Fewer than half of stolen works are insured. But art crime costs up to $4bn a year, says the FBI.
Some of the most interesting risks, and potentially the most catastrophic, are out of this world.

SPACE INSURANCE: NEW FRONTIERS p18

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The guide includes a summary of financial statements and the historical performance of all active syndicates, plus detailed statistics on capacity, premium income, claims, loss ratios, and much more.

Pre-order your copy today or find out more at www.lloyds.com/stats
HS2: FULL SPEED AHEAD

CONSTRUCTION UNDERWriters READY THEIR CAPACITY FOR THE UK’S £42BN HIGH-SPEED RAIL NETWORK

Last year’s approval of the £42bn HS2 infrastructure project promises to inject yet more energy into a sector already buoyed by Crossrail, the Forth Replacement Crossing and the Thames/Lea Tunnel – projects that together represent over £22bn of investment.

HS1, Britain’s only other high-speed railway, is the stretch of line between the Channel Tunnel up through Kent and into St Pancras. It was completed in two phases over 16 years – with a chequered history, less so in the last five to ten years. But it does still leave people more cautious and will focus attention.

The financing of the project could also prove tricky. Says Knowles: “If private finance is involved – particularly project finance – that will have a strong influence on how the insurances will need to be structured to protect the interests of the financiers as they focus on the revenue stream associated with the underlying assets, depending upon contractual and government indemnities.”

Equally, interested parties will need to be satisfied too – regional authorities, financiers as they focus on the revenue stream associated with the underlying assets, depending upon contractual and government indemnities. The £15.9bn Crossrail project, the largest currently in progress in Europe, broke new ground in terms of insurance contract duration, according to an Allianz Risk Barometer, published in January. “A natural catastrophe can result in business interruption, systems failure, power blackouts and a host of other perils,” commented Axel Theis, CEO, Allianz Global Corporate Specialty, at the report’s launch.

EMERGING RISKS

CONFIDENCE IN UK CONSTRUCTION

This improving safety record is a key attraction of the UK construction market for insurers. The 2012 London Olympics were the first delivered without a single fatality on any of the building projects. Besides being a human tragedy, accidents can mean delays, which are often costly for insurers.

“The Crossrail and Olympics projects also tested the UK construction sector’s mettle for ambitious, long-running programmes, as have projects abroad. “There’s so much big infrastructure being built at the moment,” says Paul Knowles, Construction Broker at JLT. “In Asia, for example, you’ve got extensions to the Hong Kong metro, and metros being built in Kuala Lumpur and Jakarta.”

In China, high-speed rail construction was temporarily halted following the Wenzhou train tragedy in July 2011. Two high-speed trains collided on a viaduct in the suburbs of Wenzhou, Zhejiang province, killing 40 people, and injuring 192 as the trains derailed and four cars fell off the viaduct.

Elsewhere in Asia, it is natural catastrophes that concern underwriters and risk managers, according to an Allianz Risk Barometer, published in January. “A natural catastrophe can result in business interruption, systems failure, power blackouts and a host of other perils,” commented Axel Theis, CEO, Allianz Global Corporate Specialty, at the report’s launch.

CONSIDER THE CAVEATS

Big UK projects are attractive because they do not bring these problems. Due to get underway in 2017, the insurance programme for the first phase of HS2 will soon enter the market. While there is plenty of capacity and appetite for this megaproject, there are challenges to overcome in placing the insurance. “Duration is a caveat,” thinks Patrick Bravery, Construction Underwriter at Talbot. “The project period, which will be more than five years, will restrict some people’s capacity and appetite.”

The £15.9bn Crossrail project, the largest currently in progress in Europe, broke new ground in terms of insurance contract duration, according to Arthur Gallagher International. The broker put together the first nine-year policy contract duration, according to Arthur Gallagher International. The broker put together the first nine-year policy.

Another risk, Bravery adds, is tunnelling. “There will be a significant amount of tunnelling, some of it through heavily built up parts of London and Birmingham, and later Manchester and Leeds. Tunnelling has a rather chequered history, less so in the last five to ten years. But it does still leave people more cautious and will focus attention.”

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BODY ART COVER CATCHES ON IN OZ

TATTOOS AS A FORM OF PERSONAL ADORNMENT ARE ALL THE RAGE DOWN UNDER, AND TWO NEW LLOYD’S SACKED INSURANCE PRODUCTS ARE TAPPING THE MARKET’S POTENTIAL

In Australia, where one in seven Aussies are currently sporting a tattoo, body art is big business. The industry grew at a rate of 4.7% annually over the past five years to reach $93.3m in revenue in 2013-2014, according to IBISWorld research. There are more than 300 tattoo studios in Australia, providing employment to more than 2,000 people.

Demand for tattoos has in part been driven by rapid advancements in technologies related to their removal, particularly lasers. An increase in legislation around tattoos and body piercing studies has also made consumers more confident about safety and hygiene in the industry.

Nevertheless, many insurers are reluctant to provide cover for the industry. To help fill the gap, Australian broker Parmia Insurance has developed two policies for the sector, underwritten by Lloyd’s. Its industrial special risks policy provides property cover for tattoo studios, as well as property owners with tattoo studio occupancies. It also provides public and products liability, and medical malpractice cover for the sector.

Cover is subject to strict criteria, with unacceptable risks including criminal conviction and businesses established less than 18 months.

“We have entered into this market knowing full well the risks and negative connotations,” says Parmia Founder and Director, Danny Gumm. “Obviously, while we want to help businesses in the tattoo and body piercing industry gain cover, we also need to ensure each applicant meets the criteria prior to evaluating their application for insurance.”

MARKET OPPORTUNITIES

BUSINESS, INTERRUPTED

SINGAPORE REGIONAL HUB URGES MORE SUPPLY CHAIN COVER IN WAVE OF NAT CATS

Major catastrophes in Asia-Pacific have highlighted vulnerabilities in supply chains and stepped up demand for business interruption (BI) cover. In particular, these events – including last year’s Typhoon Hayan and the Tohoku Earthquake and Thai floods in 2011 – have focused corporates’ attention on the potential for non-damage BI. The challenge for the local insurance market is meeting that demand.

