

FLASHES

A MONTHLY MAGAZINE ON KNOWLEDGE AND DEVELOPMENT
BY THE MOHAMMED BIN RASHID AL MAKTOUM FOUNDATION

NOVEMBER 2016
ISSUE 23

#2016YearOfReading

The Stars shine down in Stockholm

The Nobel Prize winners of 2016



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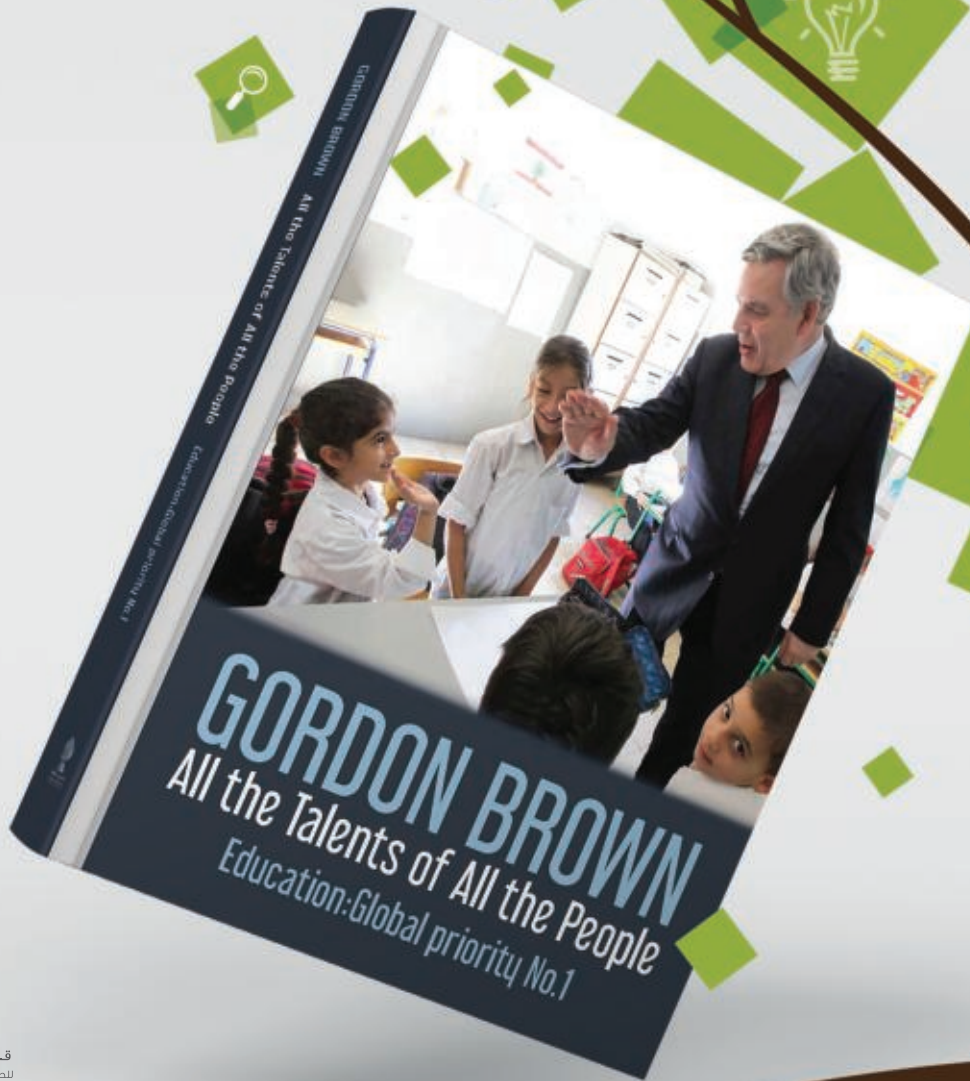
New Release

“We need Education without borders
A Schooling without frontiers”

A Book by

GORDON BROWN

United Nations Special Envoy for Global Education



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FOREWORD

Dear readers,

The UAE has embraced ambitious targets in Vision 2021, which includes the UAE National Agenda that defines a set of 52 indicators in the sectors of education, housing, economy, police and security, housing, infrastructure, and government services.

In a recent address to the nation, His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, highlighted that the country had achieved much in the past decade, but there was still work to be done in the five years leading to 2021. His Highness then gave the results of a detailed report he had received about the current progress in achieving these indicators. It stood at 62 per cent, which means 38 per cent of the indicators had not been effectively achieved. In order to ensure that 100 per cent of the National Agenda's goals will be reached, Sheikh Mohammed gave a directive to form government teams called "The National Agenda Execution Teams".

One area His Highness mentioned was that the UAE had risen from being the world's 32nd most competitive economy to the 16th in the past decade. However, by 2021 the UAE aims to be in the Top 10

countries on the World Economic Forum's annual Global Competitiveness Index (GIE). In our story in this issue we highlight what steps are being taken to achieve this aim, as well as the key indicators that are being targeted.

Another area where the UAE has made great strides is in diversifying its economy away from oil. In his address, Sheikh Mohammed stated that the economic contribution of the non-petroleum sector has increased from 66 per cent a decade ago to some 77 per cent today.

One sector that plays an important role in the UAE's economic diversification is Leisure & Entertainment (L&E). As a result the UAE has invested heavily in creating new attractions with the recently opened IMG Worlds of Adventure, the world's largest indoor theme park, being just one such example. More theme parks will follow shortly and according to estimates by International Expo Consults the parks could bring in around \$5bn in annual revenue by 2020. You can read more about this in our Business of Amusement feature.

Jamal Bin Huwaireb

MD of Mohammed Bin Rashid
Al Maktoum Foundation



A Decade of Achievements and Five Years of Challenge Ahead

In an address to the nation on 15 October, His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, highlighted that the country had achieved much in the past decade, but there was still work to be done in the next five years.

Sheikh Mohammed began his address by stating that it was a decade ago that he had assumed the position of Prime Minister and Vice President of the United Arab Emirates. His Highness said: "In those 10 years, we have launched a number of plans and strategies, led a number of reforms of our government, developed systems to track performance and improve services and encouraged innovation and the application of technology across all sectors."

Sheikh Mohammed said it was important to occasionally pause and review the UAE's past work, measure accomplishments and chart the road ahead. "Today, reviewing the past 10 years' work, we stand on a path leading in the next five years to the year 2021, the year which we set as our target year for many objectives and goals," His Highness said.

The UAE, through legislation and policies, has highlighted the importance of diversifying the economy away from dependence on oil. His Highness said: "Our non-petroleum exports have increased from 113 billion dirhams when I assumed office to 603 billion dirhams (including free zone trade) in the past year. The economic contribution of the non-petroleum sector has increased from 66 per cent to some 77 per cent today." Sheikh Mohammed also highlighted that the UAE had risen from being the world's 32nd most competitive economy to the 16th. Foreign Direct Investment had seen a sharp increase from 179 billion to 410 billion dirhams in the

past 10 years. Over the same period, expenditure on the health sector increased from 1.18 billion dirhams to over 3.82 billion currently, while public sector expenditure on education rose by 57 per cent to reach 9.75 billion dirhams annually.

His Highness highlighted that: "The UAE leads the Middle East today in over a hundred pivotal development indicators. In fact, our nation leads globally in a number of indicators, such as the quality of our public infrastructure, public safety and security and government efficiency and trust in the government, among others."

"A few years ago, we announced the indicators for our National Agenda. There are 52 national key performance indicators in education, health, housing, society, infrastructure, economy, environment, security, justice, and safety, among others, which we aim at achieving by 2021, to be among the best countries globally by that date. These indicators form historic goals for us in the next five years."

Sheikh Mohammed then gave the results of a detailed report he had received about the current progress in achieving these indicators. It stood at 62 per cent, which means 38 per cent of the indicators had not been effectively achieved. His Highness said: "Today, we issued a directive to form government teams called 'The National Agenda Execution Teams'. The teams comprise 550 members of our government across all sectors and departments, responsible for fulfilling the indicators. The teams will be under my direct supervision to intensify our efforts, mobilise our assets, and redouble our work in the coming period, in order to reach one hundred per cent of the goals of our National Agenda by the year 2021." 🏆

Tolerance Award and Institute Launched

The UAE has a reputation for tolerance, as evidenced by the fact that the country is home to some 200 nationalities. Now the country is encouraging tolerance through a global initiative, and by honouring champions of tolerance throughout the world. The 'Sheikh Mohammed bin Rashid Award for Tolerance', which was launched by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, aims to create a foundation for developing young Arab leaders in the field of tolerance and providing support to the intellectual, cultural and media promotions of values of tolerance and openness.

Sheikh Mohammed further announced the establishment of the International Institute for Tolerance, which will be the first of its kind in the Arab world. It will offer consultation, advice, and expert views on policies for promoting values of tolerance among nations. The Institute will also publish studies and research reports on tolerance, and coordinate with relevant authorities to instil principles of tolerance in the younger generations.

The Institute will further support Arab and international researchers, contribute to developing educational systems, and publish social studies on the root causes of fundamentalism, seclusion and sectarianism.

The Award and Institute are the latest to join the Mohammed Bin Rashid Al Maktoum Global Initiatives,



Above and left: The 'Sheikh Mohammed bin Rashid Award for Tolerance' will lay the foundation for developing young Arab leaders in the field of tolerance and providing support to the intellectual, cultural and media promotions of values of tolerance and openness.

a relief, philanthropy and development organisation that includes over 30 specialised subsidiaries. The Mohammed Bin Rashid Al Maktoum Global Initiatives aims to enhance the quality of life for 130 million people in the coming 10 years.

Sheikh Mohammed said: "The UAE has established itself as a global role model for tolerance and we cherish it as

a key value. Yet, we intend to transform that value into a sustainable institutional work that will reflect positively on our peoples in the Arab world".

The Mohammed Bin Rashid Al Maktoum Global Initiatives will include five categories, three of which will be dedicated to honouring champions of tolerance in human thought, literary creativity and the arts. †

UAE National Agenda for Youth Launched

The UAE National Agenda for Youth is the first of its kind in the UAE and aims to provide an enabling environment for UAE youth to achieve their objectives and enhance their leadership.

His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, said at the launch that youth are the strength of any nation and its hope for a better future, and the country's prosperity and future, lie in their hands.

The Agenda creates a national framework and a vision for serving the development needs of the youth and making them global role models. The Agenda was launched based on suggestions that were submitted by the UAE youth during a two-day youth retreat in Dubai that was attended by ministers and young leaders in the country.

A number of specialised youth centres will be launched across the UAE as part of the Agenda, such as Youth Creativity Centre, Youth Media Centre, and Youth Cultural Centre. †



Regional Campus of Global Innovation Leader 1776 Inaugurated

His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, opened the regional headquarters of the Global Innovation Leader 1776 at Emirates Towers in Dubai on 10 October.

This is the Washington, D.C.-headquartered 1776's first international campus, although it has additional campuses in New York and San Francisco. The new 1776 campus, as well as the Dubai Future Foundation's Dubai Future Accelerators (DFA), were inaugurated on the same day by His Highness.

Saif Al Aleeli, CEO of the Dubai Future Foundation, said: "1776 is the first international technology incubator to set up a direct presence in the Middle East and North Africa (MENA). We are pleased to have them as our partner to provide custom services for the Dubai Future Foundation, its member entities, and the DFA startups, following our MOU signing last April".

Three of 1776's global startups – Civil Maps, Alesca Life and Ecoisme – have been selected for the DFA's first acceleration cycle to work with Dubai Police, Dubai Municipality, and the

Dubai Electricity and Water Authority (DEWA). All DFA startups will also have access to 1776 Dubai campus programming.

Evan Burfield, 1776 co-founder & co-CEO said: "As a founding member of the Startup Federation, which was launched at the 2016 Global Entrepreneurship Summit in Silicon Valley, 1776 is also reaching out to incubators and accelerators across the Middle East and North Africa (MENA) to join dozens of top-tier international incubators and accelerators already in the Federation, thus creating a single global network for startups, institutions and investors to learn, engage and collaborate".

1776 is a public benefit corporation that scouts and funds high-growth startups around the world focused on solving society's most fundamental challenges in sectors such as education, energy, transportation and financial services. 1776 serves hundreds of startups and institutions worldwide through its innovation curriculum, mentorship, investment and programming. It hosts more than 500 international events per year that attract heads of state, Fortune 500 CEOs, influential investors and global press. [↑](#)



UAE Hosts Top-notch Talents

His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai, said that the UAE hosts the best minds in the world as it aims to shape the future.

Sheikh Mohammed's comments were made as he inaugurated the Dubai Future Accelerators (DFA) programme at its headquarters in Jumeirah Emirates Towers.

The programme is an initiative by the Dubai Future Foundation and aims to cement Dubai's – and the UAE's – position as an international hub for designing the future. The DFA connects government departments with the world's most innovative companies to find solutions for the most pressing challenges facing the world in the 21st century. The programme enables the UAE to benefit from the advantages of next-generation technology and the fourth industrial revolution by partnering directly with cutting edge technology companies.

"The United Arab Emirates embarks on a new era today," said Sheikh Mohammed, "one where we establish a government that proactively plans for the future, and sets a future-focused economic example for the world, setting both the plans and the tools to achieve them in the process." [↑](#)



Jamal bin Huwaireb, Managing Director of MBRF with Ali Matar, Head of LinkedIn Talent Solutions.

MBRF Signs Agreement with LinkedIn, Launches “Arab Professionals Forum” Initiative

The Mohammed bin Rashid Al Maktoum Foundation (MBRF) signed an agreement on October 13 with LinkedIn to increase cooperation between the two parties and launch a number of joint, knowledge-focused initiatives in the Arab region.

The agreement was signed during a press conference held by MBRF, which is part of Mohammed bin Rashid Al Maktoum Global Initiatives, at the Hyatt Regency Dubai Creek Heights hotel.

The first key part of the agreement was the launching of the “Arab Professionals Forum” initiative on LinkedIn, which will attract top global Arab subject-matter experts, academics and scientists, and serve as a platform where experts can communicate directly with regional and global Arab talent. The Forum will serve as a platform where highly qualified Arab talents can interact with international and regional organisations in order to share knowledge and help Arabs build their skillsets, and abilities in both their career and professional lives.

His Excellency Jamal bin Huwaireb,

Managing Director of MBRF, said: “The Foundation is keen to enter into alliances and agreements with government and private institutions in the UAE and internationally, in an effort to exchange experiences and effectively contribute towards building knowledge-based societies, as well as reaching out to Arab innovators and professionals everywhere.”

HE further explained that MBRF’s cooperation with LinkedIn guarantees positive results, as the latter enjoys a global reach and already serves as a specialised platform for professionals and experts in all sectors. LinkedIn has built close ties with key government and private institutions, such as MBRF, which gives employers access to the best available talent, and makes candidates aware of career opportunities. MBRF’s role will be to set the criteria by which Forum members will be selected.

However, the Arab Professionals Forum aims beyond jobs and careers by helping all Arabs make use of their talents in the workplace and beyond.

Forum members will share their knowledge and experience to encourage others to develop their capabilities and maximise opportunities.

Ali Matar, Head of LinkedIn Talent Solutions for Southern Europe, Middle East, North Africa and Growth Markets, said: “We, at LinkedIn, are honoured to be collaborating with the Mohammed bin Rashid Al Maktoum Foundation on the ‘Arab Professionals Forum’. The initiative resonates very well with LinkedIn’s commitment to provide the best solutions and opportunities for our members in the Arab region.”

The Arab Professionals Forum will shortly be joined by other initiatives from MBRF and LinkedIn to form a comprehensive series of facilities aimed at developing the expertise and capabilities of the Arab people’s human capital. According to future plans this concept will become a Global Forum to promote talent in all societies.

LinkedIn is the world’s largest and widest network of professional communication with a membership of 450 million. [↑](#)

Global Strategic Partnership Between MBRF and Frankfurt Book Fair

There are thousands of creative events taking place globally every year, ranging from book fairs to technology shows. However, one missing element is a global platform where all members of the Creative Industries can see and exchange ideas on the future of the content business.

Such a platform is now a step closer as the Mohammed bin Rashid Al Maktoum Foundation (MBRF) and Frankfurter Buchmesse (Frankfurt Book Fair) plan to form a global strategic partnership for the development of media and content-related projects and events. This new content-related platforms would start as a first step in Dubai and the wider Arab region, before targeting the entire world.

In this regard His Excellency Jamal bin Huwaireb, Managing Director of MBRF, and Juergen Boos, director

of Frankfurter Buchmesse, signed a Letter of Intent at THE MARKETS – Global Publishing Summit, the conference that signalled the beginning of the Frankfurter Buchmesse (19-23, October 2016).

The aim of this partnership is to create conventions and interdisciplinary business platforms dedicated to the current and future challenges of the new and increasingly complex creative ecosystem. By bringing together global players from all Creative Industries, the events will provide a comprehensive overview of the developments in the content market. The aim of the global partnership is to facilitate knowledge exchange and showcase the potential of cooperation across industries and geographies.

