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Science, People & Politics

Between forest and savannah.
and
World Science Forum 2019.

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From the heart of the Amazon

By Fred Pearce

Six hours out of the jungle city of Manaus, in the heart of the Amazon, the tallest tower in Latin America soars above the forest canopy. It is higher than the Eiffel Tower. This year (2019), as all around the forest was pockmarked by fires, German and Brazilian researchers have been climbing the tower to check monitoring equipment which "sniffs" the forest's breath.

They have been mapping how the 400 billion trees below, which contain 40 percent of all the living biomass on the planet, breathe in carbon while exhaling water vapour and chemicals that make clouds, cool the air, and recycle rain. Chief researcher, Meinrat Andreae, director of the Max Planck Institute for Chemistry and instigator of the tower project, told me as we peered across the rainforest, how his structure "provides a window on our planet's atmospheric chemistry". His findings could yield vital clues about what could happen if the new Brazilian president, Jair Bolsonaro, gets his way and the forest is cleared for economic development in the coming decades.

CARBON STORE

The Amazon is the world's largest natural, living carbon-store. Release into the air of that carbon would add to the atmospheric burden of carbon dioxide driving climate change. But this is not just about carbon. Andreae's team is measuring everything from volatile organic compounds, such as terpenes, to water vapour and sulphur compounds and pollen. All are released by the trees, and all could influence climate. So as recent fires burned across the Amazon researchers throughout the region were redoubling their efforts to assess the potential impacts.

Two thousand kilometres away on the southern edge of the Amazon Michael Coe of the Woods Hole Research Center in Massachusetts discussed his work at the giant Tanguro soy farm, where he has been busy for more than a decade investigating how the climate is changed locally when forests are downed. The farm abuts the vast Amazon rainforest. On one side of the fence is the most biodiverse rainforest in the world; on the other, a vast agricultural monoculture with most of its output exported to China. On the farm - it turns out - temperatures are three-degrees Celsius warmer than in the adjacent forest. The comparative coolness of the forest is a result of the trees releasing moisture into the air through their leaves. Each tree releases hundreds of litres a day. The process, namely transpiration, requires large amounts of energy, and it turns the forest into a vast natural air-conditioning system.

Rainforests, in fact, keep the entire tropics more than a degree cooler than they would be without trees, says top Brazilian meteorologist Carlos Nobre. He estimates that deforestation has caused as much as 40 percent of global climate warming to date. At the current rate it could add 1.5 degrees to global temperatures by 2100, even if we shut down fossil fuel emissions tomorrow.

The release of moisture by transpiration of a forest the size of the Amazon has a planetary impact on the water cycle, too. It creates "flying rivers" that generate rain thousands of kilometres away. A few years ago, Gerard Moss, a British-born bush pilot, tracked rainclouds across the Amazon in his adopted home of Brazil. He confirmed the theory proposed by leading Brazilian climate scientists that the Amazon is South America's biggest rainmaker, and that the flows of moisture it creates deep inland carry as much water as flows down the River Amazon itself.

Just as the rains are essential to the forest, so the forest is essential for the rains. And with a fifth of the forest already gone, says Nobre, the length of the dry season has increased by almost three weeks. The entire Amazon rain forest could be close to a tipping point from rainforest to savanna, Nobre told me. "It could trigger the loss of two thirds of the forests, and cause warming right across the tropics," he says. And beyond, says Roni Avissar of the University of Miami. His modelling suggests the loss of the Amazon's "flying river" will likely damage spring rains in the American mid-west grain belt and could even impact European rainfall.

Environmentalists have long said the Amazon rainforest is the "lung of the planet". Such claims have often been dismissed as hyperbole. Now scientists seem close to agreeing. For the Amazon is just about the biggest element in the Earth's life-support system. Its "breath" keeps our planet habitable. If it were lost, it could be the planet's undoing. If the tipping point is approaching, the scientists sniffing the forest's breath are likely to be the first to learn the truth.

The Amazon Tall Tower Observatory (Atto).
Atto is 150 kilometres north of Manaus. It is 325 metres high. It took me an hour to climb its1500 steps during a visit to the Amazon in September. I also joined a workshop to discuss research being conducted there, organised by the project's joint sponsors from The Max-Planck Institute for Biogeochemistry in Jena and for Chemistry in Mainz, and from Brazil's Manaus-based National Institute for Amazon Research. The tower was completed three years ago, and it was the brain-child of the Max-Planck Institute for Chemistry's director, Meinrat Andreae, who I met at the top of the tower.

Fred Pearce.

ETHICS, SCIENCE AND RESPONSIBILITY AT THE WORLD SCIENCE FORUM 2019

IN NOVEMBER SCIENTISTS FROM AROUND THE WORLD HELD A GIANT SEMINAR, EXAMINING THEIR COLLECTIVE CONSCIENCE. HERE **HELEN GAVAGHAN** REPORTS IMPRESSIONS, HIGHLIGHTS AND INSIGHTS FROM WSF 2019.

