a place.

The judges were aware we might end up with an overwhelmingly male, white, American-European list. People in this group have, historically, dominated business leadership, as John Gapper, the FT's chief business commentator and one of the judges, discusses on page 8. But there were and are business pioneers elsewhere too. While the

PHOTO: REUTERS

judges were determined every person on the list should deserve his or her place, we would look as widely as possible for candidates.

Mo Ibrahim won unanimous support from the judges for his role in using mobile communications to connect Africans who had long been poorly served by fixed-line telephony. Muhammad Yunus, the Bangladeshi Nobel prize winner and founder of Grameen Bank, the microcredit provider, occasioned more discussion, with some feeling others had been pioneers of the sector too. But

Spotlight on success: the inventor of containers clearly earned his place on the list as a key enabler of global trade and business

Yunus got the nod, as did Ratan Tata, for turning his family's Indian business into a worldwide conglomerate.

Estée Lauder was a unanimous choice for helping create today's vast beauty and cosmetics industry. From the same sector, Anita Roddick, founder of The Body Shop, won a place for her understanding of how consumers would respond to a company's ethical credentials. The judges saw Roddick as a central figure in promoting the idea of responsible and environmentally friendly business.

The judges felt the fashion industry, given its size and worldwide influence, should be represented too, and thought Coco Chanel and Miuccia Prada were its pioneering figures.

There was a strong feeling sovereign wealth funds should be recognised in the list, but the judges failed to agree on an outstanding pioneer.

Every reader will come up with his or her own variations, so please join the debate at ft.com/50pioneers and take part in a twitter chat at 12.00 GMT today.

WESTERN DOMINANCE

THE US FEATURES SIGNIFICANTLY IN THE FT'S LIST OF LEADING BUSINESS PIONEERS, SAYS **JOHN GAPPER**

PHOTOS: THREE LIONS, AFP/GETTY IMAGES

The US is not only the world's biggest economy but a country of trailblazers, and the FT's list of leading business pioneers reflects that. Many of the names picked by the judges are from western industrial economies, but a majority are either American or built their fortunes in the US.

There is inevitably a backward-looking element to the choice. By definition, a pioneer does something different from the crowd, the true importance of which might be hard to identify for years, or even decades. That gives the US a built-in advantage. For most of the 20th century it was the world's fastest-growing, strongest economy. From the late 19th century, as the US took over as the world's leading economy, its free market and highly competitive structure spawned powerful innovations in diverse industries. It also told its story to the world through Hollywood and its advertising industry.

Even now, its strength in internet technology and software allows people such as Mark Zuckerberg, the Facebook founder, and Jeff Bezos, the founder of Amazon, to follow in the path of business pioneers including Henry Ford, the industrialist, and JP Morgan, the banker. China and Asia are rising rapidly, but many innovations still have an American accent.

The FT list reflects how this geographical bias is changing, with Asian pioneers such as Narayana Murthy, founder of Infosys, the Indian IT group, and Li Ka-shing, the Hong Kong tycoon. But it will take several decades for the shifted balance of the world economy to be reflected fully in ground-breaking individual achievement.

Warren Buffett, one of the year's pioneers, put it well in his 50th anniversary letter to Berkshire Hathaway shareholders. "The mother lode of opportunities runs through America . . . Through dumb luck, Charlie [Munger, Berkshire's vice-chairman] and I were born in the United States, and we are forever grateful for the staggering advantages this accident of birth has given us."

These advantages include a cultural enthusiasm for trying to create

Fast buck: the flow of innovation out of the US and into emerging markets is only now being reversed

something different. The immigrant culture of the US is highly inventive. Newcomers such as Andy Grove, the former boss of Intel, the computer chipmaker, and the children of immigrants, such as Amadeo Giannini, founder of the Bank of America, were eager and ambitious to build cutting-edge businesses.

The US economy had great advantages for business pioneers. It was large, without the boundaries that limited markets in Europe, and it had a strong legal and patent system to protect and nurture invention. The Wright brothers were just as strong-willed in trying to protect their "flying machine" from competition through patents as in piloting it.

The country was also the world's largest consumer market, where companies such as Ford, McDonald's and Intel could develop and market new products and then sell them overseas. This flow of innovation out of the US and into emerging markets is only now being met at scale in reverse.

As a result, even successful entrepreneurs such as Lei Jun, founder of Xiaomi, the Chinese smartphone manufacturer, often build on technology and ideas created in the west, notably in Silicon Valley. They are producing their own versions of US concepts.

> "CHINA AND ASIA ARE RISING RAPIDLY, BUT MANY INNOVATIONS STILL HAVE AN AMERICAN ACCENT"

There are clearly exceptions. The Indian outsourcing industry, for example, did not follow a US lead. It was built on the country's unique strengths, aided by technological change. Japanese carmaker Toyota took much from Detroit but Eiji Toyoda and Taiichi Ohno's high-quality production system overtook the west, and was adopted by Ford and General Motors.

The US pioneered open, inventive capitalism, supported by strong laws and public investment in technology. That model has been exported successfully to the rest of the world, even to communist China. A new generation of global pioneers is reaping the benefits.

TECHNOLOGY

THE INDUSTRY'S RAPID CYCLES HAVE BEEN AN OPPORTUNITY FOR YOUNG OUTSIDERS TO BRING IN A FRESH PERSPECTIVE, WRITES **RICHARD WATERS**

You do not have to be a young and inexperienced outsider in business to change the world in the computing and internet industries. But it certainly helps.

More than half of the industry's leading pioneers founded their companies before their 27th birthdays, from Sony's Akio Morita in 1946 (aged 25) to Mark Zuckerberg, who set up Facebook in 2004 when he was only 19, though that was still three months older than Bill Gates when he started in software.

It is not just the relative immaturity of the computer and internet worlds that accounts for this bias towards youth. It also reflects the industry's periodic upheavals, as successive waves of new technology have risen to overwhelm what came before. At such times, it is often the outsider with the different perspective who emerges on top.

Youth has been a more pronounced factor in the software and internet industries than in electronics and hardware. Thomas Watson was 40 when he joined the business machinery company that he later renamed IBM, building it into the first behemoth of the computing era, though he retired just as the first commercial mainframes hit the market. Ren Zhengfei, a former Chinese army officer, was 43 when he started Huawei, the communications equipment company.

Yet both men created business empires that conform to another truism of the tech world: founder-led companies have tended to dominate the industry.

Only Lou Gerstner, a career manager, was not involved in the early days of the company where he made his greatest impact. But by reviving a struggling IBM in the 1990s, he pulled off a turnround that was unrivalled in the history of the tech industry — at least, until Steve Jobs returned to a foundering Apple and rebuilt it to become the world's most valuable company.

While making hardware was the main route to riches in the industry's early days, the biggest fortunes in tech have been made by more intangible means: creating the software code or the online services on which the digital world increasingly depends.

Grabbing a central role in each new generation of technology — from mainframes to personal computers and now mobile and cloud computing — has been a big determinant of success. By turning their technology into a platform on which others in the industry depend, the most successful tech entrepreneurs have been able to create a self-reinforcing cycle that has often made tech a winner-takes-all business. Microsoft's PC software remains the most effective platform monopoly, making Gates still the world's richest man, according to the Forbes billionaire list, even though the company he founded has been superseded in the mobile computing era.

Steve Jobs, as in so many things, stood apart. His focus on selling hardware — even as software such as the iOS operating system and services such as the App Store accounted for much of his success — has made Apple the odd man out.

In *Strategy Rules*, a forthcoming book about the pioneers of the PC era, US business school professors David Yoffie and Michael Cusumano point out that Jobs remained only a half-hearted fan of the platform strategy on which so many tech fortunes have been built. It is still unclear whether this has led to Apple yielding long-term dominance in the mobile industry to Google's Android operating system, they say.

Like the tech industry itself, the list of pioneers reflects the historical dominance of the US. But as tech producers in the developing world move up from electronics manufacturing and routine outsourcing to higher-value services — and as participation in digital markets booms thanks to the spread of mobile technology — it is a fair bet that many in the next generation of industry leaders will come from elsewhere.

Jack Ma of ecommerce platform Alibaba may not have made this listing of industry pioneers, but along with Pony Ma of internet company Tencent and Xiaomi's Lei Jun — the handset entrepreneur whose rock-star status in China echoes the passion once aroused by Jobs — he is one of a generation of Chinese tech entrepreneurs who could be on the brink of global prominence.

With each successive computing platform assuming greater significance than the one that came before — and subsuming a bigger slice of economic activity — it is also likely that the fortunes of the future will also put those that came before in the shade.

But there is also a dark side to this inexorable turn of the tech industry cycle. If founder-run companies have dominated, can they withstand the departure of the pioneers who gave them life? And as the opportunities from each new generation of technology grow bigger, will the half-lives of the leading companies grow shorter?

IBM, which has been in business for more than 100 years, represents a longevity that seems to be passing. Tellingly, it is already in need of another turnround, only two decades after Gerstner hauled it back from the brink.

Microsoft missed the rise of mobile computing, while Google has missed the social media wave and has yet to show that its core search service can be as dominant in the mobile world as it was on PCs.

Even Zuckerberg has had to address the risk of being eclipsed: at the age of only 30, he was forced to spend $22bn to buy messaging service WhatsApp last year to prevent Facebook fading into irrelevance in the mobile age.

Amid the upheaval, the foundations of the industry's next dominant businesses are already being laid.

> "SUCCESSIVE WAVES OF NEW TECHNOLOGY HAVE RISEN TO OVERWHELM WHAT CAME BEFORE"

50 PIONEERS

SERGEY BRIN & LARRY PAGE

BY RICHARD WATERS

As graduate students at Stanford University, Larry Page and Sergey Brin did not set much store by the idea of building an advertising business. In the academic paper laying out their ideas for a new type of search engine, they explained that to take paid messages would risk compromising the integrity of their service, adding: "We expect that advertising-funded search engines will be inherently biased towards the advertisers and away from the needs of consumers."

The qualms did not last: instead, they ended up creating a system of search-related advertising that has served as one of the main economic drivers of the consumer internet industry in its first two decades.

Page and Brin are best known for innovations in web search — not to mention their long-range ambitions, such as driverless cars. But it has been in advertising that they have had their biggest impact on the business world. The idea of search advertising was pioneered by Overture, another internet start-up, but perfected at Google.

Online display, mobile and video advertising have followed: with revenues of $66bn, around half of the world's digital advertising flowed through Google's systems in 2014. The data amassed from the company's growing range of services have served to feed this unparalleled advertising machine — though that has also raised privacy worries.

The Google co-founders have taken different directions of late. Brin has taken an interest in longer-range projects, notably through Google X, the company's ambitious research labs — though Glass, the augmented reality headset and one of the first products of X, has failed to catch on.

Meanwhile, as chief executive, Page has sought to remake Google for a future that stretches far beyond ➤

PHOTOS: CHUYU/DREAMSTIME; AP

search. His vision of using Google's massive profits to turn it into a holding company with interests ranging from devices for the "smart home" to treatments for the diseases of ageing could lay the foundations for a new type of digital conglomerate.

Still in their early 40s, the founders now face two questions that will determine how their careers are eventually reflected in the business history books. Can they succeed in giving Google a new lease of life as social networks and mobile app stores come to dominate digital life? And will they be able to deal with the wave of resentment, jealousy and fear that has been stirred up by their success, particularly in Europe?

For the next phase of Google's history, diplomatic and political skills will be as important as the engineering and business acumen Brin and Page have shown in the past.

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BILL GATES

BY RICHARD WATERS

If turning points in business history can be traced to single events, then a meeting that took place in Boca Raton, Florida, in the autumn of 1980 will go down as a seminal moment.

At 24, Bill Gates, who had dropped out of Harvard University to go into business with school friend Paul Allen, had already created one of the first software companies built for the new microprocessors that would define the personal computer era.

But it was the deal he struck in at the 1980 Florida meeting with executives from IBM that sealed the fate of much of the tech industry for the next quarter of a century — while turning Gates into one of the world's richest individuals.

The IBM meeting showed Gates at his most effective: the master strategist and determined negotiator whose superior understanding of what was at stake enabled him to walk off with the prize. In agreeing to make the operating system for IBM's PCs, Gates made sure he kept full control of the source code and the rights to sell the software to other manufacturers — terms that led to the commoditisation of PC hardware and Microsoft's massively profitable operating system monopoly.

Eventually, however, Gates's uncompromising competitiveness brought an anti-trust lawsuit from the US government. A court-ordered break-up of the company was avoided only with a settlement that saw Microsoft bow to years of close government supervision.

For much of his time as chief executive, Gates's strong personal leadership enabled Microsoft to respond to new technology threats. His rallying cry about the risk of Microsoft being swept away by an "internet tidal wave", for instance, galvanised its developers and enabled it to fend off the threat from browser developer Netscape.

After the fight with the US government, Gates stepped down from running the company to focus on directing its technology. Microsoft's wealth and PC dominance remain intact, though Gates was unable to position the company to lead in the next phases of the personal computing and internet revolution, from web search and social networking to the rise of mobile internet access.

Unusually among his generation of technology entrepreneurs, Gates opted to quit the company he founded and start a second career, leaving Microsoft at 52 to focus on philanthropy. With its massive budget and ambition to improve life in emerging nations, the foundation could one day rival the founding of Microsoft in terms of its impact on the world.

> "GATES'S STRONG PERSONAL LEADERSHIP ENABLED MICROSOFT TO RESPOND TO NEW TECHNOLOGY THREATS"

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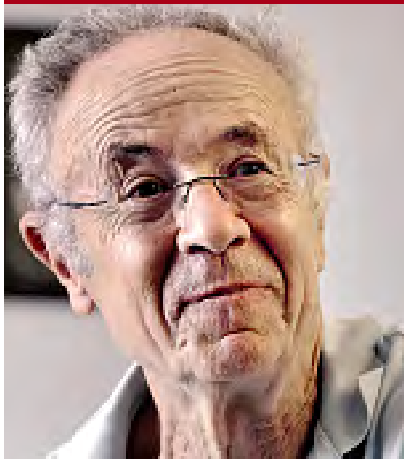
ANDY GROVE

BY SARAH MISHKIN



The title of Andy Grove's memoir says it all: *Only the Paranoid Survive*. It was a lesson the co-founder of Intel learned young. He grew up in Hungary as András Gróf, a Jewish child during the Holocaust, and spent his early years with his mother racing between hideouts in Budapest and rural Hungary to outrun the invading Nazis. He fled to the US after the Hungarian uprising of 1956.

He ultimately graduated from university, moved to California and got a job in the nascent semiconductor industry. Ultimately, he partnered with Robert Noyce and Gordon Moore, key developers of the silicon chip, to launch Intel.

Today, Intel is the world's largest semiconductor company by revenue. Its chips are used by everything from Apple computers to the servers in the massive data centres that power many of the world's most popular apps. For the average consumer in the developed world to go through a day without relying directly or indirectly on an Intel product would be difficult.

Yet Intel's growth was not always so assured, and Grove played a key role in leading the company to success. He helped see Intel through a crisis in the mid-1980s ultimately to emerge as the leading microprocessor company it is today. Japanese companies were driving prices down in memory chips, which then comprised an important part of Intel's business. Most of its research and development went into memory. Microprocessors, effectively the brains of computers, were but a small business.

Amid that turmoil, Grove pulled a daring move: leave the business of memory entirely and

PHOTOS: CHUYU/DREAMSTIME; BLOOMBERG; AFP, TED THAI, BILL PIERCE/THE LIFE PICTURE COLLECTION/GETTY IMAGES bet the house on microprocessors. It changed the identity of Intel and required the laying off of thousands of employees and closing of plants.

The lesson Grove learned about the value of being proactive — paranoid — remain applicable, perhaps even more so now as industries are being shaken up by the accelerating pace of technology. He made a presentation to the Intel board in the mid-1990s about the importance of the internet. Not everyone was convinced it was more than a fad. But Grove pressed on with his argument that the company needed to be proactive in figuring out how the world wide web would affect the business.

"In technology, whatever can be done will be done. We can't stop these changes. We can't hide from them. Instead, we must focus on getting ready for them," he wrote. "We won't harness the opportunity by simply letting things happen to us."

50 PIONEERS STEVE JOBS

BY TIM BRADSHAW

The name on the door of an office on the fourth floor of One Infinite Loop still reads "Steve Jobs". Four years after his death in October 2011, Apple has left its co-founder's room in its Silicon Valley headquarters untouched.

Since that time, Apple's share price has more than doubled thanks to ever-increasing iPhone sales, under the leadership of Jobs's successor, Tim Cook. Jobs's principles of focus, simplicity and striving for perfection still guide Apple today.

Jobs pioneered not one but three great businesses — only two of them named Apple. After ushering in the birth of the personal technology era, as chairman of Pixar he helped to turn the animation industry digital with *Toy Story*. Then he upended the music industry with the iPod before creating a far more ubiquitous kind of computing with the iPhone.

Throughout each transformation of Apple and its adjacent industries, Jobs was dynamic yet difficult. Accounts of his management style often bring up his ruthless and capricious nature. In Walter Isaacson's biography of Jobs, former Apple chief executive John Sculley describes Jobs's staring contempt as "like an X-ray boring inside your bones".

Yet that same force of personality could be used to drive his colleagues to achieve things they never believed themselves capable of.

Jobs may have taken advantage of innovations created elsewhere, such as Xerox Parc's mouse, but his genius was in bringing them together as a complete package, accessible to all. In an industry where many see technological advancement as ever-greater complexity, Jobs stood for the intuitive. "The reason that Apple is able to create products like the iPad is because we've always tried to be at the intersection of technology and the liberal arts," Jobs said as he introduced the tablet computer in 2010.

A year later, he explained: "It's in Apple's DNA that technology alone is not enough. We think we have the right architecture not just in silicon but in the organisation to build these kinds of products."

Perhaps Jobs's greatest achievement was not any single product but his ability to form an organisation that could repeat such innovations, and is not afraid to disrupt itself to move forward. "You can clearly feel him in these products and you can feel him in the company," Cook said last year. "His DNA will forever be the foundation of the company."

50 PIONEERS AKIO MORITA

BY KANA INAGAKI

The sound of progress: Sony's Walkman revolutionised the way people listened to music

Akio Morita, the co-founder of Sony, changed the face of Japan's tech industry, elevating the country's gadgetry creations into what he called "the Cadillac of electronics". Morita, together with Sony's innovations, from the Trinitron colour television to the Walkman cassette player, personified Japan's rise in the wake of the second world war. The products he helped to deliver revolutionised the way people worldwide listened to music and watched TV.

Born in 1921 as the eldest son of a wealthy sake-brewing family, Morita broke with tradition by leaving his family business in his mid-20s to set up a tiny electrical engineering firm inside a bombed-out department store building in Tokyo. The start-up, founded with his partner Masaru Ibuka in 1946, rapidly expanded to become one of the world's most iconic consumer electronics brands.

If Ibuka was the engineering genius, Morita was the energetic and charismatic salesman who travelled around the world. His business acumen was reflected in his shrewd branding strategy, which kept prices competitive during a period when Japanese goods were seen as poor-quality replicas of western products.

Sharing the same scepticism towards market research as Steve Jobs of Apple, Morita said the Walkman would not have been born from asking consumers what they wanted. In fact, very few, even inside Sony, except Morita, imagined the Walkman would be a hit. ➤

Morita, with his trademark silver hair, was also an avid and at times controversial spokesman for Japanese business, criticising what he called the US industry's preoccupation with short-term profit.

Defying convention catapulted Sony's products to international recognition, starting with the pocket-sized transistor radio in 1955, followed by the portable transistor TV in 1960 and the Trinitron colour TV in 1968. With the Walkman in 1979, Sony heralded the age of mass-market, portable music.

50 PIONEERS — NARAYANA MURTHY

BY JAMES CRABTREE

Narayana Murthy's reputation as a pioneer of Indian software seemed secure when he stepped down as chairman of Infosys. He had co-founded the business in 1981 and led as chief executive until 2011, in the process becoming perhaps the most recognisable figure in the country's fast-growing outsourcing sector.

But his crucial importance was only underscored two years later. Infosys had lost its way since his departure, its record of rapid expansion replaced by an image of rocky financial performance, and the board unexpectedly asked him to return from retirement.

An occasionally taciturn leader with an exacting eye for detail, Murthy helped Infosys during his second stint to rediscover some of the traits that helped India's information technology sector flourish, including a renewed focus on its traditional strength of providing basic services to leading global companies at prices far below those of foreign competitors.

The company's performance stabilised and morale improved. When Murthy handed over to his successor just a year later, he admitted that the group's turnround was unfinished, but most analysts agreed it was at least under way.

Beyond his role at Infosys, Murthy's career symbolises something more profound about his country's development. As an entrepreneur, he enjoyed an image for honesty and modest public pronouncements that belied his billionaire status.

"Many intelligent people possess a high ego and low patience to deal with people less capable than themselves," he wrote in his valedictory letter to shareholders in 2011. "Leaders have to manage this anomaly very carefully, counsel these errant people from time to time, and allow them to operate as long as they do not become dysfunctional."

The story of Infosys's foundation in 1981 in Pune with just $250 in start-up capital (it soon relocated to the developing information technology hub of Bangalore) became a metaphor for the possibilities of India's own growth. In a country where business remains dominated by family-run conglomerates and lumbering state-controlled enterprises, Murthy and his Infosys co-founders came to represent something different — entrepreneurs with ordinary backgrounds who created a world-leading new industry through a mixture of education, innovation and determination.

At the time of Murthy's return to Infosys, Meera Sanyal, the former head of Royal Bank of Scotland in India and a one-time Infosys client, summed up why the career of this elder statesman of Indian software had taken on such outsized significance. He "represented a middle-class aspiration to win in business, but do it in a clean way", she said. "He became like a beacon of hope, and all of us felt a sense of pride in what he accomplished."

> "HUAWEI HAS BECOME THE WORLD'S BIGGEST PROVIDER OF TELECOMS EQUIPMENT"

50 PIONEERS — REN ZHENGFEI

BY LESLIE HOOK

Ren Zhengfei, a former army engineer, recalls that his start in business was somewhat rocky. When he left the People's Liberation Army to go into business in the southern Chinese city of Shenzhen he quickly ran into problems: he knew nothing about how a market economy worked. Nor did the rest of China — the country was in the midst of a profound transition from a state-run economy to "capitalism with Chinese characteristics".

Huawei, the company Ren founded in 1987, is now one of the biggest global symbols of capitalism with Chinese characteristics. With $47bn in sales last year, Huawei has outpaced Ericsson to become the world's largest provider of telecommunications equipment.

It has not always been easy. Ren studied architecture at university — shortly before the disastrous years of the Cultural Revolution — before joining the army. He then tried his hand in communications because "we thought that the communications market was so big, filled with plenty of products". Money was tight in the early years. "We survived by paying a high personal cost," Ren, 70, said in a recent Davos talk. "There was no turning back because we had no money left. That was how we started."

As one of China's most prominent global brands, Huawei, with its rapid expansion around the world, has at times tested the limits of its welcome, particularly in the US. Huawei has repeatedly lost out on US contracts, partly because of concerns voiced by US lawmakers over Ren's past military connections.