HE Jamal bin Huwaireb said: “The partnership offers a perfect opportunity

to present the potential and dynamics of the Creative Industries in the Arab world and to connect it to the global content business. As one of the initiators we are delighted to be associated with this new partnership and to be driving this exciting project.”

“Book fairs, film festivals, games, and art or technology shows – there are thousand of industry events taking place all over the world. What’s still missing is a global marketplace that meets the needs of the new creative ecosystem by bringing together all Creative Industries – including media, technology, design and art – from all over the world on an equal footing to discover the future of the (united) content business,” said Juergen Boos. “In cooperation with the Mohammed bin Rashid Al Maktoum Foundation, the Frankfurt Book Fair would like to close this gap”.¹



His Excellency Jamal bin Huwaireb and Juergen Boos, director of Frankfurter Buchmesse signed a Letter of Intent at THE MARKETS – Global Publishing Summit

MBRF Delegation Visits Japan

A delegation headed by His Excellency Jamal bin Huwairb, Managing Director of the Mohammed Bin Rashid Al Maktoum Foundation (MBRF), visited Japan to explore and create new avenues for collaboration with Japanese Cultural institutions.

HE Bin Huwairb met with Shinjiro Komatsu, the Japanese Deputy Minister of Education, Culture, Sports, Science and Technology. They examined the successful methods that Japan has used to establish a reading culture among its youth, and explored how these initiatives could be adapted and implemented in the Arab region.

HE also met with Professor Tadashi Uchino of the University of Tokyo to introduce the Mohammed bin Rashid Al Maktoum Knowledge Award, as well as to explore ways for Japan and the Arab region to exchange knowledge and expertise.



Mr Komatsu Deputy Minister Education, and HE Jamal bin Huwairb

HE Bin Huwairb's final visit was the Japan Foundation in Tokyo, one of the country's top institutions that is dedicated to carrying out comprehensive international cultural exchange programmes. The two parties explored ways to boost cultural and knowledge exchange between Japan and the Arab

region. A successful exchange programme for writers has already been established between Japan and the UAE, and the Japan Foundation is keen to send more scholars to Arab countries to study the early links between Japan and the region in the areas of trade and commerce, and literature.

"The Mohammed bin Rashid Al Maktoum Foundation is keen to build bridges of knowledge cooperation and exchange with countries and peoples all around the world," noted HE bin Huwairb.

HE bin Huwairb added: "We look forward to cooperating with our Japanese counterparts, and to learn from their experience in the fields of knowledge and education. This is particularly pertinent as Japan is regularly ranked among the top nations in the world in terms of science and reading – a sector that the Foundation places great emphasis on."

Strategic Partnerships and Cooperation Agreements with Leading Private Sector Entities

The Mohammed Bin Rashid Al Maktoum Foundation (MBRF) concluded its first successful participation at GITEX Technology Week 2016.

During the event from 16 to 20 October, MBRF signed a number of agreements and MoUs (Memorandums of Understanding) with several leading agencies and private sector entities.

The Foundation signed an MoU with AMIDEAST Company to strengthen cooperation and coordinate joint efforts to serve the community. MBRF and AMIDEAST will explore initiatives and sustainable programmes to enhance R&D to foster a new generation of scientists, thinkers and researchers in line with the UAE National Agenda 2021.

MBRF also signed a partnership agreement with Aramex, the Dubai-based global provider of transportation services and logistic solutions. Aramex

will provide comprehensive transportation services and logistics solutions for all participants of all events and activities organized by MBRF around the world. The first step in this cooperation was the sponsorship by Aramex of the 'Nobel Museum in 2015', organised by MBRF in Dubai annually.

His Excellency Jamal bin Huwairb, Managing Director of MBRF, said that MBRF's participation in GITEX Technology Week had been very rewarding. At the event, MBRF highlighted smart applications that contribute to a qualitative leap in enriching Arab e-content.

His Excellency said: "AMIDEAST and Aramex have extensive experience in different fields that will contribute to the provision of logistical support for events organised by the Foundation around the world."



MBRF signed an MoU with AMIDEAST (top) and Aramex (above).



THE MIGHTY ERUDITE

Athens has been named UNESCO World Book Capital for 2018. The programme intends to democratise the written word for the city's populace, including its immigrants and refugees

It is perhaps apt that the cradle of Western civilisation should reclaim its erudite leanings with such élan – and Athens is indeed poised for a renaissance of sorts by being chosen as UNESCO World Book Capital for 2018. Irina Bokova, the Director-General of UNESCO, bestowed the honour on the Hellenic city on the recommendation of the programme's Advisory Committee. According to UNESCO, "The city of Athens was chosen for the quality of its activities, supported by the entire book industry." In keeping with the theme of spreading knowledge to the people, the programme will feature talks with celebrated authors, translation workshops, concerts, themed exhibits, poetry readings and interactions with professionals from the publishing industry.

One of the reasons Athens is an appropriate fit for the programme is its world-class cultural infrastructure and its long-standing know-how in curating international events. A series of events will kick-start Athens' innings as the 18th World Book Capital on 23 April 2018, which also happens to be World Book and Copyright Day.

Reacting to the news, the current International Publishers Association (IPA) president, Richard Charkin, said, "Ever since my predecessor, Pere Vicens, proposed the idea for a World Book Capital in 1996, it has been about celebrating and promoting literacy and reading culture. Our warmest congratulations go to Athens, which put in a fantastic bid this year. This ancient city naturally corresponds with the values of the World Book Capital initiative, and I am sure will deliver an outstanding programme in 2018."

"UNESCO's decision is an honour. It reflects Athens' international appeal and



Photo: Getty Images



Above: Children enjoy an event in the Polish city of Wrocław, this year's UNESCO World Book Capital.

enhances our strategic pursuit to turn our city into a modern cultural destination," said Athens' mayor Giorgos Kaminis.

HISTORY OF THE WORLD BOOK CAPITAL PROGRAMME

Despite Athens' formidable reputation as a historical and contemporary centre of culture, competition has been fierce for the title of World Book Capital ever since the programme began. An Advisory Committee, comprising representatives of UNESCO, the International Publishers Association (IPA), and the International Federation of Library Associations and Institutions (IFLA), met at UNESCO's headquarters in Paris to select the winner. This was more difficult this year than ever before due to a record number of candidacies. However, it was Athens who walked away with the laurels.

A precursor to the World Book Capital concept was the astounding success of World Book and Copyright Day, celebrated on April 23, which was launched in 1996. It encouraged UNESCO to build on the idea of a World Book Capital City, starting with Madrid in 2001. This initiative was met with such international enthusiasm that UNESCO made it an annual affair. It is also fitting that the day chosen to kick-start World Book Capital Day is April 23, a date on which many

renowned authors were either born or passed away: Cervantes, Shakespeare, Inca Garcilaso de la Vega, Maurice Druon, Haldor K. Laxness, Vladimir Nabokov, Josep Pla and Manuel Mejía Vallejo are some luminaries associated with World Book Day.

HOW A CAPITAL IS SELECTED

Cities that wish to be chosen for the honour of being a World Book Capital need to present a detailed programme of how they will promote books and encourage reading in the one-year period starting from 23 April. The selection committee examines the following criteria:

- A. The depth of the one-year programme conceived by the competing country.
- B. A financial plan on how funds will be allocated to appropriate programmes and strategies.
- C. The impact of the one-year programme at a municipal, regional, national and international level.
- D. The quantity and quality of the proposed programme in terms of national and international organisations participating, and the roster of writers, publishers, booksellers and librarians representing the city's one-year celebration of the written word.
- E. Whether the number and quality of projects will indeed promote literature and reading among the public.



- F.** If the programme fosters the principles of freedom of expression and freedom to publish and disseminate information in accordance with the UNESCO Constitution, as well as by Articles 19 and 27 of the Universal Declaration of Human Rights and by the Agreement on the Importation of Educational, Scientific and Cultural Materials (Florence Agreement).
- G.** In addition, by participating the chosen city also commits itself to associate UNESCO and the three associations of the selection committee in its campaigns throughout by displaying logos, etc. It will also present reports on the activities implemented through the year.

To make the process more inclusive and offer it the necessary heft, UNESCO brought on board the International Publishers Association, the International Federation of Library Associations and Institutions, and the International Booksellers Federation to participate in the nomination process. More importantly, these organisations also gave the programme a three-pronged thrust from all the three major branches of the book industry. The programme is unique in the sense that it does not carry any monetary prize; instead, it gives a much-needed congratulatory nod to the remarkable initiatives across the world that promote books and reading activity among citizens.

A CELEBRATION OF CULTURE: HOW WROCLAW WON THE DAY THIS YEAR

For 2016, the selection committee chose Wrocław, a city in Poland, “in light of the strong assets of its programme in terms of quality and variety” and “for its special focus on grass-root community involvement, as well as promotion of publishing,



bookselling industries and libraries at regional and international levels”.

Wrocław is special by many standards: Poland’s fourth largest city boasts an enviable combination of stunning baroque architecture, hypnotic riverside vistas and a buzzing nightlife thanks to its lively student population.

In her congratulatory letter, the Director-General of UNESCO Irina Bokova wrote that: “Wrocław had been awarded this uniquely prestigious distinction in recognition of the city’s preparation of an outstanding programme aiming at the promotion of reading among a broader audience for a whole year”. Incidentally, the Polish city is also the European Capital of Culture this year.

The opening night featured a Korean Night in which bibliophiles had the rare chance to meet with Iwona Chmielewska, author of *Maum*, which was first published in Korea and has been awarded the prestigious Bologna Ragazzi Award, also called the Nobel Prize of children’s literature. Other highlights included the official opening of the Goethe-Institut Pop Up Pavillon, combined with a meeting with writers Olga Grjasnowa and Filip Springer.

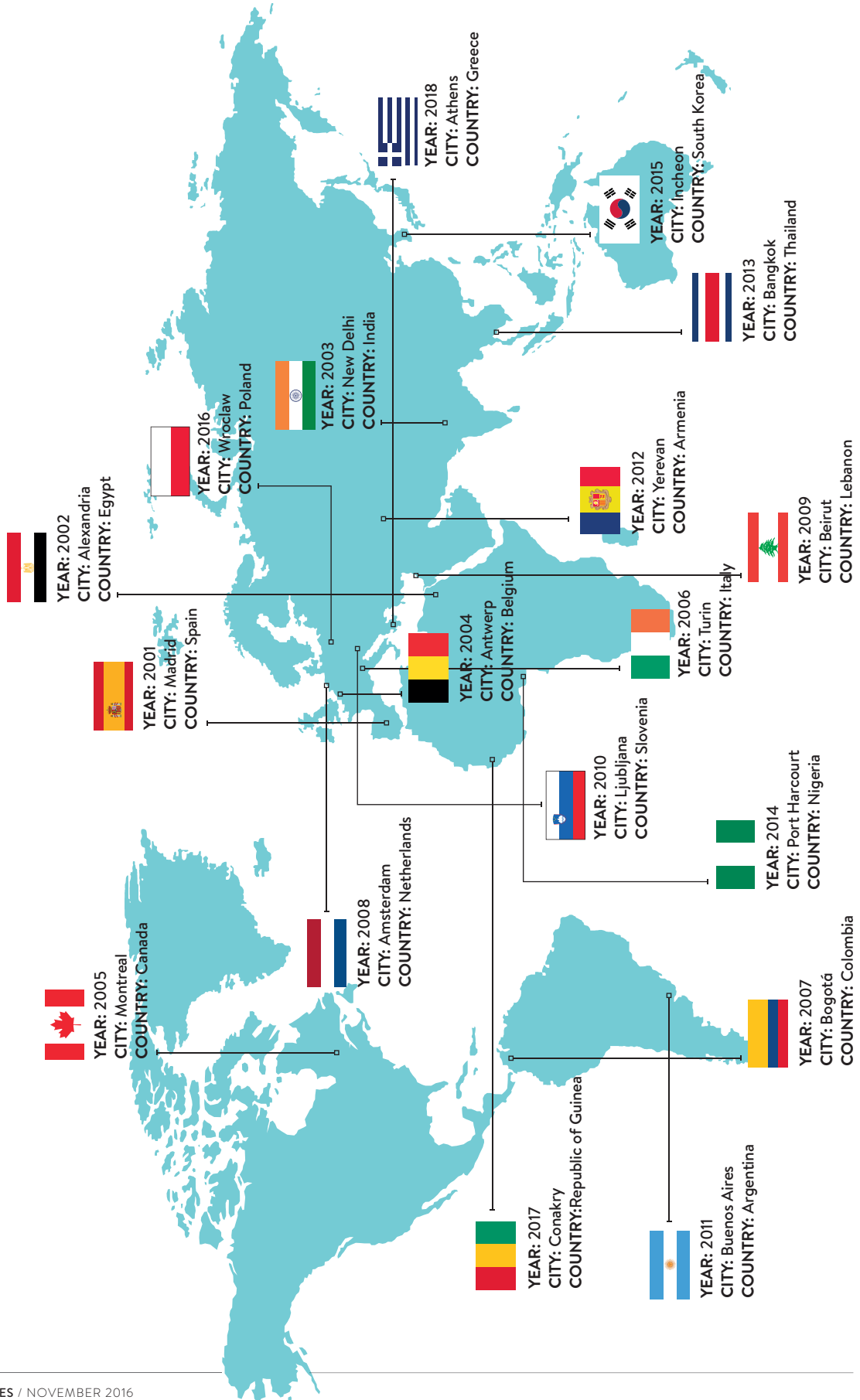
Lovers of crime fiction were delighted to interact with Norwegian superstar Jo Nesbø. In addition, it being the 400th anniversary of Shakespeare’s death, a range of events was dedicated to the bard. Thespians representing Helena Modrzejewska Theatre from Legnica presented fragments

Left: Athens is striving to reinvent itself as a modern cultural destination. **Above:** Depiction of the Royal Library of Alexandria.



UNESCO WORLD BOOK CAPITALS

Past, present and future cities
Source: UNESCO





of the British master's famous plays, accompanied by the music of Kormorany and wearing costumes designed by Malgorzata Bulanda.

THE RENAISSANCE IN BEIRUT

When Beirut was given the honour of UNESCO World Book Capital in 2009, it came at a time when the Arabic novel was enjoying a renaissance across the Middle East. Not only was Arabic literature taking on topics hitherto untouched by earlier generations, it was also producing more novels than ever before. "More than 100 novels were up for the International Prize for Arabic Fiction (the Arab version of the Booker Prize) in 2008/2009 – and that's an unprecedented number," said Fakhri Salih, a former jury member for the award and current chairman of Jordan's Association of Literary Critics. Beirut was picked as the world's literary centre in 2009 "in the light of its focus on cultural diversity, dialogue and tolerance", according to the UNESCO selection committee. Bibliophiles have always had much to draw from Lebanon, since every April it hosts a plethora of book readings. Among the books highlighted in 2009 were Egyptian novelist Youssef Zeiden's *Azazil*, which focuses on the Arab world around the Mediterranean circa 5th century ACE. In addition, the Arabic novel received a further boost when Egyptian author Ala al-Aswany released *The Yaacoubian Building*. "The production of novels in Gulf countries exploded



in recent years," said Rana Idriss, head of the Al-Adab publishing house in Beirut. In 2005, for example, Saudi author Rajaa Alsanea found fame with *Girls of Riyadh*, a book that traces the lives of four young women in the Kingdom. "Individualism and the ego awoke in the Arab world through the novel," declared Lebanese author Jabbour Doueihy.

When Alexandria in Egypt was anointed the World Book Capital in 2002, UNESCO's selection committee perhaps took into account its significance to the world of letters and its priceless history in the context of education itself. The Royal Library of Alexandria or Ancient Library of Alexandria, after all, was one of the largest and most relevant libraries of the ancient world. By choosing Alexandria as the World Book Capital in 2002, UNESCO threw light on a literary legacy that went back centuries.

The Arab world is home to internationally acclaimed writers such as Egypt's Nagib Mahfuz and Sudan's Tayeb Salih, author of the 1966 bestseller *Season of Migration to the North*. However, reading culture has been on the wane and governments across the region are taking measures to promote the habit among its citizens. In this regard, the UAE is at the vanguard with its remarkable initiatives, such as the Reading Nation campaign that plans to provide five million books to students in refugee camps and establish 2,000 libraries in the Islamic world. ♪

Above: Norwegian author Jo Nesbø poses for pictures during the signing of his novel *The Bat*.

Above right: Promoting reading is the main thrust behind the UNESCO World Book Capital event.



THE BUSINESS OF AMUSEMENT

2016 will go down as Dubai's year of the theme park with the opening of four mega-attractions, and more are set to follow. But what impact will it have on Dubai's economy?

The hospitality, leisure and tourism industry sector is a key economic pillar that supports the UAE Vision 2021 and the National Agenda, which aim to make the UAE the region's economic, tourism and trade capital. This sector also plays a pivotal

role in Dubai's far-reaching aims to diversify its economy. Currently, Dubai is the world's most visited city after London, Paris and Bangkok. In 2001, Dubai attracted 9.3 million visitors, the number grew to 14.3 million in 2015 and by 2020



– the same year as the Dubai Expo – the target is 20 million visitors. Another telling statistic is that Dubai has the world's highest visitor per resident ratio, a number that grew from 4.9 visitors in 2009 to 5.7 in 2015.