"Philosophers don't own ethics. Ethics is the responsibility of everyone."
S. Matthew Liao, professor and director, Cener for Bioethics, New York University.

I turned my head and found I was looking at "The Feast of Herod" by Sir Peter Paul Rubens. Imagineering in the days before The Disney Corporation. Just as when it took my eye time to relate to what I saw under a microscope, so my brain did not recognise immediately what it was absorbing. Then it did. A startled fellow delegate said with some discomfort, "that is a head". "Perhaps you do not know the story," I replied, "but I think that painting must have taken great courage to complete." We were at the Museum of Fine Arts in Budapest for the Gala dinner on the penultimate evening of the World Science Forum 2019. The meeting's theme was science in the light of ethics and responsibility. On this last evening delegates had an opportunity to view an exhibition of Flemish Art. If anything in the world could speak to science and scientists of the perils of hubris, disregard and dearth of ethics I was looking straight at an artistic summary of genius[1].

CONFERENCE VALUES

Transparent, accountable science.

During the keynote speech two days earlier at the ceremonial opening of the forum UNESCO's representative had asked what kind of science was needed for today's priorities, which are specifically to meet the UN's global strategic development goals and to combat climate change. Both enhanced budgets and closing knowledge gaps between peoples were called for. This speech was part of a formal occasion, and a scene setter. There was no question and answer session to explore solutions. Such opportunities arose during the next three days in plenary and themed parallel meetings, at coffee breaks and during shared meals. One delegate, for example, wondered about the tone to take with a talk. I speculated an option might be to address the room as though they were smart grad students, while avoiding doing US Foreign Policy.

Notable throughout the conference were the high-profile women from international science. Margaret Hamburg, for example, chair of the board of the American Association for the Advancement of Science (AAAS) moderated a plenary held the next morning in the ceremonial hall of the Hungarian Academy of Sciences. On the table was the question of whether there are ethical limits to what science can achieve or should pursue. A registry of germline gene editing was mooted. That would be something for the Global Young Academy to consider, because they are interested in whether science can be better regulated. For example, creating a human being susceptible to less suffering needs more thought was one point made.

Debate about whether we have the ethical and philosophical tools needed for artificial intelligence raised its head. AI introduces us to the possibility of a world driven by algorithms. Such matters are explored in the scientific literature. Open access to that literature and open science were themes which wound through the Forum within a context of openness and communication of findings from science. Magdalena Skipper the editor on the international journal *Nature* at some stage pointed out that open science and open access are different things. Open science clarifies how and why scientifically the science is carried out. Open access takes the research from behind pay walls, leaving the scientific community with the conundrum of who pays for peer review and publishing.

Given the topics which are the focus of science today an answer to that question is urgent. Consider Kjersti Lohne's concerns. She is a postdoctoral fellow in the Department of Criminology and the Sociology of Law at the University of Oslo, and she undertakes research into contemporary political violence. She has previously researched drones and warfare. Lohne told delegates she felt stuck in three paradoxes. These are: the perpetual threat of global disaster, such as atomic bombs and the impact of artificial intelligence on elections. Other dilemmas voiced by Lohne included the populist pushback against science, and the agency of scientists. Research topics such as these could well pose a dilemma for scientists in some countries seeking State funds for publication.

I grasped Lohne's concern about the importance of scientists accepting moral agency. But in writing up this report the brilliance of Rubens' depiction of the fate of John the Baptist comes to mind. Science is only a small part of the picture surely? It seems there is care needed that science does not assign itself more importance than belongs to it. There are many groups, not only science, which think the world would be a better place if politics gave them greater credence. Business, finance and commerce spring to mind.

MORAL AGENCY IN SCIENCE

My moral agency was tested after the coffee break. Where to go among five parallel sessions? The competition included "How science reinforces democracy through a more realistic picture of human nature." Tempting, but my Court reporting has given me a surfeit of human nature – including my own. How about, "What humans will be after genome editing of human embryonic stem cells?" On the grounds that my Court reporting suggests we do not currently know what humans are now made me turn down this opportunity. Three choices left. One was, "The Urgent Responsibility of Science to Support SDGs." That seemed uncontroversial. What, after all, is the alternative? Thinking that the session would turn into a working group I decided to leave the delegates to share their expertise unencumbered by at least one member of the press (me). Down to a choice of two alternates. "Centenary of Organised International Science Co-operation and Science Diplomacy" or "Science for Peace: successes and future responsibilities." Tough choice. I went to the latter, moderated by Sumaya bint el Hassan, president of the Royal Scientific Society of Jordan. She was spoken of toward the end of the Forum as being its ambassador, and she spoke of herself as being a scientist despite also being a Princess. So, I intend no disrespect by omitting her formal title.