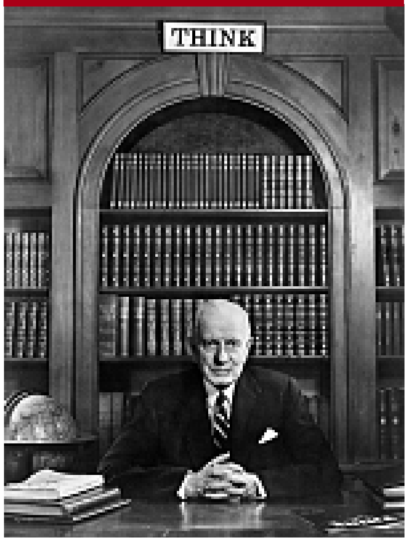
These concerns are fuelled by a legacy of secrecy: Huawei does not identify details of its shareholding structure, other than to say it is owned by 80,000 employees. Prior to 2011 it did not disclose the identity of its board members.

Huawei has enjoyed spectacular growth and expects revenues to grow 20 per cent this year to $56bn. While most of its sales come from telecoms equipment, its fastest-growing segment is in enterprise, where it provides data centre and cloud computing products.

Debate lingers over whether, and how much, Huawei has benefited from government ties. "The US government believes Huawei represents socialism," Ren said at Davos. "Some people in China believe that Huawei is a capitalist bud, simply because many of our employees hold shares. What do you think Huawei is? I can't give you a definite answer today."

50 PIONEERS — THOMAS WATSON & LOU GERSTNER

BY RICHARD WATERS



Thomas Watson Sr (above) and Lou Gerstner both came from working-class backgrounds to head a company whose progress has done much to define the first century of the information age, from punch cards to mainframe computers and the complex information technology systems on which modern corporations depend. But they could hardly have been more different.

A natural salesman who adopted the patrician style of the business establishment he rose to head, Watson sold pianos, shares and cash registers before ending up at the Computing-Tabulating-Recording Company in 1914. He quickly became president, renaming it International Business Machines a decade later to reflect its spreading range of office equipment.

In nearly four decades at the company, Watson built a culture that became synonymous with mid-century corporate America. Big Blue became known for its dark-suited salesmen and emphasis on loyalty to the company. He also helped to establish the blueprint for the modern, multi-divisional company, with a declared focus on customers, employees and shareholders, in that order.

"The clouds of doom never gathered on Watson's horizon," the New York Times noted in its obituary in 1956. The optimism, it added, had helped earn him the reputation of being "the world's greatest salesman".

IBM's success made Watson the first monopolist of the computing age to come up against US anti-trust regulators, thanks to its dominance of the tabulating machine market. A later case revolved around mainframes, though the products with which the IBM name is almost synonymous were only just being introduced on his retirement in 1952.

By the early 1990s, however, IBM was struggling, unable to compete with the wave of low-cost technology that came with the rise of personal computers. It took a very different leader to drag it back from the brink.

Gerstner had the drive and focus on operational detail to rescue IBM. He had honed his skills at Harvard Business School and McKinsey, the consultants, before taking on senior roles at American Express, the financial services company and conglomerate RJR Nabisco.

Gerstner's tough style of leadership was jarring for the IBM rank and file, but turned out to be the medicine the company needed. His focus on operational excellence and refusal to consider sweeping strategic changes at the company were summed up in one of his first public statements: "The last thing IBM needs right now is a vision."

Before Steve Jobs rebuilt Apple, Gerstner's revival of IBM stood out as the tech industry's most celebrated turnround — though a quarter of a century on, the rise of cloud computing threatens IBM's long-term position in corporate IT and raises new questions about its leadership.

Connecting people: Lou Gerstner, above, and Thomas Watson, below left; Huawei's Talkband B2 smart watch, left, and company founder Ren Zhengfei, below left; Mark Zuckerberg, below

50 PIONEERS — MARK ZUCKERBERG

BY HANNAH KUCHLER

He created the world's largest communication network, is building drones to beam down the internet to far-flung corners of the globe and has become such a figure in popular culture that he recently launched a book club to rival Oprah Winfrey's.

Mark Zuckerberg's journey from Harvard bedroom to Silicon Valley billionaire was made famous by the film adaptation, *The Social Network*. His creation, Facebook, started as a way to track classmates online and grew into a network of almost 1.4bn people. Facebook has shaped how we interact, pushing new words such as "likes" and "friend requests" into the 21st-century lexicon.

But the company's chief executive is determined for that to be just the first chapter. He has set his sights on Facebook's oft-repeated aims of "connecting everyone", "understanding the world" and "building the knowledge economy". He wants to bring every one of the world's 7.1bn people online, make Facebook into a searchable database to rival Google using the network to help people create jobs and companies, as well as increase productivity.

Zuckerberg is an evangelical founder, comfortable with telling shareholders he believes in far more than making money. When asked why his Internet.org initiative to connect more people in developing countries to the internet mattered to investors, he hit back: "It matters to the kind of investors we want to have."

Zuckerberg is just as driven in other areas of his life, including his philanthropy — he topped the list of US philanthropists making big donations in 2013 with his gift of Facebook shares worth almost $1bn to the Silicon Valley Community Foundation, which works to support Facebook's neighbours.

He takes on ambitious new year's resolutions, such as learning Chinese, which he recently showed off in China to much acclaim, and reading a book every fortnight. Being a — if not the — key proponent of the social media sharing culture, Zuckerberg invited his followers to read along, showing his soft power by causing a book by a former trade minister in Venezuela to sell out.

PHOTOS: CHUYU/DREAMSTIME; BLOOMBERG; DEEPAK G PAWAR/ THE INDIA TODAY GROUPGETTY IMAGES; REUTERS

TECHNOLOGY MAY DEFINE THE FUTURE BUT SERVICE HAS ALWAYS MARKED OUT THE LEADERS, SAYS ANDREA FELSTED

For the first mass-market retail pioneers, it was all about the shop. Jack Cohen, founder of Tesco, the supermarket chain, started with a market stall in London's East End in 1919. But it was a decade later, when he opened his first shop in Edgware, and began buying up stores in expanding London suburbs, that the growth of Tesco really took off.

It was the same for the Sainsbury family, which transformed its small dairy shop in London's Drury Lane into one of the UK's biggest grocers. Meanwhile, Sir Ken Morrison built his family's three egg-and-butter stalls in postwar Bradford into the Wm Morrison supermarket chain.

One of the most significant innovations in retail was in 1916, when Clarence Saunders opened Piggly Wiggly, which is regarded as the world's first self-service supermarket, in Memphis, Tennessee. According to Piggly Wiggly's official history, Saunders, "a dynamic and innovative man", noticed the method of clerks gathering goods for customers wasted time, so he had shoppers serve themselves.

The idea spread around the world; Sainsbury opened one of the UK's first self-service stores in Croydon in 1950.

It is no coincidence the fast-food craze, exemplified by McDonald's burger bars, was gathering pace at the same time.

Meanwhile, in France, Carrefour was pioneering the concept of the hypermarket — a giant one-stop shop that combined food and non-food goods. The first one opened in 1963, near Paris. A year earlier, Sam Walton had opened the first Walmart store in Rogers, Arkansas, followed a quarter of a century later by the first Walmart Supercenter, combining general merchandise and groceries in one shop.

Ready to go: the rise of McDonald's in the 1950s reflected the beginnings of a fast-service culture

There were other innovations along the way, such as Tesco's Clubcard loyalty card, launched in 1995, which gave the chain vast quantities of data about its customers. "Why did Tesco get that enormous advantage over the early years of the 21st century? It was because their information was better," says Andrew Seth, author of *The Grocers* and *Supermarket Wars*.

The next wave of innovation involved not stores, but shopping online, led by Jeff Bezos, who created Amazon, which started as a bookstore in 1994 before moving into hundreds of other categories.

Neil Saunders, managing director of Conlumino, the retail research group, says developments in online retail were driven by pioneers from outside the industry such as Bezos and Steve Jobs, founder of Apple, which is now a significant retailer of consumer electronic products and music. Indeed, Apple's retail business is led by Angela Ahrendts, former chief executive of Burberry, which pioneered fashion's links with technology and social media.

Social media are increasingly influential in retail. Shopping activity on Facebook may have fallen short of the excited predictions of those who dubbed it "F-commerce", but Pinterest, a digital pinboard that fuses interests and things, offers greater potential. Some retailers, including Burberry, have begun to sell through Twitter, but retail analysts say shopping via Instagram, the photo-sharing site, may be the holy grail in the blending of shopping and social media. Meanwhile, other disrupters are overlapping with retail, such as ride-hailing company Uber, which is moving into grocery deliveries in the US.

Similarly, in fashion the next wave of pioneers might come from the sphere of technology, rather than the world that gave us the likes of Coco Chanel and Miuccia Prada. Wearable technology is already fusing fashion and functionality. But Apple is set to shake up the field further with the launch of its watch.

Richard Hyman, however, an independent retail consultant, predicts the next wave of retail pioneers will be those who hark back to the early days of retail, by understanding their customers and offering them what they want. "Ultimately, you can have all the great technology you want," he says. "But if you are not able to have a relevant offering, you will fail."

Seth agrees that at the heart of the next wave of innovation will be the consumers — and how they want to shop. "Entrepreneurs have to give customers what they want. That is what Sam Walton did and what [Sir Terry] Leahy did at Tesco. They were giving customers a much better deal than anybody had given them before," he says.

PHOTOS: BLOOMBERG; AP

50 PIONEERS

JEFF BEZOS

BY SARAH MISHKIN

His rivals call him one of the most aggressive and terrifying men in the technology industry. Jeff Bezos, founder of Amazon, would probably agree. When brainstorming names for the company back in 1994, he first registered the URL "relentless.com" for the then new online bookseller.

Since then, Amazon has branched out far beyond books, reshaping the entire ecommerce and most of the publishing industry in the process. It has pushed into selling cloud computing services to other tech companies, helping to make it cheaper and easier for entrepreneurs to launch start-ups. It has also begun publishing books on its own and producing its own creative series, threatening to shake-up existing TV networks and film studios.

Bezos had his start at DE Shaw, the quantitative hedge fund notable for its early adoption of computers. He thought of the idea for Amazon while still at Shaw, but left the firm to give himself the freedom to pursue it on his own. It started with books — a straightforward product to market online, with the advantage that no physical bookstore could stock everything.

But Bezos envisioned Amazon from the outset as something much more and gradually it became that. The retailer added jewellery, clothing, music and DVDs. Eventually it pushed into digital sales, notably ebooks, the market for which Amazon all but created with its cheap Kindle reader.

That expansion has come with substantial controversy around its method of dealing with its competitors and partners. Famously, Amazon noticed a smaller start-up, Quidsi, succeeding in selling nappies online. Amazon responded by cutting its prices substantially. Quidsi, which could not sustain losses like Amazon, ultimately felt cornered, and sold out to its bigger rival.

Amazon has also locked horns with publisher Hachette over how the pricing of print and digital books. A seven-month fight ended with an agreement that Hachette could retain pricing power, but Amazon would incentivise it to keep prices low. Amazon also put pressure on the publisher by substantially delaying shipments of Hachette books or making them unavailable for sale.

Those tactics inflamed a publishing industry wary of Amazon's market dominance and willingness to force through better deals from the publishers that supply it. Amazon was unapologetic and willing to fight hard. In an open letter to Amazon customers, the company criticised Hachette on pricing — the publisher paid a fine to the US government to settle a lawsuit alleging anti-competitive behaviour with other publishers to keep prices high.

Rags to riches: Coco Chanel, below, created the 'new uniform of the modern woman'

50 PIONEERS

COCO CHANEL

BY SCHEHERAZADE DANESHKHU

Coco Chanel stamped her mark on women's dress in the 20th century by overturning fashion norms — mirroring the unorthodox nature of her own climb to fame and fortune.

The French designer recognised that women's role in society had been changed by the first world war and that the strictures of the past no longer applied. She dispensed with corsets and structured clothes in favour of clingy but comfortable jersey knit and casual, collarless two-piece suits. Her simple lines and functional styles were distilled in the little black dress, a staple in many western women's wardrobe.

The dress, with a skirt ending just above the knee, was described by French Vogue in 1926 as "Chanel's Ford" — a fashion that was, just like the American car, available to the masses and was the "new uniform of the modern woman", as the magazine described it.

But in 1926, black was still reserved for funerals, prompting Chanel's fashion rival, Paul Poiret, mockingly to enquire: "For whom, madame, do you mourn?"

Gabrielle Bonheur Chanel was born in 1883 into poverty and brought up in a convent orphanage, where she learnt to sew. As an adult, she received help from wealthy or aristocratic boyfriends to set up boutiques.

She started selling hats on Paris's Rue Cambon, where she was later to maintain a sumptuous apartment while living in style at the nearby Ritz. She used to recount that her fortune was built on a dress she had made for herself from an old jersey on a cold day in the French coastal town of Deauville. After a couple of women asked her where she had got the dress, she offered to make one for them.

Her rags to riches experience — she picked up the name Coco as a café singer around the turn of the century — may have helped liberate her from convention.

She pioneered costume jewellery and made it acceptable to mix faux with authentic jewels. Menswear provided inspiration — she was influential in establishing unisex dressing. Her relationship with the Duke of Westminster led to sporty sweaters, tweeds and tartan fashion for women.

She had already achieved success by the 1920s, but her business was hit by the 1930s depression and she shut up shop altogether during the second world war. Her relationship with a German officer left her tainted by scandal, though she made a fashion comeback in 1954 at the age of 71.

Chanel embodied her own style, epitomising chic in the way she wore her designs and in the double intertwined "C" that became her logo.

"Fashion," she said, was "not something that exists in dresses alone". Her money-spinning Chanel No 5 fragrance and the many iterations of her hugely successful quilted chain bag are testament to that.

50 PIONEERS

INGVAR KAMPRAD

BY RICHARD MILNE

Ingvar Kamprad revolutionised the world of design, bringing affordable but stylish furniture within the grasp of the masses. The founder of Ikea, the Swedish flatpack furniture maker, he commercialised Scandinavian style and built a business empire that today employs almost 150,000 people in more than 300 stores worldwide.

He developed an impressive insight into consumer behaviour, coming up with ever more ways to keep customers inside an Ikea store, from a labyrinthine layout to play areas for children He also changed the logic of the furniture business, pressing prices lower by making people assemble their own furniture, having stores out of town and reducing transport costs by flatpacking goods.

Kamprad's own story is almost a classic entrepreneur's tale. Born in 1926 in the wooded countryside of Småland,

PHOTOS: BACHRACH, ROGER VIOLLET, EVELYN STRAUS/NY DAILY NEWS ARCHIVE/GETTY IMAGES the southern Swedish region that is the country's bible belt, Kamprad started selling matches at the age of five, buying them in bulk in Stockholm and selling them individually, making a small profit on each one.

He founded Ikea — which takes its name from the initials of his name, farm and village — in 1943 and five years later added furniture to a plethora of objects sold such as jewellery, pens and stockings. In the 1950s a slew of innovations that would define Ikea swiftly followed: a catalogue in 1951, a store in 1953 and, after customers complained about how much they were charged for transporting furniture by train, the first flatpack table in 1956.

Kamprad was famed for his frugality: tales abound of him reusing teabags, taking bags of salt and pepper from restaurants or driving a decades-old car. That rubbed off on Ikea's corporate culture and its deflationary mindset for its products, with average selling prices falling year after year as small improvements are found. For instance, a Lack table that sold for SKr259 in 1990 now sells for SKr79 ($9.20).

Kamprad's life was not without controversy. A friendship with a pro-Nazi leader in Sweden led to him issuing an apology to staff entitled "the greatest mistake of my life". He also lived in tax exile for four decades.

But his success is illustrated by Ikea's continuing expansion to new countries. There are plans to open dozens of stores in India. And impressive results in China, where customers are even allowed to nap on beds in stores.

50 PIONEERS

RAY KROC

BY NEIL MUNSHI

Ray Kroc did not become a burger man until he was 52. But when he did, his conversion was absolute. The first time he set foot in a McDonald's car park in 1954, it was filled with cars, a long queue of people and a pretty woman who looked like she could have been a movie star. But "it was not her sex appeal but the obvious relish with which she devoured the hamburger that made my pulse begin to hammer with excitement", Kroc wrote in his 1977 memoir, *Grinding it Out*.

> "STRICT CONSISTENCY MEANS A BIG MAC TASTES THE SAME IN PARIS, TEXAS, AND PARIS, FRANCE"

He was hooked. He had dinner with the McDonald brothers that night to understand the system they used at their burger joint in San Bernardino, California. "Each step in producing the limited menu was stripped down to its essence and completed with a minimum of effort," he later wrote. "The burgers were all a tenth of a pound, all fried the same way, for 15 cents. You got a slice of cheese on it for four cents more. Soft drinks were 10 cents, 16oz milk shakes were 20 cents, and coffee was a nickel."

The US was then full of one-off, small-town soda fountains and burger joints. But that night Kroc had visions of "McDonald's restaurants dotting crossroads all over the country". The next day he flew back to Chicago with a contract to begin opening new franchises. Within nine years there were 500 US outlets. In 1967, the first international restaurants opened. Today the 36,000-plus McDonald's in more than 100 countries are — if not the paragon of high quality that Kroc envisioned — a global cultural force.

In recent years the chain has been threatened by upstarts such as Chipotle and consumer tastes that have swung away from greasy burgers and fries. It has become the posterchild for both the obesity epidemic and the fight for a higher minimum wage. But some 69m people still eat at McDonald's every day.

One of the main reasons is the consistency that Kroc first fell in love with at the original McDonald's, and which he and his protégé, Fred Turner, codified in the company's operating manual in 1958. French fries can be no thicker than 0.28 inches, A Quarter Pounder with Cheese has two pickles, while a regular burger has one. This is why a Big Mac in Paris, Texas, tastes the same as one in Paris, France. It is the reason a piano-playing paper-cup salesman became perhaps the world's most influential — if sometimes reviled — restaurateur.

50 PIONEERS

ESTEE LAUDER

BY SCHEHERAZADE DANESHKHU

"I didn't get here by dreaming or thinking about it. I got here by doing it," wrote Estée Lauder in the autobiography that relates how she transformed beauty into big business.

Her success derived from hard work and persistence to the point of pushiness. Ambition defined her, according to her son Leonard Lauder, and, as she once explained, she never worked a day in her life without selling.

Lauder died 11 years ago, but the cosmetics empire she launched 58 years earlier saw off competition from the other big names in beauty — Elizabeth Arden, Helena Rubenstein and Charles Revson's Revlon.

While these businesses either fell into financial disarray or were taken over, Estée Lauder has thrived with annual sales of $11bn and remains under family control despite a stock market listing in 1995 that values the company at $31bn.

Josephine Esther Mentzer was born in Queens, New York, to Jewish immigrants from Hungary and Czechoslovakia. She was embarrassed by her modest origins, changing her name to Estée to sound French and periodically inventing a wealthy background more suited to the high society to which she aspired and succeeded in penetrating.

She was fascinated by her chemist uncle's home-concocted skincare creams and she helped market them to local pharmacies, proving herself to be a good saleswoman. "To sell a cream, you sold a dream in the early days," she said. Her company was later to devise other innovative marketing ploys that became industry norms, such as giving free samples with purchases.

After setting up the Estée Lauder brand in 1946 with her husband Joseph Lauter, a textile salesman who smoothed out his name, she decided to sell her own creams, cooked up on a stove at home, to upmarket department stores, as she could not afford a flagship shop.

Her breakthrough came when Saks Fifth Avenue placed an order that sold well and her company started growing. Sales accelerated with the launch in 1953 of Youth Dew, a highly scented bath oil and perfume that was a big hit and lived up to the Estée Lauder maxim: "If you can't smell it, you can't sell it."

50 PIONEERS

MIUCCIA PRADA

BY RACHEL SANDERSON

At 65, Miuccia Prada remains arguably the world's most influential living fashion designer. She wrestles into her runway shows season after season a panopoly of ideas and influences that — love them or loathe them — set the bar for the industry and have made her a billionaire many times over.

Prada's "creative combustion" — in the words of one rival luxury senior executive — has given rise to trends that have had a global impact, including the industrial canvas black knapsack, wallpaper-motif pleated skirts, tie-dyed dresses and thick high-heeled wedge shoes, to name a few.

She was named one of the 100 most powerful women in the world last year by Forbes, which puts her personal fortune currently at $4.7bn.

Prada has an unusual background for a fashion designer. She has a PhD in political science, spent five years training as a mime artist and was a fierce feminist in the 1970s, even photographed at anti-establishment marches in Italy. She created her eponymous brand out of her grandfather's luggage store in Milan's Galleria Vittorio Emanuele II shopping centre. The store is now the flagship for the group worldwide.

"PRADA CREDITS HER FAMOUSLY FIERY RAPPORT WITH BERTELLI FOR DRIVING HER FORWARD"

Together with her husband Patrizio Bertelli — whom she first met at a trade fair in Milan in 1977 — Prada has built Prada Group into a global luxury juggernaut encompassing the Prada, Miu Miu, Church's and Car Shoe brands, €3.6bn sales in 2014 and 594 directly owned stores worldwide.

Prada and Bertelli took the company public in Hong Kong in 2011 where the shares have had a volatile ride in the past two years, being hit by falling demand in China.

Prada, who credits her famously fiery rapport with Bertelli for driving her forward, opened her first New York store in 1986 selling handbags and smart luggage. Two years later, she started designing women's wear and five years later moved into menswear.

Her influence on global trends and ability to produce new ideas season after season has conferred on Prada the status of being more an artist than a fashion designer. An avid contemporary art collector, she nevertheless told New York magazine in 2012: "Art is for expressing ideas and for expressing a vision. My job is to sell. And I like very much my job."

50 PIONEERS

ANITA RODDICK

BY SCHEHERAZADE DANESHKHU

Dame Anita Roddick was the public face of The Body Shop, the UK's best-known natural cosmetics chain, set up in 1976 to sell peppermint foot lotion, hemp hand butter and papaya body scrub. The products and their presentation in plain plastic bottles were innovative in their own right and, eight years after her death, she is still the country's best-known female entrepreneur.

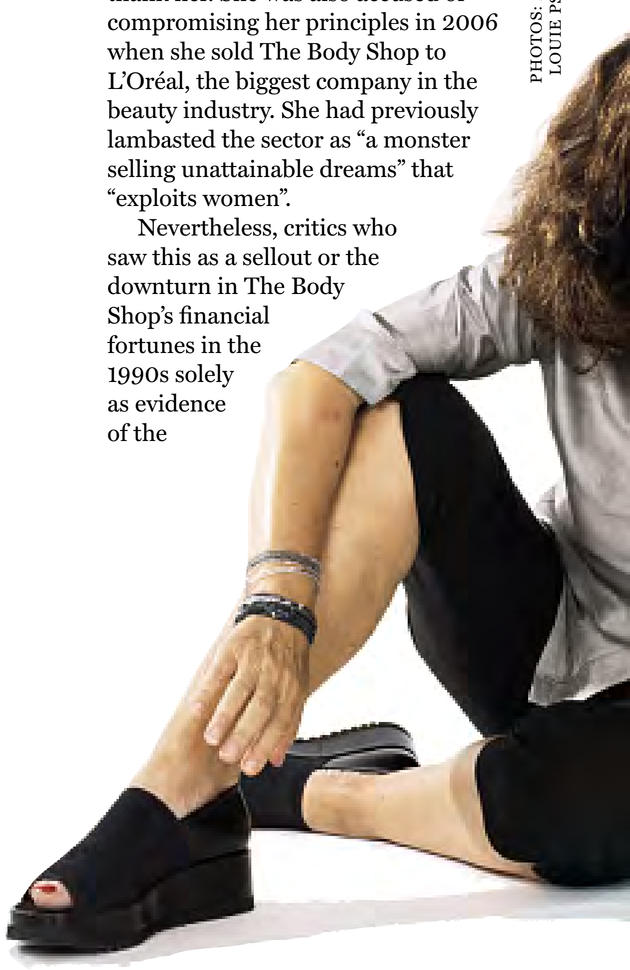
Where she was ahead of her time was in tenaciously pioneering a form of corporate social responsibility well before the term became the fashion in annual reports.