“In Singapore, traditional BI is readily available as part of a property damage/business interruption package. The challenge, says Iris Teo, CEO, Marsh Singapore, is securing contingent BI cover on behalf of clients in light of the losses associated with large-scale natural catastrophes. “We expect to see increased interest and demand for contingent business interruption and supply chain protection, as the interdependence between a company and its suppliers becomes more widely understood.”

UNLOCKING THE CHINESE MARKET

NEW UNIVERSITY PARTNERSHIP WILL IMPROVE LOCAL MARKET INTELLIGENCE

One of the biggest challenges for insurers in China is data transparency – particularly access to historic claims and granular hazard information.

Lloyd’s established its reinsurance operation in Shanghai in 2007 and the licence was extended to cover direct insurance by the regulator CIRC in 2010. Now, Lloyd’s is partnering with one of the country’s leading institutions, Nankai University, to build on its market intelligence.

Working with Professor Wei Liu, Vice Director of the university’s International Insurance Research Institute and a member of its Department of Risk Management and Insurance, Lloyd’s will support tailored research to provide more in-depth understanding about crucial aspects of the market.

“The partnership was initiated to provide access to quality Chinese insurance market information and analysis, under the circumstance of a challenging data transparency environment,” says Eric Gao, Lloyd’s China CEO. “The tailored research programmes can also bring added value to managing agents and the Lloyd’s market for future product development and strategic plans.”
Earthquake Special Report
We explore new ways architects are designing for disaster and whether fracking leads to tremor troubles. And we look at how emotion can colour our attitudes to risk, plus cutting-edge earthquake prediction technology. We also cast our eyes to the future, with forecasts for serious seismic activity.

WORDS BY EDWARD MURRAY
Statistics show the deadliest ten earthquakes between 1980 and 2012 killed more than three quarters of a million people, while the ten costliest over this period generated losses of $557bn. Less than 15% of this was insured. What is perhaps most concerning about these figures, is the difference between where the biggest fatalities and the highest costs arise. Although three of the costliest temblors happened in New Zealand, they resulted in relatively few fatalities. The 6.3 magnitude earthquake of 2010 earthquake in New Zealand, killed more than three quarters of a million people, while the ten costliest earthquakes, including the 2004 earthquake in Haiti, however, saw the third and resulted in the death of one person. In one of the earthquakes no one died, but it does not exist in the other two places. Trust issues are also central. We found, particularly in Turkey, that because people do not trust their buildings to withstand any shaking, and feel they will simply crumble around them, then why do anything to prepare? Residents in Turkey feel a corrupt construction sector means the materials and techniques used often undermine the strength of their buildings, and they question the point of trying to strengthen a building weakened by poor practice.

MARKET: Why do you think people in highly seismic areas do little to protect themselves against a potential earthquake?
HELENE JOFFE: “With more regular threats like monsoons, you do find that people prepare. But when it comes to earthquakes, those in affected areas have a much more complex response. The fact that earthquakes have a very long return period, coupled with an inability to accurately predict them, means people tend to live with them as a fact of life. They refuse to let the ongoing, but non-time specific threat inhibit them. The potential scale of an earthquake also makes people feel impotent. There is a fascinating factor that, if you feel something is out of your control, you think, 'why bother?’”

MARKET: How different were the responses from the people you spoke to in Japan, Turkey and the US?
HELENE JOFFE: “In all three countries there is a sense of the potential loss following an earthquake, and the panic and anxiety that would be elicited if one strikes. But the interesting thing is that in the US there is an extra emotion of awe and excitement about potentially witnessing an earthquake. It is a minority position, but it does not exist in the other two places. Trust issues are also central. We found, particularly in Turkey, that because people do not trust their buildings to withstand any shaking, and feel they will simply crumble around them, then why do anything to prepare? Residents in Turkey feel a corrupt construction sector means the materials and techniques used often undermine the strength of their buildings, and they question the point of trying to strengthen a building weakened by poor practice.”

MARKET: Many of the preparations that people make are non-earthquake specific. What can the insurance industry do to encourage people to better prepare?
HELENE JOFFE: “Partly, it’s people having a sense they can survive – that earthquakes are not necessarily death events. If you’ve retrofitted buildings, or built to code, and you take additional measures, your survival chances are quite high. So, what encourages preparedness is a sense of self-efficacy – that there is something you personally can do to mitigate the impact and survive.”

EARTHQUAKES: NATURE’S MOST DESTRUCTIVE FORCE
THEY’RE A DAILY OCCURRENCE, AND WHILE THE MILDEST TREMORS GO UNNOTICED, THE MOST VIOLENT TEAR THE COUNTRYSIDE APART, REDUCE CITIES TO RUBBLE AND GENERATE TERRIBLE PERSONAL AND ECONOMIC LOSSES

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BASE ISOLATION, A TECHNIQUE THAT PREVENTS OR MINIMISES DAMAGE TO BUILDINGS DURING AN EARTHQUAKE, HAS BEEN USED IN NEW ZEALAND, INDIA, JAPAN, ITALY AND THE USA.

FIXED BASES
Superstructures that are coupled directly with the ground are more likely to experience lateral movement induced by an earthquake – and therefore to suffer extensive damage.

ROLLERS
When a building is isolated from the ground, resting on flexible rollers (or bearings), it will only move a little or not at all during an earthquake.

RUBBER PADS
Similarly, flexible rubber pads that work like a car suspension system allow the building to adapt to tremors and ground shifts, with reduced shaking.

DESIGNING FOR DISASTER
ARCHITECTURAL AND ENGINEERING INNOVATIONS, COUPLED WITH WELL-REGULATED BUILDING CODES, COULD SAVE COUNTLESS LIVES – AND PROPERTIES

Minutes after the 2008 Sichuan earthquake struck China, the world’s tallest building at the time, the Taipei 101 in Taiwan, started swaying. As it moved, a 728-ton pendulum, suspended between the 87th and 92nd floors, rocked back and forth to counteract the shockwaves and protect the building.

This counterbalancing technique is just one of the approaches that architects and engineers are evolving to enable buildings to maintain their integrity during quakes. “Another technique is to actually isolate the building from the foundation system so that the superstructure rolls with the earthquake,” explains Michael Gustafson, Industry Strategy Manager for Structural Engineering at software design specialist Autodesk.