In order to keep visitor numbers growing, Dubai is consistently adding new attractions to its portfolio. IMG Worlds of Adventure, the world's largest indoor theme park with a size equivalent to 28 football fields, opened its doors on August 31. IMG Worlds of Adventure is the first global theme park to bring international brands Marvel and Cartoon Network together, in addition to two proprietary brands IMG Boulevard and Lost Valley – Dinosaur Adventure.

Dubai Parks and Resorts, which started a phased opening on October 31, will become the Middle East's largest multi-themed leisure and entertainment destination when completed. It comprises three separate theme parks: Motiongate Dubai, a Hollywood movie inspired theme park concept; Legoland Dubai, the first Legoland theme park in the Middle East; and Bollywood Parks Dubai, a first-of-its-kind theme park that will showcase the authentic Bollywood movie experience. Construction on Dubai Parks and Resorts' fourth theme park, Six Flags Dubai, began in June this year with its opening scheduled for late 2019. Furthermore, Dubai Parks and Resorts still has undeveloped land that is earmarked for another three theme parks in the future.

Dubai Safari Park, a 119-hectare zoo, is slated to open later this year or early in 2017. This \$40.8 million project will house close to 1,000 animals, with more than 350 species of rare and

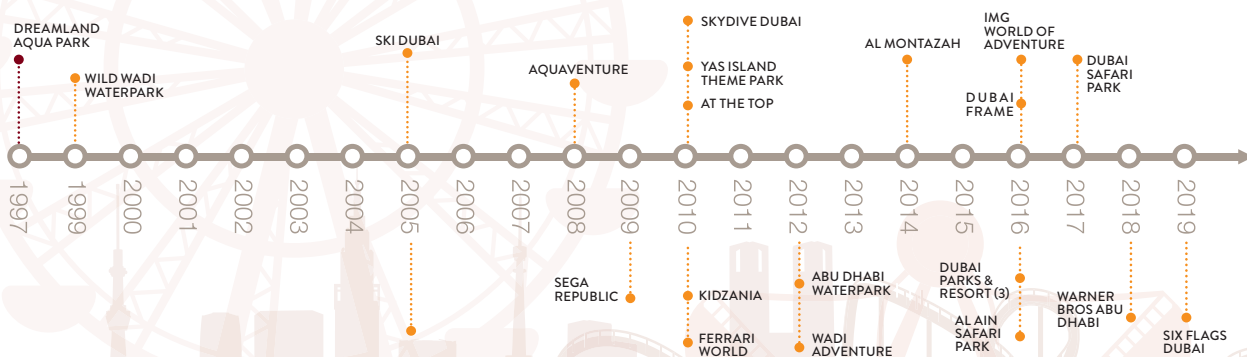
endangered animals. By 2020, Warner Bros World in Abu Dhabi and Twentieth Century Fox World in Dubai will be added. At a combined cost exceeding \$6 billion, it is clear that theme parks represent a major investment for the UAE.

The undisputed theme park capital of the world is Orlando, Florida, in the United States. In 2014, Florida drew a record 97.3 million visitors, with 73 million visiting Orlando's seven theme parks that generated \$21.1 billion in revenue that year according to estimates by consultants AECOM and PwC. According to Forbes, the average per capita spend at US Theme Parks will be \$146 in 2017, rising to \$160 by 2021.

These figures indicate that Florida is a highly successful Leisure & Entertainment (L&E) centre. The hallmark of a successful L&E centre is a location that has numerous offerings in close proximity that appeal to a wide range of holidaymakers. According to Forbes, among the most popular of these offerings are beaches, resorts, nature, and cultural activities. A successful L&E destination also creates a seamless, convenient and consistent experience for its visitors. The leisure and entertainment assets themselves become the driver of tourist growth and help increase the length of stay, rather than being isolated and independent attractions without critical mass. Due to their wide appeal, the L&E segment is regarded as a high-growth industry.

The UAE, with its beautiful beaches, numerous resorts, cultural offerings, and growing number of theme parks is perfectly positioned to become an important L&E centre. More importantly, the infrastructure is already in place to create that >

UAE L&E LANDSCAPE TIMELINE





The first completed model for Legoland Dubai is readied for installation.

all-important seamless, convenient and consistent experience for visitors. In a report published last year, consulting firm PwC concluded that Dubai and the broader UAE had the potential to compete with the likes of Orlando thanks to the necessary groundwork already being done by developing transport links, accommodation, a thriving retail sector and a comprehensive food and beverage sector. As a result, PwC found the UAE could support an expanding L&E segment capable of attracting 45 million visitors by 2021.

The UAE, particularly Dubai, has the first mover advantage into the theme parks business with their currently being no regional competition. Singapore, which had 6.7 million theme parks visitors in 2013, is geographically the closest one. Furthermore, the UAE is within four hours flight of three billion people. According to Lennard Otto, CEO of IMG Worlds of Adventure, Dubai's strategic location should give the emirate an advantage. "One of Dubai's key differentiating factors is its location. Until now, large-scale, themed entertainment parks were only available in other parts of the world for those prepared to travel long distances. Look at Emirates Airline's direct flights to Orlando. They are full, just for people to go and visit theme parks. There is an appetite in this market place. Dubai is now shaping up to be Orlando 2.0. The infrastructure here is far superior to that of Orlando. Within the next five years we will have the same amount of large-scale theme parks."

Opinions differ on what impact theme parks will have on the UAE's economy. PwC expects 18 million theme park visitors in 2021 and the UAE's L&E market to reach 45 million. Phil Taylor, managing director of Team Leisure, says the UAE's visits to outdoor attractions currently number 10 million, but that is expected to reach over 30 million by

2020. Dubai Parks and Resorts – the operator of Motiongate, Bollywood Parks, and Legoland Dubai – is expecting more than 6.7 million ticketed visits in 2017. Abu Dhabi's upcoming Warner Bros theme park is expected to increase the number of visitors to Yas Island from 25 million in 2015 to 30 million by 2018. According to estimates by International Expo Consults the parks could bring in around \$5bn in annual revenue by 2020.

The numbers are amazing and not only add up to significant long-term revenues as the country continues its wide-ranging economic diversification efforts, but also serve as a catalyst for Dubai's tourism ambitions. Dubai Parks and Resorts' chief executive officer, Raed Kajoor Al Nuaim, believes that 70 per cent of their visitors will be tourists. As a result related industries, ranging from retail, construction to infrastructure and real estate could also see knock-on benefits from tourism growth and growth of new tourism segments – including family tourism, experiential tourism and entertainment.

One such beneficiary will be the hotel sector. As Dubai aims to welcome 20 million visitors per year by 2020, and in an effort to accommodate these visitors, it is encouraging the building of new hotels. It has set a target of 160,000 hotel rooms by 2020.

INTERNATIONAL OVERNIGHT VISITOR SPENDING IN DUBAI



Dubai is the 4th most visited city in the world after London, Paris and Bangkok.



Photo: Getty images



Bollywood Parks
Dubai pays homage
to India's film
industry.

According to TOPHOTELPROJECTS, an online database for hotel projects, there are 190 hotels in the UAE construction pipeline, of which 138 are set to open in Dubai by 2022. Theme parks will also lead directly to the creation of a new sector, namely hotels in the parks themselves that offer a complete family experience.

There is also expected to be a knock-on effect on the timeshare industry. According to Mohannad Sharafuddin, chairman and chief executive officer of Arabian Falcon Holiday, "The timeshare market will grow exponentially in 2017, surpassing the growth rates of 15 to 20 per cent per year, and heralding a new era with an annual growth rate of 50 per cent, primarily driven by tourists visiting these theme parks." A study by Ernst & Young for the American Resort Development Association, a trade association representing the vacation ownership and resort development industries, revealed the US timeshare industry contributed an estimated \$68.7 billion in consumer and business spending to the national economy in 2013.

The food and beverage sector is also expected to double from the 2014 number to \$7.5 billion in 2018. More visitors also mean growth for the UAE's airports. In 2014, Dubai International Airport surpassed Heathrow to become the world's busiest airport with around 70 million international passengers per year. Al Maktoum International Airport will help Dubai airports to cater for an expected 240 million passengers by 2027.

Another positive aspect for the UAE's L&E

future is its cultural diversity and sensitivity. From Dubai's Global City through to the annual Dubai Shopping Festival, efforts have always been made to be as inclusive as possible. The theme parks also need to deal with the very diverse cultures of visitors from within the Middle East, Asia and Europe. The opening of Bollywood Parks Dubai, for example, is a nod to Indian culture and a positive step to diversify itself from the standard 'Made in America' theme park.

The final and most important aspect for the UAE's L&E market is the high coordination between stakeholders. As long as government departments responsible for infrastructure, tourism authorities, hospitality owners, and operators and destination management companies continue to share a common vision, the future for the UAE's L&E market will remain as bright as a fairground attraction. [f](#)

Motiongate has
areas dedicated
to Sony Picture
Studios, Dreamworks
and a complete
Smurfs village.



THE STARS SHINE DOWN IN STOCKHOLM

From the science of a pretzel to nanocars, from the mysteries of yeast to the intricacies of an employment contract, the Nobel Prize winners this year have thrown light on things you'd rarely see with the naked eye

A new range of luminaries was introduced to the world with the Nobel Prize in Physics, Chemistry, Medicine, Economics and Literature announced recently. From “topological phases of matter” to molecular machines to the intricate economics of “contracting relationships”, the world has been enriched by award-winning intellects from laboratories and workshops in the UK, United States, France, Netherlands and Japan. Naturally, there was also some controversy with Bob Dylan winning the Nobel Prize for Literature, which proves the times they are a-changing’.

TOPOLOGY GETS THE LIMELIGHT

The Nobel Prize in Physics 2016 was shared by three Britons: one half of the award went to David J. Thouless of the University of Washington; the other half of the prize was awarded to F. Duncan M. Haldane (from Princeton University) and J. Michael Kosterlitz (from Brown University) “for theoretical discoveries of topological phase transitions and topological phases of matter”. These three men, through diligent research that harks back to the 1970s and the 1980s, have assiduously explained through their research what

happens to matter when it is pinned down to a flat plane or “cooled down to near absolute zero”. Thors Hans Hansson, a Nobel committee spokesperson, said: “It [their work] has combined beautiful mathematics and profound physics insights, and achieved unexpected results that have been confirmed by experiments.”

A branch of mathematics called topology is at the centre-stage of their ground-breaking research, as it proves how matter at extremely cold or condensed states exhibits certain properties, such as being able to conduct electricity. Topology is a skein of mathematical thought that takes into account what properties are preserved when objects are “stretched, twisted or deformed.” In a unique moment at the prize announcement and revealing our lack of knowledge about topology, Hansson, the Nobel Prize committee member, came with a cinnamon bun, a bagel and a pretzel to explain why the three had won the award! You can describe the number of holes in each of these items via topology, he explained: a bun has zero holes, a bagel has one, and a pretzel has two. “There are no half holes.” And the number of holes in this basket of items remains the same if you

Below (l-r): Nobel Prize winners for Physics: David J. Thouless, F. Duncan M. Haldane, J. Michael Kosterlitz



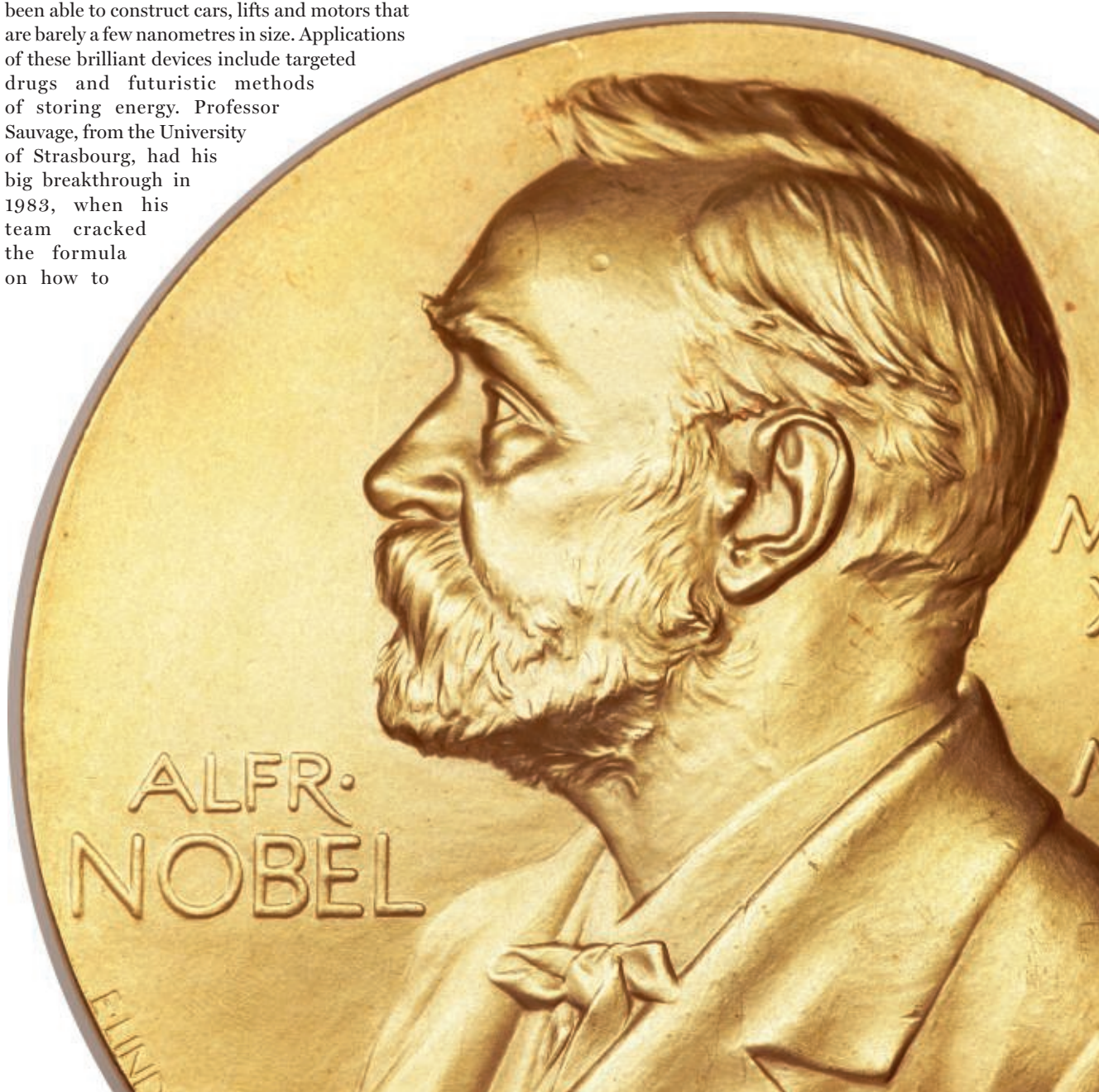
stretch or twist them. In other words, this hitherto unknown branch of mathematics also stretches the imagination. The application of topology by the three scientists has already led to new materials with unique properties. For instance, “topological insulators” conduct electricity purely on their surface.

AGE OF THE MINI-MACHINE

The Nobel Prize in Chemistry 2016 was awarded to Jean-Pierre Sauvage, Sir J. Fraser Stoddart and Bernard L. Feringa “for the design and synthesis of molecular machines”. In other words, the three winners developed the world’s tiniest machines out of molecules! Basically, these scientists have been able to construct cars, lifts and motors that are barely a few nanometres in size. Applications of these brilliant devices include targeted drugs and futuristic methods of storing energy. Professor Sauvage, from the University of Strasbourg, had his big breakthrough in 1983, when his team cracked the formula on how to

connect two molecules in a mechanical chain, with the aid of a copper ion. The fundamental prowess of this experiment lay in the fact that these molecules were not bound together in a rigid manner; they were able to move about. From this emerged the idea of a “tiny machine”.

Sir Fraser Stoddart also started toying with this concept and, in 1991, his team developed a molecular ring that snuggled up to an “electron-rich axle”. When heated, the ring acted much like a satellite of the axle. Its advanced application led to the nano-computer chip. In a Eureka moment, Ben Feringa from the University of Groningen in Holland, built mechanical motors out of molecules





Above (l-r): The Nobel Prize in Chemistry 2016 was awarded to Jean-Pierre Sauvage, Sir J. Fraser Stoddart and Bernard L. Feringa

with the aid of chemical structures that spun continuously in one direction when stimulated by UV light. This led to even further microscopic victories, such as nanometre-scale cars in 2011. This month was truly a celebration of the future as scientists participated in the world's first nanocar car race. Now that's something F1 fans might want to watch out for.

