COLLABORATION


Eco-Robotics: Pembroke Fellows revolutionising research with interdisciplinary partnership
Upcoming Events

It was with great regret that the College had to postpone two Gaudies, the 2020 Leavers Dinner, and many other popular events due to the COVID-19 pandemic. We know that these events are valuable opportunities for alumni and friends to reconnect with each other and with Pembroke. The College team is working hard to safely restore opportunities for alumni gatherings in College, but this will take some time as the priority for the rest of this year has to be ensuring that new and returning students are given the best and safest possible College experience in the circumstances. Please bear with us.

In the meantime, the Development team and the College at large have been hosting new events online. An unexpected positive of this enforced adjustment has been that participants have joined together from around the world, and some have been recorded so that they can be enjoyed by more people in their own time. Below is a selection of highlights of the year so far. Please do join us for future events if you can – upcoming opportunities will include:

Virtual Alumni Weekend
11th & 12th September
Including the chance to meet our new Master, Sir Ernest Ryder; an introduction to a new academic seminar series Pembroke Horizons; an interview with renowned photographer Frederic Aranda (1998, Japanese); and the Uncomfortable Oxford online tour.

Pembroke Horizons
Monthly
Pembroke is launching a new online initiative which will feature our academics presenting their research. Each session will focus on a particular topic to showcase the thinking and research within college with questions invited from the audience.

Virtual Carol Concert
4th December
Whilst the guidance on event gatherings are still uncertain, this year’s Carol Concert will be available to all members of the Pembroke community via live stream.

Previous Events
Careers in Unprecedented Times
During Week 8 of Trinity Term, the Development Office hosted a Careers Week. The main event of the week was a virtual discussion entitled which was attended by more than 100 students and alumni. Panelists included Paul Forster, co-founder and former CEO of Indeed, Tazeen Hasen, a specialist in gender equality and development at the World Bank, and Peter Jones, the Chief Operating Officer of the Foreign and Commonwealth Office. The event was moderated by Gabriel Schenk, co-founder of the Tolkien Lecture series here at Pembroke.

Virtual Business Breakfast: Cybersecurity
Nick Viney and Nina Paine held an online Business Breakfast on the 23rd of July 2020. The topic of the session was Cybersecurity and how to keep your data safe when working virtually.

Painting Pembroke
Jeremy Sutton (1979, Physics) held two online art classes for members of the Pembroke community on the 22nd of April and the 2nd of June 2020. The events showed techniques for drawing a still life scene and self-portraits, with a focus on using an iPad as the artistic medium.

Technos Ceremony
On the 23rd of June 2020, the first virtual Technos International Prize award ceremony took place. Full write up: https://www.pmb.ox.ac.uk/news/technos-prize-awarded-nicolas-jezierski

Pembroke on the Sofa
Our last ‘real-life’ event this year was all the way back on the 27th of February. Held at The Frontline Club in London, attendees discussed the topic of ‘Reporting in the Age of Fake News’ with panelists Harriet Dedman (2002, Modern History), Darren Shaw (1985, PPE) and Adela Selman. The event was moderated by Tanya Beckett (1984, Materials Science), who has hosted the series since it began in 2010.

Subject Dinners
Throughout January and February 2020 subject tutors opened up their annual student dinner to invite alumni back to meet the current classes. These events, allowed alumni to reconnect with their subject and fellow classmates. We hope to be able to offer this again in the near future, and we will be in contact via email to inform you of relevant upcoming events.

400 Club Dinner
The inaugural 400 Club event was launched with a dinner at the RAF Club on the 16th of January 2020. The 400 Club was founded to mark the upcoming anniversary, and is open to all Pembrokeians who commit to making a regular gift to the College. The attendees heard about the fascinating research of one of our current postgraduate students and former MCR President, Louis Morris (2017, DPhil History).

Letter from the Editor

When we chose the theme for this issue of the Pembroke, ‘Collaboration’, in January, little did we know that the world would change so drastically just a few short weeks later. If we have learned anything since March, however, it is that Pembroke’s commitment to being collaborative is at the foundations of our resiliency and our relevance in times of trouble.