Labelled the "Queen of Green", she viewed commerce as an agent of social change and anger as a more useful business qualification than an MBA.

To that extent she was an activist, espousing environmental sustainability, fair trade, human rights, local farming and an end to animal testing in cosmetics — becoming a multi-millionaire along the way.

Shareholders who lost money during The Body Shop's badly executed US expansion did not thank her. She was also accused of compromising her principles in 2006 when she sold The Body Shop to L'Oréal, the biggest company in the beauty industry. She had previously lambasted the sector as "a monster selling unattainable dreams" that "exploits women".

Nevertheless, critics who saw this as a sellout or the downturn in The Body Shop's financial fortunes in the 1990s solely as evidence of the



PHOTOS: AFP, GEMMA LEVINE/GETTY IMAGES; LOUIE PSIHOYOS/CORBIS; BLOOMBERG incompatibility of running a business with social activism, miss the point.

In the three decades between the establishment of the first Body Shop in Brighton in 1976 and its sale to L'Oréal, ethical consumption moved from the hippy fringes to the mainstream, in part due to Roddick's disruptive force.

The daughter of Italian immigrants, she opened the first Body Shop with a £4,000 loan. She understood the importance in marketing of telling a story, and customers liked the idea of environmentally friendly cosmetics with a narrative in tribal origins, the stance on animal testing and reducing waste through refillable bottles.

Roddick's entrepreneurial flair was not in question, but she was the first to admit the business acumen came from her husband, Gordon Roddick. Using a franchise model, a new shop opened every two and a half days, sales and profits grew by more than 50 per cent a year and the group floated in 1984, despite her distaste for the City and admission that "finance bores the pants off me".

Though the relationship with the stock market started well enough, it ended unhappily in the face of competition from new entrants and a failed US adventure. In 1998, Roddick quit as chief executive, becoming co-chair with her husband instead.

The Body Shop today has 2,600 outlets in 65 countries. Her own view of the sale to L'Oréal was that: "Enemies are now our staunchest supporter. I have spent my life trying to change the beauty industry from the outside. Now I can change it from within."

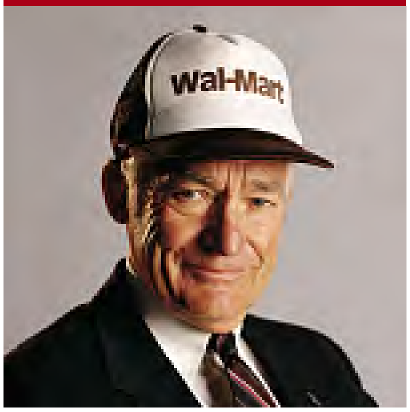
She did not get the chance to demonstrate this, however — she died a year later at the age of 64.

Multiple choice: Prada's canvas black knapsack, opposite top; Anita Roddick, below left; a branch of Walmart-owned Asda in the UK, above

50 PIONEERS

SAM WALTON

BY BARNEY JOPSON



Sam Walton did not invent penny-pinching. But what helped Walmart to become the world's biggest retailer by sales was the way he embedded his skinflint instincts so emphatically throughout the business he founded.

Keeping costs down enabled Walmart to keep prices low — and it is the retailer's simple ability to undercut its competitors that drove its growth from the first store in Rogers, Arkansas, in 1962 to more than 11,000 in 27 countries today.

Walton was born in Oklahoma in 1918, and the poverty of backwoods America in the mid-20th century helps explain Walton's ruthless focus on low prices and logistical efficiency. But he was also canny enough to build a folksy corporate culture to mask some of the hard-headedness.

Even today, 23 years after Walton's death, Walmart continues to nurture the evangelical cult of "Mr Sam", a figure whose earthy values and down-home charms the company tries to inculcate into employees with varying degrees of success.

> EVEN TODAY WALMART TRIES TO INCULCATE THE EARTHY VALUES OF MR SAM INTO EMPLOYEES

It was a remarkable achievement for Walmart to conquer most of America with its giant Supercenters while operating from an isolated home base of Bentonville, Arkansas, which was far from anyone's idea of a commercial hub.

Perhaps the greatest testament to Walton's business tenets is that the company that now poses the gravest threat to Walmart — online retailer Amazon — has gone a long way towards mimicking the older retailer.

Jeff Bezos, Amazon's founder, has built his business on ultra-low prices and squeezing costs out through efficiencies (plus technology), and an early Amazonian says managers once read Walton's biography at a corporate book club.

There is a darker side to the ethos Walton inculcated. Walmart is reviled by a not insignificant portion of generally better-off Americans who do not like its reputation for bullying suppliers, steamrollering mom-and-pop stores and paying stingy wages.

To address the last of these criticisms, Walmart this year announced it would give 500,000 workers a rise to ensure all of its 1.4m workers are paid at least $9 an hour.

Walton also nurtured a certain cowboy bravado that dictated "get it done today, we don't care how". But foreign markets are proving to be a particularly stern test for the company. Even if many consumers in Brazil, China and elsewhere also want the lowest prices, Walmart has learnt that it cannot just copy and paste its US model.

ENERGY

RADICAL INNOVATIONS HAVE BEEN SCARCE IN THIS SECTOR, FINDS ED CROOKS

It is no coincidence that the two energy pioneers featured here both began their careers in the 19th century. The industry changes only slowly. The industrial revolution that began in the 18th century was fuelled by coal, which still supplies 30 per cent of the world's energy today. The latest genuinely new energy source, nuclear power, was first deployed commercially in the 1950s.

That is not to say that innovation in energy is impossible. The industry has provided the technological advance that has arguably had a greater global impact than any other in the past decade: the commercial extraction of shale oil and gas.

Energy companies continue to make remarkable progress, for example in the relentless decline in the costs of solar and wind power, but truly radical innovations have been scarce.

To be a pioneer in the energy business, you need to tackle the problem of scale. Larger plants are generally more efficient, and the gap between successful experiments and success on a commercial scale can be vast.

As Alex Trembath, senior analyst at the Breakthrough Institute, an environmental think-tank, puts it: "It is hard to make the transition to a new energy economy in a laboratory. You need to make your discoveries work in the marketplace."

Up-front capital requirements can be huge and energy technologies generally fit together in systems. Any innovation must either work within an existing system, or replace it entirely. The classic example is electric vehicles. Crude oil is converted into personal mobility through a complex system of extraction and refining, fuel distribution and retail, and the manufacture and servicing of vehicles with internal combustion engines. To change that model, you need not only a new type of car, but a network of charging stations.

Would-be pioneers face the challenge of effective existing technology. Fossil fuels continue to dominate the world's energy system because they are convenient to handle, store and use. Were it not for their adverse consequences in terms of pollution, the world would probably not be looking for alternatives.

There is also the question of safety. If entrepreneurship is all about risk taking, the energy industry is all about risk avoidance. As they manage combustible and volatile hydrocarbons, high voltages and toxic or radioactive materials, energy companies can cause catastrophic accidents if they are not absolutely rigorous about safety.

Reliability is another critical issue. People need their cars to start in the morning and their lights to come on when they flick a switch, and they will swiftly reject any innovation that cannot guarantee those services.

As Daniel Yergin, energy historian and vice-chairman of IHS, the research company, puts it: "You don't just try something."

It is significant that the greatest energy pioneer of the 21st century so far worked within all these constraints. George Mitchell, the father of the US shale revolution, searched for years for ways to extract gas from rocks where it did not flow at commercially viable rates. Although the challenges involved in extracting shale gas defeated many others, he found his first success in the early 2000s.

Mitchell, who died in 2013, was smart in not trying to overcome any of the fundamental problems of innovation in energy. He was working to produce a fossil fuel that would fit into an existing infrastructure. His team did "just try something": using a mixture of water, sand and chemicals pumped into a well at high pressure to crack the rock and release the gas. Hydraulic fracturing, or fracking, made the shale revolution possible.

Mitchell did not stick around to build the business, but sold to Devon Energy, an Oklahoma-based rival, for $3.5bn including debt in 2001.

From a shareholder's perspective he might have sold too soon, given that the US shale industry is now making billions of dollars in revenue every month. Controlling as much of the shale business as John D Rockefeller did of the US oil industry in the 19th century would put your fortune into the hundreds of billions.

However, Devon made critical additional progress with the technology, including the use of horizontal drilling. It seems clear that if Mitchell had not sold, the growth of the US shale industry would not have been as rapid as it was.

50 PIONEERS

THOMAS EDISON

BY ED CROOKS

In popular memory, Thomas Edison is known as a great inventor, the creator of electric light, the phonograph and moving pictures.

As a business pioneer, however, his significance lies in structures and processes, not products. His greatest contribution was not so much what he did as the way he did it.

All of Edison's best-known inventions, including the incandescent electric light bulb, benefited from the discoveries of others who came before and after him. Often similar ideas were being worked on by many different people around the world.

What was unique about Edison was his ability to develop, adapt and commercialise ideas and protect them with patents, and his vision of an organisation dedicated to taking scientific advances and turning them into viable products.

Edison's laboratory at Menlo Park, New Jersey, was the first real research and development facility in a form that we would recognise today.

His Pearl Street power plant in New York, opened in 1882, was not the world's first, but it was the first to have a workable business model.

"Edison understood how no one else did that he needed to develop an entire electricity system to make electric light practical," says Paul Israel, a biographer of the inventor and the director of the vast archive of his papers at Rutgers University, New Jersey.

"What he did was commercial strategy. That is a really crucial thing, and it is much harder than what was going on in the lab."

Edison had his first real successes improving telegraph equipment, and opened Menlo Park in 1876. The breakthrough that made him famous was primitive sound recording with the phonograph in 1877, and his first light bulbs went on sale in 1880. It was an extraordinary rate of progress.

In the years that followed, Edison's knack for success deserted him. He mistakenly backed direct current against the alternating current systems being developed by his competitors, including George Westinghouse and Nikola Tesla.

In 1892, JP Morgan, Edison's leading backer, arranged the merger of the Edison General Electric Company with rival Thomson-Houston to form General Electric, and Edison became marginalised. He sold his stake in GE and walked away to pursue other inventions, with uneven results.

"He was very good as an innovator and an R&D entrepreneur," Israel says. "He was not so good as the industry matured and the market changed."

Nevertheless, he deserves his reputation as a business pioneer, above all for his innovation of the practice of innovation itself.

> "EDISON UNDERSTOOD THAT HE NEEDED TO DEVELOP AN ENTIRE ELECTRICITY SYSTEM TO MAKE ELECTRIC LIGHT PRACTICAL"

PHOTOS: BLOOMBERG; NATHAN LAZARNICK/GEORGE EASTMAN HOUSE, HULTON ARCHIVE/GETTY IMAGES

50 PIONEERS

JOHN D ROCKEFELLER

BY ED CROOKS

The most glamorous figures in the oil business have always been the wildcatters: the explorers who venture into territories and drill wells without knowing what they are going to find, triumph or disaster hanging on their skill and luck.

However, one of the most successful oil men in history took a different route. John D Rockefeller looked down on the wildcatters, and left nothing to luck if he could help it. His fortune — the largest the US has ever seen, relative to the size of its economy — was built through the unglamorous virtues of consistency, discipline and organisation, and by a strategy of suppression of competition.

In the years after the first production of crude from a well in western Pennsylvania in 1859, oil was a chaotic, ramshackle business. Daniel Yergin, vice-chairman of IHS, the research company, and a historian of energy, says that although Rockefeller saw the vast potential, he was also instinctively suspicious of the industry.

"It was a very anarchic industry, and he really disliked disorder," Yergin says.

"It went from boom to bust; prices were going up and down; fortunes were made and lost. He fashioned out of that a modern refining industry."

Like a handful of other great industrial pioneers, he created not just a product or a company, but a way to make a business work.

Rockefeller began his career as a bookkeeper with a trading company in Cleveland, and later in life would extol the virtues of his training in accounts. He branched out first with his own trading company, and then, in the 1860s, into oil refining, followed by the formation of Standard Oil in 1870.

The "standard" referred to the product, kerosene used for lamps, which performed better and was safer if it had a consistent quality. It also described the company, which was run as a rigorous, methodical organisation.

Standard Oil quickly became the dominant force in its field. Yergin describes in his book *The Prize* how Rockefeller led a series of deals to buy up rival refiners, sometimes competing aggressively against them to persuade them to sell. He was helped by good relations with the railways that transported the oil.

The group he created, organised not as a single company but as a network owned by a trust, controlled about 90 per cent of US refining capacity. That level of market power attracted political attacks, and in 1911 Standard Oil was forced to break up.

Its successors include ExxonMobil, Chevron and ConocoPhillips, the largest American oil companies, and the US operations of BP. Their industry-leading positions today, 145 years after Standard was founded, are testimony to Rockefeller's genius and enduring influence.

MEDIA & SPORT

ADAPTING TO NEW TECHNOLOGY AND ANTICIPATING AUDIENCES HAVE BEEN THE KEYS TO SUCCESS, SAYS **MATTHEW GARRAHAN**

Fairytale fortunes: Lily James in Disney's 2015 adaptation of *Cinderella*

From the first printed books to newspapers, radio, film, television and the internet, media have always been fuelled by technology. The pioneers of this rapidly evolving industry all succeeded in harnessing technology for their own benefit but are also united by drive, passion, aggression and a willingness to take risks.

The common thread that links the media pioneers is their ability to transcend the industries they started in, often using them as a springboard for additional, even greater, success.

To become a groundbreaker and a power in media is to know how to market, sell, promote and create. It entails being ahead of consumers and audiences, and anticipating what will interest or entertain them.

Consider Walt Disney. He was an accomplished illustrator and artist who grew up at a time of great change in motion pictures. The silent era gave to way to the "talkies"; black and white became colour. Animation, thanks to Disney, became an entertaining and highly profitable form of storytelling.

Disney did not rest on his laurels. Television had become a mass-market medium and he embraced it enthusiastically. He also extended further into physical media, building the first modern theme park — Disneyland, in California — creating a template the company continues to employ. Its characters and stories fuel interest in its parks and consumer products, and vice versa.

While Disney was creating a new, cinematic art form, a continent away another media pioneer was inheriting his father's newspaper publishing group — and plotting how to push it on to the global stage. Rupert Murdoch was raised in Australia surrounded by news — his father was a war correspondent who became a newspaper publisher.

After the younger Murdoch inherited the company in 1952 he bought papers in the UK and US but, like Disney, recognised that owning other media could turbocharge his company. In the 1980s he acquired a Hollywood movie studio and launched the fourth US broadcast network; in 1990 he brought pay TV to the UK with the Sky satellite service, using the acquisition of exclusive rights to Premier League football to turn the business into a television force.

Today, Murdoch's strategy has been adopted by every big media company. In an era of fragmenting audiences, exclusive sports rights continue to bring in advertisers and viewers. Murdoch, like Disney, took his cues from those around him, such as Ted Turner, who created CNN, the first rolling news network, but created an approach that was unique. For example, CNN ushered commercial TV news into a new era with its coverage of the first Gulf war, while Sky News in the UK borrowed heavily from CNN's style but has carved its own path.

With Murdoch owning newspapers in multiple countries, they became a global industry, a byword for political and financial clout. Murdoch's papers, in particular, helped to shape, as well as reflect, popular opinion. For example, The Sun tabloid in the UK famously declared on its front page in 1992, after the Labour party had lost to the Conservatives in a general election, that it was "The Sun Wot Won It".

Others have sought to turn financial clout into the political variety. Michael Bloomberg built the world's largest privately owned provider of news and financial information, using his riches to launch a political career: he served three terms as mayor of New York.

He realised early on that the traders, analysts and investors that used his company's data terminals were also interested in news, so he built a vast global news operation to produce coverage for his network. His political days are behind him, and today he is in the midst of restructuring his news operation with the aim of building a global player that has influence well beyond the reach of his financial terminals. Television will be a central part of Bloomberg's new news strategy: despite a fragmenting audience lured away by other forms of entertainment, the medium remains a potent force.

That potency was harnessed by former used-car salesman and Formula One motor racing team owner Bernie Ecclestone to promote F1 from a minority interest to a sport watched by millions, his deals with TV companies also cementing the synergy between the media and sport.

Meanwhile, in front of the camera, no individual has done more to harness that power than Oprah Winfrey, who used the platform of a daytime chat show to create an empire. She was able to anticipate what audiences wanted at an early stage.

As technology continues to wreak havoc on the distribution of news and entertainment, the next generation of media and sport pioneers will need to be similarly adaptable.

PHOTOS: DISNEY ENTERPRISES; ARTHUR SCHATZ/THE LIFE PICTURE COLLECTION/GETTY IMAGES

50 PIONEERS

BILL BERNBACH

BY MATTHEW GARRAHAN

William Bernbach was a creative visionary who tore up the advertising rule book with campaigns that relayed powerful, persuasive messages to consumers with simplicity, humour and efficiency.

One of advertising's original "Mad Men", he relished defying convention and had little time for the data-driven, quantitative approach to advertising the marketing industry had started to embrace in the 1940s and 1950s. "Advertising is fundamentally persuasion and persuasion happens to be not a science, but an art," he once wrote.

He was the most skilled practitioner of this art form. His 1959 "Think Small" campaign for the Volkswagen Beetle was typical Bernbach, bucking the trend at the time by presenting only a limited amount of information about the vehicle and stressing its uniqueness and qualities throughout. The series of black and white print ads made such an impact that in 1999 Advertising Age magazine named it the best campaign ever produced.

His impact was felt far and wide, not just in New York, the home of US advertising, but in the UK too, where his creativity-first approach was later embraced by pioneering companies such as Saatchi & Saatchi.

The Bronx-born Bernbach employed intelligent, original copywriters. He was among the first in the industry to pair a copywriter with an art director, creating two-man teams — a model that quickly became the industry norm. He prized humour and clarity and consistently sought to forge an emotional connection with consumers.

He was born in 1911 and graduated from New York University in 1932. A brief stint at a distiller followed — there he had his first professional experience of marketing, landing a ➤

job in the advertising department.

After serving in the second world war and then working at a couple of agencies, he struck out on his own, starting a new business with peers Ned Doyle and Maxell Dane. DDB opened for business in 1949.

Advertising — and society — were in a period of intense flux after the war, but Bernbach succeeded in cutting through the clutter. He was passionate about the power of the communications industries and only took on clients whose products he respected.

Advertising had a social responsibility, he once wrote. "We must practise our skills on behalf of society," he said. "We must not just believe in what we sell. We must sell what we believe in."

He stepped aside as DDB chief executive in 1976, having changed advertising for ever.

50 PIONEERS
MICHAEL BLOOMBERG
BY MATTHEW GARRAHAN

A corner of Bloomberg's vast Manhattan headquarters on Lexington Avenue is devoted to the history of the company, founded in 1981 by Michael Bloomberg.

Its first terminals are housed in several adjoining glass cabinets, showing the evolution of the technology and the sharp growth in subscriptions that made Bloomberg a global powerhouse in news and financial information, and its founder one of the world's richest men.

The 73-year-old, three-time New York City mayor made his money by appreciating and utilising the power of real-time data, which his company delivers to subscribers all over the world.

> "MICHAEL BLOOMBERG HAS RESISTED THE PUBLIC MARKETS TO AMASS A $35BN FORTUNE"

In 1990 he launched a news service for Bloomberg's subscribers, hiring the Wall Street Journal's Matthew Winkler as its first editor. Bloomberg's reasoning was that the more informed clients were about current events and the more real-time data they had at their disposal, the better investment decisions they could make.

Both bets paid off. Bloomberg's terminals are a fixture on every trading floor, while its founder has kept complete control of his company, resisting the lure of the public markets and amassing a personal fortune Forbes estimates at $35bn.

He had to work for his success. Born in Medford, Massachusetts, he took out loans to pay for his education at Johns Hopkins University and even worked as a car park attendant.

In 2001 he successfully ran for mayor of New York, satisfied his company could manage without him. He passed several pieces of landmark legislation, including a ban on smoking in public places, that was gradually adopted by other countries and cities around the world.

He used the platform of mayor to make a strong case for strict new regulations to curb gun violence, becoming one of the most vocal opponents of the National Rifle Association, the powerful US lobby group that has succeeded in resisting attempts to reform gun ownership laws.

After his third term as mayor he returned to his company with the aim of making it a more influential player in news. Bloomberg had, in his absence, acquired Business Week magazine and revamped the title. More recently, Bloomberg has pooled its news output into a single website, integrated it with its video and radio services and hired John Mickelthwait, editor of The Economist, to replace Winkler as editor in chief.

The jury is still out on whether this news revamp will succeed. Whatever the outcome, though, Bloomberg has laid out a challenge to media rivals.

50 PIONEERS
WALT & ROY DISNEY
BY MATTHEW GARRAHAN

Walt Disney was raised with an appreciation for the value of money and hard work. When he was 10 his family fell into financial difficulties and was forced to sell its farm. After moving to Kansas City the young Disney would rise at 3.30am to help his father deliver newspapers.

Out of this childhood emerged a preternaturally talented artist and entrepreneur who invented animated cinema and redefined the modern media landscape by creating films and television programmes for children and their families. With his elder brother Roy (left) managing the financial operations of the company they started, the duo changed the face of Hollywood.

After the bankruptcy of Laugh-o-Gram, an early company he had started, Walt moved to California. Roy was already there, and the two set up a mini-studio in their uncle's garage.

Walt loved stories and when he and Roy built Disneyland in 1955 he modelled its Main

> FOR ECCLESTONE, THE SOLE PURPOSE OF ATTENDING A GRAND PRIX IS TO DO BUSINESS

Street USA thoroughfare on an idealised turn-of-the-century version of Marceline, the Missouri town where they spent most of their youth. Walt was unashamedly sentimental and, in his films at least, completely lacking in cynicism.

He also embraced technology, creating a "multiplane" camera for *Snow White and the Seven Dwarves* — the first feature produced entirely by hand-drawn animation — that placed several layers of artwork under a vertical camera to create the impression of depth and movement.

He realised he had to craft gripping stories to make his work stand out, so he separated the storyboard and animation functions at his fledgling company to create the most engaging tales. He also recognised he needed to keep growing and investing, so he ploughed the profits from *Snow White* into a site in Burbank, California, where he built America's first large-scale animation studio.

Critical and commercial success came in abundance in the years that followed. Walt was an early proponent of television marketing, using his weekly television programme on the ABC network — which, years later, became part of the Disney empire — to promote his theme park and animated work.

