Algae, Robots, The Great Unknown

SINGER INSTRUMENTS
A RESPONSIBILITY TO SCIENCE!

LUKAS JASAITIS

13th December 2020

Layout of the Talk

What is Singer Instruments?

Application Process

My Roles (And What I actually did)

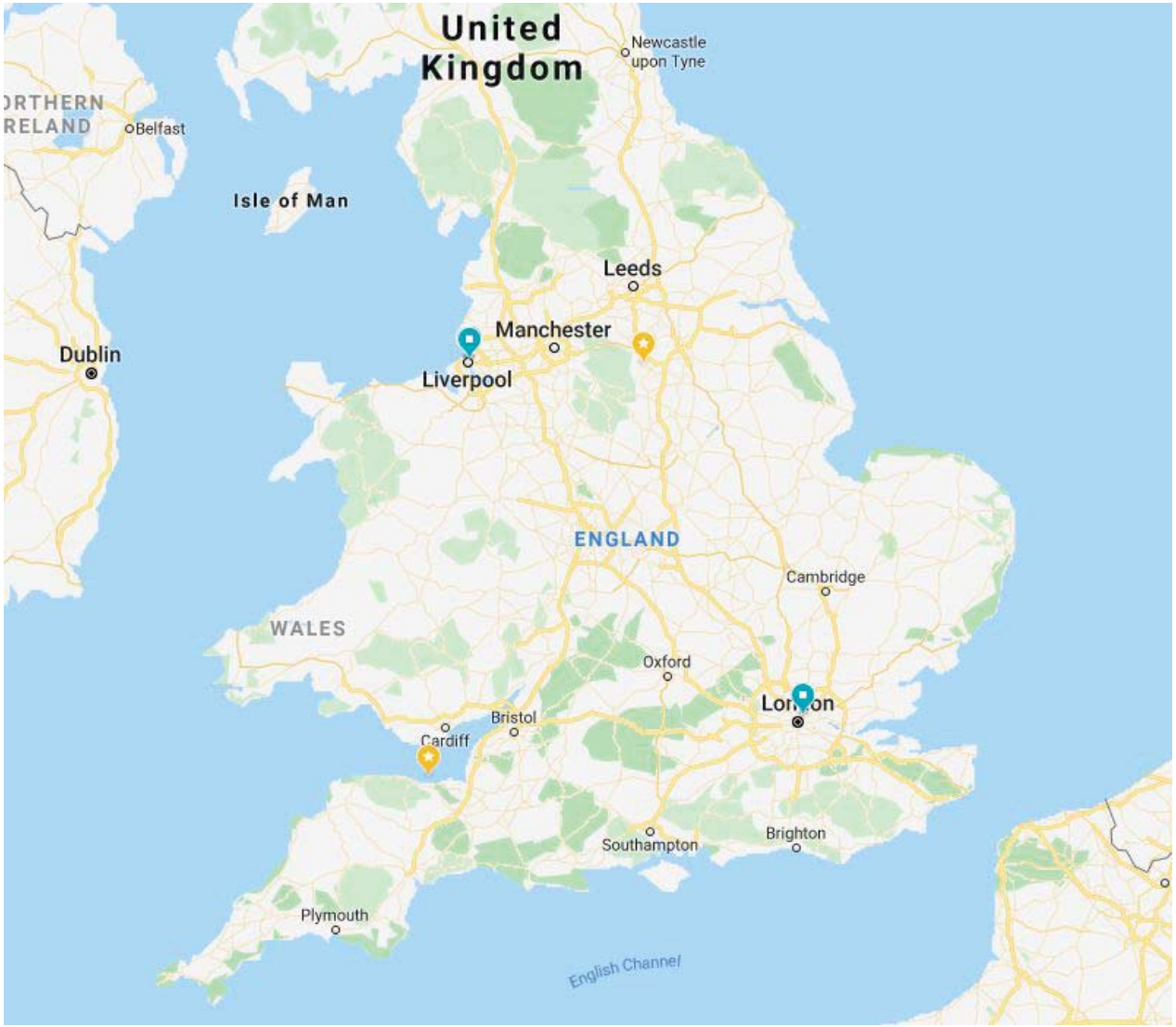
The Singer People

Somerset!

What I learned

The Company

- A Laboratory Robotics Small-Medium Enterprise (SME) based in Somerset (Watchet, Roadwater)
- Established in 1934!
- Not a sewing company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Woodcombe
Minehead
Butlin's Minehead Resort
Blue Anchor
Watchet
Doniford
Carhampton
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Old Cleeve
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Withycombe
Washford
Williton
Weacombe
Sampford Brett
A358
Bicknoller
Rodhuish
Beggearn Huish
Vellow
Roadwater
Monksilver
Stogumber
Elworthy

Getting in!

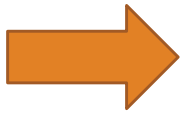
- Became aware through internal PIPS advertisement (keep them coming!)
- Saw the advert Jan 2018 and booked 3 months Starting from March 2019.
  - End of 3rd Year
  - Rational: refresh my mind before final 15 months of the PhD (Spoiler: It worked)

Read the Room

Essential Skills

REQUIREMENTS
Lots of enthusiasm and geekiness.