“Imagine being on top of a table with roller skates on. As somebody shifts the table back and forth, you actually stay in the same place because the skates allow the table to move underneath you. In the same way, the building does not feel all of the forces because it is moving and not subject to the full forces from the quake.”

Turkey’s Sabiha Gökçen International Airport, completed in 2009, is the biggest building in the world to employ seismic isolation technology, and increasingly the technique is being used in buildings across the world. The technique has proved so successful that Kubilây Hicyilmaz, a seismic engineer with ARUP, recently blogged: “Base isolation is seismic engineering’s equivalent of seatbelts in cars – and maybe more: it’s a lifesaver and possibly a property saver. That’s why I believe base isolation needs to be made a legal requirement for most new non-high-rise buildings in areas at risk from earthquakes.”

A third technique is to incorporate ‘seismic fuses’ into a building. This allows some of the building to dissipate the earthquake’s energy and crumple, without the integral parts of the structure being damaged. A wide-scale adoption of these innovations would quickly drive down costs and help engineers to further develop their effectiveness. But it is unlikely wholesale take-up will be made mandatory. Instead, engineers, architects, builders and insurers must push for building codes in every location around the world to be continually and gradually improved.

“I cannot stress enough the importance of ensuring earthquake codes in place because the skates follow them.”

A HEADS UP FOR INSURERS:

“Research suggests fracking has the potential to generate seismic activity. In the event the latter does occur, however, it can be difficult to establish a direct link between an energy company’s fracking activity and subsequent earth tremors. It is essential, therefore, that fracking companies have robust monitoring procedures to ensure they know immediately of any adverse effect from their operations. This will help them establish greater clarity on individual liabilities.”

CHRIS JONES, UNDERWRITER, KILN

“Does Fracking Cause Earthquakes? Seismic Activity in Texas at the Tail End of Last Year Has Rekindled the Debate. Our Experts from the Worlds of Geology and Insurance Weigh in…”

“The definitive research is that fracking can cause earthquakes that are felt. But the longer answer – which is important – is that if you compare fracking to other processes like mining, filling dams with water and, ironically, conventional oil and gas extraction, fracking does not make it into the premier league. When I talk about fracking, I am talking about pumping fluid underground to get hydrocarbons out.”

PROFESSOR RICHARD DAVIES, DURHAM ENERGY INSTITUTE
FROM THE US AND EUROPE TO THE FAR EAST, EXPERTS ARE PREDICTING TEMBLOR TROUBLES IN THE NEAR FUTURE. HERE ARE THREE THAT GRABBED OUR ATTENTION TO DATE, SCIENCE HAS BEEN UNABLE TO ANTICIPATE WHERE AND WHEN THE NEXT EARTHQUAKE WILL STRIKE. THIS MAY BE ABOUT TO CHANGE.

Scientists can identify earthquake signatures from electromagnetic and thermal activity prior to a major event. They are now working to develop that understanding into a predictive capability. The UK and Russia, for example, are partnering on a joint initiative that will send satellites into orbit to monitor changes in electromagnetic activity—and hopefully enable scientists to pinpoint the location and time of a strike.

Dhiren Kataria, Head of In-situ Detection Systems at UCL’s Mullard Space Science Laboratory, explains the technology behind the TwinSat Project: “During the earthquake preparation phase, there are a number of things happening on the surface of the earth that propel electromagnetic signals into the environment. You can catch these signals using plasma sensors and electromagnetic field sensors from space with the advantage that satellites provide global coverage as opposed to ground-based sensors.”

The challenge is then to isolate this data from similar signatures created by solar storms and human activity, and develop a communications network that can issue effective warnings to areas at risk throughout the world. The goal is to predict an earthquake with a magnitude upwards of six, hours and even days before it happens. However, says Kataria: “In order to build that capability and not make false predictions, there is a considerable amount of work to be done.”

**CALIFORNIA**

Global Weather Oscillations Inc. (GWO) has said California is most at risk of a major earthquake in a three-year period that began in July 2012. GWO generates its predictions by combining Meteorology, Oceanography, Climatology, Geology, Seismology, Astronomy and Astrophysics to create a framework through which it observes and forecasts.

**JAPAN**

Russian scientist Alexei Ryubushin, of the Schmidt Institute of the Physics of the Earth, put Japan on high alert when he presented research at the European Geosciences Union Convention in Vienna in April last year that suggested the country could face an earthquake with a magnitude of 9.0 between 2013 and 2014.

**GREECE, ITALY AND TURKEY**

Fifty scientists working as part of the Seismic Hazard Harmonization in Europe programme have suggested countries including Greece, Italy and Turkey could bear the brunt of a major earthquake with a magnitude in the region of 9.0. Although the group of scientists gave no timeframe for this earthquake, they have produced maps detailing the most at risk areas. The research was released in September last year, but Greek scientists have questioned whether the tectonic plate structure in Greece could produce an earthquake of such intensity.

IUMI 2014

HONG KONG CONFERENCE

InterContinental Hong Kong Hotel
21-24 September 2014

This high-profile networking event for the International Maritime Insurance Sector is a chance for London-based brokers and underwriters to hear from local experts on the current market conditions in Hong Kong and the wider region, and to discuss challenges and opportunities with industry colleagues. The Chief Executive and President of the Executive Council of the Hong Kong Special Administrative Region, CY Leung, will be the keynote speaker.

Find out more at www.iumi2014hk.com or register interest at www.iumi2014hk.com/register_interest.html

The Lloyd’s Hong Kong office can help with facilitating introductions to the local market. Contact: +852-2918-9911

IUMI IS PROUDLY SPONSORED BY LLOYD’S AGENCY DEPARTMENT.
Lloyd’s has been a pioneer in the space market since the 1960s. Here, we explore the insurance opportunities and risks...

After two rogue satellites, insured for £133m, were launched into the wrong orbit, Lloyd’s contributed £4.5m toward the cost of their successful recovery. It paid a further £3.9m for the development of the ‘Stinger’, a tool which stopped the satellites spinning and allowed them to be grabbed by the shuttle’s recovery arm.

The average value of a satellite in Geostationary Earth Orbit (GEO). There are approximately 370 active communication, broadcasting and meteorological satellites in GEO, with a lifespan of 15 years each – around 167 are insured.