Many companies in Hollywood and beyond have sought to emulate Disney over the years. And many would dearly love to get their hands on the Disney brand, which continues to rank among the world's most respected.

Telling tales: Walt Disney, left, realised he had to craft gripping stories to make his work stand out

PHOTOS: PASCAL PERICH; UNDERWOOD ARCHIVES, HULTON ARCHIVE, AFP/GETTY IMAGES

50 PIONEERS

BERNIE ECCLESTONE

BY ROGER BLITZ

There are plenty of reasons to be sniffy about Bernie Ecclestone, even appalled. The man who has run the Formula One car racing circus since the 1970s has praised Adolf Hitler, admired Vladimir Putin, disparaged women and spent years fighting off corruption allegations.

And yet, to look at F1 today you might assume it had long been destined to be a global sport, with its heady mixture of noise, danger, millionaire drivers and their entourages and celebrities swarming around the paddock. Far from it. Ecclestone battled political infighting among teams and the sport's governing body, overcame a sceptical sponsorship industry, cajoled governments to build grand prix circuits and turned an amateur pastime into a formidable, money-making business.

He has done it through an obsessive interest in work and making money, ever since his wartime days turning a profit from his schoolmates by selling them stale cakes from the local baker.

Ecclestone sold secondhand cars in London, raced them and bought a racing team. F1 in the 1970s was still largely a collection of European enthusiasts. While they argued about petty disputes, he saw the bigger picture of television rights, sponsorship, international growth and an unending diet of drama and controversy to sustain interest. He also took risks when the foundations of the empire looked precarious, underwriting the travel costs of teams in the early days of his reign.

There were many who crossed him along the way, but he shrewdly allied himself to Max Mosley, then president of the Fédération Internationale de l'Automobile, motorsport's governing body, to outmanoeuvre his enemies.

His tactics belong to an era when business was conducted on a nod and a wink. Even to this day, he talks about the "Ecclestone handshake" as preferable to signing contracts with new race promoters.

He also eschews the sport's trappings of glory. For him, the sole purpose of attending a grand prix is to do business — he rarely stays for the race itself.

At the age of 84, he is still going strong. Many have predicted his demise — some have even tried to engineer it. Yet he remains in charge of the sport he largely created. That may not necessarily be in F1's interest, but the real sign of his legacy is that F1 cannot envisage life without him.

50 PIONEERS

RUPERT MURDOCH

BY MATTHEW GARRAHAN

Much can change in four years. In 2011, as the phone-hacking scandal was blowing up, Rupert Murdoch was in trouble — a media mogul humbled, as he told a parliamentary committee, by explosive allegations of wrongdoing at his UK tabloid newspapers.

The scandal that led to him closing his News of the World Sunday tabloid was a low point in a career that has spanned more than half a century. But in the years since then, Murdoch's swagger has returned.

The 2013 separation of News Corp into two companies — one housing his print and publishing assets, the other an entertainment group consisting of his US television network, cable channels and movie studio — was a bold move. The two companies are now worth substantially more than their former, combined incarnation, and investors have responded positively to being given the choice between high-growth television and filmed entertainment or lower-growth newspapers.

If there was any doubting Murdoch's return to form it was dispelled last summer when 21st Century Fox, his entertainment group, mounted an audacious $71bn offer for media group Time Warner. The bid campaign was short-lived — Fox eventually abandoned its proposal in the face of a hostile reception from Time Warner's management — but it showed Murdoch had not lost his appetite for risk or excitement.

It is a trait that has characterised his career. After inheriting his father's Australian newspapers in 1952 he began assembling the world's biggest newspaper publisher, buying The Sun, Times and Sunday Times in the UK and the New York Post and, eventually, the Wall Street Journal in the US. In the process he established himself as a potent political force — a kingmaker to governments and prime ministers.

There have been many pivotal moments along the way. The launch of Sky Television in 1989 created the UK's dominant satellite player, while the recent consolidation of Sky Deutschland and Sky Italia has spawned a pan-European pay-TV operation.

No one gave him much hope of unseating CNN when he launched the Fox News TV channel in 1996, but it eclipsed the Time Warner-owned operation a decade ago, its fiery blend of opinion and news resonating with the political heartland of America.

Murdoch relishes taking on the establishment, whether it is the UK political class, which sniffed at the upstart Australian when he first came to Europe, or the US media, which has had to get used to a much more competitive landscape since he first came to America.

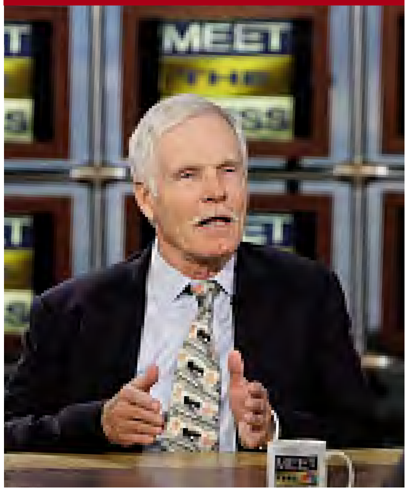
He is not the young man he once was, but at 84, Murdoch remains energetic as well as intent on proving the doubters wrong.

The show goes on: Rupert Murdoch's Sky News Arabia, below, launched in 2012. Opposite: Oprah Winfrey

50 PIONEERS

TED TURNER

BY RAVI MATTU



Ted Turner was a disrupter long before the term became a buzzword for entrepreneurs. He founded Cable News Network (CNN), the world's first 24-hour all-news television channel and his most famous business, on June 1 1980. But the story of his media empire began almost 20 years earlier and was built on two key insights.

The first came when he bought his first TV station, a local channel in Atlanta, in 1970 and set out to create a national network. Following the lead of Home Box Office, a cable station that charged a monthly subscription fee, he realised he could use a satellite network rather than TV towers to beam content across

> “FIDEL CASTRO ENCOURAGED TED TURNER TO PUSH CNN OUT INTERNATIONALLY”

PHOTOS: AFP/GETTY IMAGES; REUTERS

the country, thus bypassing the traditional broadcasting industry.

Once he had established the network, he needed some content to fill it. This led to the second observation. Cable was starved of programming but Turner realised sports would lure viewers and advertisers. In 1976, he bought the Atlanta Braves baseball team for $10m for that purpose.

By the end of the decade, Turner was rich and successful. Yet he also was becoming increasingly politically engaged, which was the backdrop to his decision to launch CNN.

The network focused mostly on domestic news in its early years, but after Turner accepted an invitation from Fidel Castro to visit Cuba, this began to change. The Cuban leader, who watched the station beamed from Florida, encouraged the American to push it out internationally. In 1982, the station started broadcasting in Asia and, three years later, in Europe.

The network's seminal moment came during the first Gulf war in August 1990. CNN broadcast from Baghdad during the conflict 24 hours a day, when many other networks had quit the city. Again, a smart investment in technology was also key. The network acquired portable satellite systems that would allow it to broadcast even when Iraq's telecommunications systems were destroyed by western bombing. CNN — and Turner — won acclaim.

Turner is no longer involved in the business. Turner Broadcasting merged with Time Warner in 1996, and in 2000 the group was acquired by AOL, the internet company. CNN's founder was not part of the new management's plans.

Still, even outside the corporate world, he was ahead of his peers. In 1997, years before other billionaires such as Bill Gates pledged to donate much of their wealth and time to charitable causes, Turner said he would give $1bn to the UN.

In philanthropy, as well as business, then, Turner was a pioneer.

50 PIONEERS

OPRAH WINFREY

BY ANDREW EDGECLIFFE-JOHNSON

It is almost 30 years since the press first identified Oprah Winfrey as a pioneer. In 1986, the Washington Post labelled her a standard bearer for "the new black woman", who was "moving into an American economic and social mainstream few blacks had experienced previously, helping to widen and redefine women's roles in the nation and bury some of the myths and stereotypes of race and gender".

That year, the young woman from rural Kosciusko, Mississippi, graduated from her Chicago network to host a nationally syndicated television show. She soon built it into the biggest talk show on US TV.

Not being white, male, skinny or from one of America's coastal media hubs, she became an aspirational symbol for previously neglected audiences that continued to identify with her even as she began to amass what Forbes estimates is a $3bn fortune.

Those audiences have followed her from daytime television to a radio station, a magazine joint venture with Hearst, films, websites, apps and — after *The Oprah Winfrey Show* ended in 2011 — the Oprah Winfrey Network, or OWN, a cable network operated with Discovery. The one-time teenage radio announcer has become a fixture at the Sun Valley gathering of (mostly male) media moguls, and Starbucks now sells an Oprah-branded blend of chai.

Winfrey's tissues-at-the-ready interviews and exhortations to "live your best life" also pointed the way for a more confessional, self-centred era in media, with her empathetic approach styled to be uplifting and empowering for audiences sharing in the intimate problems she brought to their screens. Sometimes, the problems were her own — she is a novel star whose fame depends on regularly stepping down from the pedestal fans put her on.

You can only fully judge someone's pioneering impact when you see who has followed his or her lead. It has become increasingly clear that Winfrey also pioneered the concept of a celebrity being a commercial brand that could cross media and subjects to be as comfortable promoting tea as she is recommending a self-improving novel.

The digital age has rattled radio ratings, magazine circulation and TV audience figures, but the business of being famous has just kept on growing, becoming ever more lucrative as it draws marketers like moths to its spotlight. Over the span of her career, there has been no more consistent growth business in media than celebrity, and there has been no more successful celebrity than Oprah Winfrey.

> "WINFREY'S TISSUES-AT-THE-READY INTERVIEWS POINTED THE WAY TO A NEW ERA IN MEDIA"

TRANSPORT

IT IS OFTEN NOT INVENTORS OF TECHNOLOGY WHO CHANGE THE WORLD BUT THOSE WHO EXPLOIT IT, SAYS ROBERT WRIGHT

It is tempting when considering the history of transport's great innovators to focus on the eye-catching achievements of colourful geniuses such as Isambard Kingdom Brunel, the Victorian engineer. Having cut his engineering teeth on his father's Thames Tunnel, the world's first under a navigable river, Brunel went on to engineer the Great Western Railway, the finest railway of its day, and the Great Britain, the first iron steamship powered by a screw propeller.

But those who produce a striking new object such as Brunel or Sir Frank Whittle, one of the inventors of the turbojet engine, have seldom been those who transformed the world. Instead, the true history of breakthroughs in transport has been written by a series of individuals — some charismatic, some, like Alfred P Sloan, the key figure in the history of General Motors, determinedly dull — who focused relentlessly on cost and efficiency or making a new product more attractive to customers.

The example par excellence is Malcom McLean, inventor of the container-shipping system, who realised the container's potential not because he was an expert in shipping but because he was interested in transporting goods cheaply. He is said to have had an epiphany while sitting in his truck waiting for dockers to unload wool. It would be far easier, he realised, if they simply took the whole rear of his truck and put it on the ship, rather than unpack it all.

McLean invented little — the steel box was, after all, not a breakthrough technology — but he had unique insights into its possible applications.

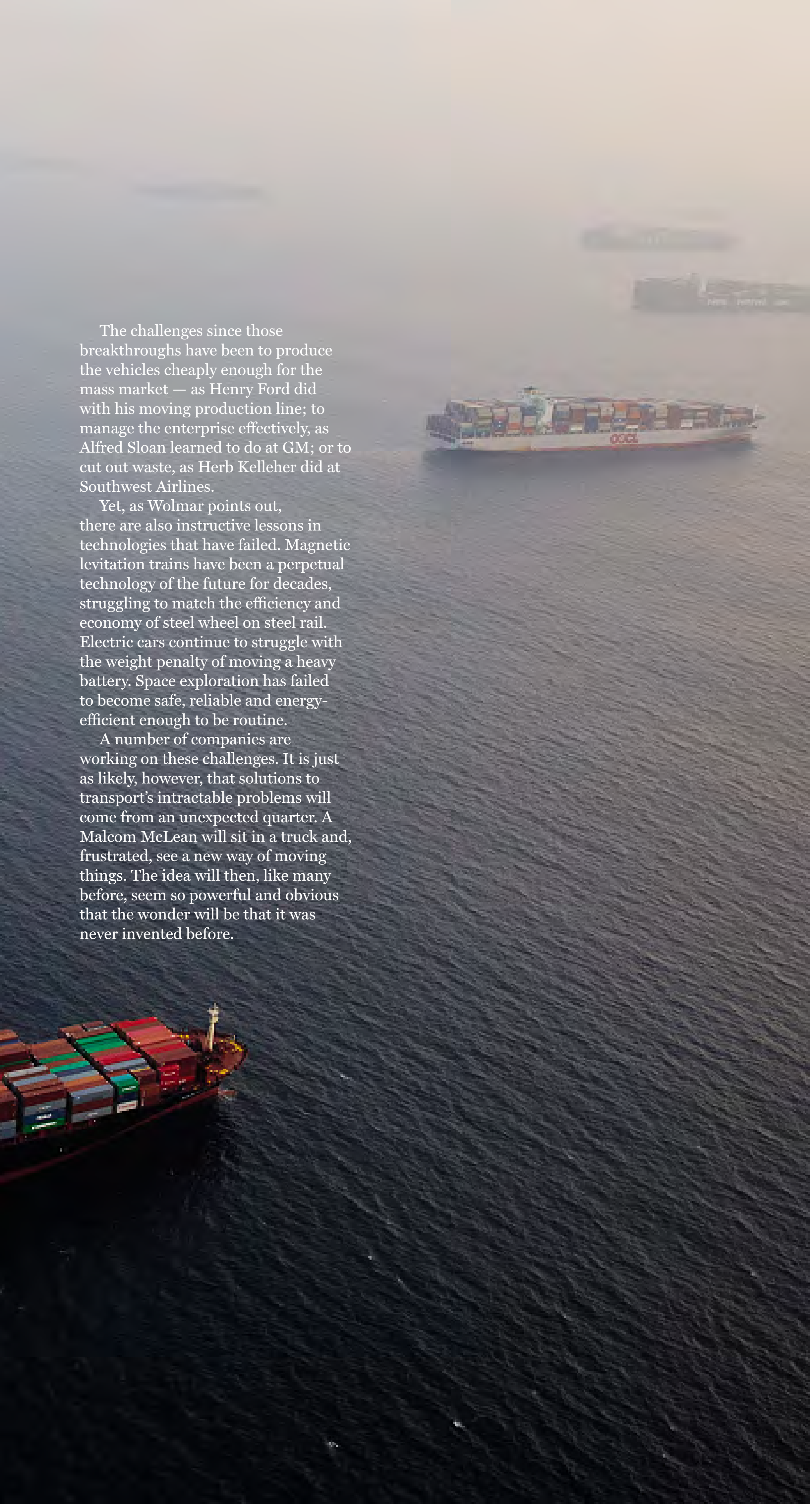
"I don't think it's the inventor of the technology that takes it forward," Christian Wolmar, a British transport writer and historian, says. He points to George Stephenson, the British engineer who, with his son Robert, exported early rail technology around the world, as a prime example. Neither Stephenson invented the steam locomotive or rail transport, but the pair are remembered because, unlike Richard Trevithick, the Cornish mining engineer who invented the first moving steam locomotive, they produced a system sufficiently efficient and reliable that the advantages over existing modes of transport were obvious.

"The idea seems to be that the people who harness technologies [that already exist] take them forward," Wolmar says. "Trevithick invented the first moving locomotive on tracks, but he just didn't develop it, so other people took it forward."

Other transport innovators have grappled with similar challenges. All transport methods need a motor that is light, efficient and reliable enough to make the vehicle as a whole an efficient means to transport goods or people. The vehicle needs to be light enough for the engine to move it but strong enough to withstand the movement.

The Stephensons' advantage over Trevithick was that they devised a system of connecting rods and valves that captured an acceptable proportion of the energy in the steam they produced to move their locomotive. Their wrought iron rails proved less susceptible to breakage than the cast iron rails on which Trevithick relied.

Early pioneers of the car — including Karl Benz, a rare pioneer who built a successful business — faced similar problems developing an internal combustion engine and gears efficient enough to carry its energy to the wheels. The Wright brothers' work in developing powered flight focused on maximising lift, minimising drag and establishing an effective control mechanism.



The challenges since those breakthroughs have been to produce the vehicles cheaply enough for the mass market — as Henry Ford did with his moving production line; to manage the enterprise effectively, as Alfred Sloan learned to do at GM; or to cut out waste, as Herb Kelleher did at Southwest Airlines.

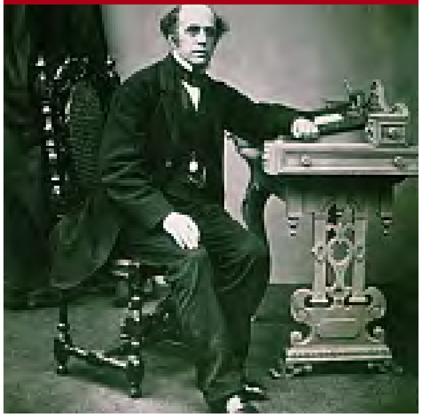
Yet, as Wolmar points out, there are also instructive lessons in technologies that have failed. Magnetic levitation trains have been a perpetual technology of the future for decades, struggling to match the efficiency and economy of steel wheel on steel rail. Electric cars continue to struggle with the weight penalty of moving a heavy battery. Space exploration has failed to become safe, reliable and energy-efficient enough to be routine.

A number of companies are working on these challenges. It is just as likely, however, that solutions to transport's intractable problems will come from an unexpected quarter. A Malcom McLean will sit in a truck and, frustrated, see a new way of moving things. The idea will then, like many before, seem so powerful and obvious that the wonder will be that it was never invented before.

50 PIONEERS

THOMAS COOK

BY ROGER BLITZ



The secret of Thomas Cook's success can be distilled into three factors: a long life, a son with a similar single-mindedness and a knack for marketing.

By the time of his death in 1892 at the age of 83, Cook had devoted a half century to selling the benefits of travel to a British public coming to terms with the joys and possibilities of transportation. From arranging train excursions in the early days for temperance society members between Midlands towns in the UK, to exotic steamship passages across the globe, he made an indelible impression on western civilisation — at least for the better-off.

Cook trained as a cabinet-maker, but as a Baptist preacher he learned the very useful art of how to spread the word. The pamphlet was his tool — the Google of its day. When he organised his first large-scale commercial enterprise — a rail trip from Leicester to Liverpool — he meticulously researched the journey and gave each traveller a handbook of the journey.

Cook expanded his horizons and those of his customers. The corners of the British Isles were soon conquered. The Great Exhibition of 1851 helped secure his national reputation — Cook organised trips for thousands of people from the Midlands and north of England to the exhibition in London.

Crossing the English Channel to mainland Europe, Cook established the circular tour, so that travellers were able to sample different places on the way back to those they had seen on the way out. Diarists helped promote his explorations, hoteliers agreed to accept coupons for board and meals and financial houses gave Cook's travellers local currency in exchange for ➤

PHOTOS: BLOOMBERG; HULTON-DEUTSCH COLLECTION/CORBIS "circular notes" — the forerunner of the traveller's cheque.

All this breaking new ground needed someone back home to mind the shop. That task fell to his son, John Mason Cook, managing the business from its City office at Ludgate Circus. Father was the idealist, son the hard-headed commercial operator. They fell out.

Thomas Cook enjoyed perhaps his crowning glory — the world tour of 1872–73 that propelled Cook's, as the company became known, into India (first-class, three-month passage via P&O steamer to Bombay, Calcutta, Darjeeling, Delhi and Lahore — £113 7s) and on to global recognition as an ambitious pioneer with an inquiring mind and a love of exploration.

Wide horizons: Thomas Cook, above, and Malcom McLean, below right, gave their respective sectors a global outlook

50 PIONEERS — HERB KELLEHER

BY ROBERT WRIGHT

It was while sitting in a bar in San Antonio, Texas, in 1967 that Herb Kelleher looked at the map his friend Rollin King had sketched on a cocktail napkin and made a decision. The pair would turn the network of airline routes King had drawn into an operational airline.

Nearly 50 years on, Southwest Airlines' network stretches across the continental US and Caribbean. More significantly, the ideas roughed out in that bar have spawned multiple imitators in Europe and Asia, and done as much as almost anyone since the Wright brothers to open up flying to ordinary people.

The innovations were mainly to do with discarding the unnecessary. Kelleher moved away from the big airlines' efforts to provide a comprehensive service via complex hub-and-spoke operations. Southwest instead took passengers between two points with strong traffic flows and often used smaller airports rather than big regional hubs. Southwest also discarded complex in-flight catering and multiple seat classes. Its aircraft consequently spent less time on the ground than rivals' and worked far harder. The airline was thus able to offer far lower fares than rivals.

As with Malcom McLean and container shipping, Kelleher's thinking partly reflected a desire to circumvent onerous regulations. The company initially operated only within Texas to sidestep federal regulation and still spent a year before it launched operations in 1971 dealing with legal challenges from rivals.

However, Southwest's success would have been impossible without the deregulation of air travel in the US under legislation passed in 1978 that scrapped the federal government's role in setting fares and routes.

Kelleher's irreverent style set the tone for imitators, such as Ireland's Ryanair. He continues at age 84 to smoke and drink enthusiastically, and has embraced eye-catching stunts. In 1992, in a dispute with another airline over the rights to an advertising slogan, Kelleher agreed to settle the matter via an arm-wrestling match, rather than in court.

In a profoundly cyclical industry, Southwest has been profitable for each of the past 42 years.

> "KELLEHER'S IRREVERENT STYLE HAS SET THE TONE FOR MULTIPLE IMITATORS, SUCH AS IRELAND'S RYANAIR"

50 PIONEERS — MALCOM MCLEAN

BY ROBERT WRIGHT

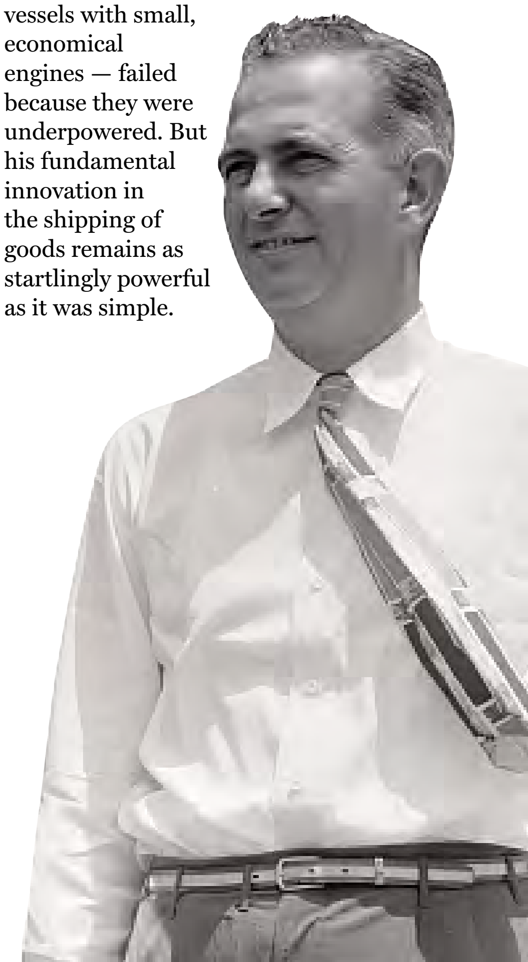
When Malcom McLean oversaw the loading of 58 containers on to the Ideal X, a converted oil tanker, at Newark, New Jersey, in April 1956, he could have had little idea that within 60 years his innovation would change the shape of global transport. McLean, a trucker from North Carolina, was, according to Marc Levinson's history of container shipping, *The Box*, simply seeking to undercut the high costs of the US's heavily regulated trucking industry. The Ideal X did so triumphantly — the ship is said to have moved the 58 containers to Houston, Texas, for the same cost as sending just one box by road.