BARRIERS TO INTERNATIONAL SCIENCE

1. Delegates from Ghana and Nigeria spoke of difficulties in obtaining visas to attend conferences.
2. Large percentages of some populations are not online.
3. AI is not as well integrated into government as it might be. An example of successful AI is the tracking of rhinos in Rwanda and South Africa.

Inadvertently I missed the first talk in this session, slated as being from the executive secretary of the preparatory commission for the Comprehensive Nuclear-Test Ban Treaty Organization (CTBTO). But I did hear Jonathan Forman of the Organisation for the Prohibition of Chemical Weapons (OPCW). He told us that 1300 tonnes of chemicals have been removed from Syria, but that allegations continue. Science by itself is not diplomacy, said Forman. That theme was taken up later by full-time diplomats. In his talk Forman said there is concern in security circles about what all this sharing is about. He reminded us of the Hague Ethical Guidelines[2] formulated to guard against misuse of chemistry, and to raise awareness of such things as measures to prevent misappropriation of equipment or supplies. Forman said scientists need to give practical advice to decision makers. "If you tell them CRISPR could lead to chemical weapons[3], it is overwhelming, but if you tell them this is how it happens then they can address the problem."

In the afternoon the Forum took up the theme of the ethics of science funding with a talk by France Córdova, director of the US National Science Foundation (NSF). Ethical funding, she said, inspires credible science, a collaborative research culture and public trust. This is a topic which has been on Córdova's radar screen since 1989. The US Office of Science and Technology Policy is leading a US government-wide effort, she said, to support the integrity of US science. She spoke of the need to create and disseminate knowledge of rigor, for sound peer review, to protect IP and to treat students and colleagues fairly and respectfully. Córdova, like Hamburg and Skipper has a voice significant in the scientific endeavour and extending beyond their national bases. I found both young and established researchers telling me during the conference of their woes with respect to Intellectual Property (IP). It is a topic of massive importance because it separates knowledge which becomes part of the global commons of science from innovation which can enhance the wealth of nations. I was intrigued to learn of Universities without legal departments handling IP. Córdova said the NSF funds discovery research, of the type where one does not know where the science is going. The alternative is goal oriented. The US strategic goal, she said, was computer literacy for all, and she told her audience that the NSF had participated in the development of the Organisation for Economic Development's (OECD) human-centred principles for Artificial ntelligence[4]. These were adopted by OECD member states in May 2019. Córdova has a significant track record. In 1989 she was the chief scientist at NASA. Later sessions during the forum informally explored whether there is bias against women in research funding for science.

NSF CRITERIA FOR SUCCESSFUL RESEARCH

Intellectual merit. Broad impact.

Not surprisingly, given the OECD's engagement with principles underpinning AI, the topic featured significantly during the WSF. High on the agenda is the need to ensure AI does not lead to new dependencies between nations. Challenges for Africa, for example, include gaps in connectivity and lack of access to data. AI is a data hungry technology. It needs a lot of data to learn how to do what is does, for example recognition of facial expressions. Despite the fact China trains hundred of thousands of people in Africa each year to understand AI, there is still a need for more training. At one point during the debate Nigeria's ambassador to Hungary said Africa is ready for AI. Matters to resolve include a likely need for transnational protocols. Stephanie Okeyo, from Under the Microscope, spoke of there not being fear of AI in Africa, but anxiety.

SCIENCE DIPLOMACY

Though science diplomacy was explored throughout the WSF the main presentation took place on the final day in the Upper House of the Hungarian Parliament. The venue is reserved for ceremonial events. On this occasion the WSF was handing over to the next hosts of the biennial series of meetings, namely South Africa. Politicians and diplomats were present. In this august venue we heard of diplomacy in science and science in diplomacy. There are events, such as the Human Genome Project, in which diplomacy between scientists and diplomats are needed for a significant project to advance. Cross-border aquifers and migratory species call on diplomacy both at a scientific and political level, but scientists beware. Diplomats use science for and in diplomacy.

FURTHER READING ALL URLS ACCESSED 21st December 2019.

(1) Museum of Fine Arts, Budapest. https://www.mfab.hu/exhibitions/rubens-van-dyck-and-the-splendour-of-flemish-painting-museum-of-fine-arts/

(2) Organisation for the Prohibition of Chemical Weapons. The Hague Ethical Guidelines. https://www.opcw.org/hague-ethical-guidelines

(3) Why Gene Editors Like CRISPR/Cas May Be a Game-Changer for Neuroweapons https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5510677/

(4) THE OECD AI PRINCIPLES https://www.oecd.org/going-digital/ai/principles/

TWEETS FROM BUDAPEST BETWEEN 21st and 23rd November 2019.The items below were published first on Twitter. The PDF for sale of this issue will not include these items, nor will they appear in the html version of the magazine.