The premium range covering cancellation of a Virgin Galactic suborbital spaceflight trip. Tickets for flights, scheduled to commence in 2014, cost $250,000.

The weight of the asteroid Apophis, which will cross Earth’s orbit in about 2030. The probability it will strike us, however, is one in 250,000. On a smaller scale, several thousand meteors, each weighing at least 1kg, fall to earth every year – mostly over oceans.

The biggest insured loss in space market history. In February 2013, the US-made Intelsat-27 took off from a platform run by Sea Launch, using Russian Zenit launch systems. The 3SL rocket booster was destroyed when the satellite fell into the Pacific.

The number of objects above ten centimetres in size orbiting the earth. 500,000 items between one and ten centimetres are too. And there are tens of millions of other particles smaller than a centimetre circulating the planet. All of it is travelling at several kilometres a second – sufficient velocity to cause significant damage to operational satellites.

The Carrington Event of 1859 is regarded as the most intense geomagnetic disturbance on record. If a comparable solar storm struck North America today, estimates suggest up to 40 million people could be without power for up to five years. And the economic cost would be between $60bn and $2tn.

$2,000,000,000,000
He may be adamant it is in the market’s interests the UK should remain within the European Union, but Sean McGovern is no passionate or uncritical Europhile. Indeed, he has spent the past 17 years working in London at Lloyd’s, including a stint as North America Director, and he is more likely to be found sailing off the coast of his hometown of Brighton than holidaying in the South of France.

The European question could hardly be more pressing following Prime Minister David Cameron’s promise to hold a referendum on Britain’s membership of the EU by the end of 2017, if his Conservative party wins the next election. McGovern, a lawyer by background, believes the current political and public debate around the issue is far too heated. “Opponents are often divided on emotional, not factual grounds and the discussion is frequently ill-informed.”

His calculation that it is in Lloyd’s interests for the UK to stick with Europe is based on cold, rational analysis. In reality, he warns, business decisions taken as a consequence of the UK exiting the EU would be made on “hard-headed, economic grounds alone”. A recent case in point is a major US investment bank’s intention, in case of the so-called “Brexit”, to relocate its London team to the Continent.

So what does McGovern, who oversees legal, government and regulatory affairs and risk management for Lloyd’s, see as the consequences for the market if the UK leaves the EU? First, he emphasises how important European business is to Lloyd’s. Some 15% of its premium income is from the EU, excluding the UK. Thus, “any change to the way we access that income will have to be looked at carefully”.

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His calculation that it is in Lloyd’s interests for the UK to stay with Europe is based on cold, rational analysis. In reality, he warns, business decisions taken as a consequence of the UK exiting the EU would be made on “hard-headed, economic grounds alone”. A recent case in point is a major US investment bank’s intention, in case of the so-called “Brexit”, to relocate its London team to the Continent.

So what does McGovern, who oversees legal, government and regulatory affairs and risk management for Lloyd’s, see as the consequences for the market if the UK leaves the EU? First, he emphasises how important European business is to Lloyd’s. Some 15% of its premium income is from the EU, excluding the UK. Thus, “any change to the way we access that income will have to be looked at carefully”.

He adds: “You normally can’t do business in a country without being established there, including holding some level of capital and reserves locally, and reporting and filing with the local regulator.” So, setting all this up in other EU
“The idea that regulation in the UK would be easier and less burdensome if we left the EU is fanciful”

Member States would mean a significant and costly upheaval for Lloyd’s and a fundamental change in the distribution of its business. How long this process might take is unclear, but there would be a period of uncertainty and disruption, says McGovern. “One can surmise that brokers, and clients of brokers, may find other carriers during that time, and there is a risk that, even if we could secure licenses, they may not return.”

McGovern points out that such relationships already exist: “A number of businesses within Lloyd’s do have insurance companies outside the market and they may well choose to write insurance through another part of their group.”

The Principles of Solvency II Are Sound
Would one benefit of the Brexit not be to deliver us from the perceived perils of Solvency II? “Solvency II gets a lot of negative press because of the uncertainty around when it will be implemented and the cost,” McGovern admits. “And it’s true the UK has spent around £2bn preparing for the new regime, while Lloyd’s itself has spent in the region of £300m.”

However, he argues, “Regulations are not always a bad thing. I believe the principles of Solvency II are sound. The better management of risk and capital that companies have introduced in order to prepare to comply with the directive have left us with much better-run businesses.” McGovern notes that Solvency II is built on the UK’s own Individual Capital Adequacy Standards (ICAS)—introduced in 2005 by the Financial Services Authority as extra ‘gold plating’ on the EU’s Solvency II regime. “ICAS is more sophisticated than Solvency I as it requires you to model how much capital you need to cover your risks. It did increase the regulatory burden, but was mostly welcomed by the industry.”

McGovern also questions the notion that the UK would escape EU regulations if it left the Single Market. “Regulations are increasingly determined at global level, not just coming out of the EU,” he says. If Britain exited the EU, the UK would still wish to comply with European insurance rules that require ‘third countries’ to show their regulations are equivalent to those of the Single Market. “The idea that regulation in the UK would be easier and less burdensome if we left the EU is fanciful,” he adds.

So the UK would have to follow the same rules as practice, even if it were not a member state—the difference being it would not be able to influence changes to EU regulations. That particularly matters to Lloyd’s as, over the years, and as a result of intensive lobbying, EU rules have taken legislative account of Lloyd’s unique legal and economic structure and business model, to the market’s clear benefit.

Finally, McGovern points out, leaving the EU would mean we would no longer be able to shape the trade liberalisation talks and insurance regulatory dialogues with non-EU countries, conducted by the European Commission on behalf of all Member States. To date, the EU has shown itself willing to take up issues raised by Lloyd’s. “There is no reason to suppose that it would be willing to do so in the future if the UK was no longer part of the EU,” he says. “Who are major economies pursuing trade deals with?”

McGovern asks. “Not the UK, but the EU—the economic prize is simply not the same.”