Yet McLean's insight would transform the economics of moving goods around the world and, by doing so, alter economic geography. Because containers could be loaded far faster than most traditional bulk cargoes, it quickly became possible to operate far bigger ships than previously, to gain huge economies of scale — and to employ far fewer dock workers.

Today, the largest container ships can carry 20,000teu (twenty foot equivalent units) of containers, and ports can quickly and efficiently handle the vast quantities of goods unloaded from ships, loading boxes on to trucks to complete their journey, while the terminal operators load the ships with other containers.

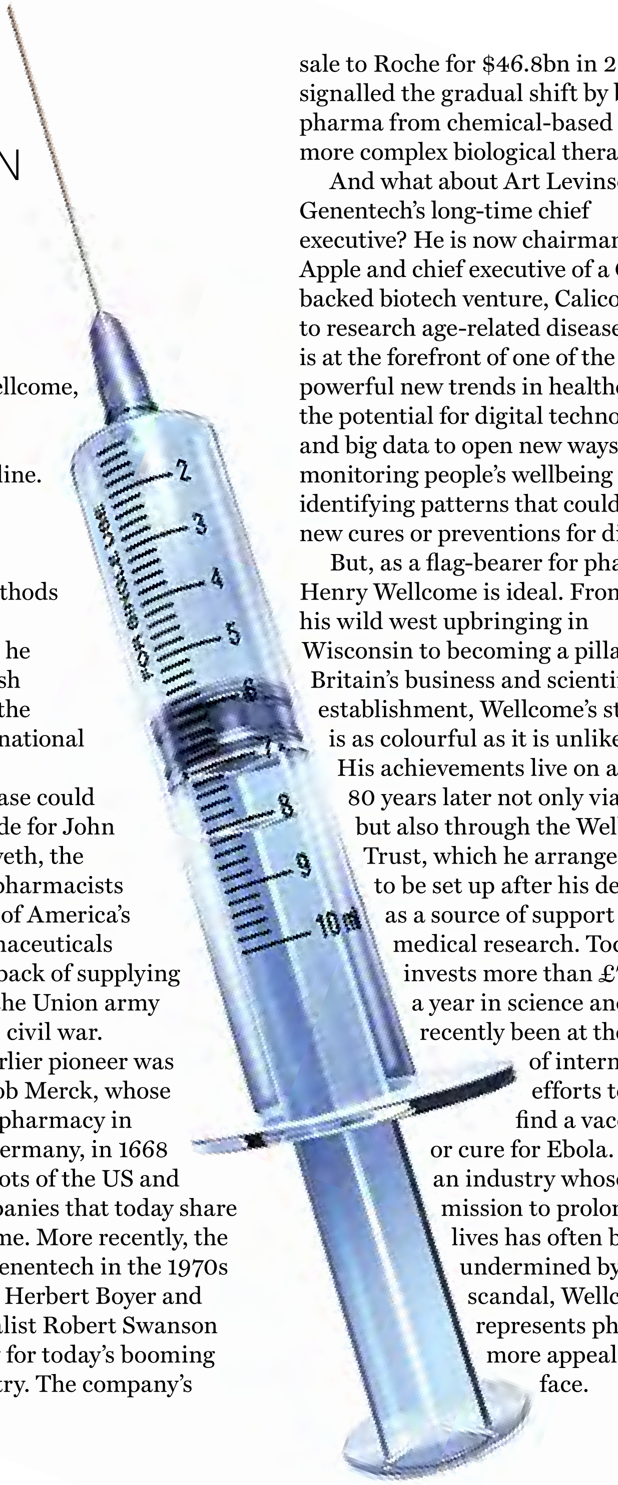
It is the plummeting transport costs brought on by McLean's innovation that has made much of the industrialised world's manufacturing migrate to China and other Asian countries over the past 30 years, spurring those countries' economic development. Sea-Land, McLean's company, helped to start that process after it won a contract to supply the US military in Vietnam. It would drop off empty containers in Japan on the way home to the US, helping to start Japan's export-led boom.

McLean also made mistakes. Sea-Land invested heavily in the early 1970s in super-fast vessels that became profoundly uneconomical after the 1973 oil crisis. Another innovation — big vessels with small, economical engines — failed because they were underpowered. But his fundamental innovation in the shipping of goods remains as startlingly powerful as it was simple.



PHARMACEUTICALS

PHARMACEUTICAL COMPANIES HAVE MADE A SIGNIFICANT CONTRIBUTION TO MANKIND, SAYS **ANDREW WARD**



If a ranking were made of industries based on their contribution to mankind, pharmaceuticals would surely occupy a lofty position.

The industry is not without faults but, from the earliest painkillers and antibiotics to the latest cancer breakthroughs, drug companies have played a central role in the increased longevity and quality of human life over the past century.

Today, big pharma jostles with oil and technology among the world's biggest industries.

So why does such an important sector have only one representative in our business pioneer ranking? Partly it tells us that the real trailblazers were usually the scientists who develop medicines rather than the executives who sell them.

Thus Sir Alexander Fleming, the Scottish biologist who discovered penicillin, and Louis Pasteur, the Frenchman who developed some of the earliest vaccines, are better remembered than cousins Charles Pfizer and Charles Erhart, who founded Pfizer, the world's biggest drugmaker by sales, with a $2,500 loan in 1849.

The sole pharmaceuticals entrepreneur to break into our top 50 was Henry Wellcome, co-founder of Burroughs Wellcome, a forerunner of today's GlaxoSmithKline. By combining scientific research with innovative methods of marketing and branding, he helped establish the model for the modern multinational drugmaker.

A similar case could have been made for John and Frank Wyeth, the Philadelphia pharmacists who built one of America's earliest pharmaceuticals giants on the back of supplying medicines to the Union army during the US civil war.

An even earlier pioneer was Friedrich Jacob Merck, whose purchase of a pharmacy in Darmstadt, Germany, in 1668 created the roots of the US and German companies that today share the Merck name. More recently, the founding of Genentech in the 1970s by biochemist Herbert Boyer and venture capitalist Robert Swanson paved the way for today's booming biotech industry. The company's sale to Roche for $46.8bn in 2009 signalled the gradual shift by big pharma from chemical-based pills to more complex biological therapies.

And what about Art Levinson, Genentech's long-time chief executive? He is now chairman of Apple and chief executive of a Google-backed biotech venture, Calico, set up to research age-related diseases. He is at the forefront of one of the most powerful new trends in healthcare: the potential for digital technology and big data to open new ways of monitoring people's wellbeing and identifying patterns that could lead to new cures or preventions for disease.

But, as a flag-bearer for pharma, Henry Wellcome is ideal. From his wild west upbringing in Wisconsin to becoming a pillar of Britain's business and scientific establishment, Wellcome's story is as colourful as it is unlikely.

His achievements live on almost 80 years later not only via GSK but also through the Wellcome Trust, which he arranged to be set up after his death as a source of support for medical research. Today, it invests more than £700m a year in science and has recently been at the heart of international efforts to find a vaccine or cure for Ebola. For an industry whose mission to prolong lives has often been undermined by ethical scandal, Wellcome represents pharma's more appealing face.

50 PIONEERS

HENRY WELLCOME

BY ANDREW WARD

Henry Wellcome was born in 1853 in a log cabin in northern Wisconsin. He died 82 years later in London as a British knight, leaving a legacy that still resonates today. Wellcome's pioneering role in the pharmaceuticals industry began in his teenage years, when he learned to make medicines while working at his uncle's drug store.

After a spell as a travelling drug salesman, he crossed the Atlantic to form a partnership with friend and fellow pharmacist Silas Burroughs, importing US medicines to Europe. They set up their own research laboratories, helping to bring scientific credibility to a fledgling industry hitherto notorious for quackery. Their company, Burroughs Wellcome, formed part of the roots of today's GlaxoSmithKline, the biggest UK drugmaker.

Sir Henry bequeathed his fortune to the Wellcome Trust. It is the world's second-largest funder of medical research after the Bill & Melinda Gates Foundation, with an £18bn endowment. Another legacy is the Wellcome Collection – a London museum based on Sir Henry's passion for collecting paraphernalia, from Napoleon's toothbrush to ancient sex aids. His own ashes were lost for decades among the hoarded artefacts. They were discovered in 1987 and interred in St Paul's Cathedral.

PHOTOS: BLOOMBERG; MARGARET BOURKE-WHITE/THE LIFE PICTURE COLLECTION/GETTY IMAGES; WELLCOME ARCHIVE; ISTOCK

INDUSTRY

THE GREATEST INNOVATORS ARE THOSE WHOSE IDEAS CAN BE APPLIED ACROSS INDUSTRIES, SAYS **PEGGY HOLLINGER**

When asked who his industrial heroes are, Sir Hermann Hauser, father of the UK's semiconductor industry, ignores the obvious. Not for him the Henry Fords or Andrew Carnegies. Instead, the man who founded Acorn Computers and has been called in by the UK government to help revive British industrial innovation, chooses the mathematicians and computer scientists whose work brought the power of computing to the world of manufacturing.

"The great brains, like Alan Turing or Maurice Wilkes, laid the foundations for everything we do now," he says.

Equally he might have chosen Charles Babbage, who in the 19th century came up with the concept of a programmable computer, or James Watt, who improved designs for the steam engine that would transform manufacturing. The difficulty in drawing up a list of just 50 business pioneers is that they have all built on the work of previous generations of equally determined and original thinkers.

Henry Ford is often credited with inventing the assembly line, which brought down costs and workers' injuries while increasing productivity and output. But, like Watt, he merely expanded on an idea that had been around for more than 100 years. His success, though, was copied on a wider scale than ever before across a variety of industries as technology and communications improved in the 20th century.

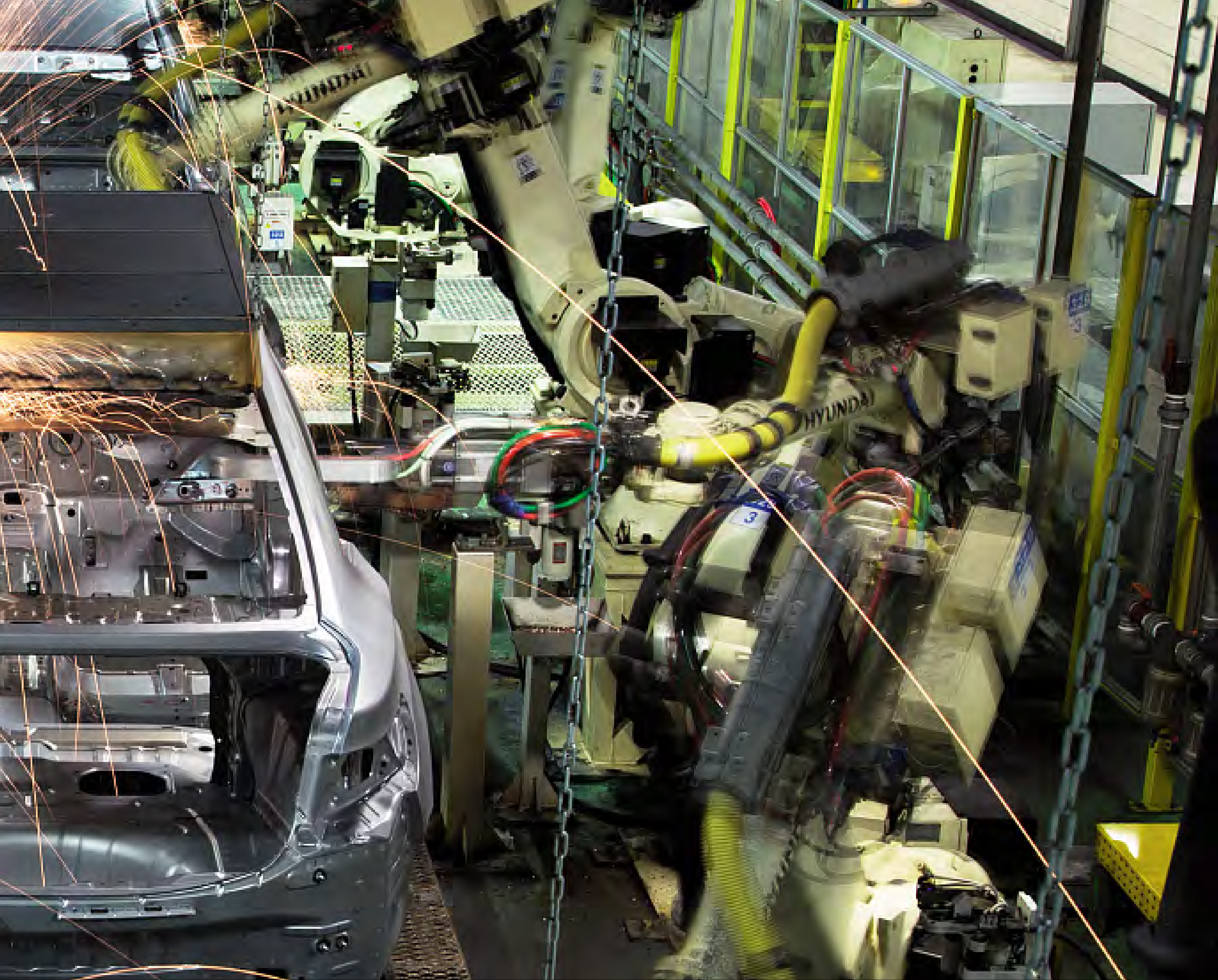


PHOTO: BLOOMBERG

The impact adapters such as Ford have had on the way people live, work and consume is undeniable. These pioneers "made it easier to manufacture large quantities, and to market them through the world's ever-stronger distribution and communication networks", Lord Bhattacharyya, British industrialist and founder of WMG, a consultancy at the University of Warwick, said in a speech. "These changes created the factory, urbanisation, new transport systems and a shift in the nature of the 'maker' — from craftsman to labourer. Ultimately, they created the mass market."

They also created vast economic wealth. Wages, even in a world where manufacturing jobs have plummeted, are generally higher than in the lower-skilled services sector.

In the 20th century, unlike the 19th, many of the revolutionary changes were brought about by those who found better ways of organising production than those who invented tools or machines.

Taiichi Ohno is considered to be the founder of lean manufacturing, the philosophy otherwise known as the Toyota Production System, which helped the Japanese car company to survive after the second world war. The lean approach aims to eliminate waste in every aspect of a manufacturing process — from workers' actions to the supply and use of raw materials. Partly based on theories described in Henry Ford's 1926 book *Today and Tomorrow* and on the methods of US supermarkets, the principles devised by Ohno have become common practice in world-class industrial companies and in their supply chains.

Hauser, meanwhile, cites Sir Robin Saxby, founder of Arm Holdings, whose chips are used in 95 per cent of the world's smartphones. His genius was in sensing there could be a different business model for a chip company than the traditional make-and-sell approach. "Arm does not sell chips — it sells licences (on its design) to make chips to 350 chip companies that all compete with each other," says Hauser. "This helped Arm to become the dominant player in microprocessors."

The world is on the brink of a new industrial revolution — one where manufacturing is network-based ➤

"HENRY FORD'S SUCCESS WAS COPIED ON A WIDER SCALE THAN EVER BEFORE" and data will flow through the production process into the customer experience and back again. This will open up new ways to produce more customised and affordable goods that people want. In the days of Henry Ford, to keep costs down, customers could have any colour they wanted as long as it was black. But now, with intelligent systems that can inform manufacturers earlier of consumers' desires, manufacturing is entering the era of mass customisation. Bhattacharyya cites Jaguar Land Rover, the UK-based carmaker owned by Tata Group of India. Using social media, JLR has cut the costs of marketing a car by 70 per cent.

This new revolution will create new industrial pioneers, who may not be traditional industrialists.

Ineke Dezentjé Hamming-Bluemink, a former politician, is leading the Dutch government's strategy to adapt to the labour, educational and social challenges implied by the next phase of industrial development. "The next innovator will not be some big company. It will be someone working in his or her garage coming up with an idea," she says.

In a way, this is a return to a golden age of innovation, when a humble locksmith like Benjamin Huntsman could invent new ways to make steel that would make the industrial age of the 19th century possible. Now engineers with heart problems, for example, are using the possibilities created by the internet, social networks and advanced manufacturing techniques such as 3D printing to create innovative medical solutions for their own needs.

Elon Musk is challenging the mighty aerospace and defence companies with SpaceX, a company that aims to develop rocket technology by making commercially viable reusable space launch vehicles. Jim Cantrell, former vice-president of SpaceX, is reported to have said of Musk that he "used $1bn to do what NASA couldn't do with $27bn".

These are the people who will transform industry for the future. The knowledge that will be gathered in the development of rocket technology will be fed back into other sectors — just as Ford's own success was absorbed and copied in other industries.

There will be failures along the way, but as Musk told New Scientist magazine: "One failed experiment does not invalidate the greater goal. If that was the case, we'd never have had the light bulb."

50 PIONEERS

MARVIN BOWER

BY ANDREW HILL

Very few management consultants deserve the title "pioneer". It is not consultants' style to lead from the front. A more appropriate — cynics would say safer — approach is to help provide the tools with which their corporate clients can break new ground.

Bruce Henderson, the founder of Boston Consulting Group, would merit a mention for the way in which he helped define strategy. But BCG was only founded in 1963. By then Marvin Bower had already shaped McKinsey into the model of a modern management consultancy, creating the sector as we now know it.

As Duff McDonald writes in *The Firm*, his portrait of McKinsey: "Bower was obsessed with making sure he and his peers would not be dismissed as corporate parasites and would enjoy a respect similar to other early 20th-century professionals such as doctors, lawyers, engineers and ministers."

McKinsey might have made just a footnote in business history if Bower had not taken the lead when the group's official founder, James O "Mac" McKinsey, died suddenly in 1937. The group split in two: the other half became AT Kearney and Bower kept the McKinsey name for the part he went on to head.

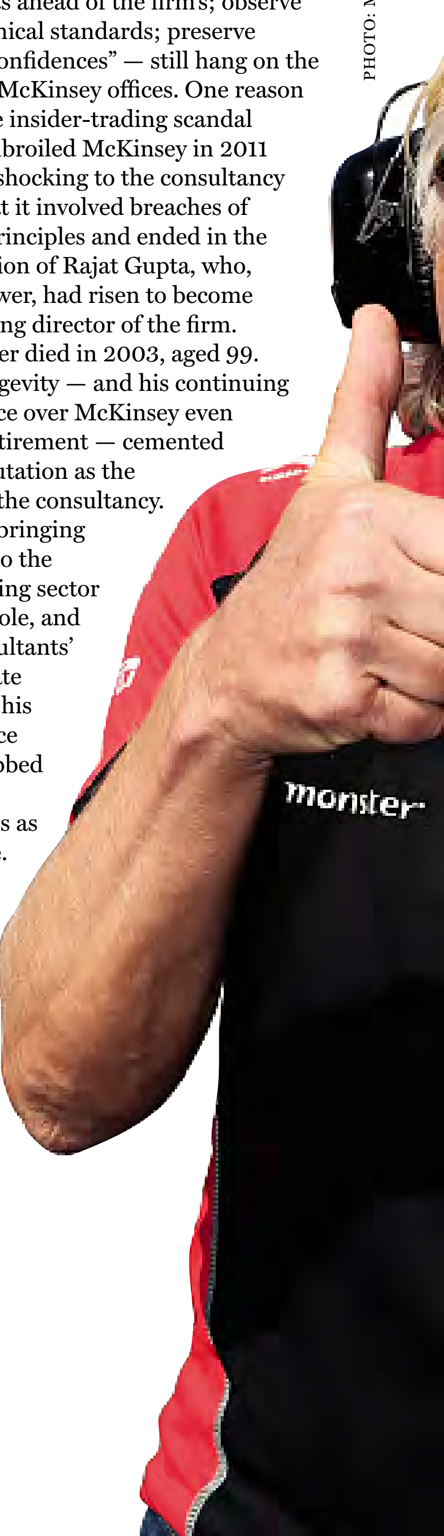
One of Bower's achievements was to move McKinsey consultants up the corporate hierarchy until they became the trusted advisers to senior executives. He deliberately left behind Mac McKinsey's original concept of the group as "management engineers", hired to solve the lowlier challenges facing big US companies. As in law, where Bower had started his career, McKinsey would be a "practice" rather than a business and have "clients" rather than customers. He also developed many of the techniques that helped McKinsey — and ultimately other consultants — become efficient money-makers.

But Bower also established a set of principles for the group. Framed copies of his mission statement and values — including "Put client interests ahead of the firm's; observe high ethical standards; preserve client confidences" — still hang on the wall of McKinsey offices. One reason why the insider-trading scandal that embroiled McKinsey in 2011 was so shocking to the consultancy was that it involved breaches of these principles and ended in the conviction of Rajat Gupta, who, like Bower, had risen to become managing director of the firm.

Bower died in 2003, aged 99. His longevity — and his continuing influence over McKinsey even after retirement — cemented his reputation as the soul of the consultancy. But by bringing rigour to the consulting sector as a whole, and to consultants' corporate clients, his influence also rubbed off on business as a whole.