It was interesting to hear views of an Algerian PhD student at WSF that there's too much top-down driven research. I think he meant one gets career Brownie points for proposals fitting particular calls, but not for equally valid research which don't. I may have misunderstood him. 9:30 PM · Nov 23, 2019·Twitter Web App

During casual conversation at the WSF 2019 held in Budapest 20-23rd November, 2019 I was alarmed to hear of Universities which do not have IP departments. I am curious about harmonisation of IP ownership for PhD students and others. 9:24 PM · Nov 23, 2019·Twitter Web App

The positive side of AI was described and demonstrated by Chieko Asakawa, an IBM research fellow from IBM. Asakawa, who is sight impaired, showed how AI could help her, and made the audience laugh with delight. She was applauded warmly today by delegates at the WSF in Budapest. 10:37 PM · Nov 22, 2019·Twitter Web App

"As an ethicist I cringe, S. Matthew Liao, director of the Center for Bioethics, at New York University told delegates today at the World Science Forum in Budapest. "We can't just have these algorithms running around in the world."
10:31 PM · Nov 22, 2019·Twitter Web App

We heard today during the presentation on basic sciences infrastructure at the World Science Forum that the President of Ghana has decided to champion an African Light Source. Price tag for any coalition? About half a billion dollars.
10:20 PM · Nov 22, 2019·Twitter Web App

Herwig Schopper, former director general of CERN, said in Budapest today at the Hungarian Academy of Sciences during WSF 2019 that governance of CERN is one of the few places one sees Israeli and Iranian delegates voting for one another.
10:16 PM · Nov 22, 2019·Twitter Web App

The moderators at today's session about basic sciences infra structure were Michele Zema, executive outreach officer for the International Union of crystallography and Michel Spiro, president designate of the International Union of Pure and Applied Physics. 10:10 PM · Nov 22, 2019·Twitter Web App

The WSF in Budapest this week has brought together an impressive array of international leaders in science research strategy and funding. 9:42 PM · Nov 22, 2019·Twitter Web App

Fascinating to hear from Herwig Schopper, former director general of CERN, this morning at the WSF in Budapest that during the hottest parts of the Cold War Cern provided a neutral, safe forum at which Gorbachev and Reagan's nuclear disarmament dilemmas could be discussed. 9:41 PM · Nov 22, 2019·Twitter Web App

Herwig Schopper (University of Hamburg), former director general, of CERN this morning told the World Science Forum meeting in Budapest that CERN's convention assigns it the double task of promoting science and bringing nations together.
5:36 PM · Nov 22, 2019·Twitter Web App

During Q&A with press yesterday at the World Science Forum in Budapest at the Hungarian Academy of Sciences France Córdova, head of the US National Science Foundation, said the question of science oversight by funding bodies after grant allocation is a hot topic in the US. 1:59 PM · Nov 22, 2019·Twitter Web App

Hamaguchi Michinari, president of the Japan Science and Technology Agency, told the WSF in Budapest research is divided into: curiosity driven, mission oriented and disaster response. Michinari seemed visibly moved when trying to describe a tsunami and 3000 still missing. 8:48 PM · Nov 21, 2019·Twitter Web App

Mohamed Hassan, president of The World Academy of sciences, today told the World Science Forum meeting in Budapest until 23 November 2019 that it is "a global moral responsibility to meet all the UN's SDGs".
8:40 PM · Nov 21, 2019·Twitter Web App

France Córdova, head of the US National Science Foundation today said at the World Science Forum in Budapest that the NSF's criteria for successful research are intellectual merit and having a broad impact.
8:33 PM · Nov 21, 2019·Twitter Web App

France Córdova is one of the most influential women in science internationally. She said 80% of proposals received by the NSF are turned down, and 600 people per day enter the NSF daily to participate in peer review.
8:30 PM · Nov 21, 2019·Twitter Web App

France Córdova, head of the US National Science Foundation, told the World Science Forum in Budapest today that ethical science creates and disseminates knowledge of rigour, undertakes sound peer review, protects IP, and practitioners treat students and colleagues with respect. 8:21 PM · Nov 21, 2019·Twitter Web App

Tollulah Oni, immediate past co-chair 2019/2020 of the Global Young Academy said in the science and peace session this morning at the WSF that, "It is important scientists not just work in their silos." 8:09 PM · Nov 21, 2019·Twitter Web App

The Nigerian ambassador to Hungary this afternoon during a parallel session informally took the continent of Africa under her wing, declaring to a session on AI that Africa is ready for Artificial Intelligence. 8:07 PM · Nov 21, 2019·Twitter Web App

During a parallel session on ethics and AI at the WSF in Budapest UNESCO representatives this afternoon said that the organisation is well placed to lead the conversation needed in establishing a global dialogue on the ethics of Artificial Intelligence. 8:04 PM · Nov 21, 2019·Twitter Web App

Tweets above selected from those made contemporaneously from Budapest by Helen Gavaghan during WSF 2019.

NOBEL PRIZES 2019. Fuller accounts of these prizes will appear in Issue 1 (Jan.-Mar.) 2019.