CELLS THAT EAT THEMSELVES

The Nobel Prize in Physiology or Medicine 2016 was awarded to Yoshinori Ohsumi, a 71-year-old Japanese scientist from the Tokyo Institute of Technology, "for his discoveries of mechanisms for autophagy". The etymology of the term "autophagy" is literally the Greek word for "self-eating". Ohsumi has spent a lifetime describing the machinery and genetics of this strange branch of science that is an essential aspect of basic cellular

function. Experimenting with yeast in the 1990s, Ohsumi built a case for how cells self-cannibalise in order to regenerate. Taking his cue from the ground-breaking research by Belgian cytologist and biochemist (and Nobel winner) Christian de Duve, Ohsumi has been able to demonstrate how cells self-destruct to create energy for their re-birth, ward off infections with

bacteria and viruses, and create energy under duress (including severe lack of food). His discoveries and relentless

Applications of Ohsumi's research will help us understand how cancer, Parkinson's disease and Type 2 diabetes works in the human body, thus paving the path for more effective treatments.

research in the field has, according to the Nobel Committee, "opened the path to understanding the fundamental importance of autophagy in many physiological processes." Applications of his research will help us understand how cancer, Parkinson's disease and Type 2 diabetes works in the human body, thus paving the path for more effective treatments.

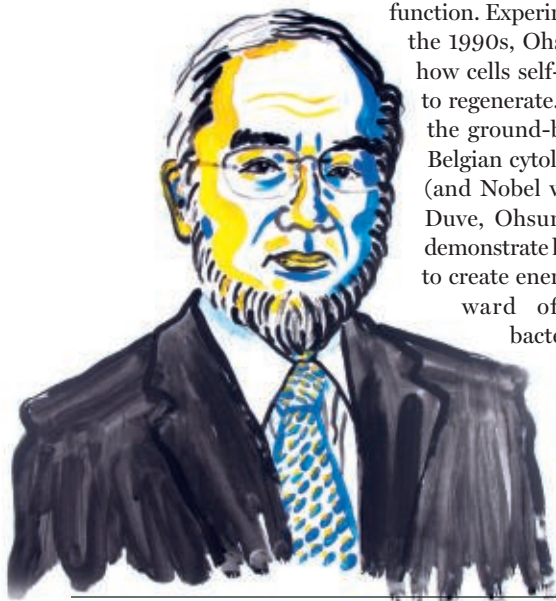
THE PROBLEM WITH CONTRACTS

The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2016 was awarded to Oliver Hart and Bengt Holmström "for their contributions to contract theory". What is contract theory? Firstly, contracts – legally binding documents that define one's volume and type of work across industries – are the fulcrum of the market economy. Everything from a transaction at your neighbourhood grocery to an agreement with your tenant or landlord involves a "contract".

Oliver Hart from Harvard and Bengt Holmström from MIT have separately developed the concept of contracts and built a theory that "there is no such thing as a perfect contract". Trade unions would be delighted, but there is much more to their research than just disgruntled employees.

There is a significant difference, says Hart, "between a government that operates a prison

Below: The Nobel Prize in Physiology or Medicine 2016 was awarded to Yoshinori Ohsumi



directly and a government that contracts out prison management to a private operator". Using examples as diverse as private prison operators (contracted by the government) to how the air force of a nation is better served by private airline manufactures, both economists have been able to throw light on the "complicated interplay between owners, managers, and workers". They have employed economic theory to investigate real problems in the market structure and proven something even more relevant to the world of economics: that abstract ideas are important to increasing productivity in specific industries.

THE FIRST SONGWRITER TO WIN THE NOBEL

In a move that surprised (and delighted) much of the literati, US singer Bob Dylan was awarded the 2016 Nobel Prize for Literature. The 75-year-old rock star received the honour "for having created new poetic expressions within the great American song tradition." Dylan is the first songwriter to have ever won the prestigious prize, which has sparked some controversy. It has been 23 years since an American has been awarded the world's most coveted literary honour, the last US winner being novelist Toni Morrison in 1993. Sara Danius, permanent secretary of the Swedish Academy, said that Dylan was "a great poet in the English-speaking tradition. For 54 years now he's been reinventing himself, constantly creating a new identity." In a biographical note accompanying the announcement, the academy added, "Dylan has recorded a large number of albums revolving around topics like the social conditions of man, religion, politics and love. The lyrics have continuously been published in new editions,

under the title 'Lyrics.' As an artist, he is strikingly versatile; he has been active as painter, actor and scriptwriter." Since the late 1980s, Dylan has been on the "Never-Ending Tour". Aside from being a legend, he has influenced a range of musicians and poets, thus making him "the object of a steady stream of secondary literature."

Above (l-r): The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel 2016 was awarded to Bengt Holmström and Oliver Hart.

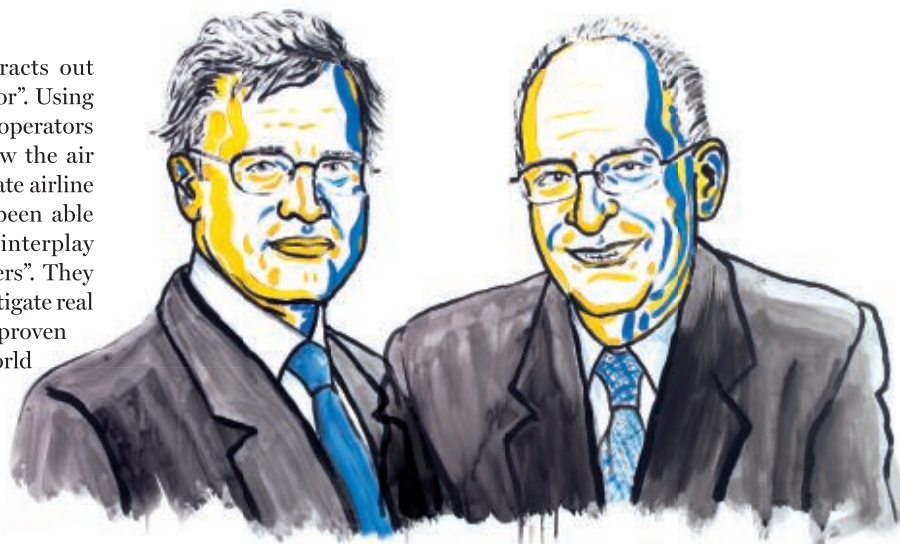
NOBEL MUSEUM EXHIBITIONS

The Mohammed Bin Rashid Al Maktoum Foundation (MBRF) and the Nobel Foundation started a 10-year partnership in 2015 that will see a series of initiatives and specialised exhibitions organised across the UAE and other Arab countries with the aim to promote the dissemination of knowledge and document human achievements to enrich minds.

The Nobel Museum exhibition in 2015 shed light on the elite prize and how the Nobel Prize-winning efforts have shaped the transformation of the world under the banner of 'The Nobel Prize: Ideas Changing the Word'. Earlier this year, the second edition highlighted breakthroughs in the medical and health fields by Nobel laureates under the theme, 'Exploring Life: Nobel Prize in Physiology'.

This exhibition was divided into seven different sections, introducing visitors of all ages to several aspects of medicine, from the achievements of Islamic scientists in the medical and pharmaceutical fields to Nobel-prize awarded discoveries related to chronic diseases and the efforts to prevent and cure them. As instructed by HH Sheikh Mohammed bin Rashid, the Nobel Museum will begin to cover other emirates in the UAE, as well as cities around the Arab and Muslim worlds.

Left: The US singer Bob Dylan was awarded the 2016 Nobel Prize for Literature



A PASSION FOR EDUCATION

In his latest book former British Prime Minister Gordon Brown passionately advocates that education is the world's biggest priority

Gordon Brown is a man who needs little introduction. During his UK political career he was a Member of Parliament from 1983 to 2015, served as Chancellor of the Exchequer from 1997 to 2007, and as Prime Minister and Labour Party leader from 2007 to 2010. He is also a prolific writer, having authored or co-authored 10 books. Brown's latest release, *All the Talents of All the People – Education Global Priority No.1* is a collection of speeches and writings published by Qindeel Printing and Publishing Services, one of the investment projects of the Mohammed bin Rashid Al Maktoum Foundation (MBRF). As the title suggests, education is a subject that lies very close to Brown's heart.

Brown believes that education is the fundamental right of every child in the world. In fact, he states: "the fight for education is the civil rights struggle of our time". Unfortunately, it seems to be a fight the world is currently losing with around 30 million children denied access to schooling due to their status as refugees and displaced persons because of humanitarian disasters. All in all, 124 million children around the world are out of school, and this is further compounded by the fact that one in five children are in substandard school.

Since 2012, Brown has been the United

Nations Special Envoy for Global Education and he has seen the problems for himself. He gives some stark examples, such as South Sudan – a country of 10 million – where only 400 out of half a million teenage girls are in school, compared to London that has a population of 10 million and has 500,000 girls in school. Brown says, "we have to do more to invest in the 1.8 million teachers we need, in the technology we need and in the four million classrooms we don't have."

In the first section of the book, Brown focuses on the right of every child to have a quality education. In the second set of articles he stresses the importance of fulfilling the goals that the international community has committed to. Part of the Millennium Development Goals, that were to be achieved by December 2015, was that every child should at least complete primary school. This has not happened. The Sustainable Development Goals set for achievement in 2030 are even more ambitious, namely that every child should complete primary and secondary school.

Unfortunately, as Brown highlights, we are well on the way to missing this target as well. The problem, as always, is a lack of money. In order to achieve the Sustainable Development Goals by 2030, it will require an additional investment of \$20 billion or more annually. The issue, as Brown states, is that "international development aid for education has fallen by nearly 10 per cent in recent years – and government spending in low-income countries has failed to make up the difference".

Brown points out that the problems are manifold. In some countries girls have no rights and their lives are predestined to be child brides, working in the fields, at home or in factories. Child



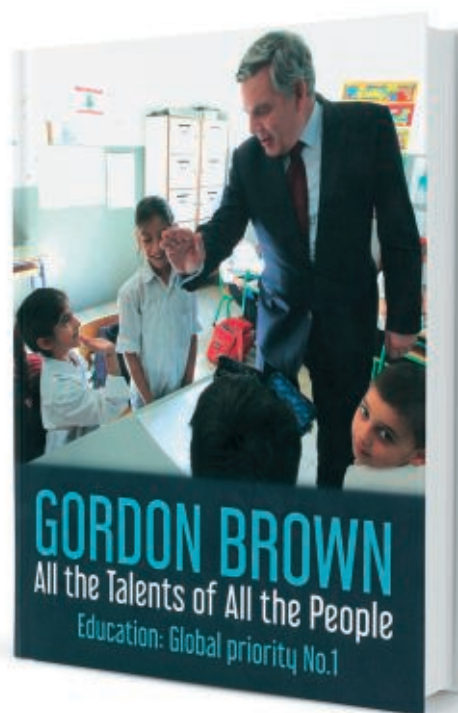
Left: Malala Yousafzai, the Pakistani girl shot by the Taliban after campaigning for girls' education, stands next to British former Prime Minister Gordon Brown as she receives an honorary masters degree from the University of Edinburgh.

labour is rife, with more than 215 million children in some kind of employment. It is also increasingly common that insurgents, extremists and other powers target schools. In Syria, thousands of schools are closed or destroyed and the exodus of refugees is straining the education systems of Lebanon, Jordan and Turkey. Extremism and the resulting prosecution of educators is further worsening the situation. In this context, Brown highlights how important it is to fight “extremists’ message of hate with one of tolerance and understanding”. In this regard he singles out the UAE, which is championing a curriculum based on tolerance. The Dubai-based MBRF has also undertaken a bold pilot project where the best coursework on offer – in mathematics, science, foreign languages and literature – can be loaded onto a mobile phone and placed in a student’s hand. In this way the classroom can be brought to the children.

In Lebanon, strides are also being made in the direction of tolerance. Born out of a National Charter for Education on Living Together in Lebanon – which all the leaders of major religions have signed – a common school curriculum on shared values is being taught in primary and secondary schools to Muslim and Christian pupils. The curriculum focuses on “the promotion of coexistence” by embracing “inclusive citizenship” and “religious diversity” and aims to ensure what the instigators call “liberation from the risks of sectarianism”.

Moreover Lebanon, operating under a double-shift system, educates Lebanese children in the morning and Syrian refugees in the afternoon. As a result some 200,000 Syrian children are getting an education. However, there are still 200,000 Syrian children who are not getting an education in Lebanon, and up to 2 million in total across all countries. Once again lack of money is the problem. Brown argues that for about \$500 per student per year a million refugee children across Turkey, Lebanon and Jordan would receive an education. If education were available, many parents would think twice about making the life-threatening journey across the Mediterranean, which would slow the exodus to Europe. In other words, “the case for large-scale Western financial support for an education program in refugee communities is compelling”.

Although Brown cites many problems along the road for universal education, he retains an optimistic attitude. “Hope is no guarantee of a better future, but it summons us to try and build one,” he writes. “Hope is not the promise of success



The problem, as always, is a lack of money. The issue, as Brown points out, is that “international development aid for education has fallen by nearly 10 per cent in recent years – and government spending in low-income countries has failed to make up the difference”.

-GORDON BROWN

but the promise that perseverance, irrespective of outcome, is a virtue. Perhaps that is why I believe hope is synonymous with education, as both offer the assurance of a future worthy of planning. For education and hope are forever in tandem – one without the other is impossible.”

If you care about education, and you should, *All the Talents of All the People – Education Global Priority No.1* is a good primer. The book is a compilation of speeches and writings, but this does not distract from Brown’s crisp writing style, well-constructed arguments and his very clear message that education is the best antidote to poverty, inequality, discrimination, ill health, extremism and a host of other issues. Brown is passionate about education, and it shows. †

PARLEZ-VOUZ KLINGON?

Artificial languages, inspired by films and novels, are not merely jargon for nerds. They are universes unto themselves, and even a hope for endangered languages

A TONGUE OF PARAMOUNT IMPORTANCE

It is a mark of an artificial language's legitimacy when a major motion picture studio decides to claim copyright to it. This is precisely what happened when Paramount Studios and CBS, the *Star Trek* rights holders, claimed entitlement to the Klingon language (an artificial language from the franchise) via US courts.

This outlandish lawsuit brings to light the world of artificial languages (also known as 'conlang', for 'constructed languages'), whose proponents are fiercely protective of the make-believe world they create. Klingon, for instance, was a language created to represent characters of the *Star Trek* franchise in 1979. Today, in 2016, there are over 300,000 sold copies of a Klingon dictionary. Clearly, somebody finds a use for these. Moreover, there are Klingon language certification programmes available, and a couple in Scandinavia even exchanged vows in the language to become man and wife. Love, after all, knows no language, they say.

MIND YOUR LANGUAGE

So what goes into making an artificial language? In a sense, all languages are inventions that have been constructed through centuries of linguistic improvisation and collaboration. Modern English is a far cry from Old English, which European settlers brought to Britain in the fifth century BCE.

In the following centuries, it was subjected to various influences such as the Norman conquest of 1066, which led to large numbers of French words being imported into English. Words were also borrowed from Latin, and through trade and colonization words were acquired from other European languages, such as Spanish and Portuguese, and from languages in far-flung places such as Africa, India and the Americas. The *Oxford English Dictionary* contains 171,476 words in current use and 47,156 obsolete words. The Global Language Monitor estimates there are 1,035,877.3 English words, with a new word created every 98 minutes. Furthermore, English is just one of an estimated 6,900 distinct languages existing today.

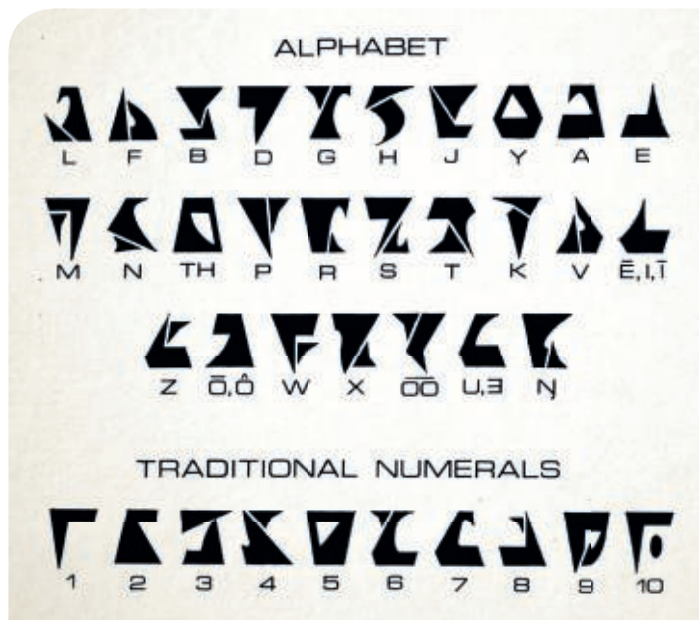
However, the ones that linguists describe as invented languages can all trace their existence to individual creators.

The first person who truly constructed languages for entertainment was *Lord of the Rings* author J.R.R. Tolkien. He invented not just a single language, but a whole family of languages which he fully fleshed out and then had some of



Marc Okrand invented the Klingon language for the *Star Trek* franchise, and subsequently published a dictionary.