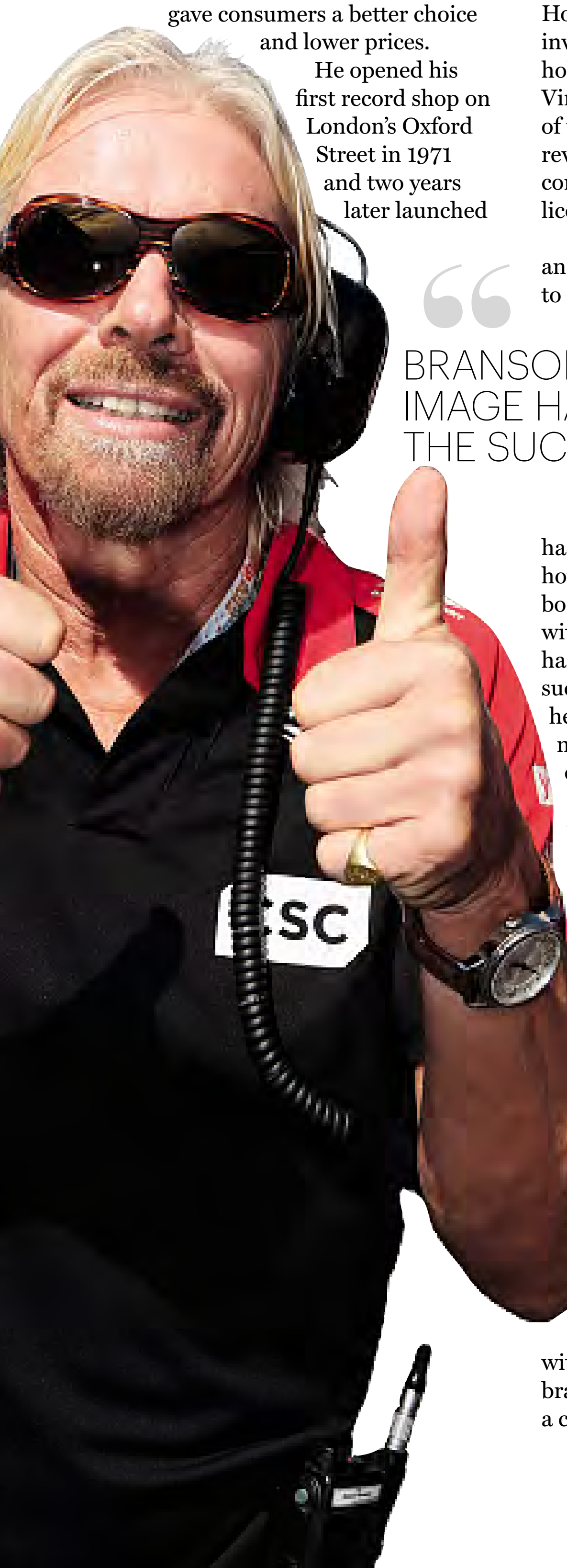
"BOWER MADE McKINSEY CONSULTANTS THE TRUSTED ADVISERS TO SENIOR EXECUTIVES"

PHOTO: MARK THOMPSON/GETTY IMAGES



50 PIONEERS
RICHARD BRANSON
BY SARAH GORDON

Sir Richard Branson, pictured below, regularly appears on lists of the UK's most successful businesspeople, or most inspiring entrepreneurs. His reputation as a challenger to the status quo is due in part to his launch of a range of businesses, from mobile telephones to trains to airlines, that challenged complacent incumbents such as British Airways and often gave consumers a better choice and lower prices.



He opened his first record shop on London's Oxford Street in 1971 and two years later launched Virgin Records, which signed controversial bands such as the Sex Pistols. This was followed by a variety of other businesses, such as the Virgin Atlantic airline, founded in 1984. Some have been more successful than others — Virgin Mobile may be a familiar name but Virgin Brides, a bridal wear company, is probably best forgotten. Virgin Atlantic itself has just returned to profit after three years of losses.

The precise nature of the Virgin business empire is little understood by the public. About 80 businesses bear the Virgin name, but Virgin Group Holdings, which manages Branson's investments and his personal brand, holds a direct stake in fewer than half. Virgin Group owns just over a quarter of the 12 largest Virgin companies by revenues, and most Virgin-branded companies pay the holding company a licensing fee for use of the name.

The recognisability of that name, and of Branson himself, is in part due to a series of high-profile exploits he

> "BRANSON'S BUCCANEERING IMAGE HAS PLAYED A BIG PART IN THE SUCCESS OF THE BRAND"

has engaged in over the years, from hot-air ballooning to high-speed boating. His buccaneering image, with blond beard and mane to match, has played a considerable part in the success of the Virgin brand, which he has parlayed into a franchising model that has given him a fortune, estimated by Forbes, of $5bn.

The contradictions underlying this image — for one, Branson is a socially liberal philanthropist but lives as a tax exile on his Caribbean island of Necker — appear not to have undermined its financial value.

In 2005, he stepped back from day-to-day running of the Virgin Group to focus on his philanthropic activities and Virgin Galactic, his project to send tourists into space. In October, the endeavour was rocked by the fatal crash of a spaceship in the Mojave desert in the US, killing a test pilot. Despite such setbacks, Branson has vowed to continue with the business — and his personal brand seems to have suffered little as a consequence.

50 PIONEERS
BARBE NICOLE CLICQUOT-PONSARDIN
BY ADAM THOMSON

If life had taken a more predictable course, Barbe Nicole Clicquot-Ponsardin would probably have spent her years as a devoted wife and mother in a wealthy, connected family in northern France.

As things turned out, she became one of France's first successful female business leaders in a male-dominated world, selling her Veuve Clicquot champagne in international markets and pioneering a technique that transformed the drink from a cloudy wine into the crystal-clear tipple we know today.

The event that sparked the change was the death in October 1805 of François Clicquot, the man she had married just seven years before and with whom she had helped build the family's wine business.

Barbe Nicole Clicquot persuaded her father-in-law to allow her to take over the company — a move that later prompted the inclusion of "*veuve*", or "widow", in its name. But Europe was at war and business proved exceptionally tough.

Production slumped initially, and Britain's naval blockade forced her to look east to Russia, at one point shipping champagne bottles hidden in barrels to skirt an embargo the Tsar had placed on French wine.

To survive, she cut costs, reined in overdue payments from clients and diversified into selling red wine in the domestic market, according to Tilar Mazzeo in her book *The Widow Cliquot: The Story of a Champagne Empire and the Woman Who Ruled It*.

"Barbe Nicole's workday, in the cellars or at her desk, began at seven in the morning, and she rarely set aside her account books and ➤

letters until nine or 10 in the evening," writes Mazzeo.

With her husband, she had the idea of putting an anchor on each of the corks as part of an early attempt at branding in an era when bottles were not even sold with labels.

She also continued to develop her marketing: in 1810, she produced the world's first vintage champagne; in 1811, an outstanding vintage, she began putting a star on each of the corks in homage to the comet that appeared in the night sky that year.

But beyond her industry and tenacity as a business woman, Clicquot's lasting contribution was pioneering the *remuage*, or riddling process — tilting the bottles and turning them for several weeks to collect the dead yeast in the neck and then removing it — that gives champagne its clear appearance.

The result was what is generally considered the first modern champagne, and its popularity spread among Europe's elites, who soon began to associate it with celebration and luxury.

Clicquot died in 1866, when the company sold 750,000 bottles, compared with about 100,000 when she took it over. It seems only fitting that, even during her lifetime, she became known as the grand dame of champagne.

Chains of production: Henry Ford, right, drove down costs to make cars affordable to ordinary people; a Veuve Clicquot vineyard, below

50 PIONEERS

HENRY FORD

BY ROBERT WRIGHT

For an invention so momentous, the origins of the moving production line remain obscure. Henry Ford is celebrated as the father of the invention but, according to *The People's Tycoon*, a biography of him by Steven Watts, Ford gave two different stories, claiming it had been inspired by how carcasses moved in Chicago slaughterhouses or by the workings of a watch factory.

> "FORD IS WIDELY CREDITED WITH CREATING THE US CONSUMER SOCIETY"

What is certain, though, is that, in 1913 and 1914, workers in the Ford Motor Company's Highland Park plant, in a city on the north side of Detroit, started to assemble first components then whole vehicles on a moving production line. The effect on productivity was astonishing — and led Ford to a second extraordinary innovation.

Far more than contemporaries such as William Durant of General Motors or the Dodge Brothers, Ford had focused from his company's earliest days on trying to bring down the cost of cars to within the reach of ordinary people. The company started production of the vehicle intended to do that — the Model T — in 1908.

But despite Ford's determination to make his factory's layout as logical and efficient as possible, there were still substantial problems smoothing the flow of parts and vehicles through Highland Park, opened in 1910. Managers started, according to Watts, experimenting with different techniques, including pushing vehicles along with bars and pulling them with ropes to carry them smoothly past individual workers' work-stations. The company finally settled on a chain to pull vehicles along.

The system ironed out the effects of different workers' different work styles, speeding up the slow and slowing down the fast. The added efficiency quickly put Ford in a virtuous circle of cost-cutting that fuelled demand. The company made 68,773 Model Ts in 1912. The basic model sold for $590, already a sharp reduction from $900 in 1910. By 1920, Ford was producing nearly 1m Model Ts a year and selling the basic model for $395. At points in the 1920s, the Model T accounted for half of US vehicle sales.

However, the tedium of work on the assembly line quickly pushed up Ford's workforce turnover. In response, he increased wages to $5 a day — twice the average for the time — and cut the working day to eight hours. It was the kind of idiosyncratic decision-making that would later cause the company many problems. But, by creating for the first time large number of workers with spare time and money, the move is widely credited with creating the US's 20th-century consumer society.

PHOTO: AP; BLOOMBERG; ALAN HATAT/VEUVE CLICQUOT

50 PIONEERS

CARLOS GHOSN

BY ANDY SHARMAN

No chief executive is irreplaceable. But Carlos Ghosn may be about as close as it gets. The Lebanese Brazilian has taken a multinational upbringing and applied it to a carmaker that accounts for one in 10 new cars sold worldwide and employs 450,000 people.

Ghosn has done something almost unprecedented in the world of cars by forging the Renault-Nissan alliance. Now 15 years old, its longevity is testament to his principles of mutual respect and cultural sensitivity in an industry littered with failed partnerships (Daimler-Chrysler, BMW-Rover, Ford-Volvo-Jaguar Land Rover).

The Renault-Nissan universe — which is regularly orbited by Ghosn's Gulfstream jet — includes ownership of Avtovaz in Russia, which he chairs, and a cross-shareholding and electric vehicle development partnership with Daimler of Germany.

Then there is the Romanian brand, Dacia, which has been resuscitated as a low-cost marque and has taken a bite out of Europe's biggest carmakers.

"It's cross-cultural squared — not just people from different cultures but different companies too," says Chris Donkin, one of the car industry's leading headhunters.

When Ghosn arrived at Nissan in 1999, it was sitting on $20bn of debt and nearly $5bn in annual net losses. To an anti-foreigner outcry in Japan, he closed factories, cut jobs, sold off non-core assets and redesigned the cars. Since then, the diminutive polyglot has inspired bento boxes and manga cartoons.

Nissan is sustainably profitable and the French and Japanese groups have integrated, using a big joint-purchasing unit to haggle down prices from suppliers.

The supremely confident Ghosn is in his element addressing international media at global car shows — fixing reporters with piercing eyes and gravity-defying eyebrows. He is respected for an ability to think and communicate clearly despite the complexity of the organisation.

But some say his success and durability at the top of Renault-Nissan has been to the detriment of the companies' future. Aspiring successors — including Andy Palmer and Carlos Tavares — have turned elsewhere for top roles in the car industry. And his success with Dacia contrasts with the continued underperformance of the upmarket Infiniti marque.

Meanwhile, sharp declines in Russia and Brazil have raised doubts over his historic focus on pushing the alliance into emerging markets.

As the 61-year-old nears the end of his contract with Renault-Nissan in 2017, speculation is rising over how he might be replaced — or rather, how many people will have to replace him.

Ghosn himself is cryptic. "A lot of people think that the only solution is to have one person running two companies," he says. "[But] the present organisation of the company is not the only one."

Cultural link: Carlos Ghosn, below, has succeeded where others have failed in multinational partnerships

> GHOSN IS RESPECTED FOR AN ABILITY TO THINK AND COMMUNICATE CLEARLY

50 PIONEERS

MO IBRAHIM

BY PETER MARSH

With a fortune made from the early days of the mobile phones, the Sudan-born entrepreneur Mo Ibrahim has emerged as a key mover in attempts to rebrand Africa as a success story in both politics and business. His Mo Ibrahim Foundation, established in 2006, gives substantial sums to people promoting the best standards of leadership and transparency in government across the continent.

But Ibrahim's unusual awards would never have been possible without his own exceptional business record. He moved to the UK from Sudan in 1974 and later joined BT, where he helped the telecoms business become established in the then new world of mobile phones. After that, he started a successful business in operating mobile phone networks across Africa. In 2005, he sold his company Celtel for $3.4bn.

His foundation's biggest award is an annual prize for a former political leader who has "developed [his or her] countries, lifted people out of poverty and paved the way for sustainable and equitable prosperity". The amount of money handed out in these prizes — even though in some years the cash is left unawarded — is eye-popping, especially by the standards of a continent where incomes are low.

But Ibrahim argues his awards are a practical encouragement to politicians to quit and hand over to someone else rather than cling on with incomes supplemented by, as often happens, bribery and corruption.

This year's award — which gives the recipient $5m over 10 years, followed by $200,000 a year for life — was given to the Hifikepunye Pohamba, the outgoing president of Namibia.

The size of these awards — ➤

which are accompanied by smaller disbursements of scholarships and fellowships to others lower down the ladder of African politics — has created some controversy. This is on the grounds that many African leaders are well remunerated and hardly need handouts when they step down.

But Ibrahim's big theory is that on the back of a rise in standards of government, helped by the potential of people given his awards to act as role models, the climate for business will gradually improve. That in turn should help improve standards of living in a continent blighted by poverty. Some tentative support for his ideas has emerged in the indications in recent years that African economies have started to ramp up, helped by signs of sometimes impressive entrepreneurial activity.

50 PIONEERS
LEE BYUNG-CHULL

BY SIMON MUNDY

As his battle with cancer neared its end, Lee Byung-chull became concerned about the biblical warnings of rich men struggling to enter heaven. "Does this mean the rich are bad?" he asked a priest a month before his death in 1987.

Lee had plenty of time to ponder the meaning of wealth, spending most of the second half of his life as South Korea's richest man. Samsung, the group he founded, remains by far the country's biggest; it includes the world's biggest technology company by sales and 73 other businesses, from stockbroking to theme parks.

Lee was born to a wealthy family in southern Korea in 1910, the year the country was formally annexed to the Japanese empire. Like many upper-class Koreans he went to study in Japan, although he did not complete his economics degree at Tokyo's Waseda University.

His business career began in 1936, when he set up a small rice mill in the southern town of Masan, buying a truck to gain an edge in distribution over competitors, who relied on ox-carts.

After a failed foray into property speculation, Lee founded Samsung, which began by exporting foodstuffs to China. It prospered despite the tumult of the second world war, becoming one of Korea's biggest trading companies by 1950.

That year Lee had to flee Seoul in the face of North Korean invasion but continued to trade in his southern homeland for three years until the civil war drew to a close. He played his political cards right, making generous campaign donations to President Syngman Rhee, who smoothed his entry into sugar refining, textile manufacturing and financial services.

Lee's links with the old regime became a liability in 1961 when it was overthrown by army officers who threatened to confiscate the assets of top businessmen. But Lee persuaded the dictator Park Chung-hee to allow him to retain capital to invest in new industries, while sharing the profits with the state.

Samsung and its fellow *chaebol*, or family conglomerates, were at the core of Park's export-focused economic strategy, under which South Korea developed at a speed matched by few countries in modern history.

Lee's most significant moves, however, were in manufacturing: between 1969 and 1978 he set up businesses making consumer electronics, ships and semiconductors, in each of which Samsung now stands among the world's biggest producers.

His achievements went alongside a steely personality: the chain-smoking Lee once intervened in a recruitment process to rule out a man whose shoes he deemed too dusty, and fired two of his own sons for underperformance.

"They were not fit to hold executive positions," he told a reporter from Time in 1976. "The life of a man is short, but that of a corporation must never be."

> "LEE'S ACHIEVEMENTS WENT ALONGSIDE A STEELY PERSONALITY"

50 PIONEERS
LI KA-SHING

BY JENNIFER HUGHES

Flee China, produce plastic goods, then move into property. Put like that, Li Ka-shing's beginnings are similar to many other Hong Kong tycoons of his generation, and they track the territory's own economic development. Li's trick is doing it better, bigger and more globally than anyone else.

Today Cheung Kong and Hutchison Whampoa, his flagship conglomerates, operate in more than 50 countries in businesses ranging from ports and property to pharmacies, oil, hotels, telecoms and more. The geographic spread alone makes Asia's richest man stand out among the region's tycoons, who tend not to venture farther than neighbouring markets. Even Jardine Matheson, his most storied rival, has mostly restricted itself to Asia after ill-fated ventures into the UK and the US in the 1980s and 1990s.

Li's reputation is as a bargain-seeking buccaneer — indeed, in the past 20 years alone, he has bought and sold assets worth about seven times those traded by Jardine. His biggest bargain may have been the acquisition of Hutchison in 1979 from HSBC for a knock-down price reportedly well below book value. In one swoop, that acquisition expanded his interests beyond the property portfolio that is the bedrock of most Asian fortunes.

PHOTOS: AP; BLOOMBERG; RISCHGITZ/GETTY IMAGES

But behind the wheeler-dealer façade is a businessman who favours protected profits and legal certainty, neither of which are exactly swashbuckling traits. Most of his operations are based in countries with strong legal traditions to limit risk. Many are also utilities or are utility-like in that they have high barriers to entry that protect profits and increase certainty. That even includes his Hong Kong property interests, a sector still dominated by a handful of tycoons, and even his local supermarkets in the city that operate in a near-total duopoly with those of Jardines.

Li can also play the long game. Hutchison's foray into European 3G mobile telecoms in the early 2000s was viewed for years outside the company as a cash-draining disaster. But more recently it has begun to deliver profits — and has emboldened the company to consider buying UK operator O2 from Telefónica for $15bn.

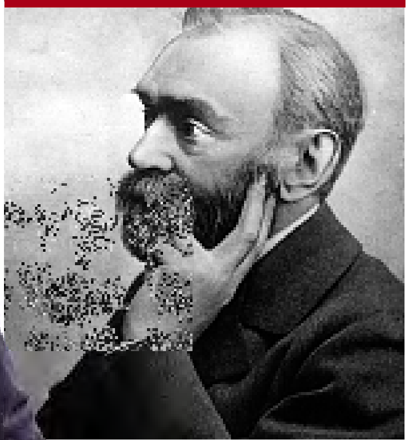
In Hong Kong Li has often been dubbed "Superman" by the press, helped by his beginnings in poverty — he assumed responsibility for his family aged 15, three years after fleeing the mainland. He may not be superhuman, but the scale and range of his businesses clearly sets him apart from others of his generation.

Playing safe: behind the wheeler-dealer façade, Li Ka-shing, opposite, prefers protected profits

50 PIONEERS

ALFRED NOBEL

BY PETER MARSH



He was the founder of the world's most prestigious award for peace — and someone known as a "merchant of death" for inventing dynamite. Few have left such a legacy of contrasts as the Swedish industrialist Alfred Nobel, who before he died assigned the majority of his vast wealth to establish the Nobel prizes.

Born in 1833 in Stockholm, Nobel studied chemical engineering in the US. He learnt enough about nitro-glycerine, a volatile liquid known for its explosive properties, to work out how to turn it into a reasonably safe compound. In 1867, after mixing nitro-glycerine with other substances to make a paste, Nobel patented this invention as "dynamite," from the Greek *dunamis*, or power, and built factories in Hamburg and Stockholm, and later New York and California. Dynamite revolutionised the mining, construction and demolition industries. Railroad companies could now safety blast through mountains, opening up vast areas to exploration and commerce. As a result, Nobel — who was responsible for 355 patents and set up companies and laboratories in more than 20 countries — grew hugely wealthy.

But his name became controversial after many accidents in the use of his product, including an 1864 explosion at the factory in Stockholm that killed Nobel's younger brother Emil. Undeterred, military authorities soon began experimenting with the compound for use in weaponry.

In an obituary printed erroneously in 1888, eight years before his death, Nobel was described as a man "who became rich by finding ways to kill more people faster than ever before". The writer was perhaps looking ahead too far because at that time the use of dynamite had not become established in conflicts: it was not until the first world war that it really took off as a tool of destruction.

Understandably stung, Nobel was determined to leave behind something other than a set of formulae for blowing things and people to pieces. His will provided for sufficient funds to establish a set of prizes that for more thana century have been celebrating the achievements of people in physics, chemistry, medicine, literature and economics, and for work in peace.

Nobel's name also lives on in AkzoNobel, a Dutch company that is one of the world's biggest makers of paint and evolved partly from a business he started in 1895. Elements of his work linked to warfare can be glimpsed in several companies — among them RUAG, a Swiss munitions maker, and Dynamit Nobel Defence, a German producer of tank armour — whose origins can be traced to some of Nobel's early business ventures.

"FEW HAVE LEFT SUCH A LEGACY OF CONTRASTS AS ALFRED NOBEL"

50 PIONEERS

CECIL RHODES

BY PETER MARSH

It is hard to think of anyone who has served as chairman of one of the world's best-known companies and has been more vilified than Cecil Rhodes. The British imperialist and mining entrepreneur was the founding chairman in 1888 of De Beers, the South Africa-based diamond business, now owned by Anglo American, and which since it started has been bracketed with opulence and power.

Rhodes also possessed views that few other than members of neo-Nazi organisations would now want to be associated with. In June 1877, after he became a freemason while at Oxford university, he wrote: "It is our duty to seize every opportunity of acquiring more territory. More territory simply means more of the Anglo-Saxon race, more of the best, the most human, most honourable race the world possesses.

"The absorption of the greater portion of the world under ➤

our rule simply means the end of all wars."

Rhodes is widely regarded as one of the prime forces leading to the all-out 19th-century "scramble for Africa" led by the UK and other European countries. As a result, he has been blamed by many for policies that consigned millions of Africans to lives of poverty and abuse.

The son of a vicar, Rhodes had become interested in South Africa's mineral wealth after arriving in the country in 1870 with £3,000 from his aunt to invest in business ventures. He teamed up with others to form the goldminer Gold Fields of South Africa (now Gold Fields).

But Rhodes always appeared to be more interested in politics — in particular, imposing UK-centred rule on as much of Africa as he could target — than in operating businesses.

With the help of a fortune gained from his mining operations, in 1890 he was appointed prime minister of Cape Colony, a region established by the British and later subsumed into the new country of South Africa. One of his most cherished ambitions was to create a railway along a continuous pink strip of land from Cape Colony to Cairo.

Closer to home, he introduced laws that would benefit mine and industry owners, at the expense of local people. The police force of the British South Africa Company — an administrative operation under Rhodes' control — moved into lands north of South Africa to form what became Southern and Northern Rhodesia, named in his honour. Today, these are Zimbabwe and Zambia.

The political legacy of Rhodes has not lasted nearly as well as the businesses he founded. But in his will, Rhodes left behind enough money to fund the Rhodes scholarships, which are used to tutor future world leaders in traits of "excellence in intellect, character, leadership, and commitment to service". The assistance programme for students counts former US president Bill Clinton among its alumni.

Management genius: Alfred Sloan, below, devised a blueprint for the modern corporation

> SLOAN CONSISTENTLY SOUGHT TO SUBORDINATE HIS OWN PERSONALITY TO THAT OF THE CORPORATION

50 PIONEERS: ALFRED P SLOAN

BY ROBERT WRIGHT

He trained as an electrical engineer and started in business devising roller bearings. But Alfred P Sloan's genius was nothing to do with the underlying technology of the automotive industry, which he transformed in the years after the first world war.

He was, instead, one of the first great geniuses of American management. His Organization Study, a report produced in 1919, provided the blueprint for the modern corporation, leaving individual divisions' entrepreneurial energy undimmed but allowing the central corporation to maintain control.

At a time when Ford was focused primarily on making a single vehicle — the Model T — ever more cheaply and efficiently, the Organization Study propelled General Motors towards the brand strategy most carmakers still pursue.

GM's range, from the mass-market Chevrolet to the exclusive Cadillac, was meant to offer consumers options that would ensure they stuck with GM as their tastes and priorities changed over a lifetime.

Sloan also, just as importantly, recognised that cars could be fashion statements. While Henry Ford was trying to build vehicles that would last in perpetuity, Sloan developed vehicles he knew would wear out in time. He introduced annual design changes to encourage sales.