Applied Lithium Chemistry wins Nobel Laurels.

The 2019 Nobel Prize in chemistry was awarded to John B Goodenough (b.1922), M. Stanley Whittingham (b.1941) and Akira Yoshino (b.1948). Among them they have developed lithium chemistry needed for lightweight rechargeable lithium batteries, such as those in mobile phones. For a battery to work electrons must flow from anode (negative) to cathode (positive). Anode and cathode are separated by a solvent (electrolyte) or solid substance able to accept ions. Electron flow from anode to cathode enables energy to be extracted during the process to do work. There must be a virtuous circle of ions and electrons moving from anode to cathode and back. For re-chargable batteries an external power source is needed to maintain that virtuous circle during recharging. That is where the chemistry of lithium becomes interesting. Lithium has three electrons, one of which is available for chemical bonding or providing an electron for conductance. That electron is both lithium's strength in a battery and its weakness. The electron makes lithium highly reactive. The need when lithium batteries were first being developed was to find a chemical means of combining lithium with other substances such that its reactivity was tamed, while its electro-potential was maintained. And that had to be accomplished while keeping the light weight of lithium. It is the lightest metal, making lithium more attractive than lead as a battery component. That is the applied chemical magic which Goodenough, Whittingham and Yoshino performed, and which led them to their Nobel prize in chemistry today. They found materials accepting of lithium in anode, electrolyte and cathode, and chemical combinations through different types of bonding arrangements that made lithium batteries safe, with reaction kinetics which can sustain a continuing cycle of reversible reactions.
Published first online at 21.30 BST, 9th October, 2019 for issue four 2019.

Developmental economics.

There is macroeconomics and microeconomics. Then there is economics revealing that despite a global census showing a growing human population our international economies remain mired in localised mud banks of poverty. This year's Nobel Prize in economics is awarded in equal parts to Abhijit Banerjee (MIT in the US), Esther Duflo (MIT) and Michael Kremer (Harvard University) for empirical field studies seeking to make sense of how to alleviate poverty. Their specialty is development economics. Their case studies identify, among other things, localised elements that impact macro economic factors as well as the phenomenon of poverty. For example, higher income countries have a more equitable application of more modern means of production, while in low and middle income countries the efficiency and modernity of the means of production is more patchwork. Intersectoral outmoded means of production are more common in less developed economies. There is a correlation between this microeconomic quantitative and empirical observation and a lower average *per capita* income in the low to middle income countries. The laureates applied and developed their methods also in the field of education.
While the laureates are not the only ones working at the intersection of localised economic effect and interventions, The Nobel Prize committee says their works gives a developing understanding of specific mechanisms behind poverty, and of quantifiable interventions to alleviate that poverty. Though the work is at the leading edge of development economics it also rests on well established principles in economics, such as understanding human motives, and behaviour such as not turning up for work.
Published first online at 20.00 BST, 14.10.2019.

NOBEL PRIZES 2019. Fuller accounts of these prizes will appear in Issue 1 (Jan.-Mar.) 2019.

PHYSICS THEORY AND PRACTISE COMBINE TO REPOSITION HUMANITY IN THE UNIVERSE.

Copernicus decentred the Universe of Western Science, repositioning that humanity in relationship to its Universe. Next came Kepler who plotted the paths of celestial bodies to show how Earth ploughs in oval furrows through the firmament. This we know, and mostly learned at school. By Victorian time science fiction writers dreamt of other worlds and plotted the lives of exotic intelligent beings. No-one would have believed in the last years of the Twentieth Century - to paraphrase H.G.Wells - that scientists would identify planets orbiting a distant Sun. Yet that is exactly what Michel Mayor from the University of Geneva, Switzerland and Didier Queloz from the Universities of Geneva and of Cambridge in the UK did. Today saw their creativity awarded with a quarter each of the Nobel Prize for Physics. Canadian, James Peebles, the Albert Einstein Professor of Science from Princeton University in the US, won the other half. Peebles is a theoretician, while Mayor and Queloz are experimentalist. Experiment exists in a safety net of extant theory, and its findings reinforce, expand, completely overturn or create parallel current knowledge. Isaac Newton and Albert Einstein, for example, live side by side on library shelves. In other words, the task of Mayor and Queloz was a lot more complex than randomly sweeping the sky with a large telescope. Like Galileo and Kepler they had informed speculation and plausible theories to guide their search. In part, work by Peebles linking routine concepts of physics to cosmology (essentially an effort to make the Universe understandable) gave Mayor and Queloz a conceptual framework to work within. Published first online 8.10.2019.

THE PHYSIOLOGICAL RESPONSE TO HYPOXIA.