“Governments are becoming aware that the more systemic challenges caused by climate change and food scarcity influence the more systemic challenges caused by climate change and food scarcity. Insurers can play a part. Says Waughray: “Each country has to face some strategic risk management choices: do they invest in water-efficient technologies so that every farm can have maximum production with minimum water usage. Or will it be cheaper to invest in an insurance scheme that pays out when the one in 20-year drought eventually becomes a one in four-year event?”

“While insurers do provide some coverage against water scarcity, they have yet to fully address the complexities of the risk in their products. They could also do more to improve risk management and practices among clients, adds Waughray. “It’s the right time to register the link between damage caused by climate change and the more systemic challenges of water scarcity and its impact on economic growth, food production and water sources,” he says. “Only if insurers can potentially influence governments and corporates to be more responsible.”

By 2050, the UN predicts the world population will grow to 9.6bn, while agricultural production will need to increase by 40% over 2005 levels to meet food security needs. Energy demand from hydropower and other renewable energy sources will also rise by 60%. Factor in anticipated spikes in extreme rainfall and droughts, the hardening of ground through urbanisation, and the decreasing resilience of wetland, river and lake ecosystems, and water scarcity is expected to reach unprecedented levels.

Increasing competition for water will affect all business sectors, from water-reliant industries such as agriculture, beverages or mining, to retail (whose supply chain could be disrupted) or financial services (whose performance depends on the success of the companies it invests in or pays out to).

Water stress is also a global problem. Climate change is creating scarcity and quality issues in California, Northern Europe, and the Middle East. Southern Amazon and Australia. And demographics and economic growth are putting massive pressure on water supply in Northern India, China and sub-Saharan Africa.

Governments are becoming aware that their long-term economic future may be linked to how well they manage their resources, rather than whether or not they have them,” says Guy Pegram, Managing Director of management consultancy Pegasys, Water Advisor to the WWF and author of Global Water Scarcity, a 2010 briefing on the issue from Lloyd’s.

ECONOMIC FORUM
In the run-up to Christmas, national news broadcast CCTV footage of a man in a hooded sweatshirt breaking in to the Exhibitionist Gallery in Notting Hill and making off with two artworks, *Pyronin Y* and *Oleoylsarcosine*, by Damien Hirst. Together they were said to be worth £33,000.

Robert Read, Global Head of Fine Art at Hiscox, says that on rare occasions such thefts are to order, because someone wants these specific works in their personal collections. But, he adds, the thief often has a different motive altogether. “It’s like a calling card to the criminal underworld. It does give you some credibility to turn up to a gangland meeting with the *Mona Lisa* under your arm.” Read says criminals might also use stolen art as collateral for a loan to fund a different crime altogether.

Charlotte Wilson, UK Specie Underwriter at Catlin, says high profile, brazen art thefts are unusual. “Often art is stolen by mistake. It might be in transit in the same container as a load of perfume the gang is targeting. The criminal then cannot sell the artwork and the art happens to be in the way.” Sometimes the art just gets dumped, or hidden, occasionally finding its way back to the insurers when rewards are offered.

“*The art industry is pretty scrupulous about not paying ransom. We will offer rewards based on a conviction,*” says Read. Looser rewards are offered for information leading to the return of the stolen art, providing the police and insurers are certain the money is not going to criminals who stole the art in the first place. The value of those rewards is tiny compared with the value of the art itself. “If you steal a big and valuable work it is very hard to turn that into cash,” says Read.

**THE ART OF RECOVERY**

Michael Borle, Class Underwriter at Liberty Specialty Markets, says recovery is the insurer’s problem, not the client’s. “The priority is the payment of the valid claim. Because there is an abandonment, any recovery is in the interest of the insurer.” That means bringing in specialist loss adjusters, such as Mark Dalrymple of Tyler & Co. He has 35 years’ experience settling multimillion-pound claims, and recovered prized works of art through a network of ‘contacts’ within international crime fighting organisations and elsewhere. He’s the man who – after piecing together snippets of information from unconnected sources handed into police forces that had not spotted the significance of their tip-off – might hand over a reward.

Dalrymple insists it is much less cloak and dagger than it sounds. “The person claiming the reward is not criminally involved. Checking that is where the police come in. There is no question of us ever meeting under a railway arch with a brown envelope.”

His most famous case – few are talked about and Dalrymple never claims credit – was the Tate’s missing Turners. Stolen in 1994, insurers led by Hiscox paid out £24m. Fast forward to 1998 and the Tate offered to buy back its interest in the paintings and a deal was struck for £8m, including Hiscox approving the secondment of Dalrymple as an adviser to the Tate’s Trustees.

By the following year, 1999, the three thieves and their getaway driver had been convicted. In 2000, the first of the paintings, *Shade and Darkness*, was recovered in utmost secrecy. The second Turner, *Light and Colour*, was recovered in December 2002 when the Tate finally made the announcement public.

**MASTERPIECES, MASTER CRIMINALS**

The FBI puts the worldwide cost of crimes linked to art at nearly $4bn a year – eclipsed only by the drugs and arms trades. And yet fewer than half of stolen works are insured.

WORDS BY CHRIS WHEAL ILLUSTRATIONS BY MIGUEL MONTANER
Dalrymple says crossing the necessary palms with silver had to be approved at the highest level. "A payment that facilitated the return of the painting was made to third parties – not the criminals. This payment was first approved by a judge in chambers in the UK, the federal prosecutor in Germany, and by the Charities Commission in the UK," he says. Dalrymple gets paid for his claims settlement work as any loss adjuster would, but works on recovery of stolen artworks on a contingency basis. "If we get a success, it depends what input I have had. But within about five minutes, I have usually agreed a fee with the insurer that I think is acceptable," he says. There are sometimes private detectives and ex-police officers involved, as well as the official law enforcement services.

THE WAR AGAINST THEFT
Another player in the war against art theft is the Art Loss Register, established in 1991. Its Chairman, Julian Radcliffe, takes a pragmatic approach, arguing that paying nothing to recover art "would only be effective if the criminals could not sell the items or use them for any other purpose and the policy was enforceable internationally." Given that is not the case, he says, "it is necessary to develop a more sophisticated approach".

There are rules, Radcliffe explains. "The first element is to prevent the sale of the stolen items for anything like their original price. The world housing extensive ranges of art so it can be bought and sold without tax. Switzerland claims to be a leader, with heavy concentrations of art in Chiasio, Zurich, Basel and Geneva. But there are others too, such as the self-styled 'art fortress' in Singapore. Insurers are less convinced.