Above: Klingon even has its own alphabet

his characters speak. For example, Sindarin and Quenya, two forms of Elvish spoken by different communities in his Middle-earth novels, are not only descended from a common ancestor, but are related to a whole slew of other languages. In 1931, Tolkien gave a lecture called “A Secret Vice” about language invention.

As the century wore on, a few people repeated the trick. A case in point is linguist Marc Okrand who was asked to develop the Klingon language in 1984 for *Star Trek III: The Search for Spock*.

Most of it he made up, but there was some raw material to begin with: Klingon names, improvised speech from an earlier film (actor James Doohan had written the first six sentences of Klingon for an earlier movie), and aspects of Klingon culture (they are a warrior race, honourable and direct).

“Human languages are very patterned,” says Okrand. “There are no 100 per cent rules, but there’s a lot of tendencies, and more-likely-than-nots.” Creating Klingon allowed him to subvert these patterns. So, for example, syntactically Klingon has OVS (object-verb-subject) word order, which is very rare in human languages.

However, Okrand admits it wasn’t all plain sailing. “You can’t



help being influenced by what you know, which for me was a bit of Spanish, French and American Indian. I also knew Southeast Asian languages. I’d be writing something and suddenly realise that it sounded like Navajo. I’d stop and make sure the next thing sounded as different as it could possibly be.” At the urging of the film’s crew, he went on to flesh out the language; a Klingon dictionary he published after the movie came out sold more than 300,000 copies.

David J. Peterson is an artificial linguist who is credited with having created around 40 languages for TV series and movies such as *Game of Thrones*, *Penny Dreadful* and *Thor: The Dark World*. The author of *The Art of Language Invention* says: “a language is basically three things – a sound system or a phonology, a series of atoms. You need the grammar – how the things built up into words relate to each other. And you need the tokens and spells lexicon.” After all, this is a game of tones.

Peterson’s most popular creation is the fictional Dothraki language for HBO’s *Game of Thrones* series. The language itself first appeared in George R. R. Martin’s fantasy novel series *A Song of Fire and Ice*, which the TV series is based on. As a result, the Dothraki language was developed under two significant constraints. First, the language had to match the uses already put down in the books. Secondly, it had to be easily pronounceable or learnable by the actors. These two constraints influenced the grammar and phonology of the language.

Peterson has significant insight and pointers

“You can’t help being influenced by what you know, which for me was a bit of Spanish, French and American Indian. I also knew Southeast Asian languages.”

Marc Okrand



for “conlangers” – a term for people who wish to invent their own foreign language. He believes that the internet has been exceptionally helpful for those wishing to pen their own tongue. Having created his own language in 2000, Peterson credits the expansion of the internet as being the catalyst for more “conlangers” to connect with one another. “Once the internet became more common in homes, the first language creation community formed – the Conlang Listserv – and little by little, conlangers began to find one another,” he said. In other words, creating artificial languages may soon move from individuals to groups.

For Peterson, constructing languages is an art form. “I’ll tell you from personal experience that conlanging feels like an art to the conlanger,” he writes in his book *The Art of Language Invention*. “When I was a kid, all I did was draw. In high school, I picked up fiction, and then all I did was write. Finally in college I began conlanging, and all I did was conlang. For each stage, the drive – the motivation – was exactly the same: creation and expression. Inspiration comes from wherever it comes from and hits you, and then you’re conlanging. I didn’t know a thing about conlanging until after I was doing it, so I can say

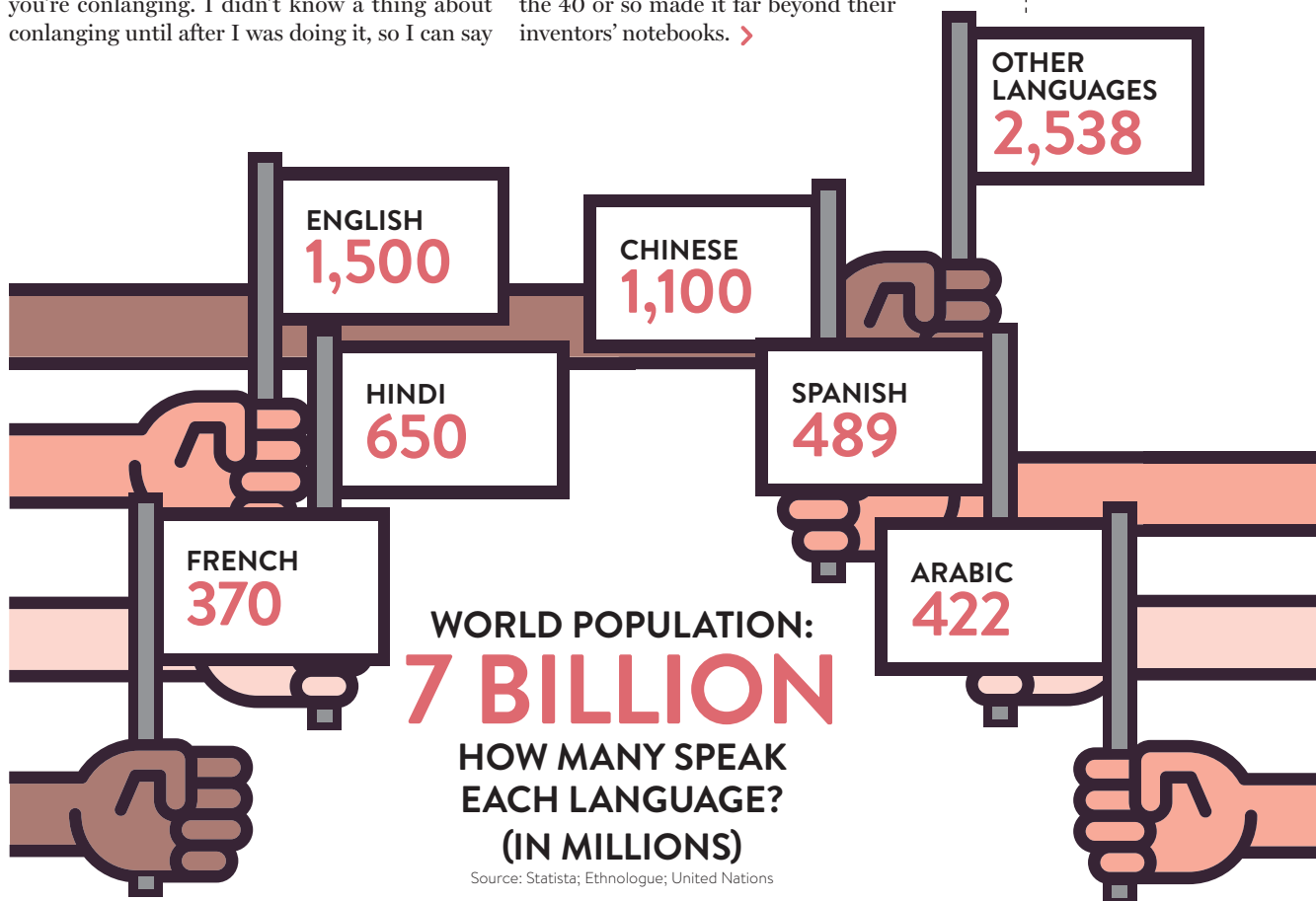
for myself, it felt no different from any other art I pursued.”

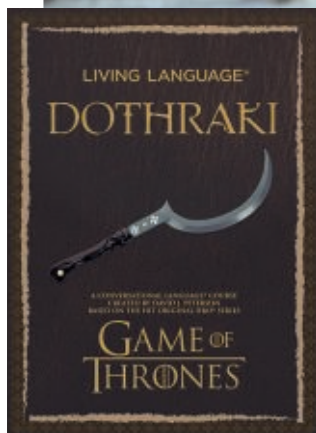
ITS NOT ALWAYS FUN

Yet, make-believe languages are not restricted to cinephiles. More significantly, not all artificial languages are fun. Some can have dire consequences. Keep in mind that it was the seminal science-fiction novel *Nineteen Eight-Four* by George Orwell that introduced an entire generation to the concept of Newspeak. In the imagined dystopia of Oceania, to cull the thought process of its inmates, Newspeak was developed by its dictators as a tool to limit freedom of thought. While the language was similar to English, it had a vocabulary that was controlled by its rulers. Not surprisingly, some dialects of Newspeak such as *Ingsoc* and *Miniature* were lifted from Russian syllabic abbreviations, clearly invoked as a reference to the shackles of communist rule.

Idealism has also played a role in language creation. In the 19th-century utopians and idealists hoped universal languages would promote international harmony. Almost none of the 40 or so made it far beyond their inventors’ notebooks. >

Left: David J. Peterson developed the language system of the evil elves featured in *Thor: The Dark World*.





The Dothraki language created for *Game of Thrones* now comes with its own language course.

➤ One, Esperanto, did catch on and it has hundreds of thousands of speakers – including Dothraki language creator Peterson among them.

NO COUNTRY FOR YOUNG MEN

If you thought that artificial languages merely attracted lovers of cinema and literature, it would be edifying to learn that some breakaway political entities called ‘micronations’ have also developed their own languages.

For instance, ensconced in Milwaukee, is the “Kingdom of Talossa”, founded in 1979 by Robert Ben Madison, when he was all of 14 years of age. “Talossa” literally translates to “inside the house” in Finnish. As such the Kingdom operated from his room in Milwaukee, but subsequently set claims on a portion of Wisconsin city as well. The “kingdom”

enjoys a citizenship of 213 – a tribe that speaks Talossan. Yet, hold the jokes, one might add. The language is credited with being one of the most detailed fictional languages ever created. The Association of Talossan Language Organisations (ATLO) helms a website that handholds new converts to the kingdom (and thus the language with research and translation facilities. Talossan committee members are constantly suggesting improvements to their “native tongue”, as languages, after all, are dynamic entities.

LESSONS TO LEARN

So what do artificial languages teach us about linguistics? For one, they teach us a crucial fact that linguists have been trying to say for a long time: that a language dies only when the last person who speaks it dies. Therefore, the sort



The Dothraki language was developed under two significant constraints. First, the language had to match the uses already put down in the books. Secondly, it had to be easily pronounceable or learnable by the actors.



David J. Peterson has created more than 40 artificial languages.

of support systems and online camaraderie that artificial languages enjoy would be equally helpful to the estimated 3,000 languages of the current 6,900 languages on our planet that could become extinct in the next 100 years. Unesco's *Atlas of the World's Languages in Danger* lists 576 as critically endangered, with thousands more categorised as endangered or threatened. However, it is already too late for the around 400 languages – about one every three months – that have gone extinct over the past century alone.

A stark example of this is cited in *The Guardian*: in 1995, the linguist Bruce Connell chanced upon the last surviving speaker of a language called Kasabe on the Indian Ocean island of Cameroon. A year later, when he arrived on the same idyllic island, the man had passed away; a language had been wiped off our planet.

Today, almost 500 languages have fewer than 100 speakers.

The question is, does it matter if a seemingly obscure language dies out? Some people argue that language loss, like species loss, is simply a fact of life on an ever-evolving planet. Yet we spend huge amounts of money protecting species and biodiversity, so why should it be that the one thing that makes us singularly human shouldn't be similarly nourished and protected? Diversity occupies a central place in evolutionary theory because it enables a species to survive in different environments. Increasing uniformity holds dangers for the long-term survival of a species. Today, the top ten languages in the world claim around half of the world's population, so the question is can language diversity be preserved, or are we on a path to becoming a monolingual species?

What's more, languages are conduits of human heritage. Writing is a relatively recent development in our history (written systems currently exist for only about one-third of the world's languages), so language itself is often the only way to convey a community's songs, stories and poems. Moreover, languages contain an accumulated body of knowledge including geography, zoology, mathematics, navigation, astronomy, pharmacology, botany, meteorology and more. In other words, when a language dies the knowledge dies with it.

Professor David Crystal, an honorary professor of linguistics at the University of Wales, claims that it would cost \$48,000 to save an endangered language from extinction. That is a total of \$440 million to save all the vanishing tongues of our world. It sounds like a lot of money at first sight and a lot of work, but come to think of it, *Star Wars: The Force Awakens* made \$2 billion at the box office. All one needs is some socio-cultural will, and some fans of faraway languages. Moreover, combined with the ever-increasing power of the internet to bring people together, resuscitating a dying language could well become child's play. Comprenez vous? 🦋

AIMING FOR The Top 10

The UAE wants to be ranked as one of the world's top 10 most competitive economies by 2021, but how can it achieve it?

The late September launch of the World Economic Forum's annual *Global Competitiveness Index* (GIE) would have made disappointing reading for many in the Gulf Cooperation Council (GCC), with the notable exception of the UAE.

As the Davos-based organisation noted, regional instability in the wider Middle East and North Africa (MENA) linked to conflicts in Libya, Syria and Yemen was "undermining economic progress in the entire region". It also

said the "uncertain future of energy prices" was leading to "lower growth, higher fiscal deficits and rising concerns about unemployment" among oil exporting countries.

This was reflected in the shifting positions of the GCC countries in the 2016-2017 Index, which ranked 138 nations based on 12 metrics including institutions, infrastructure, education, health, innovation, and efficiency of the labour market.

Former regional leader Qatar dropped four

The UAE is the MENA region's most competitive economy



places to 18th, Saudi Arabia declined four places to 29th, Kuwait dropped four places to 38th, Bahrain declined nine places to 48th and Oman dropped four places to 66th

This left the United Arab Emirates as the only Gulf bright spot, rising from 17th to 16th and becoming Middle East and North Africa's most competitive economy in the process.

"The United Arab Emirates (UAE) improves by one place to 16th as it continues to lead the MENA region, building on improvements in competitiveness in recent years. This year small gains in areas such as technological adoption and business sophistication are partially offset by deteriorating macroeconomic stability that is the result of lower energy prices, which have led to a rise in inflation and public debt and to the emergence of a fiscal deficit," the WEF noted.

Speaking following the release of the Index, Reem Al Hashimi, Minister of State for International Cooperation and chairperson of the Board of the Federal Competitiveness and Statistics Authority, said the country's position on the world stage was thanks to the efforts of federal and local taskforces who are working as one team towards Vision 2021.

Vision 2021 is a statement of intent from the UAE with six key national priorities outlined. These are a cohesive and preserved identity, safe public and fair judiciary, competitive knowledge economy, first-rate education system, world-class healthcare, and sustainable environment and infrastructure.

Under the competitive knowledge economy pillar the country has outlined 12 national key performance indicators, encompassing some of the world's top measures for competitiveness and innovation, in which it intends to improve its ranking.

Among them is for the UAE to enter the GIE's top 10, led again this year by Switzerland, Singapore and the United States.

Doing so will involve surpassing the likes of Canada, Taiwan, New Zealand, Denmark, Norway and Finland and proving the country can stand above both its global and regional peers. It will also mean recapturing some past form, after the UAE advanced from 24th in the 2012-2013 index to 12th in 2014-2015 before sliding back five places.

A difficult task, but there are clear indications the emirates can stand shoulder to shoulder with leading economies.

In this year's index, the UAE ranked in the top 10 for three of the index's 12 basic metrics and in the top 20 for half. This included a third place

BECOMING A COMPETITIVE KNOWLEDGE ECONOMY

Under Vision 2021, the UAE intends to become the economic, touristic and commercial capital of more than two billion people. To do so it plans to transition to a knowledge-based economy, promote innovation and research and development, strengthen its regulatory framework for key sectors and encourage high value-adding sectors.

Among the country's goals are to improve its business environment, increase its attractiveness for foreign investors, diversify the economy and become a global leader in entrepreneurship, ease of doing business, income per capita, innovation, private sector participation and R&D.

The country has outlined a number of key indicators to mark its progress in each of these areas:

ranking for efficient goods market and fourth as a global infrastructure hub.

"Overall, the UAE boasts a number of competitive strengths: infrastructure is top notch (4th overall) and goods and labour markets are open and efficient," the WEF noted.

In a wider list of 114 indicators the country also stood in the top 20 for 76 including first for absence of the impact of crime and violence at work and second for trust in the leadership and lack of wasteful government spending.

Other notable rankings included third globally for efficient government, first for road quality, second for airport infrastructure and third for seaport infrastructure and mobile phone subscriptions per 100 users.

State news agency WAM said these positions reflected the country's huge investments in infrastructure, including expansions to the road network, airports, seaports and plans to link the UAE's rail network with the wider region.

However, to achieve its goal of climbing the world competitiveness rankings, the WEF noted a number of areas for improvement.

"Going forward, for the country to diversify its economy, enhancing innovation – where the country currently ranks 25th – will be crucial. There is equal scope for better leveraging digital technologies that are an important enabler of business innovation. Currently the country ranks 29th in ICT use," it said.