Whether it is the involvement of Pembrokeians on the front line of Covid, or the continued conviviality of the entire College community to keep students and staff safe while feeding Oxford’s homeless and providing the books, tutorials, lectures and welfare support that all students need to continue studying, we have worked together for the greater good of our communities large and small. Our students have been just as active as staff in building virtual opportunities for each other to engage, explore, enjoy, and stay involved in the issues of the day. You would be hugely proud of their inventiveness, care for one another, and commitment to making the world a better place.

Just look to your right at what is featured in this Pembrokeian and page 13 detailing the launch of Pembroke Connects and Pembroke Links. You will see that with the collaboration of alumni, the College has not just continued to communicate, entertain, enlighten, and support its members, it has actually developed new ways to engage and interact that are stronger than ever before.

Throughout this issue, you will also see how the research being done by our Fellows and alumni is an exemplar of collaboration, whether it is an Engineering Fellow and a Biology Fellow developing new capabilities over lunch in the SCR, a digitally-based History project involving academic and alumni partnerships to transform fieldwork, or a Specialist in Gender Equality and Development at the World Bank, and a Chief Operating Officer of a Technology company discussing how remote working has affected cybersecurity.

Enjoy this glimpse into Pembroke in a time of change.

Andrew Mitchell
Alumni Engagement Officer

In the midst of the global pandemic and UK lockdown the Pembroke marked the transition of the College Mastership from Dame Lynne Brindley to Sir Ernest Ryder. Without the usual opportunities to host events in person Dame Lynne became the first College Master to say her farewells by video message, and Sir Ernest has been meeting academics and alumni in online chats.

Dame Lynne’s farewell message to the College community can be found at: www.pmb.ox.ac.uk/lib-farewell

The next edition of the Pembroke Record will contain a full farewell to Dame Lynne and welcome to Sir Ernest.
As a DPhil student working with emerging viruses, it’s been “all hands on deck” for our collaborate with great people across the globe has kept me motivated. I’m currently analysing originally from, and helping our collaborators contributions to the COVID-19 Data Working Group and HealthMap. It’s an exhausting time to be a virus researcher, but also full During our first ever “virtual” term, students and staff sent digital postcards from their lockdown surroundings to tell us about how they were adapting. Below are just a few I miss seeing everyone, but love keeping up with enjoy the extra time at home with family. My "new karaoke number in the shower." I had my first virtual psychology tutorial with EXPERIMENTAL PSYCHOLOGY. Although I miss seeing students face-to-face, it is great that we can continue to support students remotely. Recently, I had my first actual Psychology lecture with students in four different timezones. I feel excited about meeting in an “online course” with such motivated and enthusiastic students. I am enjoying the extra time at home with family. My husband has a full marathon as loyal around our house and I am a half marathon in my garden. I miss seeing everyone, but love keeping up with the Pembroke Community through emails, online tutorials, and social media. As a DPhil student with emerging viruses, it’s been “all hands on deck” for our collaborate with great people across the globe has kept me motivated. I’m currently analysing originally from, and helping our collaborators contributions to the COVID-19 Data Working Group and HealthMap. It’s an exhausting time to be a virus researcher, but also full

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> Pembroke Postcards

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A single pace across the forest reserve boundary represented a legal leap in history. This anachronism gave rise to disparities in rights of access to forest land and resources, and eventually the law was changed to be more responsive to community needs. In 1992 I moved from Tanzania for a two year post-doctoral fellowship at the University of Copenhagen, to work with some of the biologists with whom I'd been collaborating during the 1980s. From there I took a lectureship at the new department of environmental economics at the University of York and started to expand my new-found interest in institutional economics with work on forest law and community use in Nepal, Mexico and Australia. Tanzania kept calling me back and whilst at York I led the environmental assessment of a hydropower project at Kihansi in the southern part of the mountains where I'd lived for so long. The work involved frequent field trips and discovery of yet more species new to science in the forested gorge affected by the scheme. This work on a major energy project also started my next career shift. At around the same time as the Kihansi project I became part of a Conservation International team researching the potential effects of climate change on biodiversity. The dramatic potential impacts shown by our models demonstrated the imperative need for change in the way people use both land and energy. As in the lesson I'd learnt about needing to understand economics and law when designing forest management plans, I now realised I needed to work with engineers to be part of the effort to halt climate change through a transformation to sustainable energy.