Any trawl through Nobel Prizes reveals they attach to elucidation of a basic scientific conundrum once the findings are beyond controversy. The 2019 prize for physiology or medicine is no exception. William G. Kaelin Jr., Sir Peter J. Ratcliffe and Gregg L. Semenza were named as this year's winners of the prize for physiology or medicine for work expounding molecular and genetic behaviours involved in cellular and physiological responses to an organism's oxygen levels. Semenza and Ratcliffe independently showed a response to low oxygen levels (hypoxia) is present in nearly all tissues. Semenza then identified a protein complex involved in the response. Now known as hypoxia-inducible factor (HIF), the complex binds to DNA and up regulates certain genes. Kaelin uncovered that a gene called *VHL*, which protects from cancer, is connected to the body's response to hypoxia. Ratcliffe's group next found that protein products of *VHL* and *HIF* genes can physically link together. When VHL and HIF-1 alpha (one of two HIF moieties) are bound together in a healthy oxygen environment they become chemically modified and in a way making them susceptible to being broken down, and so removed from the body. If oxygen levels are low then HIF (which is composed of two chemical moieties - ARNT and HIF-1 alpha) instead attaches to parts of DNA known as hormone response elements. Such DNA sequences play a part in gene regulation. The ramifications of these findings in combination are likely to be far reaching in cancer research and physiology because of their widespread occurrence in cellular tissues and their interaction directly with DNA. Published first online 22.00 B.S.T., 7.10.2019.

HANDS TOUCHING HANDS.

Today the Norwegian Nobel Committee awarded the 2019 Nobel Prize for Peace to Abiy Ahmed Ali, the prime minister of Ethiopia. The award recognises the contribution of Abiy Ahmed Ali toward resolving a border dispute between the State of Eritrea and the Republic of Ethiopia.
Published first online at 18.30 BST on 11TH October, 2019.

THE NOVEL PRIZE 2019 FOR LITERATURE.

Peter Handke is the 2019 winner of the Nobel Prize for literature, award on 10th October, 2019 for his book, “A Goalie’s Anxiety at the Penalty Kick.

A VICTORIAN EXPERIENCE OF HEARING LOSS

By Helen Gavaghan

“And the children in the apple-tree
Not known, because not looked for
But heard, half-heard, in the stillness
Between two waves of the sea."
An extract from Little Gidding by T.S.Eliot

IT IS IN POETRY AND PERSONAL LETTERS that historians have found most insight so far into the experience of going deaf, as it was felt among the Victorians. There is a sense of mourning and loosing connection. Otherwise, said Karen Sayer, professor of social and cultural studies at Leeds Trinity University, it is family members rather than the person going through hearing loss who write about what is happening. Sayer was speaking this morning at The Thackray Museum of Medicine in Leeds. She and Graeme Gooday, a professor at the University of Leeds, gave talks about aspects of hearing loss and deafness before the NHS was established. Much of what they said was based on their 2017 book, "Managing the Experience of Hearing Loss in Britain, 1830-1930" (Published by Palgrave).

In poetry, Sayer said it was loss of childrens' voices and birdsong the person with the condition often noted. That is connected to the tendency when aging to lose the ability to hear high frequencies, though middle and/or some low frequencies can be lost too. The experience is personal to the individual. One woman writing in the late nineteenth century of what she was going through signed her letters "Out in the cold".

Both Gooday and Sayer portrayed deafness during the Victorian era as a multi-layered social and cultural experience. The first prominent scientist to talk at any length in the UK about the subject was William Wollaston (1766-1828), president of the Royal Society in 1820. As he lost his hearing Wollaston noted that others speaking louder did not help matters. During the nineteenth century awareness of deafness grew. Slowly it was noted that hearing loss can be different in each ear. It is known now that volume, intensity, background noise and frequency impact, among other factors, the severity of experience of deafness or hearing impairment. Sometimes, said Gooday, one can hear a nearby conversation but not what is being said by the person one is speaking with. In Victorian times scientists, physicians and engineers began to develop hearing tests ranging from ticking clocks and tuning forks to whispering. It was hard to establish norms, but some reductionist efforts were made to test the extent of deafness. For example, groups of men were exposed to sound and a "norm" established for the distance at which they could hear. Some workers in loud industrial environments were found to have only 9 percent of normal hearing compared with that norm. Such tests became important in the late nineteenth Century when governments began to lay down laws to compensate workers' injuries. Some workers with severe hearing loss resulting from their employment were not compensated despite it being work which had caused their disability. The argument was that they did not need to be able to hear to do their job.

The Thackray Museum had laid out exhibits for those at the talk to examine. These included a conversation tube, hearing trumpets and ancient hearing aids. The conversation tube links a hearing trumpet at one end to a receptacle to speak into at the other end. There was a faux mother of pearl ear trumpet and disguised hearing aids. The physical properties of the hearing aid impacted the users' experience of what they heard in tone and completeness. For the elegant Victorian keen to disguise his or her impairment there were gendered items, such as hearing trumpets looking like a lady's fan or a man's walking stick. Not everyone wanted to spend money disguising their hearing devices, said Sayers. Some would flaunt their aids.