ADDITIONAL BONUS REQUIREMENTS
A strong interest in science, technology, robotics and innovation.
Must enjoy socialising and eating home-baked delicious snacks!



To whom it may concern,

My name is Lukas Jasaitis and I am very much interested in doing a three-month placement at Singer Instruments. As a budding 'human pipette' life scientist I immediately got hooked on the idea contributing to the growth of a company with such great attitude.

I am currently doing a PhD in the University of Sheffield where I am trying to develop a better way to produce magnetic hard-drives. The idea is to use biological molecules (proteins) to pattern magnetic nanoparticles that would each act as one bit of information. The project is highly inter-disciplinary and includes me travelling between departments, learning new techniques and making new professional connections daily. Nothing says "out-of-the-box thinking" more than trying to make a hard-drive out of soft things.

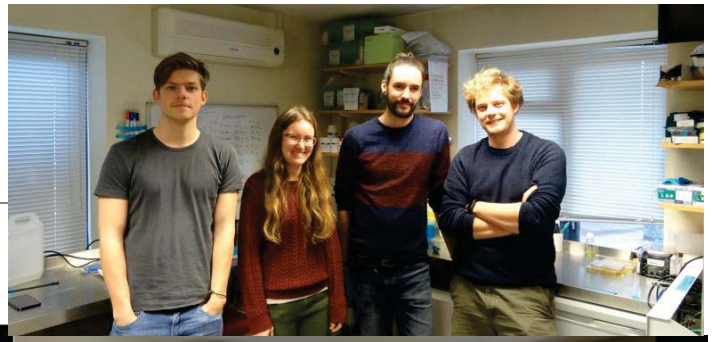
Timeline To Start

- Confirm The position
- Arrange the date between me and my Supervisor
- Confirm with The Company
- 4 Months before the start – arranged accommodation with future colleague
  - Common for PIPS students
- 1 month before the start date began talking to the finance department about modes of payment to the landlord
- 3 days before start date wrote a debrief document describing where I am leaving my PhD work and where I will need to pick it up

Induction

- One on one sessions with Heads of departments
- A Chat with CEO Harry Singer – introduction to profit sharing model and company culture
- Read and Sign NDA etc.
- Testing a PIXL on the first day

My Roles

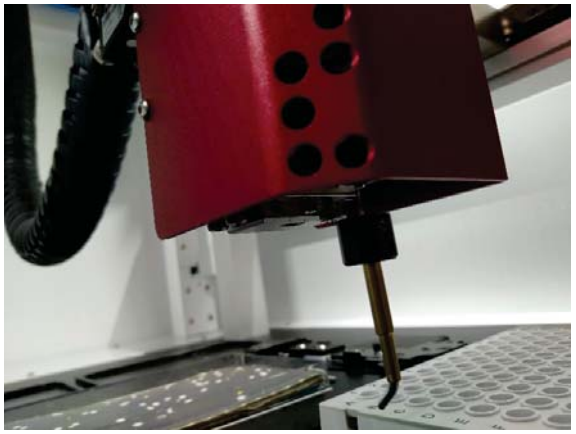


- Joined the in house RnD department – Team Science
  - Dr. Oliver J. Severn – Lead Scientist (my line manager)
  - Heather Jeffrey– overlapping PIPS student
  - Jose Aguiar – PhD Student

- Freedom to engage with all departments
  - Depending on what I am keen to learn
- Roles within the Science Team:
  - Quality assurance on a number of high value products within demanding time frames.
  - Assessment of novel software features, and analysis of functionality with high impact international deals and stakeholders.
  - Pioneering the *Chlamydomonas reinhardtii* research project within the Singer lab.