And insurers have insisted on changes to how artworks are transported and stored when not on display, as this is where many damage claims occur. "Damage is a big risk, not total loss," says Catlin’s Charlotte Wilson. "The bread and butter claims come from water damage, fires and flood, and natural catastrophes. Insurers want to see wind rooms in hurricane zones, secure dry buildings in potential flood zones and proper plans to get artworks to these safety zones promptly. They like water sensors built into walls and artworks raised off the ground. Most will exclude subtropical galleries.

A big concern now is the aggregate risk from the many fine art premiums, which are a hindrance to the world housing extensive ranges of art so it can be bought and sold without tax. Switzerland claims to be a leader, with heavy concentrations of art in Chiasio, Zurich, Basel and Geneva. But there are others too, such as the self-styled ‘art fortress’ in Singapore. Insurers are less convinced.

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Michael Burle, Class Underwriter at Liberty Specialty Markets, agrees. "It can cost £50,000 to repair a rip in the corner of a painting, yet that tear might reduce its value. We would pay for that repair cost and any resulting depreciation in value."

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THE PREMIUM STEAL
Recovering stolen art is a big business in itself. FBI estimates of the value of art theft worldwide have hit highs of $4bn, putting it behind only the drugs and arms trades. But this figure is now thought of as exaggerated. According to the Art Loss Register it is impossible to truly know. Not all police forces worldwide keep records and those that do have different definitions of what is and is not art. Thefts from private houses have declined significantly over the past 25 years in the UK, but not so much on the Continent.

The reasons for the drop are better security, locks, safes and alarms — all driven by insurers — and the reduction in value of other items that can be stolen at the same time. Electronic goods aren’t that lucrative, and those that can be sold are usually carried in pockets and bags, not left at home. Europe’s an easier target because of ownership rules — someone buying a stolen item in good faith can keep it, whereas in the UK the buyer loses out and the original owner has the stolen item returned.

What is clear is that only about half of the works that are stolen are insured. Putting a value on the total premium on art insurance is tricky. Estimates for the pure fine art cover range as high as $600m, with $550m more widely quoted. There are as many as 35 syndicates at Lloyd’s writing it and new entrants coming in. “You don’t necessarily see anybody pull out of the market, but you have seen two or three new entrants a year in 2012 and 2013,” says Liberty’s Burle. “There is a bit of loyalty from some clients but it still comes down to price. There’s not a huge differential in wordings.”

Catlin’s Wilsons adds: “There is so much capacity, and loss rates are such that there are low rates and no deductibles. There are some galleries and owners who simply will not buy — public museums may have state backing or be prevented from buying. There are private owners who have had valuable works uninsured for years, and see no reason to buy now — they may be asset rich, but too cash poor to afford it. Some dealers that do have fine art policies are suspected of buying too little cover for their collections. New buyers are coming into the market, seeing art as a financial investment. All need to be targeted by insurers.”

The major fine art insurers are on a constant round of conferences and speaking engagements, marketing to brokers to get across the point that many high net worth clients ought to have specific fine art policies because of the more comprehensive cover and claims expertise. Theft is just part of the picture (see box, left). When it comes to claims, the fine art premium is a steal.
If you take the more excitable headlines too literally, it won’t be long before we have a queue of drones outside our front doors waiting to deliver our shopping, Christmas presents, takeaway meals and urgent medicines. You name it and one day an unmanned aerial vehicle (UAV) will be on its way to you – although that day remains a few years away.

In the hands of the military, especially the US and Israeli armies, UAVs have been used extensively for more than 20 years – mostly over hostile territory where it would be too risky to send manned planes or helicopters. Initially, their prime purpose was detailed reconnaissance, but recent years have seen highly publicised armed attacks deep into the notorious North West Frontier region of Pakistan and the neighbouring tribal areas of Afghanistan. Controlled from bases hundreds of miles away they have been used to assassinate some of the most wanted terrorist leaders – not without some public disquiet, including in the US.

**A CAUTIONARY TALE**

That level of sophistication and potential for long-distance control might be throwing up all manner of potential civil and commercial uses, but so far aviation regulators remain extremely cautious. In the UK, fewer than 300 licences have been granted by the Civil...
Aviation Authority (CAA) to operate UAVs commercially, although the rate of issue doubled last year and should do so again in 2014. A key reason for the low numbers is the restrictions imposed by aviation regulators on how and where they can be used. Around the world the picture varies enormously. The US Federal Aviation Authority currently only authorises UAVs for use by public authorities or emergency services, although it has been running a small test zone in a remote corner of Alaska looking at civilian uses. At the end of December, the FAA announced five further test sites as it rushes to comply with Congressional demands to produce comprehensive regulations for licensing the commercial use of UAVs by the end of September 2015.

Estimates of the value of the UAV market to the US of between US$80m and US$100m may excite some, but others remain sceptical, if not outright hostile. There are widespread fears about the threat to privacy, as leading US insurance and aviation lawyer, Ray Mariani, explained at a panel discussion in New York: “Our society still values privacy, despite the exponential growth of social media over the past decade or more. Will [UAV] use become just one more means of eroding this precious commodity? No one contends that a small [UAV] equipped with a very high resolution camera can easily capture our actions while driving, typing on a laptop on the back patio, or in our bedroom. Is that presently lawful, or do we wish it unlawful and therefore need to consider legislation to forbid such practices?”

While the FAA looks to open up the opportunities for UAVs, other parts of the US are heading in the opposite direction, permitting residents to shoot them out of the sky. In Deer Trail, Colorado, they are even holding a referendum on whether to allow people to claim a US$100 bounty for every government-owned UAV taken down.

The UK’s CAA occupies a middle ground. It does not permit UAVs to be flown beyond ‘line of sight’ of the ground-based operator and has strict rules about the heights at which they are permitted to be flown. Its standard restriction is no higher than 400 feet and no further than 500m from the operator for UAVs weighing up to 20kg, with limited permissions granted for variations from this. This imposes a huge limitation on uses, but that isn’t stopping a wide range of industries looking at their potential, ready for the day when the rules are relaxed. As Gerry Corbett, Unmanned Aerial Systems Programme Lead at the CAA explains: “We are being invited to a lot of meetings and get many enquiries from companies with bright ideas, but most of them are still very tentative.”