An executive opinion survey conducted as part of the index also pointed to a number of areas considered hurdles to doing business. Among them, restrictive labour regulations (18.1), access to financing (18), inflation (12), inadequately educated workforce (12) and poor work ethic

EXPLORE

INDEX	INDICATOR	DEFINITION	SOURCE	2021 TARGETS	KEY SPONSOR
1	Non-Oil Real GDP Growth	An indicator that measures the real annual economic growth of all sectors except oil.	Federal Competitiveness and Statistics Authority	5%	Ministry of Economy
2	Gross National Income (GNI) per Capita	An indicator that measures the average income per person in a country.	World Bank	Among the top 10 countries	Ministry of Economy
3	Net Inflow of Foreign Direct Investment as % of GDP	An indicator that measures foreign direct investment (FDI) as a percentage of GDP.	United Nations Conference on Trade and Development (Unctad)	5%	Ministry of Economy
4	Global Competitiveness Index	A composite indicator that measures the competitiveness of countries based on (12) perspectives.	World Economic Forum Global Competitiveness Report	Among the top 10 countries	Federal Competitiveness and Statistics Authority
5	Share of UAE Nationals in the Workforce	An indicator that measures the share of employed UAE nationals out of the total workforce (expatriates and nationals), across all sectors (NKPI specific to UAE).	Ministry of Human Resources and Emiratization	8%	Ministry of Human Resources and Emiratization
6	Ease of Doing Business Index	A composite indicator that measures government procedures around business activity.	World Bank	Rank 1	Federal Competitiveness and Statistics Authority
7	Emiratization Rate in the Private Sector	An indicator that measures the share of UAE nationals employed in the private sector, as a proportion of the total workers in the private sector.	Ministry of Human Resources and Emiratization	5%	Ministry of Human Resources and Emiratization
8	SME Contribution to Non-Oil GDP	An indicator that measures the share of GDP produced by small and medium-sized enterprises.	Ministry of Economy and Federal Competitiveness and Statistics Authority	Among the top 10 countries	Ministry of Economy
9	Global Entrepreneurship and Development Index (GEDI)	An indicator that measures three sub-indices: entrepreneurial attitudes, entrepreneurial activity and entrepreneurship aspiration.	Global Entrepreneurship and Development Institute	Among the top 10 countries	Ministry of Economy
10	Global Innovation Index	A composite index that measures the performance of innovation in countries.	INSEAD	Among the top 10 countries	Ministry of Economy
11	Share of "Knowledge Workers" in the Labour Force	An indicator that measures the share of highly skilled workers, workers in high-level professions, and workers classified under the International Standard Classification of Occupations (ISCO - 08) of the total workforce.	Ministry of Human Resources and Emiratization	40%	Ministry of Human Resources and Emiratization
12	Research and Development Expenditure as % of GDP	An indicator that measures the total domestic expenditure on research and development (in the public, academic, and private sector), as a percentage of GDP.	Federal Competitiveness and Statistics Authority	1.5%	Ministry of Education

in national labour force (7.4) were the most heavily weighted by respondents.

Across the wider Middle East region the WEF highlighted common issues across all oil exporting nations, namely the state domination of national economies.

“In Saudi Arabia, for example, the state’s stake in state-owned enterprises amounts to 19.8 per cent of GDP; in the UAE, this is 21.8 per cent; and in Qatar, 23.1 per cent,” the WEF said.

But the country can take some encouragement from its progress in other areas.

“The most competitive economy in this group, the United Arab Emirates, is also the most diversified and has made great strides toward improving technological readiness and innovation since 2011, moving from 30th to 18th and from 28th to 25th on the related pillars of the GCI, respectively,” the WEF added.

Maintaining this momentum will be key as the region continues to face economic pressures.

As His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice-President and Prime Minister of the UAE and Ruler of Dubai, references on the Vision 2021 website, an ambitious nation cannot achieve its goals just by relying on its past achievements.

It will take continued hard work, innovation and dedication for the UAE to transition to a knowledge-based economy and become one of the world’s top 10 most competitive nations in the process. ↗

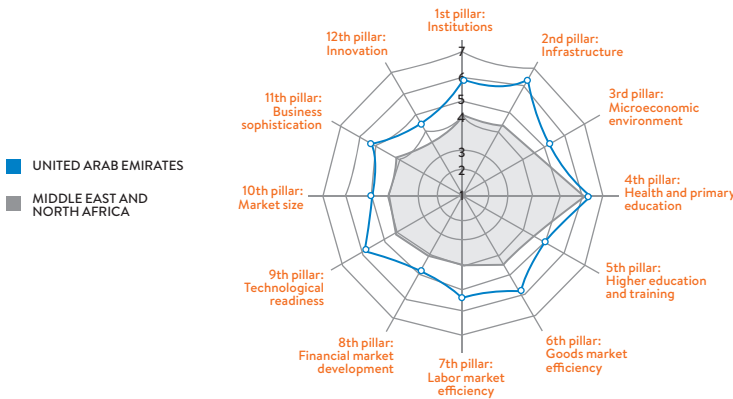


IMPORTANCE OF HAPPINESS

The UAE ranked first in the region and the 28th happiest place to live in, according to the World Happiness Report 2016 issued by the Sustainable Development Solutions Network (SDSN) and the Earth Institute at Columbia University.

It ranked 157 countries based on happiness levels using factors such as per capita gross domestic product (GDP) and healthy years of life expectancy.

“The cause of happiness as a primary goal for public policy continues to make good progress. So far, four national governments – Bhutan, Ecuador, United Arab Emirates and Venezuela – have appointed ministers of happiness responsible for coordinating their national efforts,” stated the report.



Top: The UAE scores high rankings for infrastructure.

Left: The UAE is working hard to transition to a knowledge-based economy.

SAVING THE SKYROS PONY





With just 200 left, the fabled Skyros ponies may soon only be found in Greek mythology

Skyrian horses, best known for pulling the Greek hero Achilles' legendary chariot at the battle of Troy, are on the brink of extinction. For over 2000 years, the semi-wild Skyrian horse has been an inhabitant of the Greek island of Skyros but in recent years their numbers have dwindled down to a few hundred and they are now on the Endangered Species list. Overgrazing of sheep, declining habitat and interbreeding with donkeys are some of the factors to blame for their rapid disappearance. They are also the victims of mechanisation, as from the 1960s onward they played a decreasing role in agriculture. Today, only 200 of these docile animals are left on the planet, with 160 of these living on Skyros. The Greek island of Corfu has a breeding herd of 30, and there are also efforts underway in Scotland to save the animal, which has a herd of 22 Skyrian horses. The herd came into being in 2005 when a retired vet, who also happened to breed Exmoor ponies, imported five animals from Corfu. However, the focus is on Greece to save them.

LIVING HISTORY

The Skyrian horse or Skyros pony, as it is also known, is not just another animal on the brink of extinction for the Greeks. Back in the 1970s, a breed of cow indigenous to Skyros was declared extinct and if steps are not taken to save the ponies, conservationists fear Greece will lose another of its native animal species. With bloodlines going back as far as 2500 BCE, the Skyros pony is one of earth's most ancient and therefore, important species. Scientists have identified seven distinct breeds of Greek horses, but the Skyros pony stands out by having a distinct phenotype.

The Skyrian horse is most probably a descendant of mountain horses, which evolved in



➤ America about a million years ago and migrated by way of Alaska arriving in South-Eastern Europe during the early Holocene. According to scientists, Skyrian horses are descendants of horses first brought to Greece in the 5th century BCE. While they once traversed the whole country, they eventually became limited to Skyros. Over the years, evolution stepped in to help the horses adapt to life on the island. They became smaller in size measuring 116 centimetres at shoulder height and grew thicker manes. Skyros ponies are usually black, brown, grey or bay in colour and have small but very strong hooves.

Of the 200 ponies alive, scientists think only about 90 of these have the original gene pool. Furthermore, most Greeks have a strong cultural bond with the ponies – their legendary association to Achilles makes them a ‘living link’ between Greek history and the present. In fact, they are one of few animals depicted on friezes that graced ancient Greek temples.

SKYROS ISLAND HORSE TRUST

Realising the gravity of the situation, Amanda Simpson and Stathis Katsarelias launched a conservation project in 2005 aimed at protecting the Skyrian horse in its birthplace. Named the Katsarelias-Simpson Project, the duo started off with just three ponies in their care. Today, 37 Skyrian horses (nearly 20 per cent of the Skyrian pony population) troop through their farm grounds.

Run under the banner of the Skyros Island Horse Trust, the project is making a tangible difference to the welfare of the small horses on

Skyros. Since 2006, over 20 horses have regained health and spirit at the Katsarelias-Simpson Project. Suffering from problems like Cushing’s, arthritis, laminitis and obesity, recurring colic in foals, starvation, or even abuse and neglect, each horse has found a new chance at life here. Currently, a dozen ponies are recuperating at the farm.

Katsarelias and Simpson work with the non-profit NGO Elliniki Etairia Society for the Environment and Cultural Heritage, and the Skyrian Horse Society to ensure all horses on the island are immunised against tetanus and dewormed. The duo has also been instrumental in developing a gelding scheme in Skyros.

However, it is breeding that is the most vital part of the Katsarelias-Simpson Project – through it they aim to create an authentic and wide genetic pool of Skyrian horses. Of the 37 Skyrian horses on their farm, 16 have been bred and raised here. The selective breeding process ensures a superior gene pool that will in turn produce a breed of Skyrian horses that is true to its forebears.

MORE THAN CONSERVATION

Katsarelias and Simpson haven’t stopped just at breeding and welfare to save the Skyros pony. The duo run a variety of workshops, seminars and displays and even undertake educational and therapeutic work involving the Skyros pony. They are eager to teach people a respectful approach to horsemanship in keeping with the animal’s psychology. They believe a relationship with these gentle animals can teach humans the virtues

Statis Katsarelias (centre) and Amanda Simpson (right) started the Skyros Island Trust





of patience, persistence, responsibility, and firmness balanced with kindness. The Skyrian horse's own nature – an intuitive and quick learner, gentle yet playful – makes it ideal for equine-assisted therapy.

Simpson teaches intelligent/natural horsemanship skills to local children at the farm. The weekly classes teach children the 'language' of the ponies, groundwork skills, riding, trick training and driving. She also runs training sessions for adults in equine assisted learning and body awareness.

Each year up to 15 volunteers from around the world are given a chance to volunteer at the Skyros Island Horse Trust. The volunteers come from a variety of backgrounds – university students studying equine or agricultural science; trainee vets or just young adults who are passionate about horses. They help Katsarelias and Simpson in taking care of them by feeding, watering and cleaning the horses in addition to maintaining the farm.

In an attempt to publicise the cause of the Skyrian horse, Katsarelias and Simpson launched the Skyros Horse Festival in 2014. Run for three days, the event puts the spotlight on the endangered animal through performances, art exhibitions, workshops, mountain safaris and nature walks around Skyros.

Although the Skyros Horse Trust has succeeded in raising the profile of the Skyrian horse nationally and internationally, they still have no core funding which is essential to the running of the farm. The farm itself is small and can shelter only a limited number of animals. Lack of funds

also means the farm cannot hire the professional services it needs for the upkeep of the animals. Greece's economic situation limits government funding so the Trust relies solely on donations in kind, practical support and adoption finances to manage operations.

Katsarelias and Simpson hope the situation improves. Their current efforts are engaging people to save the Skyrian Horse – they have found homes for some horses on the island's farms. Skyros also has its own vet, a major accomplishment for the small island. But it will take more time and effort for the Skyrian Horse to run wild again. †

Above: Depiction of Achilles at Troy

Below: Horses play an important role in Greek mythology. This stamp depicts the flying horse Pegasus.



MAGIC OF SPIDER SILK

Spider silk could be the super material of the future, but producing it in commercial quantities remains a problem.

Humans have been using spider silk for thousands of years – cobwebs were used to stop bleeding in ancient Greece, the Aborigines used it to make fishing lines, and during World War II spider silk was used as the crosshairs in optical targeting devices such as guns and telescopes.

Despite its deceptive looks, spider silk is actually an incredibly strong and versatile material. Over the past decade, interest in spider silk has spiked mainly due to its mechanical properties and its eco-friendly production techniques. According to scientists spider silk is five times stronger than steel of the same thickness, plus it has massive tensile strength or elasticity. These properties suggest spider silk is strong enough to be used in the manufacturing of bullet-proof clothing, wear-resistant light weight clothing, ropes, nets, seat belts, parachutes and even artificial tendons or

ligaments. It could also be used to suture damaged eyes and nerves. Spider silk's ability to absorb energy better than other materials is also creating interest amongst auto manufacturers. Conventionally produced air bags can knock children and adults back into their seats upon deployment, but if the air bags were made of spider silk they would absorb the energy and minimise knock back.

In fact, if the production of spider silk becomes industrially viable it will give tough competition to other man-made super-fibres including Kevlar (used to make body armour). Kevlar is drawn from sulphuric acid, involves petro-chemical processing and is a major contributor to pollution. Alternately, spider silk is absolutely environmentally friendly – it is made by spiders at ambient temperature and is fully biodegradable. Even when manufactured artificially, spider silk remains a 'green' product. >



Right: This cape made from the silk of 1.2 million Golden Orb spiders took eight years to create.

UNTANGLING THE WEB

Given its advantages, it comes as no surprise that science is keenly looking to harness the super power of spider silk. However, the road ahead is daunting. One of the biggest hurdles to mass production of spider silk is that spiders cannot be farmed like silkworms. Being cannibals, if left in close proximity they will simply eat each other. Spiders also make seven different kinds of silk from seven different glands, but no single spider possesses all seven. A male may have at least three, while a female has at least four – the additional being for egg sac silk.

While spider silk is supremely strong, it is also so fine that nearly 400 spiders would be needed to produce just one square yard of cloth. Even if it was produced, the property of the silk is such that it hardens when exposed to air making it difficult to work with.

What scientists actually want is to be able to spin spider silk without the aid of spiders. As amazing as that sounds, it is possible. The scientific community has been trying to mass-produce spider silk through a variety of approaches ranging from goat milk to genetically altered silkworms.

Randy Lewis, professor of molecular biology at University of Wyoming, and his team have successfully isolated the genes related to spider-silk production – revealing the formula spiders use to make silk from proteins. Spiders can spin up to seven different types of fibres with various properties and Lewis' team has managed to duplicate the fibre the arachnids use to suspend themselves in air. They combined the required proteins into a solution and injected it into a needle. Lab workers then tease the silk out of the needle – a process much like pulling out floss. The end product is a fibre that is very strong, light weight and very versatile.

Unfortunately, the process is not as refined as the natural one and is very time consuming making it useless for mass-production. The other more practical and industrially viable approach is to introduce the silk-spider genes into other organisms such as bacteria or goats.

One company that took the leap into spider silk production is Nexia Biotechnologies Inc in Montreal, Canada. In 2002, the team of scientists there inserted two key spider silk genes into goats to produce silk proteins in their milk. The silk produced by this method was named BioSteel and was a success. The company's breakthrough meant that laboratories or factories would no longer need to have individual homes



for thousands of spiders. All they now had to do was set up goat farms for the genetically modified, silk-producing goats.

In 2011, German biotechnology firm AMSilk claimed they were the first company to have devised an industrially-viable method to produce spider silk. They achieved this through bacterial culturing. AMSilk used *E. coli* bacteria as the host organisms for the spider silk genes. The *E. coli* form a protein, which is then processed into usable dragline silk through a special spinning process.

US-based Kraig Biocraft Laboratories announced this year that it was manufacturing spider silk in commercial quantities at its Indiana facility after hatching more than 40,000 silkworms. Although it did not release production figures, the firm said the breakthrough was due to its genetically engineered silkworms that create approximately 20 different genetically engineered spider silk fibres based on its genetic designs. "Bringing this facility online is a major milestone for Kraig Labs and a significant step forward for spider silk manufacturing," said Jon Rice, the chief operating officer.

Kraig is known for a series of material science breakthroughs using its genetic engineering technologies, including a patent-pending Dragon Silk fibre that the company has claimed is stronger and more flexible than native spider silk.



Now, scientists are considering the possibility of introducing the silk-producing genes into human genomes to produce ‘bulletproof’ skin. Dutch scientist Jalila Essaidi performed tests involving a spider-silk embedded bulletproof skin vest created in her lab. Although the lab-grown skin fused with spider silk can withstand direct impact from a bullet fired at full speed, it is not as strong as the original spider silk fibres. However Essaidi is not discouraged and believes the application holds much potential.

“Why bother with a vest: imagine replacing keratin, the protein responsible for the toughness of the human skin, with this spider silk protein. This is possible by adding the silk producing genes of a spider to the genome of a human: creating a bulletproof human,” she says.

It may be sometime before spider silk ventures into our everyday lives, but one thing is clear: it is the super fibre of the 21st century and humans are determined to unravel its mysteries. †

Above: The German biotechnology firm AMSilk is using *E. coli* bacteria as the host for spider silk genes.

SPIDER SILK FACTS

Webs are not just traps spiders weave to capture their food. Spiders have weak eyesight and depend on their webs to acquire important sensory information. When plucked, the threads of the web tell them what insect has been trapped in the web; the strength of the web and even the quality of a prospective mate. In fact, spiders can even modify their webs by adjusting the tension and connections between threads. Webs lose their stickiness after about a day due to factors such as dust accumulation and exposure to air.