The next career change took me to the University of Twente in the Netherlands where I had been offered a professorial chair heading the technology and sustainable development group in the faculty of business administration. I was now a long way from lichen in the Antarctic. The group had major research programmes on the role of both land use and renewable energy in the mitigation and adaptation to climate change. It was six exciting years during which I attended UNFCCC meetings in Poznan, Copenhagen, Bonn, Rio and Cancun to present our work to policy makers. I’ve also been reunited with Kew through Kathy Willis, who was formerly Kew Director of Science, and is now Principle of St Edmund Hall and Professor of Biodiversity in the Department of Zoology, following restructuring of Kew's scientific organisation and creation of a new Natural Capital and Plant Health department. Kathy invited me to join Kew as a Research Fellow to develop bioenergy as a research topic. In 2019 we held a one day international workshop at Kew on ‘Plant Power’, to bring together our renewable energy project partners, and this year bioenergy is a theme in Kew’s flagship ‘State of the World’s Plants’ conference.

The world is undergoing an energy transition in both generation and supply. Renewable sources of energy from solar, wind, wave and biomass are now cost-effective and integrated into national and global energy strategies. At the same time a revolution in taking place in how electricity is distributed with ‘smart’ systems and mini-grids. New technology has enabled local and small scale generation, placing Sustainable Development Goal 7 “Ensure access to affordable, reliable, sustainable and modern energy for all” within reach. Reducing greenhouse gas emissions and shifting to regenerative land uses will help stem climate change and loss of biodiversity. Collaborating with economists and engineers all over the world seeking solutions to one of the greatest global challenges was not what I expected to result from that cup of coffee with Tessa in 1979. It's been a long and fascinating journey.
Robot AE25 (for Autonomous Ecologist unit 25), an autonomous ground vehicle, has finished charging its battery. It is sitting in a solar-powered field shelter in the heart of the Karoo Desert, South Africa. Overnight, it off-loaded data from yesterday’s biodiversity survey of a region 5 hours away from the closest town. AE25 now checks, contrasts, and validates its predictions regarding how its surrounding environment, plants, and animals have responded. AE25’s wheels and heavy base mean that it cannot drive on the first target site without damaging the endemic, fragile minuscule flora.

Therefore, AE25 deploys a UAV (Unmanned Aerial Vehicle, i.e. drone) with a hyperspectral camera to complete a low pass over the target site to gather data. Once this task is complete, the UAV lands on AE25 and they head to the next target site. The usage of hyperspectral imaging allows the ecologists back at Oxford remotely receiving AE25’s data to evaluate the effects of the drought on the community’s hydraulic stress and to identify camouflaged species. The same task is repeated until AE25 notices that its battery has been draining faster than predicted (the drought has made the soil more brittle, and thus provides greater resistance). AE25 cannot complete the final inspection without risking getting stuck in the middle of the desert, and so it decides to head directly back to the shelter where it starts charging and off-loading the day’s data.

Whilst AE25 was out in the field, software was running on the computer in its shelter, quantifying recent changes in cover of endemic and invasive species. These data, which would be too expensive to be collected by humans, are now entered into the ecological model that generates field tasks for subsequent days. Whilst AE25 charges after another successful day, a satellite link uploads the data from the day’s run. These data are then shared with AE24 and AE26, AE25’s neighbours, across a network of 50 robots that cover over 100km² of land. Every night, the processed data collected by every autonomous ecologist unit are transmitted to Oxford, where the team of information engineers and ecologists use them to monitor, understand, and predict changes in biodiversity due to climate change.

Science fiction? Perhaps, but the same thing was said of smart-phone technology or virtual reality headsets. Indeed, this is the very real research vision of two Pembroke Fellows: Rob Salguero-Gómez and Nick Hawes. Rob is an expert in ecological modelling of populations of animal and plant species in harsh environments, and Nick in artificial intelligence (AI) for robot behaviour. After discovering an overlap in their interests over an alumni event at Pembroke, they are now exploring ways in which these interests can grow into a collaboration which could change the face of ecology and robotics. Rob has spent the last few years manually flying aerial robots (i.e. drones) in order to collect data from ecological field sites which are often days away from the nearest major population centre. Nick has studied how autonomous robots (i.e. robots that don’t require human control) can be deployed for long durations in work settings such as offices, care homes, and even college open days. Putting their heads together, this leads to the question of how autonomous robots can be deployed for long durations (weeks, months, or years), at remote ecological sites, in order to gather vast data in a cheaper, more efficient and less error-prone manner than to collect them manually.