THE FRIENDLY, FLEXIBLE FACE OF DRONES...

THEY’RE HANDY FOR IRRIGATION MONITORING IN AGRICULTURE AND SURVEYING OIL AND GAS RIGS... AND THEY'RE BEING USED TO INSPECT POWER LINES, PATROL AIRPORT PERIMETERS, AND CAPTURE AERIAL SHOTS FOR FILM AND TV. THEY’VE ALSO BEEN FITTED WITH THERMAL AND VISUAL CAMERAS AND DEPLOYED TO LOCATE SURVIVORS IN THE AFTERMATH OF NATURAL DISASTERS. THE INDIAN GOVERNMENT IS EVEN USING THEM TO TRACK HERDS OF ELEPHANTS AND WARN RAILWAY OPERATORS IF THEY'RE NEAR LINES. BUT THAT'S JUST SCRAPING THE SURFACE. THERE ARE PLENTY MORE INNOVATIVE APPLICATIONS, LIKE THESE...

**VOLCANO DIVING**
In early 2013, NASA Earth scientists flew Dragon Eye UAVs—transferred from the United States Marine Corps and equipped with thermal cameras and sensors—into the sulfur dioxide plume of Turrialba Volcano, near San José in Costa Rica. The project’s objective? To improve the remote-sensing capability of satellites and computer models of volcanic activity.

**CROWD CONTROL**
In an alleged first, the Royal Canadian Mounted Police in Saskatchewan province last year used the small Dragonfly X4-ES helicopter UAV to locate and treat an injured man whose car had flipped over in a remote, wooded area in near-freezing temperatures. The drone managed to pinpoint the accident victim’s position after a regular, manned helicopter equipped with night vision had failed.

**REMOTE RESCUE**
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**“Even a lightweight UAV is equivalent to the weight of a small vacuum cleaner. Imagine that falling on someone’s head from 400 feet”**

GERRY CORBETT, UAV PROGRAMME LEADER, CAA

operators to professionalise the image of the market: “We’re keen to ensure this whole business grows out of model aircraft hobbyist image to become part of the professional aviation market.” He says the people currently coming forward for operator training aren’t professional aviators, but photographers, surveyors and other professionals “who see an opportunity to gather data in a cheaper, faster and safer way.”

This approach sits well alongside the CAA, explains Corbett: “The regulations we have were developed over one hundred years. We are not going to radically change them or our approach. UAVs are still aircraft and are still piloted.” The CAA wants to strike a balance between allowing UAVs to develop, without taking risks with safety: “Operators largely get away with it.”

They have been deployed for the purposes of border control, search and rescue, and tracking suspects. On average, they carry third-party liability cover up to around US$10m, says Cox, although this rises to US$50m for some of the larger risks. In some countries—France and Germany for instance—public services are indemnified for their UAV use by national governments. Kiln offers UAV and hull liability insurance for all types of UAVs, but sees the biggest growth coming from the small—to medium-end of the market—which hull values range from £30,000 to £100,000—due to the regulation currently in place. Says Jay Wigmore, Aviation Underwriter: “It’s the sub-50kg market—sub-20kg in the UK—which is seeing the most growth. People are looking to develop uses within the current CAA regulations, where the vehicle has to be kept within line of sight of the ground-based operator.”

Wigmore says Kiln is working closely with manufacturers to understand the potential uses, and that it has teamed up with Resource UAS, one of two firms approved to train operators of UAVs by the CAA. The rates it offers on combined or liability cover up to around US$10m, says Cox, although this rises to US$50m for some of the larger risks. On average, they carry third–party liability cover up to around US$10m, says Cox, although this rises to US$50m for some of the larger risks. In some countries—France and Germany for instance—public services are indemnified for their UAV use by national governments.

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“We are already seeing strong growth, but we expect the smaller end of the market to really open up in the next five years.”

MARTIN COX, UNDERWRITER, GLOBAL AEROSPACE

The London market is braced for the expansion in demand for insurance as unmanned solutions spread. CAA will approve, however. It remains to be seen whether the market opens up in the UK around Aberporth or leads to operators, to the efficacy of in-built ‘sense and avoid’ protocols in the event that operator control is lost. In the future, the possibility of UAVs being operated autonomously without human intervention, together with the potential for hacking or malicious hijacking, could further compound the threat of ground impacts or mid-air collisions resulting in death, ball loss or third-party property damage.

A REGULATORY ROADMAP

Much of the future development in commercial use of UAVs lies in the hands of aviation regulators and they are working closely to create a roadmap for harmonising the rules, led by the EU and the Joint Authority for Rule-Making for Unmanned Systems. The current roadmap is looking at harmonisation for the under-20kg UAVs flying in line of sight by 2018, with certain ‘beyond line of sight’ operations allowed in sparsely populated areas. This is already permitted in the UK around Aberporth Airport in Wales and over parts of Salisbury Plain. This will be followed between 2019 and 2023 with agreement on rules allowing larger UAVs to operate in some types of airspace and limited beyond line of sight operations in populated areas. That is when we might see UAVs flying down streets, checking on the elderly, delivering medicines to pre-determined collection points, monitoring traffic or anti-social behaviour.

Beyond that, there are more ambitious plans for unmanned cargo planes using general airspace and airports, with the rules allowing that to happen coming in the latter part of the next decade. The London market is braced for the expansion in demand for insurance as unmanned solutions spread. CAA will approve, however. It remains to be seen whether the market opens up in the UK around Aberporth or leads to operators, to the efficacy of in-built ‘sense and avoid’ protocols in the event that operator control is lost. In the future, the possibility of UAVs being operated autonomously without human intervention, together with the potential for hacking or malicious hijacking, could further compound the threat of ground impacts or mid-air collisions resulting in death, ball loss or third-party property damage.

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The Internet of Things (IoT), uniquely identifiable objects that have their own Internet Protocol (IP) address, will grow to an installed base of 26 billion units by 2020—a 30-fold increase from the 0.9 billion in 2009, according to analysts at Gartner. And while the obvious application for insurance is in telematics—monitoring how cars are driven, with policies determined by that data—there are many other uses.