Advent of the telephone presented a new challenge to those with hearing impairment. This was the first time, said Gooday, that people needed to be able to hear without any visual clues. He recalled that one of his own grandparents had not wanted to use the telephone. Then when talkies replaced silent films access to entertainment became less varied for those with limited hearing.

In modern times it is known hearing can sometimes be a result a neural inability to process some sounds rather than an issue with the ear itself, or that a person may have different hearing profiles in each ear.
First Published online for Science, People & Politics Issue 4 (Oct.–Nov.) 2019 in October 2019.

Being Human: The Exhibition.

Helen Gavaghan, London. 14th November, 2019.

There is a human figure, upside down, with his feet on the ceiling of the foyer into The WellCome Collection in London. One could easily not notice. I walked beneath him on my way to the Art Exhibition "Being Human". Only as I was leaving did I see the upside-down man.

The Exhibition opened on 5th September 2019.

On entry to the display space my eye was caught immediately by the fish tank. Small busy fish darting, playing their part in an aquascape created by Serge Tasic. Clean, clear water, light, rocks, plants and snails, with air bubbling through. The tiny fish swam independently, occasionally seeming to chase one another. At least that is how things appeared to my human eye. They had lovely, varied markings and colours. They were zebra fish, a favourite experimental organism in biology.

Zebra Fish. Credit: Wiki media Commons.
https://commons.wikimedia.org/wiki/File:Zebrafish_(26436913602).jpg
This image will be removed in the html version of this issue and from the PDF for sale.

There was a prosthetic limb in a display cabinet. Glasses were on show in the adjacent glass box. Red and blue gas canisters with sections artistically removed to leave behind an outline of a map of the world drew my attention next. Artwork hung in traditional manner on walls. The cloth carrying a message saying, "water is life" needed little interpretive imagination.

During a reception in Bloomsbury the evening before at The October Gallery for Contemporary Art a student from St Martin's School of Art had suggested I look at exhibitions without reading the work's description on the card placed nearby. I decided to try the approach during my visit to The Wellcome Collection. On a large area of wall - perhaps 12' high by 20' wide (a guess) a video was playing. We looked into a branch of McDonalds. Water began trickling across its floor. A Ronald McDonald full-size plastic model stood in the corner. Soon the figure was lifted slightly from the floor. The camera swept across the menu. Still upright Ronnie McDonald bobbed around the store as water rose. So did some debris, decorating the water's surface. Empty bags and cups carrying proudly their corporate logo milled in swirls. The shop seemed empty. Half-eaten food was left on counters. The yellow sign warning of a slippery surface collapsed as the water rose further. Ronald McDonold lost his balance. Chips in 'tomato' sauce reached seat level as water rose further, and Ronny was now rolling. Chairs began to wobble. Then they floated. The 'M' of McDonalds, fixed to the half-wall below the serving counter, became submerged. Ronnie was flat on his plastic back. More items were propelled off kitchen counters. Where was the water coming from?

The screen had a line of water across the top, as if the viewer was watching a giant tank fill. Instead of fish, detritus swam. Camera angle changed, so that now we looked down, as water rose to cover surfaces from which plastic trays were swept. Water entered the rubbish bins. It reached an abandoned till. Buns half eaten, discarded straws and plastic toys jostled in the turbid water. A puff of smoke appeared top right. Water lifted half-empty carafes of cold black coffee from the coffee-making machines. The yellow 'M' of McDonalds began to flicker as water met electricity. This story of the rising water was told in McDonalds, but it could as easily have been in any fast-food restaurant, coffee-shop chain or local artisan venue. I looked around the room and saw everyone else was doing what I was doing, standing in front of works of art and jotting down their thoughts.

Being Human can be seen at the Wellcome's premises on Euston Road, close to a number of mainline railway stations and public transport. It is worth a visit.

FROM BRITISH COURTS

Reports in this section of the magazine are written and edited and published by Helen Gavaghan. The items form part of an investigative journalism project exploring the interaction between the Criminal Justice System and the Mental Health Act in the UK. Though I entered journalism via trade and technical publications after graduation from the University of Leeds I am an experienced and trained journalism in line with norms of when I entered journalism in 1980. I have attended formal courses provided by the BBC World Service and London College of Printing, and followed come NCTJ training with the editor of my first magazine. I maintain my skill level through practice and reading and by professional interactions with fellow journalists. To complete this piece of investigative journalism I need to report from Court and to interact with psychiatrists (both academic and non academic). This is a world in which it is fatal to make assumptions on the basis of what seems to be.

SWIFT JUSTICE. By Helen Gavaghan, Bradford Crown Court, UK. 7th October, 2019.