In order to save energy, the spider eats its own web before making a new one so the protein used for the silk threads is recycled. The toughest silk is the dragline silk from the Golden Orb spider (*Nephila clavipes*), so-called because it uses silk of a golden hue to make orb webs. Spiders use silk for a variety of functions:

- Swathing silk for the wrapping and immobilisation of prey.
- Webs for catching prey using sticky silk – it is elastic to prevent the prey from rebounding off the web.
- Draglines – which are used to connect the spider to the web, as

safety lines in case a spider should fall – and as the non-sticky spokes of the web. Dragline silk is the strongest kind of silk as it must support the weight of the spider.

- Parachuting or ballooning that is used to aid the dispersal of young spiders and to find new areas as a food source. Silk is released and caught by the wind to lift the spider up into the air – flying spiders!
- Egg-sacs
- Mating
- Shelters such as burrows or nests

OUT OF AFRICA

Three separate studies have concluded that all non-Africans today trace their ancestry to a single population emerging from Africa between 50,000 and 80,000 years ago. However, they also unearthed some surprises.

According to David Reich, professor of genetics at Harvard Medical School, “Genetics tells you about the movements and relationships of people.” With the advent of powerful new sequencing technology, genomes past and present are shedding new light on early human history.

This process can come up with some surprising results. For example, while Reich and his colleagues were trying to sequence the Neanderthal genome, they were surprised to discover that modern humans had interbred with Neanderthals not long after moving out of Africa. In fact, pieces of Neanderthal DNA live on today, in people of European and East Asian heritage at an average of about two per cent of the human genome.

It is an accepted fact that modern humans evolved in Africa about 200,000 years ago and dispersed from the continent to other areas. However, the unanswered question has been how and when our species went on to populate the rest of the globe. Finding an answer to this riddle has a huge impact on the study of human evolution.

This question has now been answered by three separate teams of geneticists who surveyed an unprecedented amount of DNA collected from cultures around the globe. Their conclusion, arrived at completely separately, was that all non-Africans today trace their ancestry to a single population emerging from Africa between 50,000 and 80,000 years ago.

The three teams sequenced the genomes of 787 people, obtaining highly detailed scans of each. Unlike smaller, previous studies the genomes were drawn from people in hundreds of indigenous populations – many whose genes had never been sequenced before. This was of vital importance, as many geneticists believe the DNA of indigenous populations is essential to understanding human history. Yet until now scientists have sequenced entire genomes from very few people outside population centres such as Europe and China. However, this has now changed with the three studies taking samples from Basques, African pygmies, Mayans, Bedouins, Sherpas, Australian Aboriginals and Cree Indians, to name just a few.

Although the three teams came to the same conclusion they worked totally separately, with

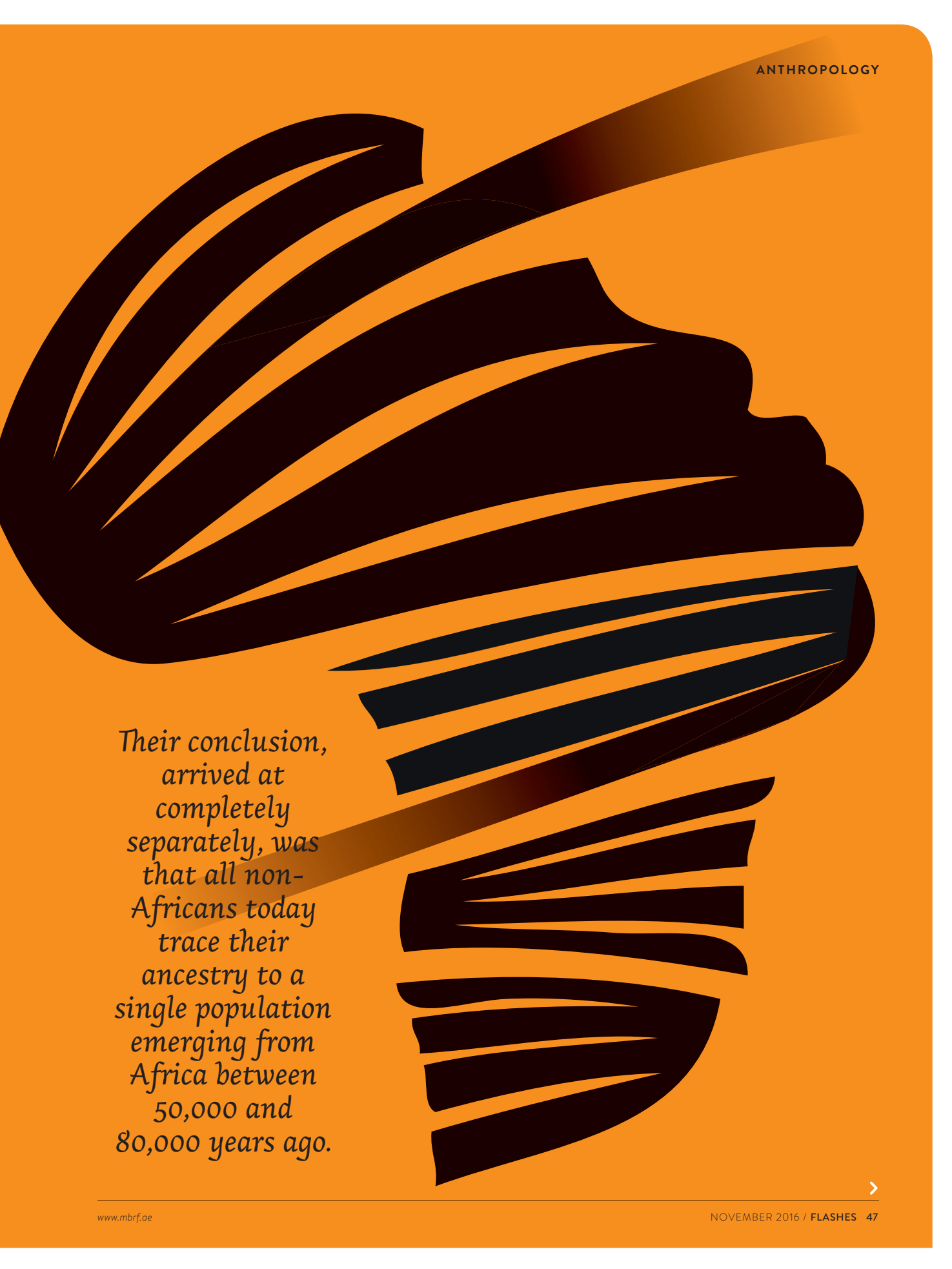
different genomes and looking at different questions. Eske Willerslev, a renowned geneticist at the University of Copenhagen, was intrigued by the origins of Australian Aboriginals who have unique language and cultural adaptations. Furthermore, Australia is home to some of the earliest undisputed signs of modern humans outside Africa, which gave rise to a theory that they were part of an earlier migration. The team was able to sequence 83 genomes from Aboriginal Australians and 25 from people in Papua New Guinea and the results proved they had all descended from a single migration.

The second team, led by Mait Metspalu of the Estonian Biocentre, came to a slightly different conclusion. Metspalu’s team of 98 scientists picked out 148 populations to sample, mostly in Europe and Asia, with a few genomes from Africa and Australia. They sequenced 483 genomes at high resolution and came to the same conclusion as Willerslev’s team. However, in Papua New Guinea they found that 98 per cent of each person’s DNA could be traced back to that single migration from Africa. Yet the other two per cent appeared to be much older and pointed to an earlier wave of Africans who left the continent as long as 140,000 years ago, and then – genetically speaking – vanished.

David Reich and his team assembled a third database of genomes from all six inhabited continents that contained 300 high-quality

The KhoiSan tribes in southern Africa were thought to be isolated 100,000 years ago, but research has revealed they have western Eurasian DNA from around 3000 years ago.





*Their conclusion,
arrived at
completely
separately, was
that all non-
Africans today
trace their
ancestry to a
single population
emerging from
Africa between
50,000 and
80,000 years ago.*

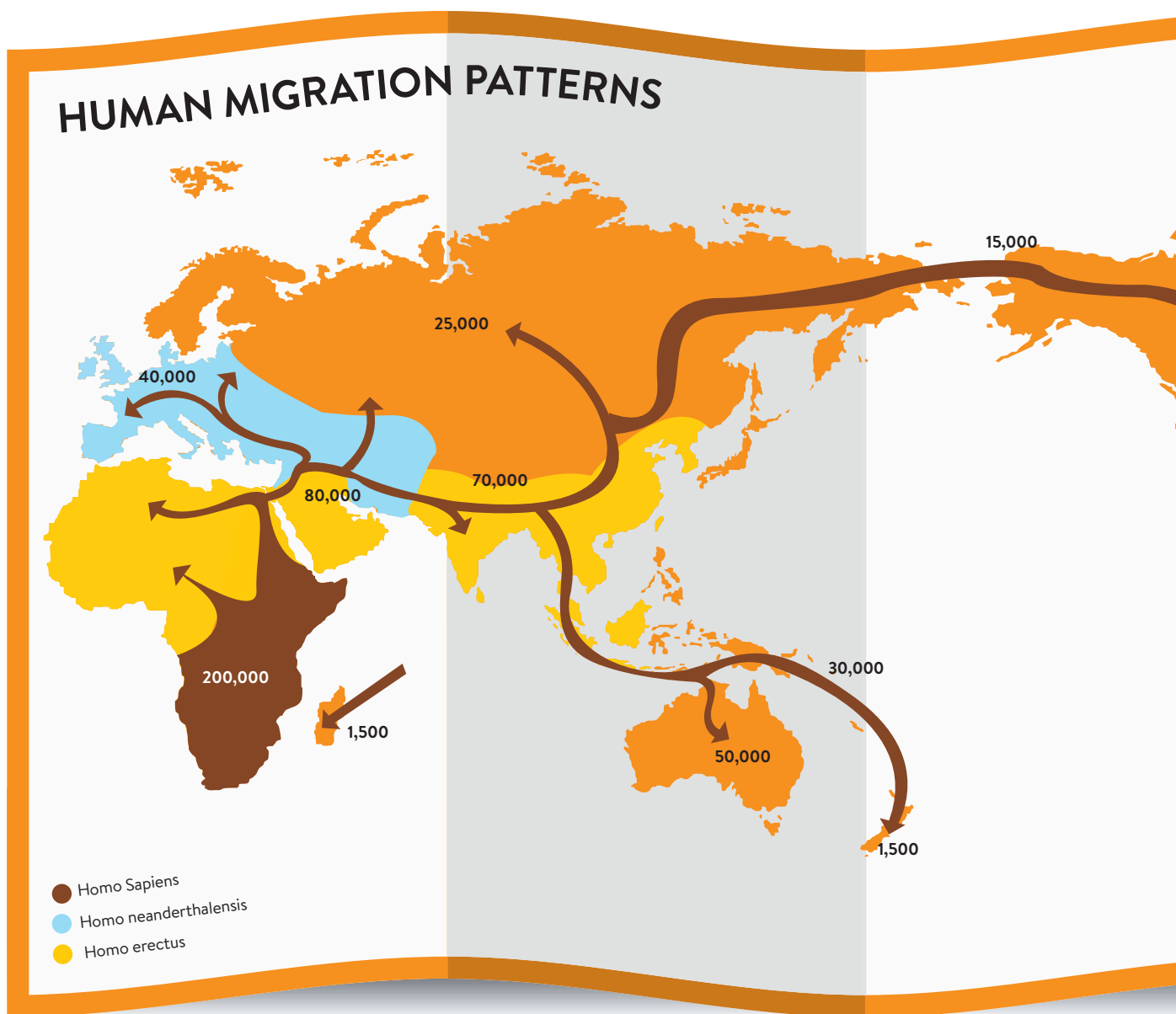
genomes from 142 populations. Once again everything pointed to a single migration, but they also found that human groups began genetically separating from another much earlier than previously thought. For example, the KhoiSan hunter-gatherers who live in southern Africa today, began to split off from other living humans about 200,000 years ago and were fully isolated 100,000 years ago.

The fact that all modern humans are descended from a single migration does not preclude other migrations. In Palestine, for example, researchers found a few distinctively modern human skeletons that are between 120,000 and 90,000 years old. In Saudi Arabia and India, sophisticated tools date back as far as 100,000 years. Last October, Chinese scientists reported finding teeth belonging

to Homo sapiens that are at least 80,000 years old. According to population geneticist Joshua Akey of the University of Washington, Seattle, the most recent migration “explains more than 90 per cent of the ancestry of living people.” Reich has a different opinion. “Our best estimate for the proportion of ancestry from an early-exit population is zero. Taken together, all three studies leave wiggle room for, at most, around two per cent.”

An important fact to remember is that DNA and the human genome only show what is there, and not what is missing. In other words, nobody is disputing that there may have been earlier human migrations. However, these populations – genetically speaking – disappeared. It could be that the modern humans who migrated from Africa between 50,000 and 80,000 years ago were

The map indicates how modern humans may have spread chronologically around the globe.



numerically and technically superior and simply swallowed up these populations.

A study conducted by Axel Timmermann and Tobias Friedrich of the University of Hawaii, Manoa, in Honolulu, found that changes in climate and sea level would have favoured earlier migrations. They reconstructed conditions in northeastern Africa and the Middle East, based on the astronomical cycles that drove the ice ages. They found that a wetter climate and lower sea levels could have enticed humans to cross from Africa into the Arabian Peninsula and the Middle East during four periods, roughly around 100,000, 80,000, 55,000, and 37,000 years ago. This may explain the modern human skeletons found in Palestine and the tools in Saudi Arabia, however it appears that these lineages died out.

A wetter climate and lower sea levels could have enticed humans to cross from Africa into the Arabian Peninsula and the Middle East during four periods, roughly around 100,000, 80,000, 55,000, and 37,000 years ago.

Discovering that all modern humans are descended from one migration is only the tip of the iceberg, however. Thanks to the large genome sample millions of previously unknown population-specific mutations could be identified that may help scientists develop precision-targeted diagnostic tests and treatments on their quest to improve the health of the world's underserved populations.

"As humans, we are not just the people who live in industrialised countries, and we are not just the people who live in numerically large groups," explains Reich. "If we want to understand who we really are, we have to realise that some of the most interesting aspects of human variation are only present in underrepresented, small populations."

Reich and his team made another startling discovery in their research when a study of southern African genes shows that, unexpectedly, another migration took western Eurasian DNA back to the very southern tip of the continent 3000 years ago. The unexpected snippets of DNA in the KhoiSan tribes most resembled sequences from southern Europeans, including Sardinians, Italians and people from the Basque region. In other words, they were not as isolated as previously thought.

We know that southern Europeans can trace their ancestry to the Middle East, so it is highly likely that the reverse migration to Africa originated there. This also means that our ancestors were a lot more mobile than previously thought, and it is highly likely that further research will unearth some more surprises in the human family tree. †



Sophisticated tools dating back as far as 100,000 years ago have been found in Saudi Arabia.

LEADING BY EXAMPLE

Dr Rashid Alleem is widely known as a visionary and thought leader in business, socio-economic, academic and cultural fields.

Dr Rashid Alleem, who has been the Chairman of Sharjah Electricity and Water Authority since 2014, is a multifaceted leader with a breadth of experience and interests. On the business front, his portfolio speaks for itself. As the Director General of what he fondly calls “The Four Big Sisters” – The Sharjah Seaports Department, The Sharjah Customs Department, The Sharjah Airport International Free Zone (SAIF Zone) and The Hamriyah Free Zone Authority (HFZA) – he was the driving force in transforming them into a strategic commerce hub and empowering thousands of businesses in the region, contributing to the development of the UAE economy. They were the best performers among all Sharjah Departments for ten consecutive years witnessing an annual growth rate of 25-30 per cent. Even during the meltdown of 2008-2009, the growth didn’t go below 20 per cent.

However, soon a new challenge presented itself. On Wednesday 22nd April, 2014, which Dr Alleem describes “as a historical day in my life” and a “transformational moment”, he received a call from the executive office of His Highness Sheikh Dr

Sultan Bin Mohammad Al Qassimi, a member of the Supreme Council of the United Arab Emirates and the Ruler of Sharjah, stating that His Highness had chosen him to chair Sharjah Electricity and Water Authority (SEWA). At that point SEWA was teetering close to bankruptcy, but Dr Alleem was ready for the challenge. “I felt I was given a mighty challenge to bring alive an organization which had only a one per cent (or less) chance of survival,” he says. “It was a tough call, my innermost belief and timeless principles echoed within me, a voice came from within, ‘Rashid, it is just another tough/challenging assignment. Nothing you should worry about. You can do it. Mr Achiever. Go ahead. God bless you.’” That was not misplaced confidence, as by this point he had already been recognised for creating ‘built to last’ organisations and society and people around him had bestowed the title of ‘The Change Leader’ on him.