To kick-off their collaboration, Rob invited Nick and a collection of researchers from the Oxford Robotics Institute to one of the field sites where he is conducting ecological research locally: Wytham Woods. Wytham Woods is one of the oldest ongoing biological research sites in the UK and in the world. This was an opportunity for the team from the Department of Zoology to understand the capabilities of a number of different autonomous ground robots, including a Clearpath Husky and Jackal, and ORI’s unique Hulk platform. It was also a chance for the team from the Department of Engineering Science to understand the constraints of operating at an active ecological field, and what kind of data the researchers require.

Ecology, the science that examines the relationships of organisms with other organisms and with the environment, represents the next frontier in the solution to many of our current societal challenges. Food provisioning, climate regulation, and clean water all emerge as a direct function of the quality of the ecosystems that surround us. The need to better understand and predict responses of ecological systems has led ecologists to become more quantitative. Indeed, to study ecology nowadays typically means to study a lot of statistics, mathematics, programming, etc. While this has greatly improved the speed and efficiency with which we can analyse ecological data, the acquisition of data has not advanced as fast. It is of course true that we now have access to satellite data at an
Eco-Robotics

Ecology, the science that examines the relationships of organisms with other organisms and with the environment, represents the next frontier in the solution to many of our current societal challenges. However, certain ecological systems require data gathering that cannot be achieved by orbital observation. A significant number of ecologists have resorted to a brute-force method: we go to the field, we carefully observe the different attributes that we are interested in to describe the ecological system, and then we have to go back to the office, digitise them and analyse them. Most ecological data collection is inefficient: it takes a long time, is error prone (because it is done by humans, and we are not perfect), and it is expensive because it requires training field ecologists on very specific aspects of the biology of the system, and because, of course, those people have to make a living out of the activities they engage in.

The usage of technology means a potential new revolution in ecology. It will allow us to say goodbye to paper and pen, long-hours in the rain/hot sun, and accidental typos while annotating observations. We see the application of robotics (across land, sea, and air) as the next step in our ability to understand and predict how ecological systems respond to various disturbances. These disturbances (e.g, climate change, habitat degradation/fragmentation, pollution) have already exposed the immense majority of human settlements to significant physical and mental risks, as well as the drastic decline in the ecosystem services that these systems provide to humans.

In summary, the dream of forming a symbiosis between ecology and robotics is closer than ever before. Ecological settings bring robotics real-world challenges which, if successfully navigated, could then be applied not just to those settings, but also to other settings such as cities and farms. Robotic technologies bring to ecology the unprecedented opportunity to monitor and predict almost real-time how habitats and its species may respond now and into the future to human-led disturbances. Their unification into eco-robotics could revolutionise both fields of research, and also produce multiple benefits to society and biodiversity.

College News

Alumnae Dr Helen Margolis MBE (1987, Physics) and Natasha Finlayson OBE (1982, Modern History) were both recognised in The Queen’s Birthday Honours List 2019. In the 2020 New Year list, awards were made to Andrew Jowett (1980) Professor Ed Hawkins (1995) and Oz Clarke (1967).

Pembroke celebrated the 40th anniversary of the admission of women students into the College with a special art exhibition and a lecture by Anna Murphy (1990, English and Modern Languages). This year’s display of photographic portraits in the College Hall featured six other Pembroke women.

Fellow and Tutor in Chemistry Professor Ben Davis was awarded the Davy Medal by the Royal Society in recognition of his outstanding contributions to science.

Dr Ushashi Dagupta, the Jon and Julia Aisbitt Fellow in English, recently released a book focusing on Charles Dickens and his works on tenancy, titled Charles Dickens and the Properties of Fiction: The Lodger World.

The College created 8 new graduate scholarships ahead of the 2019-20 academic year, thanks in large part to the generosity of alumni donors. Pictured: Audrey Driscoll and Siddharth Kumar, two of the recipients.

In November 2019 Pembroke Co-launched the Goldsmiths’ Sutherland Centre for Philosophy and World Religions. A partnership with Manchester University and Ashton Sixth Form College, the Centre provides academic seminars and events for year 12 pupils in Greater Manchester and Cheshire.