Through a subsidiary, agribusiness giant Monsanto uses internet-connected sensors to capture everything from meteorological information and the size of crop yields to the water-holding capacity of soil. It can then draw on this big data to offer farmers targeted insurance policies—and to determine whether they’re likely to have experienced a loss and settle a claim. In fact, the Kenyan microinsurance scheme, Kilimo Salama, is turning your typical claims process on its head by embracing ‘connected’ agriculture. Really, there is no “claims” process. Automated, IP-based weather sensors record if, for example, rainfall is 15% below the average, a payout is calculated, and the amount owed to farmers is then sent to their mobile phones.

PREVENTION, NOT CURE

And with sensors becoming ever cheaper and more sophisticated, the ability to capture and use the data derived from the IoT is getting easier—making a shift from a reactive to a proactive approach to claims possible, particularly in personal

“...where risk management is not as prevalent as it is in commercial insurance.”

“There is a Chinese saying that a very good doctor is someone whose patients never get sick in the first place,” says Craig Beattie, insurance analyst at Celent. “That’s the opportunity for the IoT. It allows us to monitor data in real time, such that we can prepare for a loss and in some cases prevent it as well.”

CRAIG BEATTIE, INSURANCE ANALYST, CELENT

The Internet of Things (IoT), uniquely identifiable objects...
In 1913, a future prime minister of France pushed ahead with plans for a grand exhibition that would put Lyon on the map, and insured it with Lloyd’s against a budget deficit. Just in case…

The year was 1913, and Europe stood poised on the brink of war. In the French city of Lyon, the ambitious and charismatic young mayor, 32-year-old Edouard Herriot, was overseeing Lyon had not had a happy exhibition record. Hasty plans for a grand exhibition that would put Lyon on the map, in 1872, a commercial failure. In 1894, a young mayor, 32-year-old Edouard Herriot, was overseeing the event, he always had to face a deficit. Herriot asked for a guarantee of 3mFF, and promised to pay a premium of 250,000FF. To his astonishment, “the whole thing was drawn up in a single sentence, and written with that lead pencil”. Such informality was baffling. Where, asked Herriot, would they find a lawyer to ratify their agreement? Heath laughed. “Will a lawyer be more honest than we are? Put the paper in your pocket… And sleep well.”

Despite his efforts, Herriot’s exhibition opened late – and within weeks had encountered every sort of hazard. “A tempest soaked the building; a sudden rising of the Rhone carried away the bridge that lead to the fairgrounds; storms raged.” There was also the little matter of war, declared on 3 August. Herriot was in despair: “What was to become of me? Full of anxiety, I wrote to the local and London market in the replica of 1872. I handed me the cheque which freed me”.

Heath replied at once, and a few days later his loss adjuster, a Mr Price, arrived in Lyon. He rapidly verified Herriot’s accounts, “then, in the elegant flourish of the event, he always had to face a deficit. He had broken his city’s exhibition curse. But as writer Henri Beraud later recollected: “It is a fact that every 20 years in our country, a World Expo is a signal of the most disastrous events.” Perhaps with the bumpy past in mind, Herriot had already taken the precaution of insuring the exhibition against a budget deficit. Over the New Year holiday of 1913-1914, he had travelled to Lloyd’s in London, where he was introduced to legendary underwriter Cuthbert Heath. Heath’s reaction seems to have been amusement; every time anyone asked him to insure an exhibition, he told Herriot, they promised a brilliant success and exceptional profits, but in the event, he always had to face a deficit. “However, that’s of no importance,” he said. “Here’s a pencil and a slip of paper. Write down the amount for which you wish to be guaranteed. I will deduct the premium, and the deal will be closed.”

The Great Exhibition of Lyon

In 1913, a future prime minister of France pushed ahead with plans for a grand exhibition that would put Lyon on the map, and insured it with Lloyd’s against a budget deficit. Just in case…

The year was 1913, and Europe stood poised on the brink of war. In the French city of Lyon, the ambitious and charismatic young mayor, 32-year-old Edouard Herriot, was overseeing enthusiastic preparation for the Exposition Internationale, or Great Exhibition – to be held from May to November 1914. Lyon had not had a happy exhibition record. Hasty plans for a grand exhibition that would put Lyon on the map, in 1872, a commercial failure. In 1894, a young mayor, 32-year-old Edouard Herriot, was overseeing the event, he always had to face a deficit. Herriot asked for a guarantee of 3mFF, and promised to pay a premium of 250,000FF. To his astonishment, “the whole thing was drawn up in a single sentence, and written with that lead pencil”. Such informality was baffling. Where, asked Herriot, would they find a lawyer to ratify their agreement? Heath laughed. “Will a lawyer be more honest than we are? Put the paper in your pocket… And sleep well.”

Despite his efforts, Herriot’s exhibition opened late – and within weeks had encountered every sort of hazard. “A tempest soaked the building; a sudden rising of the Rhone carried away the bridge that lead to the fairgrounds; storms raged.” There was also the little matter of war, declared on 3 August. Herriot was in despair: “What was to become of me? Full of anxiety, I wrote to the local and London market in the replica of 1872. I handed me the cheque which freed me”.

Heath replied at once, and a few days later his loss adjuster, a Mr Price, arrived in Lyon. He rapidly verified Herriot’s accounts, “then, in the elegant flourish of the event, he always had to face a deficit. He had broken his city’s exhibition curse. But as writer Henri Beraud later recollected: “It is a fact that every 20 years in our country, a World Expo is a signal of the most disastrous events.” Perhaps with the bumpy past in mind, Herriot had already taken the precaution of insuring the exhibition against a budget deficit. Over the New Year holiday of 1913-1914, he had travelled to Lloyd’s in London, where he was introduced to legendary underwriter Cuthbert Heath. Heath’s reaction seems to have been amusement; every time anyone asked him to insure an exhibition, he told Herriot, they promised a brilliant success and exceptional profits, but in the event, he always had to face a deficit. “However, that’s of no importance,” he said. “Here’s a pencil and a slip of paper. Write down the amount for which you wish to be guaranteed. I will deduct the premium, and the deal will be closed.”

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