In his latest book *The Sewa Way*, which is due to be published soon, Dr Alleem freely shares his knowledge and outlines 15 principles based on his 15 years of personal experience that a good leader should have. ➤





Above: Dr Alleem at the launch of the Kerala State Business Excellence Awards.

Above right: Dr Alleem is a sought-after speaker at conferences, and is also active on the lecture circuit.



“The book tells a story of transformation, commitment, and determination,” explains Dr Alleem. “It’s about conscious leadership that inspires, fosters transformation and brings out the best in those around them.”

Out of the 15 principles, two have to do with knowledge. Principle #2: Teaching and Learning, and Principle #3: Learn from Experience reflect Dr Alleem’s belief that we continuously have to improve ourselves, especially in today’s competitive and rapidly-evolving world. “The best leaders are insatiable learners. Don’t be satisfied with what you already know,” he advises. “In my opinion, both teaching and learning go hand in hand, one has to be a learner to be a teacher. There is no end to learning in life and teaching is never restricted to the classroom. This quote by John F Kennedy sums up my feelings: ‘Leadership and learning are indispensable to each other.’”

When it comes to learning, reading is invaluable. “Read all that comes your way or interests you. In fact, if you read one hour per day in your field (or outside your field), that will translate into about one book per week and eventually to about 50 books per year,” says Dr Alleem. “In fact, expand your horizon of knowledge, don’t restrict it only to books: Listen to relevant podcasts while driving and seek out mentors vigorously.” The Chairman himself admits to having a penchant for Harvard Business Review’s audiobooks and being a voracious devourer of weekly newsletters, journals, articles, white papers, and all the other newest releases.

Another excellent way of learning advocated by Dr Alleem is to connect with knowledgeable people, regardless of whether they are friends, colleagues, mentors or industry specialists. “Good advice is good advice – regardless of the source,” he explains.

Another powerful source of knowledge is learning from experience. “Given the fast pace of change confronting managers, employees and employers today, it is critical that they develop capacities to learn from current work situations and adapt this learning to new situations,” says Dr Alleem. “Achieving success will cause you to fail, there is practically no way to avoid it. As author Kristi Loucks wrote: ‘The road to success is littered by failures, but the lessons learned are crucial in plotting your course to success.’ The more mistakes we experience in life, the more opportunities we see and the more new lessons we learn. These days it’s not only about learning from our own mistakes but it’s also about learning from others’ mistakes, and that’s a great time-saver.”

The problem with failure is that everybody hates it, something Dr Alleem admits to experiencing on a personal level. “Why? Because we will face embarrassment or loss of stature! In this competitive business world a mistake can mean losing a bonus, a promotion, or even a job. So it’s no wonder that people are petrified to fail or commit mistakes! However, I have a different viewpoint: If you see danger/failure/dead-end ahead, just modify your goals. Realise that there is



more than only one way to reach your destination. Live by your own definition of success, even if it seems failure to others.” In this regard, Dr Alleem says a leader who is tolerant of the right kind of failure plays an important role. Furthermore, great leaders know that innovation and breakthroughs are impossible without failure.

In order to achieve outstanding and breakthrough thinking, Dr Alleem has come up with a philosophy that rests on his self-coined term of thinking called ‘CRI’RAL thinking’. “It’s a unique blend of ‘critical and lateral’ thinking,” explains Dr Alleem. “The human mind is burgeoning with ideas all the time. Critical thinkers analyse the nitty-gritty of any issue on the basis of facts and figures. On the other hand, the lateral thinkers or creative thinkers look beyond the face value and delve deep into the subliminal layers of any particular thing and come out with solutions that are not mundane. The big question is what happens when you put the right-brain thinkers together with the left-brain thinkers? Collisions. That in turn results in outstanding and breakthrough thinking. From the perspective of innovation this is critically important to understand, and will help you get the best from yourself, your colleagues, and your boss.”

Another central tenet of Dr Alleem’s principles is knowledge management. “The words knowledge and management are two very broad concepts when separated, but when the two words come together, it speaks of a concept of creating,

acquiring, and communicating knowledge and improving the reutilization of knowledge towards the success of an organisation,” says Dr Alleem. “In my words, it is about making the right knowledge available to the right person at the right time with the right tools. That is knowledge put to action. I have always been passionate about acquiring knowledge and feel it’s my duty to pass on that knowledge to my subordinates or people around me. In fact, it is every individual’s prime responsibility to give back to society what he gains from it. That’s what I call a knowledge cycle. To me, knowledge is a fluid asset and it saddens me to see it go to waste. I personally feel that knowledge, just like money, can go to waste and be listed as a big non-recoverable loss if not managed intelligently.”

When it comes to sharing his knowledge, Dr Alleem practices what he preaches. In 2001, he founded the Alleem Knowledge Center, a not-for-profit organisation that has been promoting the concept and value of lifelong learning. The Alleem Knowledge Center, in turn, set up six Strategy Clubs to enhance skills acquisition, improve overall industry knowledge, create awareness of key management issues, deliver operational excellence, and leverage technologies amongst other key benefits. In 2009, the first Alleem Business Congress took place and it has witnessed phenomenal growth in the last seven years with over 2,000 delegates from every aspect of business now attending annually.

He is also a prolific author both in English and Arabic, and he has shared his knowledge and experience in seven books so far with the eighth, *The SEWA Way*, being published soon. He is also often invited to guest lecture at both local and international universities addressing almost 15,000 people a year.

There has been no shortage of recognition for Dr Alleem’s contributions. Among the many awards he has received are the Achievement Award by League of Arab States 2007, he was conferred with the Middle East Business Leaders Awards 2012, and was recognised as one among the 100 UAE nationals who contributed immensely to the ‘happiness’ of the UAE, on the eve of the United Nations’ ‘International Day of Happiness’ 2013.

However, the award that has personally honoured him the most was being recognised as “The Knowledge Ambassador Of UAE 2015” by His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President and Prime Minister of the UAE and Ruler of Dubai. †



Dr Alleem is a prolific author with seven published books.

FLASHBACK



THE COFFEE CHRONICLES

Although coffee is one of the world's favourite drinks today, its origins started in the Middle East.

Where would the world be without coffee? According to the International Coffee Organisation 151.3 million 60-kilogram bags of coffee beans were consumed in 2015, of which 70.96 million were Arabica beans and 40.68 million bags Robusta. This marked a steady 1.3 per cent annual increase since 2012.

The heartiest consumers of coffee are the Finns who consume 9.6kg per capita per year, followed by the Dutch at 6.7kg, Slovenia with 6.1kg and Austria at 5.5kg. Algerians are the biggest coffee drinkers in Africa, but the country only ranks 27th on the list of the top 50 coffee consuming countries. As for the Middle Eastern countries, none of them appear in the top 50.

When it comes to total consumption in terms of tonnes, the USA narrowly beats out Brazil, with Germany a distant third (see infographic). However, the Middle East shouldn't feel left out. Figures vary but the Middle East and Gulf region consume 270 to 300 million kgs of coffee annually. The region is also an emerging market for coffee growth with the world market growing at about 1.3 per cent annually, while the Middle East is growing at between 4 and 10 per cent.

However, Dubai's coffee market is growing at between 20 and 30 per cent annually. The number of modern coffee shops owned by chains such as Starbucks and Costa Coffee rose to 160 in 2012

from 118 in 2008 in Dubai alone, according to data from the Dubai Chamber of Commerce and Industry. By the end of 2014 the Dubai International Coffee & Tea Festival reported that the United Arab Emirates is home to over 4,000 coffee shops and teahouses. A 2016 report by Euromonitor International says the UAE sits at the centre of a region that now accounts for 8 per cent, or \$6.5 billion, of the \$85 billion global consumer spend on coffee – and that this could increase by up to a third by 2030. This is borne out by the fact that more than 19,000 tonnes of coffee was sold in the UAE last year, up 7 per cent.

That the Middle East is regaining its coffee crown is only fitting. With New Yorkers drinking seven times the amount of coffee of any other American city and most coffee brews bearing Italian names, it is hard to believe that coffee has Arabic origins.

According to legend, in 1000 AD an Ethiopian herder named Kaldi noticed his goats became friskier after eating the berries of a certain plant. Kaldi took these berries back to the abbot of his local monastery who made a drink with them. The monks quickly realised the drink kept them alert for longer hours and were especially helpful during long prayers. Word of the energizing berry and the fruit itself soon spread to the Arabian Peninsula.

Separating fact from fiction, what we do know for certain is >



ARABICA

Arabica is used in fine coffee, including estate and gourmet blends.

75%

Drink Arabica



Arabica is more expensive than Robusta



TOP 5 COUNTRIES WHICH HAS THE MOST DEMAND

Central America
Colombia
Brazil
Jamaica
Ethiopia

Fruity and sweet tasting coffee.
Half as much caffeine as Robusta.

Grown at 600-2000m altitude



ROBUSTA

Robusta is used in instant coffee and expresso blends for its high caffeine levels

25%

Drink Robusta



West & Central Africa
Brazil
South East Asia
Namibia

Harsh grainy oaty taste.
Twice as much caffeine as Arabica.

Grown at 200-800m altitude

Source: ravecffee.co.uk

that the Arabica coffee plant originated from Ethiopia, where it still grows in the wild today. Fittingly enough the region is called Kaffa, although it's not clear if coffee took its name from the region, or vice versa.

The first person known to write about coffee was a Persian physician and philosopher named Rhazes or Razi (850 to 922 AD), who characterised it as a medicine. He described a beverage called bunchum, prepared with an infusion of a fruit called bunn – the Ethiopian name for a coffee cherry.

Coffee cultivation and trade began on the Arabian Peninsula, and the Arabica coffee bean got its name around the 7th century when it crossed the Red Sea from Ethiopia to present-day Yemen and the lower Arab Peninsula. The *Coffea arabica* plant currently accounts for 75-80 per cent of the world's production. The balance is produced by the *Coffea robusta* plant, which has its origins in central and western sub-Saharan Africa. Robusta was not recognised as a species of *Coffea* until 1897.

On paper Robusta sounds like a winner. The plant is easy to care for, has a greater crop yield, contains almost double the amount of caffeine, more antioxidants, and is less susceptible to disease than Arabica. Roasted Robusta beans produce a strong, full-bodied coffee with a distinctive, earthy

flavour, but its downside is that it is usually bitterer than Arabica due to its high pyrazine content. That is why it is used primarily in instant coffee, espresso, and as a filler in ground coffee blends.

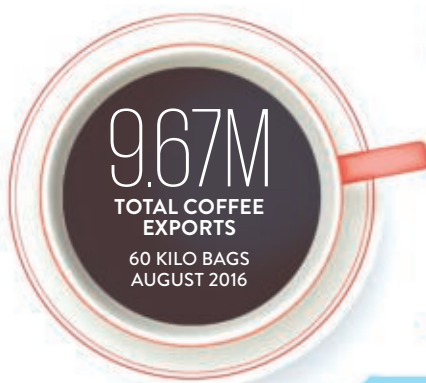
Coffee made from Arabica beans has an intense, intricate aroma that can be reminiscent of flowers, fruit, honey, chocolate, caramel or toasted bread. Its caffeine content never exceeds 1.5 per cent by weight. Due to its superior quality and taste, Arabica sells for a higher price than its hardy, rougher cousin.

By the 15th century, Arabica coffee was being intensively grown in the Yemeni district of Arabia and made according to the original Ethiopian recipe. By the 16th century it was known in Persia, Egypt, Syria, and Turkey.

Being non-alcoholic and with medicinal properties, coffee was quickly embraced by Muslims. Pilgrims to Makkah went back to their homelands talking about the new drink and even carrying coffee seeds with them.

It was in the palaces of Turkey that the first form of modern coffee was brewed – the beans were roasted, finely ground and then slowly cooked with water. This was also the time coffee stepped out of homes and into public coffee houses known as 'qahveh khaneh'. Coffee houses soon became such popular centres of social interaction and

COFFEE AROUND THE WORLD

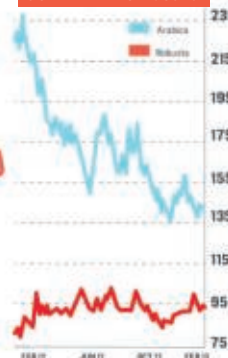
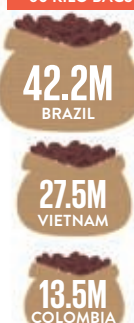


TOP IMPORTERS/60 KILO BAGS

COFFEE IS THE
2ND MOST TRADED
COMMODITY IN THE WORLD

Ireland imports
22,752
60 kilo bags
of coffee
in Nov 2012

Source: International Coffee Organization, Rotterdam & Moscow

PRICE BETWEEN
COFFEE TYPES – US\$/lbCOFFEE KILLING
FUNGUS OUTBREAKTOP EXPORTERS
60 KILO BAGS

COFFEE FACTS

- After crude oil, coffee is the most traded commodity in the world.
- The word 'cappuccino' comes from the similarity of the colour of the drink to the cloaks of Capuchin monks.
- Freeze drying was started during World War II to preserve food and coffee was the first to undergo it.
- 40 per cent of the world's coffee is produced in Brazil.
- Coffee beans are actually seeds of a cherry-like fruit.
- The world's most expensive coffee costs \$600 a pound and comes from the feces of the Sumatran luwak. The luwak eats the coffee berries and excretes the seeds, which are then used to produce a smooth chocolaty coffee.
- September 29th is International Coffee Day.
- 400 million cups of coffee are consumed in America every day.
- In 1475, Turkish law permitted a woman to divorce her husband if he failed to provide her daily quota of coffee.

sharing of information that they were known as 'Schools of the Wise'.

European travellers to the Near East brought back stories of an unusual black beverage and coffee officially reached the shores of Europe in 1615 when Venetian merchants carried back loads of the beans from Istanbul. Initially the local clergy opposed the drink calling it the "bitter invention of Satan" and a great debate ensued. Pope Clement VIII decided to taste the beverage for himself, and found the drink so satisfying that he gave it papal approval. After coffee secured the church's blessing, it spread quickly through England, France, Germany and Holland.

According to popular legend, the famous Viennese coffee culture was born after the second Turkish siege of 1683. The retreating Turks left sacks of coffee beans behind and a Polish officer, who had been held captive by the Ottomans, knew exactly what to do with them. However, according to recent research Vienna's first coffee house only opened 15 years later. What is indisputable is that coffee houses mushroomed across Europe and coffee began to appear as a common breakfast drink. The Americans got a whiff

of coffee in the mid-1600s when the British introduced it to New York.

As demand for coffee spiked, so did the competition to cultivate it outside Arabia. To preserve their monopoly, Arabian coffee traders intentionally made export beans infertile by parching or boiling them before export to Europe. However, the Dutch persevered and created the first successful coffee plantation outside the Middle East on their colony of Java in early 18th century

Above left: Coffee beans are sorted by hand in Kenya.

Below: The process of roasting coffee beans and then grinding them was invented in Turkey.





Coffee lovers can choose from 40 different Arabica varieties and cultivars.

Indonesia. The Dutch started with just a few coffee plants obtained through trade with merchants in the Yemenite port of Mocha. Mocha Java was born with its first shipment to Europe dating to 1719.

Following Java's success, coffee production was quickly established on the Dutch colonies of Sumatra and Ceylon. So important was coffee to Dutch trade that plants were cultivated in specially created botanical gardens in Amsterdam. As part of a military agreement, France received some of these plants in 1720, promptly transporting them to its colonies in Central America.

The New World's tropical regions revealed themselves as ideal for cultivation, and coffee plantations spread throughout Central and South America. Central America's first coffee harvest occurred in 1726. Today, Brazil reigns as the world's biggest producer, claiming no fewer than 10 billion coffee plants.

Coffee's journey around the world continued through the hands of traders, travellers, missionaries and colonists. New nations were established on coffee economies and by the end of the 18th century coffee's status had risen to become one of the world's most profitable export crops.

The Arabica coffee bean's epic journey around the world had a tasty side effect. Over generations, the coffee plant adapted to its new surroundings, and over time created new varieties with different tastes. Furthermore, new cultivars have also been created through horticultural or agricultural techniques. As a result we now have 40 different

Arabica varieties and cultivars, with some of the best known being the Blue Mountains variety from Jamaica, Colombian, Ethiopian Harar, Java, and Bourbon from the island of Reunion.

So next time you order a coffee, regardless of your preference, remember that coffee is yet another contribution from the Arab world. ☕



ON THE COFFEE TRAIL IN DUBAI

Dubai has its own tribute to coffee – a charming Coffee Museum located in the Al Fahidi Historical Neighbourhood. The quaint wind-towered villa enshrines the regional and global coffee history. A massive courtyard showcases the traditions of different coffee drinking cultures – right from Ethiopia, Yemen and Egypt to France and Sumatra. The Emirati style majlis offers insight into the Bedouin coffee traditions, while a series of exhibition rooms trace the history of coffee through artefacts, antiques and even literature. coffeemuseum.ae



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*"We have to make history
and approach the future
with steady steps,
not wait for the future
to come to us."*

H.H. Sheikh
Mohammed Bin Rashid Al Maktoum



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