It is perhaps easy to forget in the wake of GM's Chapter 11 bankruptcy in 2009 and subsequent scandals over some vehicles' unsafe ignition switches, that GM was the most admired company of its time. It seized market share from a once-dominant Ford and became the world's most valuable company by every measure.

Much of Sloan's thinking was developed in reaction to the chaos Sloan was horrified to discover in 1916 after Hyatt Roller Bearing, a parts supplier that he had been running, was bought by United Motors, an arm of General Motors.

GM's head then was William Durant, the company's brilliant founder, who managed GM on the gut instinct that guided many executives in the early car industry.

"Durant was a great man with a great weakness — he could create but not administer," Sloan wrote later.

Sloan sought for the first time to measure every metric affecting the company, from component costs to consumer opinions of its products.

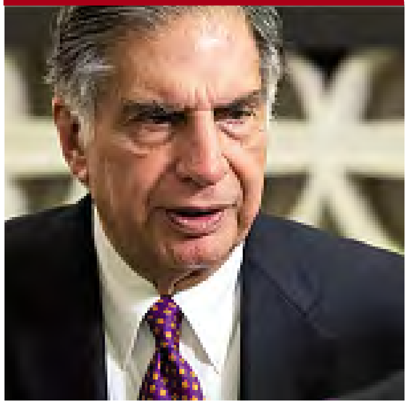
He consistently sought to subordinate his own personality to that of the corporation he helped to shape.

He was, however — according to surviving accounts of his personality — clipped, careful, cautious, correct and calculating in his behaviour. Perhaps the greatest tribute to Sloan is that it is his thinking, rather than the freewheeling style of Durant, that continues to shape corporations in the US and elsewhere. ➤

PHOTOS: LEONARD MCCOMBE/THE LIFE IMAGES COLLECTION/GETTY IMAGES; BLOOMBERG

50 PIONEERS — RATAN TATA

BY PEGGY HOLLINGER



Ratan Tata began his career in 1961 shovelling limestone and handling the blast furnace at the Tata Steel factory in Jamshedpur. But by the time he retired 51 years later, he had created an industrial conglomerate with more than 100 companies spanning 80 countries.

Tata was never destined to stay on the shop floor, given his family name. But friends say he did not lose his appreciation of the factory that those early experiences left with him.

Almost as soon as he took over from his uncle JRD Tata as head of the Tata Group in 1991, he set about taking advantage of the economic reforms sweeping India to shake up and expand a sleepy group.

He pulled out of cement, textiles and cosmetics to focus on software, telecommunications, finance and retail. At the same time, he wanted to expand internationally and chose industrial and manufacturing companies to take him into the UK with the purchase of Tetley Tea in 2000, and into Europe with the acquisition of Corus — now Tata Steel — in 2007. But it was the purchase of Jaguar Land Rover in 2008 that made Tata's reputation as a global industrialist.

When Tata Group bought the British carmaker, few would have bet on its chances of success. The company had cost its previous owner, Ford, billions of dollars over eight years and failed to deliver the necessary profitability. But Tata — at the time a manufacturer of low-priced cars and vans in India — invested heavily in updating JLR's facilities to produce top-of-the-range cars, and now even the group's once troublesome unions are generous in their praise.

On a recent visit to JLR's Halewood plant in Merseyside, Frances O'Grady, general secretary of the Trades Union Congress, held up JLR as an exemplary employer that invested in its workforce even as it sought greater productivity through automation.

The turnround at JLR has not only confirmed Tata's reputation as one of the best industrialists of his generation, but has also helped to buoy the British economy, as the UK is now exporting more cars than ever before.

Just in time: Taiichi Ohno, above; a Tata steel plant in the UK, below

50 PIONEERS — EIJI TOYODA & TAIICHI OHNO

BY ROBERT HARDING

Eiji Toyoda (above) was a pioneer in many ways: in rebuilding Japan after the second world war, turning Toyota into one of the first truly global Japanese companies, and fathering the luxury Lexus marque. But what changed the world of business was his creation, with renowned engineer Taiichi Ohno, of the Toyota Production System.

The system encompasses a host of practices, from just-in-time manufacturing to the use of *kaizen*, or continuous improvement, all aimed at eliminating waste from the process. The TPS — and less consistently the principles underlying it — have been copied and adapted all over the world.

Toyoda and Ohno formed a particular kind of business double act. Toyoda was the visionary chief executive, willing to take bold bets on new models and overseas factories, but also to instil the remarkable culture that explains why the TPS never works quite as well for others as it does at Toyota. Ohno, meanwhile, was the relentless, focused engineer who turned the ideas and principles of the Toyoda family into a systematic method for eliminating waste and constantly driving up productivity in the company's factories.

The origins of the TPS lie in a 1938 experiment by the founder of Toyota Motor, Kiichiro Toyoda, who created a flow-based system based on keeping the production line running smoothly rather than at the maximum speed.

"With our new system, making too much of anything was against the rules, and so was making too little of anything. But it was a flexible system. If you had done everything you were supposed to do, you could go home," Eiji Toyoda would later recall according to *The Birth of Lean*,

PHOTOS: BLOOMBERG; MATT CARDY/GETTY IMAGES; PASCAL PERICH

a book of interviews with Toyota managers. After the war, Japanese industry was on its knees, and seemed likely to stay that way given the vast scale advantage enjoyed by its US rivals. "The Toyota production system evolved out of need," said Ohno. "Certain restrictions in the marketplace required the production of small quantities of many varieties under conditions of low demand."

In the years ahead, the vision and drive of Toyoda and Ohno would help Toyota surpass those competitors.

50 PIONEERS

JACK WELCH

BY PETER MARSH

Famed for a hard-driving, straight-talking, "can-do" approach, Jack Welch stands out as one of the most successful industry managers of the past half-century. From an unprepossessing background, Welch ran as chief executive the sprawling operations of General Electric, the US conglomerate, for 20 years from 1981.

Welch made the company leaner and more profitable and instituted a set of business principles, based around sticking to a narrow series of core objectives, that have won him admirers in many sectors.

Welch advocated striving incessantly to make customers happy, as well as being fair to company workers. But he said that treating workers according to their merits, even if this meant sacking them, was always preferable to allowing the underperforming employees of a company to stick around when this meant reducing the chances of success for the business as a whole. This reputation for ruthlessness earned Welch, for much of his GE tenure, the epitaph "Neutron Jack", after the neutron bomb with its ability to wipe out people while leaving buildings and equipment largely untouched.

After retiring from GE — whose market capitalisation and income increased 30-fold and 10-fold respectively during his tenure — Welch has forged a new career in teaching, setting up the Jack Welch Management Institute near Washington DC. The institution, in which Welch has a leading role in engaging with students, organises online MBA courses and other facets of executive training.

But the 79-year-old has done his best to signal that his embrace of the apparently softer elements of management has not removed the rougher edges of his outlook. He scoffs at the fashionable idea of younger employees having mentors to guide them through tough periods. "Whatever you do in your career, never get a mentor, because your mentor can turn out a turkey," he told an interviewer.

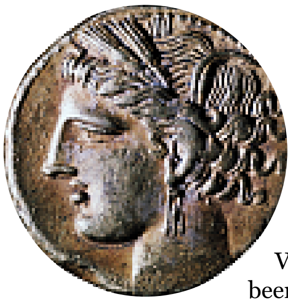
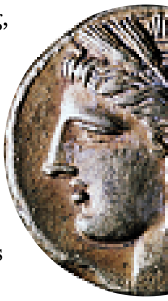
Welch was fortunate that for much of the time he held sway at GE the world economy was in a relatively benign phase. After he stepped down, managing big global corporations became a lot more complex. Welch never had to cope with the rise of China as a new economic powerhouse, the 2008–09 financial implosion and the concerns about a potential breakup of the EU.

Even though it has sometimes been hard to separate out how much of Welch's influence is down to talent and acuity as opposed to chutzpah and self-promotion, there is no denying his legacy has lived on for longer than that of most other comparable company bosses.

FINANCE

HISTORY SHOWS THERE IS NOTHING LIKE A CRISIS TO FOCUS FINANCIERS' MINDS, WRITES **JAMES MACKINTOSH**

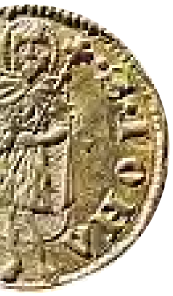


James Madison, the fourth US president, had a view of banks that was uncompromising. "The money changers have used every form of abuse, intrigue, deceit and violent means possible to maintain their control over governments by controlling money and its issuance," he said in the late 18th century while trying to stop the creation of the First Bank of the United States.

A century later John Pierpont Morgan's double rescue of the US government's finances was taken by many as evidence that Madison was right. When Morgan, founder of the eponymous bank, made immediate fat profits by selling on the government bonds he received, he was accused of a "sinister complot" to control the country, and subjected to a Congressional investigation.

In finance, little seems to change. Morgan built his reputation on trust and his fortune on smart trading tactics — what would now be called market manipulation — before using his wealth and power as a banker to dominate the railway industry.



Like many other great financiers, Morgan was a

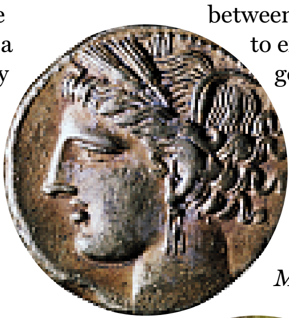
> JP MORGAN BUILT HIS FORTUNE ON SMART TRADING TACTICS

businessman, not an innovator. His initial advantage came from exploiting the big financial trend of the early 19th century — the flow of money from wealthy Europe to opportunities in the US. Later he was lucky to avoid the 1870s railway bubble, leaving him the money and connections to mop up the pieces on the cheap.

The same is true in many industries: Bill Gates did not invent the computer, John Rockefeller did not invent the oil refinery. Even so, some innovators do make a success of business, and finance is no exception. Warren Buffett is one — his success comes from great stock-picking skills but also the innovative idea of using an insurance company structure to secure high leverage without the risk that highly geared hedge funds face of having their debts called in.


In any case, financial innovation has a dire history. From note discounting to bills of exchange for silver, from fractional reserve banking to collateralised debt obligations, almost all the innovations in modern financial history have been about expanding credit and debt — fuelling booms and busts in the process.

The history of finance is of a battle between the industry's efforts to expand credit and government attempts to clamp down on them, as Charles Kindleberger points out in his magisterial documenting of the boom-bust cycle, *Manias, Panics, and Crashes*. One theory is that those who invent a new form of credit typically underprice the risk they are taking, leading to a boom. Only after the bubble bursts do their successors work out how to make money on a sustainable basis.



International banking, for example, was not invented by Mayer Rothschild, founder of the banking dynasty. Versions of it had been around since the Phoenicians, at least, and the great medieval banking families of northern Italy made large loans to kings and merchants across Europe. But Rothschild solved a large part of banking's trust problem by having his children set up in the leading capital cities, as well as being a highly capable businessman.

Financial innovation seems to be all around us today. From cash machines in the 1960s and credit cards in the 1970s to today's internet banking, computer-facilitated peer-to-peer lending and high-frequency trading measured in microseconds, technology has transformed finance. Will history decide the next great finance pioneer is one of today's entrepreneurs? Investors certainly have high hopes: online payments and peer-to-peer are valued at dotcom levels.

Yet the lesson of the past is that this time is never different. The technology may be new, but the basic principle of banking is immutable: lending money is easy — the trick is to be able to get it back. Still, if entrepreneurs can find a way to provide the same service more cheaply, they could be expected to take a fat reward, just as they would from selling any other productivity-boosting innovation.

Thomas Philippon, professor of finance at New York University's


PHOTOS: DEAGOSTINI/GETTY IMAGES; ALPTRAUM/DREAMSTIME; REUTERS

Stern school of business, has found little evidence of such a boost to productivity, at least for the finance industry as a whole. His research suggests the costs of finance to society remain fairly static, at about 1.5-2 per cent of the total amount being intermediated.

Rather than cutting the overall cost, technology seems to be used to draw previously hard-to-reach groups of customers into finance, maintaining the total cost of the industry at the same level. Bringing banking to the unbanked can make a big difference, as Grameen Bank, Muhammad Yunus's microfinance initiative, showed in Bangladesh, but extending financial services is not unambiguously good news — the world economy is still recovering from the 2007 subprime mortgage disaster.

Exactly 100 years before the stock market peaked in October 2007, a failed attempt to rig the market in United Copper shares threatened to bring down the US financial system. Morgan again rode to the rescue — and again emerged substantially richer, having persuaded the trust-busting US president to waive anti-monopoly laws to allow him to expand his steel empire as part of Wall Street's bailout.

The Panic of 1907 led to the creation of the Federal Reserve, the institution that did most to save the banks after Lehman Brothers collapsed.

> "TECHNOLOGY SEEMS TO BE USED TO DRAW IN PREVIOUSLY HARD-TO-REACH CUSTOMERS"

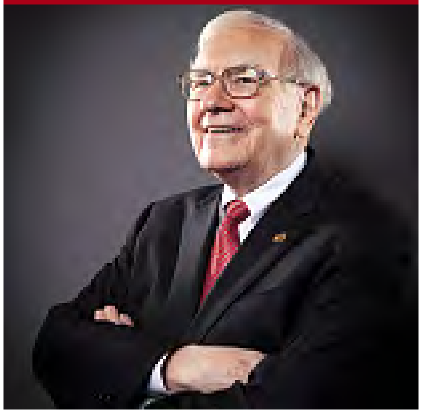
But some things stay the same: Buffett made chunky profits on the money he injected to support Goldman Sachs during the latest crisis.

If Rothschild or Morgan were around today, they would surely be filling their wallets from the money that continues to flow through the financial industry. But it is not obvious they would be leaping on the latest innovations, at least until they had been seasoned by a crisis.

50 PIONEERS

WARREN BUFFETT

BY JOHN AUTHERS



Warren Buffett stands as a reproach to almost everyone else who has tried to make a living from investing. Indisputably the greatest investor ever, the scale of his achievement is hard to comprehend.

Berkshire Hathaway, the struggling textiles company he bought 50 years ago, is now the third-largest company in the US by market value, and the world's biggest conglomerate.

Buffett's fortune has placed him among the world's two or three richest men. And this has been backed by the investment performance of Berkshire Hathaway: since 1980, the S&P 500 — the most widely used measure of the US stock market — has gained 1,850 per cent, compared with Berkshire's growth of 84,000 per cent.

How did he do it? Buffett's annual letters to investors, and his frequent loquacious appearances in the media, give plenty of hints. A student of Benjamin Graham, who invented value investing — a system for beating the market by buying stocks when they are cheap and out of favour — Buffett applied the technique to successful companies. If a company had a "wide economic moat" — a sustainable competitive advantage — he would buy it, even if it did not look a complete bargain.

He also grasped that great performance was possible only if he did not diversify too widely, stuck to companies and industries he understood and held stocks for many decades. In all of these respects, Buffett looked utterly unlike most investment management products sold to retail investors today.

He was also opportunistic. As Berkshire grew bigger, Buffett sought out deals that took advantage of its size, buying companies outright, or operating as a lender of last resort —➤

at high interest rates — during the crisis of 2008 when banks were unwilling to lend. He is not always long-termist, sometimes making short-term killings on the foreign exchange or commodities markets.

There are other criticisms. Berkshire's companies tend to be well-entrenched operators in traditional industries, rather than bold innovators. Berkshire manages its taxes as aggressively as anyone — despite its founder's folksy populism. And there is the question of who can possibly succeed Buffett, now in his 80s.

But the greatest question is how he did it. His simple-sounding ideas are almost impossible to implement in practice, yet he has managed to do so.

Full of value: foodmaker HJ Heinz is a typical Berkshire Hathaway holding

AMADEO GIANNINI

50 PIONEERS

BY JOHN AUTHERS

If anyone can claim to have brought banking to the middle and working classes, it was Amadeo Giannini. The founder of Bank of America revolutionised banking in the US, and left behind him the biggest commercial bank in the nation.

Seven decades after his death, the bank continues to provide the backbone of the biggest consumer banking franchise in the US. But the positive image he created of the banker as a pillar of the community is long gone.

The son of Italian immigrants who arrived in California in the 1849 gold rush, Giannini left school young to work as a trader of agricultural produce. He only entered banking when he set up the Bank of Italy in San Francisco in 1904, at the age of 34. His idea was to serve migrant workers who could not find financing anywhere else.

The migrants turned out to be very disciplined and focused workers, and excellent credit-risks — a combination of attributes that would also spur the growth of microcredit in the developing world many decades later.

Giannini achieved national fame after the San Francisco earthquake of 1906, when he set up a temporary bank to help ease citizens' desperate straits. According to legend, he funded this with $2m he had retrieved from the rubble of his bank's headquarters. He then built Bank of Italy branches throughout California, servicing different migrant communities. This dispersed model was a radical departure in the US.

In 1930, Bank of Italy became Bank of America, and took on a new heroic role financing infrastructure projects (including San Francisco's Golden Gate bridge) as the US tried to weather the Great Depression. It was also in on the birth of Silicon Valley, seeding the business that would become Hewlett-Packard.

In 1998, Bank of America was bought by North Carolina's NationsBank, led by buccaneering chief executive Hugh McColl, in one of the biggest bank deals in history. The new bank keeps the BofA name, but it is based in Charlotte, North Carolina, and no longer maintains the Giannini populist ethos.

Throughout most of history bankers have tended to be disliked; Giannini gave Americans a banker they could love.

> "KRAVIS HAS BECOME AN ELDER STATESMAN OF THE INDUSTRY"

HENRY KRAVIS

50 PIONEERS

BY HENNY SENDER

Walk into the airy offices of KKR overlooking New York's Central Park and one might be forgiven for thinking one has arrived at a venture capital firm, given the edgy modern art on the walls. The message is clear: better to look forwards than backwards.

The former Kohlberg Kravis Roberts may be the most venerable private equity firm around. Other firms may have more money under management and a better track record, but no single founder of any of the big alternative investment firms has the brand name or star quality of Henry Kravis (pictured below) the co-founder of KKR.

It is not just that Kravis and his cousin George Roberts were the pioneers who survived as others, such as Forstmann Little, failed to adapt to changing times. It is that the two men have presided over the institutionalisation of a firm that is far more closely identified with its founders than any of its peers such as Blackstone or Carlyle.

Along the way, they have fostered a culture that remains both entrepreneurial and collegiate. For example, Joe Bae was only 33 and not even a partner when he was sent by the firm to Hong Kong to kickstart its Asian business. Today, that business is so highly regarded by investors that KKR Asia raised $6bn in record time for its second fund for the region. (Bae is now a partner and is likely to be one of the successors when the two founders finally decide to step aside — which they show no sign of doing.)

Kravis hates the description of KKR as the original barbarians at the gate, also the title of the bestseller describing KKR's (highly) leveraged buyout of RJR

Nabisco in 1988, at the time the largest takeover in Wall Street history. Indeed, the cover of the book describes RJR Nabisco as the "victim of the ruthless, rapacious style of finance in the 1980s". Perhaps it was. But at the same time, the executive management of RJR Nabisco was all about entitlement, and contempt for shareholders. KKR executives were just as much the original activist investors as they were the *enfants terribles* of finance at that time.

Today, Kravis appears to relish the respect in which he is held. He has presided over initiatives to improve the lives of workers, softening the adversarial relationship with the unions at companies in the KKR portfolio such as HCA, the hospital chain. He has made sure that KKR-owned companies are committed to the best environmental practices, such as recycling the cardboard at retailer Dollar General.

And without much fanfare, he is one of the great philanthropists of New York. The former *enfant terrible* has become an elder statesman of the industry.

50 PIONEERS

JOHN PIERPONT MORGAN

BY JOHN AUTHERS

For better or worse, John Pierpont Morgan shaped the modern American economy and the financial services industry that serves it. The most powerful banker who ever lived, his legacy lives on a century after his death — although in some cases, this is because politicians and regulators have deliberately changed the rules to ensure that nobody can ever again amass the same power enjoyed by the original JP Morgan.

Morgan took over what was already a flourishing transatlantic banking business from his father, shortly after the end of the US Civil War. In his early years, he was a pioneer of international banking, persuading Europeans to finance explosive US growth as the growing nation rebuilt after the war, and constructed its continental infrastructure — a phenomenon only since matched by the growth of China in the past few decades.

He used his powers as a banker to become a corporate matchmaker, spotting that the interests of bankers and shareholders were best served if companies could be combined into large trusts, thus cutting costs — and eliminating competition. US Steel and other monopolistic titans emerged from his work.

Morgan also became the world's first financial firefighter, leading attempts to quell several financial panics throughout the late 19th century, culminating in his masterly performance averting disaster during the Panic of 1907. He was the convenor of negotiations, and the financier of last resort. Crowds watched in awe as he strode along Wall Street between crisis meetings.

Largely in response, the Federal Reserve was created — politicians realised it was dangerous to leave such critical public policy to a private individual. Subsequently, legislators tried to thwart such an accumulation of power by splitting investment and commercial banking with the 1933 Glass-Steagall Act, meaning Morgan's empire has ever since been represented by both JP Morgan and Morgan Stanley. Those names still adorn two of the world's most powerful banks. The antitrust battle against the monopoly power that Morgan abetted also continues to this day.

Some critical aspects of the way Morgan did business have gone. The consummate relationship banker — "insider" to his critics — Morgan believed in judgment and in dealing only with people he trusted. Asked about the importance of collateral, he said character was far more important: "A man I do not trust could not get money from me on all the bonds in Christendom."

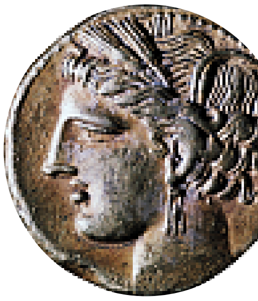
50 PIONEERS

MAYER ROTHSCHILD

BY JOHN AUTHERS

Mayer Amschel Rothschild founded the greatest of all banking dynasties, and one that enjoyed what was possibly at one time the greatest of all fortunes. He also defined the concept of the international banker, creating for the first time a power that might even be able to contend with nation states themselves.

The patriarch of the Rothschild bankers, he was born in the Jewish ghetto of Frankfurt am Main in 1744. After a brief apprenticeship at a bank he went into business as a dealer in rare coins. The business naturally expanded into the difficult area of foreign exchange, in those days fraught both by the lack of the deep and liquid market that exists today, and by the wars and revolutions that split Europe during his lifetime.

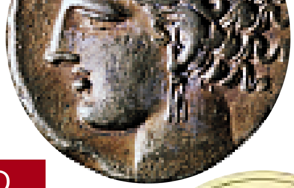


He rose to be the personal banker for the Landgrave of Hesse-Kassel, one of the electors who selected the Holy Roman Emperor, a position that added greatly to Rothschild's power. He could then issue his own bonds, using capital from the Landgrave.