During the College and national lockdown in April, Pembroke’s catering team began a scheme to deliver regular meals to over 100 homeless people in Oxford, with the successful initiative lasting throughout the summer.

Diversity week was held online by the JCR this year. Notable highlights included pre-recorded chats with alumni, a race roundtable discussion, and virtual sign language lessons.
Building Global Partnerships

The Quill Project's global collaborations and multidisciplinary research are expanding Pembroke's horizons and enabling fresh insights into some of the foundational legal texts of the modern world.

Dr Nicholas Cole | Senior Research Fellow

The Quill Project is one of Oxford University’s most innovative digital humanities projects. We have developed a software platform that transforms the study of legislative history through a combination of new approaches to document representation, visualization, search and analysis of the information contained in legislative journals, and documentary editing. I am proud of these technological innovations and the historical insights which have resulted, but also of our unique and collaborative model of research, which provides opportunities for students from a wide variety of backgrounds to engage in international partnerships on substantive research questions.

It all began in Pembroke in 2015 through the generosity of the late Matthew Holland. My early research had focused on American political thought — especially that of Thomas Jefferson, but ever since my doctoral research I had found the impression with which scholars discussed the writing of America’s constitutional law frustrating. Part of the problem was the nature of the records themselves, which describe hundreds of tiny changes to wording—sometimes separating the decision on particular language from the original proposal by days or weeks. I had long thought that the minutes (both official and unofficial) of the 1787 Federal Constitutional Convention would prove more intelligible, and more useful outside academia, if a computer system allowed users to explore the evolving context of each proposal and decision. Readers needed to be relieved of the challenge of trying to reconstruct in their imagination the implications of every suggested change and every vote taken.

Joined by a colleague from Oxford’s e-Research Centre, Afro-Abub Rahman, I began to build the initial software platform. I adapted techniques used in online messaging platforms to create a kind of ‘track changes for history’ technology, while she worked on the web user interface. Things took an unexpected turn when I received an invitation from Utah Valley University (UVU) to turn it over, I shared a mutual friend with then-President of UVU, Matthew Holland. He hoped I would visit their newly opened Center for Constitutional Studies, one of his favourite projects. He wanted the Center to develop a clear research agenda — could working with the Quill Project be part of that? I had never intended to visit Utah, a state admitted long after the founding era of American history that had been my focus. I had no idea what to expect.

UVU is, in almost every respect, the opposite of Pembroke and Oxford. It is an ‘open-enrolment’ state university with a non-residential campus. Its university status only dates back to 2008. Although it grew out of an earlier vocational school, it continues to run vocational as well as academic courses, and offers associate degrees (typically a 2-year qualification in the US) alongside BA and Masters courses. Its admissions policy is completely open and there are few real limits on student numbers. America’s only ‘data-entry’ assistants, but as colleagues. I am enormously grateful for their dedication, care, and intellectual engagement with the project. Because they had scanned so much material from state and Federal archives in advance, not even COVID-19 has derailed progress.

More than 40 people have now worked on the digital editions that we publish, from many different backgrounds. Through Oxford’s micro-internship scheme, Pembroke students have helped with highly experimental projects to refine our technology and experiment with the application of AI, and several have joined the project as one-year research assistants after graduating, roles enabled by the generosity of our funders, and that we would like to expand. At its inception, we never imagined student involvement, and certainly not this level of collaboration, nor the international nature of the project. But it now seems a natural and vital part of our work: we work with students from a wide range of backgrounds, and the result of their work, to the interest of
We are seeking to re-engage and build to promote the College as a ‘community’. Emphasises that “the purpose of the AAB is focus on the achievement of those ends. re-energised with additional/new members, to in place for some years, but recently has been pastoral and academic development. Life-long support for professional, personal, and attractive events. By that means we aim to secure a high and improving reputation for the College, by continuous communication and attractive events. By that means we aim to secure a high and improving reputation for the College and pride from Alumni.”

The role of Alumni Ambassador, outlined below, will be crucial to the success of this initiative. I encourage you to read the details on our website and look upon this as a positive, non-financial means of ‘giving back’ to the College. We look forward to hearing from you.”