In a little under two hours a jury at Bradford Crown Court this afternoon found Mr Nicholas J Gill (21) guilty of the murder of Mr Paul Bell (58). The crime took place late evening in Sowerby Bridge, West Yorkshire on 30th September, 2018. Mr Bell died 54 days after sustaining serious injuries. The guilty verdict was reached despite Mr Bell having said during a short period of lucidity that his injuries resulted from a fall rather than being consequential of assault by Mr Gill. The Court heard compelling forensic evidence that, in fact, Mr Bell was the victim of serious assault, resulting in widespread injuries, including of the brain, which led to death.

The trial judge, Judge Jonathan Durham-Hall QC, imposed a mandatory life sentence, with a minimum term of 21 years. Mr Gill will serve concurrent sentences for attempted robbery and two counts of carrying a knife. The defence sought no reports from probation or psychiatrists. During his summing up the judge had spoken of Mr Gill as having said he had not eaten for the day prior to the assault leading to Mr Bell's death. In a brief exchange with the judge prior to sentencing the defence acknowledged Mr Gill's lack of mature behaviour. In sentencing Mr Gill the judge said he had no doubt Mr Gill had no money. In his summing up the judge had spoken of Mr Gill having acknowledged that he (Mr Gill) experienced depression and anger management issues. Mr Gill had been unable to find work.

The fatal events happened after Mr Bell had been for an evening out with a friend in the nearby town of Hebden Bridge. The judge spoke of Mr Bell as having been a kind person. The judge thanked the officer in the case. The senior investigating officer was in Court, and said afterwards the judge's thanks to the attending officers would be passed on. To the jury his honour said, "You dealt with your responsibility magnificently." **[I have removed the name of police officers from the pdf and item for sale.]**

ATTEMPTED MURDER NOT GUILTY VERDICT IN COLD-BLOODED SHOOTING CASE

By Helen Gavaghan, Bradford Crown Court, UK. 29th October, 2019.

A jury at Bradford Crown Court this afternoon returned unanimous not guilty verdicts in the trial of William Lowther (47) on charges of the attempted murder of Kevin Ruding, a young man in his twenties. The crime took place in Bradford in the early hours of 30th January 2019. The second charge Mr Lowther had faced was that of possessing a firearm with intent to endanger life. The court was told people wearing black, with balaclavas and gloves had smashed their way into the home of Mr Ruding [Incorrectly this report said in this sentence, before it was corrected 'into the home of Mr Lowther' for some time on the afternoon of 29th October,

blank in the chest. Mr Ruding has had to have part of his leg amputated. When the intrusion began, Emily had moved into a nearby room with their young son.

The canister used to smash a way into the house was left at the scene. DNA on that canister was shown to be that of Mr Lowther, but the forensic evidence was that this was a low quality sample of DNA, and it was not possible to say when and how Mr Lowther's DNA got onto the canister. Existence of the DNA, for which the Court was given an alternate explanation, had, argued the defence, established a confirmation bias with regard to other evidence in the case.

Those who committed the crime had two shotguns and an axe. Two of the motor vehicles used during the offence were burned out. False number plates were used. During the trial, which at times was tetchy between Counsel, His Honour Judge Durham-Hall QC called the crime a cold-blooded attempt at execution. Security in the Court was tight.

VERDICT IN HALIFAX-BASED MURDER TRIAL.

By Helen Gavaghan, Crown Court, writing from the North of England. 16th December, 2019.

A 16-year old youth with mental health problems and, arguably, a mental age currently of 10 was today found guilty in Crown Court of murder earlier this year. Discretionary reporting restrictions under S45 of the Youth Justice and Criminal Evidence Act of 1999 remain in place. The judge was satisfied anger was the youth's motivation, and handed down a minimum sentence of 16 years. Both victim and assailant have been damaged by the availability of Crack Cocaine on the streets of Halifax in West Yorkshire.

During a significant part of the trial two consultant forensic psychiatrists were in Court. The judge thanked both at the end of the trial. Both psychiatrists were questioned closely about their diagnoses and medical views by opposing Queens' Counsels. There was both medical agreement and disagreement between the two doctors. After the last evidence was taken I spoke informally with the psychiatrist the prosecution had called. I was told biomarkers do not currently exist for one of the conditions explored by the psychiatrists, namely Attention Deficit Hyperactivity Disorder (ADHD). The Court was told ADHD is treatable. I asked the prosecution's psychiatrist the general nature of references in their reports to the Court, and was told it would be to one or other of two diagnostic manuals, rather than the scientific or medical literature. I was told also by the psychiatrist called by the defence that functional magnetic resonance imaging (of academic interest in understanding ADHD) was not a technique that had been relied on in preparing the defence report. The convicted youth (by chronological age) additionally has other long-standing medical problems, for example complex trauma.

Harrowing victim-impact statements were read to the Court by Counsel for the prosecution. Defence Counsel advocacy in mitigation included, among other things, an argument based on a psychiatric view that the defendant had had genetic problems even before birth. The judge told the jury they could be helped if affected, and that even the judge does not become inured to hearing such cases.