Perhaps his unique insight was to see the importance of an international dimension to banking, and to plan deliberately for an international banking dynasty. He sent his sons ➤

"ROTHSCHILD DEFINED THE CONCEPT OF THE INTERNATIONAL BANKER"

PHOTOS: DEAGOSTINI, HULTON ARCHIVE, CULTURE CLUB/GETTY IMAGES; ALPTRAUM/DREAMSTIME; CORBIS; BLOOMBERG



to Vienna, Naples, London and Paris, as well as Frankfurt, where they would all set up their own powerful new outposts of the Rothschild empire. These "five arrows" of banking gave a vital source of advantage. If his clients had difficulty gaining access to funds, his international network could do it for them.

Famously, the Rothschilds raised money to allow the British to fight the Napoleonic wars, in a lucrative undertaking that led to the aphorism that you should "buy when there is blood in the streets".

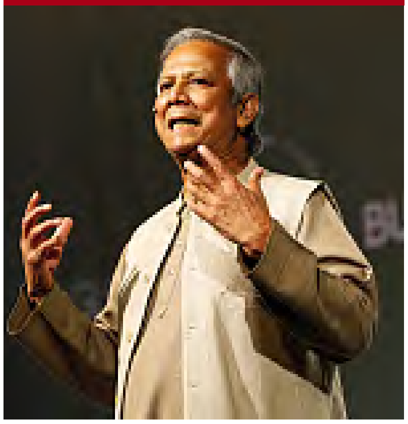
From there, Mayer Amschel's sons moved on to dominate 19th century European finance, to build what at its apex might have been the greatest fortune ever assembled, and to spark myriad conspiracy theories. Perhaps no family has ever suffered more and wilder accusations, as a quick internet search for the words "Rothschild" and "Illuminati" will show.

The family remains powerful to this day, although the model of keeping tight control through a family has long been superseded. Governments, now wise to the fact that the power to control the money supply can make bankers more powerful than politicians, have tried to ensure international bankers can no longer wield so much power. But seven generations on, Mayer Amschel's descendants still run many businesses across the world, and they have branched out into new areas, notably fine wine.

50 PIONEERS

MUHAMMAD YUNUS

BY ANDREW JACK



Muhammad Yunus may not have invented microfinance, but he is the man most closely associated with it in the modern world. His championing of small loans to the poor in Bangladesh — and the related idea of social business — has spread around the world. At home the same socially responsible values are very much in evidence in BRAC Bank, for example.

Born in Chittagong, then in East Bengal, in 1940, Yunus pursued research in economics, moving to the US to study for a doctorate. But the war that led to the independence of Bangladesh in 1971 drew him home. Within three years, at a time of famine and persistent poverty, he grew frustrated with university teaching and focused on working directly with the poor.

In 1976, he began offering very small loans without security to the

poor, notably women, to bypass loan sharks, initially extending the money interest-free and then underwriting bank loans himself, while insisting on immediate and regular repayments by instalment.

That became the basis for Grameen Bank ("the bank of the village"), which in 2013 made 7m loans totalling $1.6bn. Its model has since been exported to many other countries, even the US.

His efforts won Yunus and the bank a joint Nobel prize in 2006 — for peace rather than economics. "Yunus's long-term vision is to eliminate poverty in the world," the jury concluded. "That vision cannot be realised by means of microcredit alone. But Muhammad Yunus and Grameen Bank have shown that, in the continuing efforts to achieve it, microcredit must play a major part."

Microfinance has faced growing criticism, however, with accusations that in many countries the interest rates are usurious and that it misallocates finance at the expense of mid-sized and larger enterprises while doing little to alleviate poverty.

A study in Hyderabad in India in 2015 by Esther Duflo of Massachusetts Institute of Technology concluded it had made little difference to lifting households out of poverty. "Microcredit may not be the

> "THE ROTHSCHILDS' 'FIVE ARROWS' OF BANKING SET UP A VITAL SOURCE OF ADVANTAGE"

'miracle' it is sometimes claimed to be, although it does allow some households to invest in their small businesses," she concluded.

Grameen came under criticism, with Sheikh Hasina Wajed, Bangladesh's prime minister, accusing it of "sucking blood from the poor". Yunus himself became embroiled in a battle for control with the government and stepped down as head of the bank aged 70 in 2011.

Undeterred, he continues in books and speeches to champion "social business", which, like Grameen, reinvests profits rather than paying out dividends.

War on poverty: the microcredit approach of Muhammad Yunus has divided opinion

PHOTOS: DEAGOSTINI, AFP/GETTY IMAGES; ALPTRAUM, POPOV48/DREAMSTIME; REUTERS

SOVEREIGN WEALTH FUNDS

THE INVESTMENT VEHICLES OF OIL-RICH STATES ARE EXERTING AN EVER GREATER INFLUENCE, WRITES **SIMEON KERR**

The collapse in crude oil prices over the past six months has put many countries under fiscal pressure. But some oil-rich producers, such as Norway, Abu Dhabi and Kuwait, are in a more comfortable position thanks to longstanding commitments to ring-fence oil revenues into funds to preserve the value of their hydrocarbon resources.

The term "sovereign wealth fund" has only existed for a decade or so, but state vehicles seeking to provide for future generations have been investing for decades, with Kuwait's fund going back to 1953. The work of these organisations has been pioneering in building and using wealth.

"Oil is sold and turned into a financial asset — the idea is to preserve the value of that money in line with inflation, plus some extra," says Victoria Barbary, director of Institutional Investor's Sovereign Wealth Center, a research service.

The larger funds are savings vehicles that aim to turn government surpluses into inter-generational wealth carriers for their youth, while some have also launched development funds focusing on diversifying domestic economies.

The oil boom of the 2000s raised the profile of these generally opaque investors, prompting concerns about the market impact of funds that make up a significant chunk of global equity markets. Many introduced policies to boost transparency, although the larger Gulf funds still keep the size of their assets under management secret.

The Abu Dhabi Investment Authority (Adia), founded in 1976, has delivered annualised returns of 8.3 per cent over a 30-year period, according to its 2013 annual report.

Since 2010, Sheikh Hamad bin Zayed Al Nahyan, a half-brother of the United Arab Emirates president, has run the fund, which has developed a reputation in global markets as a sophisticated investor, says Barbary.

Operating separately from the government, Adia has not only built a portfolio estimated at $750bn, but its policy of attracting foreign talent has transformed the fund into a training academy for young Emirati executives.

Kuwait Investment Authority, formed in 1953, is one of the oldest sovereign wealth funds. It controls an estimated $550bn and has taken a more conservative approach than Adia, perhaps because of the constant scrutiny of Kuwait's rumbustious parliament.

Qatar came late to the sovereign wealth fund party, launching the Qatar Investment Authority only 10 years ago. The fund grew rapidly as it invested the state's gas revenues in a future-generations fund and raised the tiny Gulf state's global profile. With assets of around $250bn, the QIA has become one of the biggest property investors in London and Paris.

Sovereign wealth funds' long-term horizons makes them ideal infrastructure investors. "They have been moving into the world of real assets, such as real estate and infrastructure. They are also using private equity more than in the past," says Nick Tolchard, head of Invesco Middle East and co-chair of Invesco's global sovereign group.

Adia has also been more aggressive in pursuing property assets in recent years, most recently seeking to bid for the Maybourne Hotel Group, owner of Claridge's, the Berkeley and the Connaught in London.

Norway's 25-year-old oil fund, the Government Pension Fund Global, the biggest sovereign fund in the world, is also looking to diversify away from its mandated focus on listed equities into assets such as property. Norges Bank Investment Management, the fund's manager, is building its expertise in property as it seeks to raise its allocation to that sector to 5 per cent by 2016.

While seeking returns in more exciting emerging markets is a theme at these institutions, Invesco's research has shown sovereign wealth funds still find developed markets to be the most reliable for long-term returns.

PIONEERS OFTEN WORK BEST ON THE FRONTIER, WRITES RICARDO BLAUG

A list of just 50 leading business pioneers is bound to demand brutal choices. Perhaps as brutal as the methods that some will have employed to warrant their place in this group.

But this is no homogeneous list. There are many ways to be such a pioneer. Certainly, everyone on the FT tally of 50 combines a fine business mind with energy and action — all have done something shockingly new, caught the wind of their times and effected significant change. But the list includes quite different types of innovation and distinct contexts of economic development.

Some exploited stable environments in clever ways. They identified formerly unseen sources of value or benefited from an active and developing nation state. Others seemed to thrive in the complete absence of stability, exploiting rapidly changing business environments and showing others how to adapt to them. The scale of such pioneers' contribution is evident in the endless flattery of imitation. It became normal to make cars on a production line, to go on package holidays abroad, to own a smartphone. Pioneers make the formerly invisible obvious.

They do so by operating in unstructured space. Across history, the age-old struggle between marauding nomads and static defensive farmers shows that innovation comes mostly from those who roam outside civilised space. Pouring westward across the Asian steppe, it was the nomadic Mongols and Huns who perfected mobile warfare and developed new forms of political order. Afterwards, of course, when the civilised wrote history, they claimed such innovations for themselves.

But it is in disordered territory that the pioneers really show their character. When the old is dead, when order has

broken down, when the rules suddenly change or regulation is absent — this is when we see their almost pathological boldness and vision. Economic and political imperatives drive innovators to occupy and exploit empty space, like water surging on to a flat plain. Such places often lie beyond the reach of the state, as in the US frontier, or in the space left by the degeneration of states, as in post-Soviet Russia.

Before the international order of nation states came into being, tribal leaders and warlords ruled the world and drove its economic development. Though primitive in their social structures, with rigid hierarchies and brutal tactics, these warlords opened trade routes, transported knowledge between cultures and finally co-ordinated their actions in ways that put their nomadic past behind them. Once settled, they founded empires and states that were ordered, stable and civilised.

It is often said that business seeks a level playing field, but this is only when businesses feel the field is tilted against them. Genuine business pioneers are those who forge ahead over rough and pitted terrain, often cheating, borrowing and stealing, testing the rules and acting without morality. They are robbers who – almost by accident – change the world.

To exploit unexplored niches, pioneers must be idealistic, unrealistic and preferably also narcissistic. They must see the obstacles everyone sees and, quite unreasonably, imagine they can be overcome. They have an inner irritant that drives them beyond the status quo, rejects mere mimicry and conceives of the impossible. It is their inflated vision of their own capacities, their impatience with subordinates and their unbounded energy that makes them step forward from the ranks and risk the new. Charisma is what really marks them out.

The term "robber baron" was applied in the late 19th century to US businessmen who operated at the edge of the rule of law. They did this partly by influencing government and partly by finding ways to exploit labour and repress unionisation. Theirs was a space uninhibited by (adequate) regulation of monopolistic practices and they rushed in to fill it.

Such ruthlessness is familiar in the development of every civilisation. Examples can be found among Europe's past empire builders, or more recently among Russian oligarchs and Indian and Chinese entrepreneurs. Indeed, it is so familiar as to be almost a required part of the development of every culture. Even when charisma shades into hubris, arrogance and even brutality, as it so often does, nomadic pioneers are eventually civilised, their crimes forgotten and the world forever changed.

This shaping of history is being repeated constantly. Modern business pioneers, like those who preceded them, now operate against the backdrop of a general-purpose technology revolution. As with the arrival of the horse, steam and then oil, the internet offers ample room for outrageous innovation, the indulgence of narcissism and hubris, unrealistic visions of the future and the creation

THE SCALE OF PIONEERS' CONTRIBUTION IS EVIDENT IN THE ENDLESS FLATTERY OF IMITATION ”

of a new normal. Today we live in "neo-medieval" times. Even now, warlords and nomadic pioneers are fashioning a world we cannot presently see.

Ricardo Blaug is author of How Power Corrupts: Cognition and Democracy in Organisations *and is an associate professor at the University of Westminster, specialising in political psychology and democracy*

PHOTO: CHROMORANGE/THORSTEN NIEDER/ALAMY

WOMEN

ACCESS TO FINANCE REMAINS A PROBLEM FOR FEMALE ENTREPRENEURS, SAYS **MAIJA PALMER**

The women on the FT's list of leading business pioneers have built sizeable businesses and personal fortunes. US talk show host Oprah Winfrey's net worth is estimated at $3bn; fashion designer Miuccia Prada's at $4.7bn. Anita Roddick's Body Shop was sold to L'Oréal, the French cosmetics group, for £652m in 2006. Beyond the pure numbers their businesses have had lasting effects: The Body Shop made the idea of cosmetics free of animal testing mainstream.

But the list is short — just six of the FT's 50 leading pioneers are female and nearly all concentrated in the field of fashion and beauty. This reflects a broader pattern. Just five of the FTSE 100 leading companies on the UK stock exchange are headed by a woman. In the US, just 23 of the Fortune 500 companies have a female chief executive.

When it comes to female entrepreneurship, a similar ratio persists. A range of everyday items, from disposable nappies to dishwashers and the circular saw, were invented by women, and women are not holding back from founding companies — about a third of all companies in the US are female-owned. But when it comes to the very largest companies, the percentage of female ownership drops away, according to a 2012 study commissioned by American Express Open, an issuer of credit cards for small businesses.

Access to finance is part of the problem. Of all the statistics, the really surprising one is this: just 2.7 per cent of all the venture capital finance raised in the US between 2011 and 2013 went to companies led by women, according to a study by Babson College in Massachusetts.

Women such as Sara Blakely, whose Spanx shapewear business has made her a billionaire, have been able to bootstrap their businesses with little venture capital involvement. But if investment finance were made easier to come by, might more women make it big?

"I never thought of my gender when I was growing my business. I was too busy thinking about winning contracts," says Dale Murray, who co-founded and sold a mobile phone technology company in the UK in the early 2000s. "But there is something persistent here. The fact remains that the venture capital community is male-dominated."

Women's need to balance work and caring responsibilities is certainly a factor. Many women, sometimes dismissed as "mumpreneurs", set up companies to fit around school and nursery hours and may not want venture backing. Those who do may struggle to convince investors that their family commitments will not get in the way.

"Personal reasons", understood to include family commitments, top the causes of 25-34-year-old female UK entrepreneurs deciding to shut down their businesses, according to a study by RBS, the banking group.

Network effects are part of the problem, says Candida Brush, chairman of the entrepreneurship division at Babson College. "Women are not in the network of venture capitalists and VCs have no incentive to look outside their homophilous group. [VC investors] do not have to work as hard when they stay with the same entrepreneurs again and again." Many Silicon Valley tech companies, such as PayPal, Tesla,

PHOTO: RAYMOND MCCREA JONES/REDUX/EYEVINE

Facebook and Yelp, were built up by a relatively small group of entrepreneurs and funders backing each other's businesses.

The venture capital industry has, if anything, become more male-dominated in recent years. The proportion of women partners at US venture capital firms dropped from 10 per cent in 1999 to 6 per cent in 2014, according to a Babson study. Meanwhile, a high-profile sex discrimination case against Kleiner Perkins Caufield & Byers, a Silicon Valley VC firm, paints a picture of a world in which women may find themselves deliberately excluded from deals.

> "THE FACT REMAINS THAT THE VENTURE CAPITAL COMMUNITY IS MALE-DOMINATED"

In shape: Sara Blakely's Spanx shapewear business has made her a billionaire

Murray's view of the sector is less extreme. She insists that good teams find money regardless of gender. But she admits, when pressed, that the relentlessly male environment can be draining. This is partly why Murray, named British Angel Investor of the Year in 2011, is stepping back from this type of financing.

Boston-based Breakaway Innovation Group is one VC trying to rebalance gender ratios. It has partnered with Babson College to run a competition to find the best female-led businesses, with a $250,000 investment as first prize.

Getting more women to the pitching stage would be the best way to change things, argues John Burns, chief investment officer of Breakaway. "If five per cent of the people who pitch me are women, I would be surprised."

"There is such a big discrepancy between the percentage of women in the workforce and the percentage of women receiving VC dollars. It is just a huge untapped opportunity."

PEOPLE TO WATCH

SOME INDIVIDUALS LOOK ESPECIALLY LIKELY TO BE PIONEERS IN THE MAKING, SAYS **MICHAEL SKAPINKER**

How long do you have to have been in business to be a business pioneer? The judges spent time debating the merits of some newer faces in business. A few were clearly creating path-breaking businesses, but would they be remembered in 50 or 100 years?

There are many social, business and technological developments that seem important at the time but later fade without having the expected impact. Think, for example, of the Concorde supersonic passenger jet. When it first flew, many predicted most air passengers would, by now, be flying faster than the speed of sound.

The judges could not be sure, of course, which of the new faces would make a lasting impact, but they felt, in the end, that Mark Zuckerberg of Facebook (see page 10) had done enough to help develop the social side of the internet to warrant inclusion.

Two who came close were Elon Musk, the technology, space and electric car entrepreneur, and Jack Ma, a leader in Chinese ecommerce. Some judges argued for their inclusion; others felt it was too early to say. The judges concluded these too should be profiled as ones to watch.

JACK MA

BY CHARLES CLOVER

Catapulted into the ranks of the global super rich by the listing of his ecommerce company Alibaba, Jack Ma has always been something of an enigma in his native China. Now worth about $19bn, he represents a new phenomenon: the top ranks of China's rich lists until last year were dominated by real estate moguls — now most are internet entrepreneurs.

Few things say more about the power of the emerging private sector in the nominally communist country than this. Ma has long been a cult figure in China but came to global attention when he offered investors the chance to own a slice of the fastest-growing internet market in the world — masterminding the largest ever listing on the New York Stock Exchange, raising $25bn, in September.

The value of goods sold on Alibaba make up about 6 per cent of total retail in China, and the company handles about 70 per cent of Chinese ecommerce transactions. This is probably just the beginning, considering half of China is still offline. With 632m people using the internet, the country will soon overtake the US as the world's biggest ecommerce market.

He is godfather of China's scrappy entrepreneurial spirit, an enthusiast of martial arts and an keen entertainer whose parents were showbusiness performers.

Ma is a true innovator — his contemporaries have mostly copied established business models to create "China's Google", "China's Amazon" or "China's Twitter". But when Ma started Alibaba in his apartment in 1999, this type of business-to-business ecommerce website did not exist.

Unlike Amazon, Alibaba has no inventory or logistics, and does not sell anything itself, aside from space on its servers and advertising for its search engine. It is a pure platform — the only thing it sells is traffic.

One analyst likened it to an open-air flea market: "They say, 'we'll bring in the shoppers, we'll rent you [the] floor space, you are responsible for making the money.' Jack Ma transferred that whole model online. [Alibaba drives] traffic to the site and the merchants do the rest."

The company is branching out into finance, transport, healthcare and logistics, seeking to use the power of ecommerce to rationalise state-dominated ("antiquated" in the words of Joe Tsai, executive-vice chairman) sectors of the Chinese economy by injecting them with competition, speed and marketing nous.

How that game plan will play out is not yet certain. But with Alibaba's multi-billion-dollar warchest and vast experience "disrupting" industries in China, few are betting against it.

PHOTO: AFP/GETTY IMAGES

ELON MUSK

BY ANDY SHARMAN

It is fun to count the ways in which Elon Musk is unlike every other car industry chief executive. He owns about a fifth of Tesla Motors, the electric car maker. He also runs a space exploration outfit, SpaceX, and would like to be on Mars in the next few years.

Musk, who was born in South Africa, established his business credentials by co-founding and later selling PayPal, the electronic payment service, for $1.5bn in 2002.

His charisma, messianic vision to electrify transport and entrepreneurial chutzpah are beyond question. He inspires adoration and loyalty among the employees who can cope with the relentless pace. "I've worked with cabinet-level officials at the White House. I've worked with high-level executives in the tech industry," says Ricardo Reyes, Tesla's communications chief. "Elon's the most brilliant person I've ever worked with."

Musk has shown a different way of operating in the world of cars, considered one of the most disruptable industries. Tesla's $70,000 saloons are all-electric and offer 250-plus miles of range. They can be fuelled on Tesla's own, free "supercharger" network and are only sold through Tesla showrooms, some of them in shopping malls. The company uses "over-the-air" software updates to upgrade everything from the infotainment system to the suspension.

There are signs the industry is catching on to the ideas Musk is championing. Makers of upmarket cars are increasingly incorporating zero-emission powertrains into their vehicles, propelled by legislation possibly more than commercial hopes. Mass-market brands such as Opel in Europe are embracing wireless software updates. And Toyota, the world's biggest car company, opened up its hydrogen fuel-cell patents in January, copying a similar move by Tesla in June.

> "MUSK HAS SHOWN A DIFFERENT WAY OF OPERATING IN THE WORLD OF CARS, ONE OF THE MOST DISRUPTABLE INDUSTRIES"

Tesla thinks of itself not as a carmaker but as a technology company that happens to build cars. But as a listed entity in an established manufacturing industry, it cannot evade the scrutiny of financial analysts or constant benchmarking against rival carmakers.

Many in the industry see Tesla as a company that has shaken the tree but has yet to achieve scale — making about 35,000 cars versus BMW's 1.8m — or even profitability.

It had a head start by picking up a factory on the cheap in the depths of the downturn. But having been founded in 2003, its teenage years are likely to be characterised by the awkward task of achieving mass-market scale with the upcoming Model 3 car.

The space business has also faced delays and failed launches. But no one said getting to Mars would be easy.

JUDGES

MICHAEL SKAPINKER

Michael Skapinker, who chaired the judging panel, is an FT columnist who writes about business and society, and is an associate editor. Born in South Africa, he began his journalistic career in Greece and joined the FT in London in 1986. Since then he has held many positions, including management editor, FT Weekend editor and editor of FT Special Reports. His weekly column has earned him numerous awards including Business Commentator of the Year at the 2012 Editorial Intelligence Comment Awards.

JOHN GAPPER

John Gapper is the FT's chief business commentator and an associate editor. He writes a weekly column about business trends and strategy, as well as writing leaders and other articles. He has worked for the FT since 1987, covering labour relations, banking and the media. In 1991-92, he was a Harkness Fellow of the Commonwealth Fund of New York, and studied US education and training at the Wharton School of the University of Pennsylvania.

JANNIK LINDBÆK

Jannik Lindbæk Jr, vice-president of corporate communications at Statoil, the Norway-based international energy company, is responsible for media relations and internal communications. Before joining Statoil in 2010, he was senior vice-president of corporate communications at Aker Solutions and director of communications at Microsoft Norway. He has a degree in political science from the University of Bergen and an MSc from the London School of Economics.

HEATHER McGREGOR

Heather McGregor is the chief executive and principal shareholder of executive search firm Taylor Bennett. A former investment banker, she has an MBA from London Business School and a PhD from the University of Hong Kong. She was one of the group of women who helped Helena Morrissey start the 30% Club in 2010 to lobby for more women on boards. She writes the Mrs Moneypenny column in the appointments section of the FT.

JAIDEEP PRABHU

Jaideep Prabhu is professor of marketing and Jawaharlal Nehru professor of Indian business and enterprise at Judge Business School, University of Cambridge. He has held positions at Cambridge, Imperial College London, Tilburg University and the University of California, Los Angeles. His research interests are in marketing, innovation, strategy and international business. In particular, he studies various cross-national issues concerning the antecedents and consequences of innovation.

JESSICA SPUNGIN

Jessica Spungin is an adjunct associate professor of strategy and entrepreneurship at London Business School. She also works as an independent consultant advising senior executives on the interface between getting strategy and effective organisation. Before this she spent 15 years at McKinsey, the consultancy, and was a partner in its London and Johannesburg offices. She led McKinsey's organisation practice in Europe.

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