More information at: www.pmb.ox.ac.uk/node/4546

YOUR COLLEGE NEEDS YOU

BECOME A PEMBROKE ALUMNI AMBASSADOR

Pembroke has a long history of engaging with Alumni outside Oxford. Many Alumni also retain contacts with peers from their matriculation year, from shared academic and professional interests or as a result of adjacency of residence. The College is looking to build on this through Alumni Ambassadors, who will set up and facilitate Alumni Groups; based on Year, Subject, Specialist Interest or Region.

If you are passionate about Pembroke College and the contribution it can make to all those with a connection to it — and have some time to devote to putting that passion to practical use — please contact Andrew Mitchell, our Alumni Engagement Officer, about becoming an Alumni Ambassador.

The College Development Team will help you set up and develop your Alumni Group. We will provide you with the Pembroke Alumni Ambassador Toolkit*, which has been created by the AAB to support and guide you through the process.

By giving a commitment to be an Ambassador, you will be a key point of contact for and between Pembroke College Alumni, but will benefit from dedicated support in relation to: our communications network and promotional material, guidance on costs and logistics; an Annual Conference for Alumni; and in-depth briefings on College matters.

You will be expected to commit dedicated time to the role and be familiar and actively engage with the development of the College’s mission and strategy, by providing opportunities for Alumni to engage with the College and to remain connected with each other through activities appropriate and requested by your group.

For more information email Andrew Mitchell: andrew.mitchell@pmb.ox.ac.uk

Launched early in lockdown, the Development team have brought together a selection of information, events, lectures and much more on this new digital platform. The aim is to help alumni and friends stay connected, entertained and inspired. Visit the hub page on our website to find out more and contact Andrew Mitchell and the team if you have content to contribute.

www.pmb.ox.ac.uk/connects

In Week 8 of Trinity Term, Pembroke hosted Careers Week - a number of virtual events, online discussions and the launch of the Pembroke Links platform. The main event was a Zoom discussion entitled ‘Careers in unsettled times: succeeding against the odds’, attended by more than 100 students and alumni. Panelists included Paul Forster (1986), co-founder and former CEO of Indeed, Tazeen Hasan (1983), a specialist in gender equality and development at the World Bank, and Peter Jones (1980), the Chief Operating Officer of the Foreign and Commonwealth Office. The event was moderated by Gabriel Schenk (2010), co-founder of the Tolkien Lecture series here at Pembroke. You can watch the replay of the discussion at www.pmb.ox.ac.uk/content/careers-unsettled-times-discussion. Careers Week also saw the launch of Pembroke Links (https://www.pmb.ox.ac.uk/content/pembroke-links). This web platform provides access to careers-focused video resources, including interviews of alumni by students and talks produced by alumni offering career advice to students about various professions and occupations. Featured alumni and others who have offered to be career Mentors can be contacted by joining the Pembroke College Mentoring Group (https://www.linkedin.com/groups/10490654/) on LinkedIn.

The next Pembroke Careers week will take place in Week 8 of Michaelmas Term 2020. In the meantime, all the careers resources are available to alumni and students at Pembroke Links. If you are interested in being a Pembroke Career Mentor please Email our Alumni Engagement Officer, Andrew Mitchell. Thanks to everyone who has taken part so far.
If 2020 has taught us anything, it is that we cannot predict the future. Without the generosity of alumni and rigorous financial management over the last two decades, Pembroke’s ability to weather the current crisis would be severely compromised – in fact, our endowment, the assets we invest long-term to protect the College’s future, would be worth less than 1/10th its current value.

By leaving a gift in your Will, your legacy will not only contribute to Pembroke’s financial resiliency to meet future challenges; it is also an extraordinary opportunity to help future Pembrokians fulfil their hopes, dreams, and full potential.

For more information, contact development@pmb.ox.ac.uk or call 01865 276478.

**Residuary Legacy**
Leave a portion of your estate after you have provided for those closest to you.

**Pecuniary Legacy**
A fixed sum of money.

**A named item (specific legacy)**
A specific gift (such as a piece of artwork, property or collectible item) that can be sold or will generate an income.

**Reversionary legacy**
This gift provides for your family and other loved ones and then subsequently benefits the College.

**WHAT WILL YOUR LEGACY TO PEMBROKE BE?**

Recently moved house or updated your email address? Please let us know the best ways to stay in contact by emailing us.

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