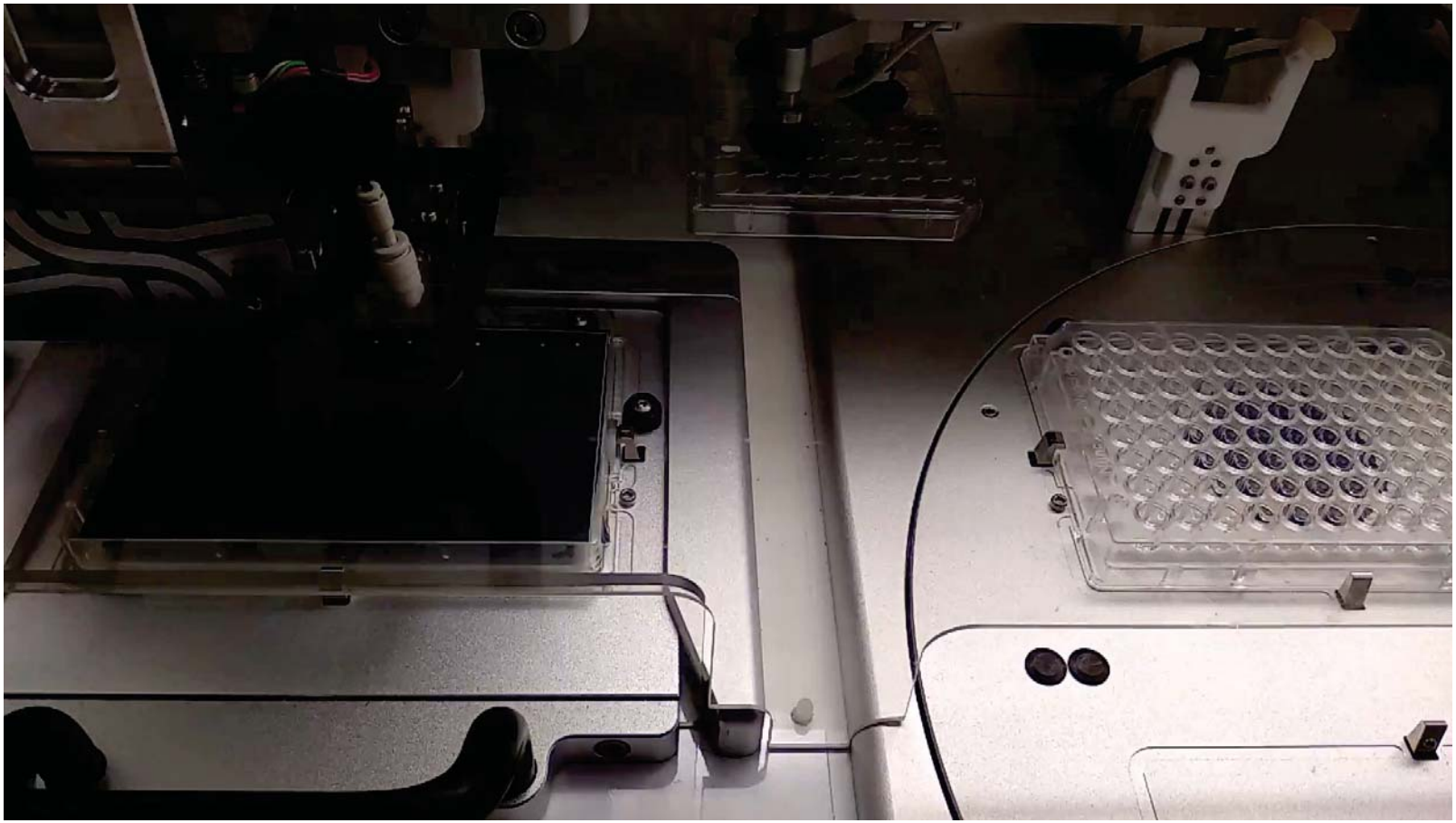
Quality Assurance /Quality Control

- Testing The Robots based on predefined testing protocols
- Coming up with new ways of testing
- Hunting specific bugs (Software, Hardware)
- Writing up reports (prioritise speed and minimal viable communication)



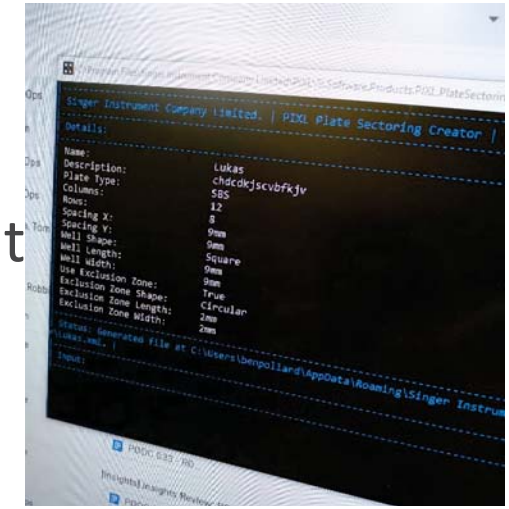
Broken Filament Nozzle On the PIXL –My Bad

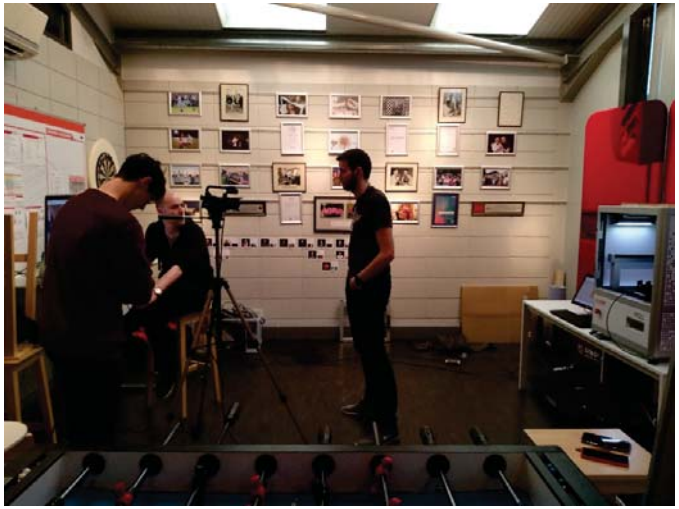
The lab Phenobooth has had its software reinstalled too many times



Feature Development/Testing

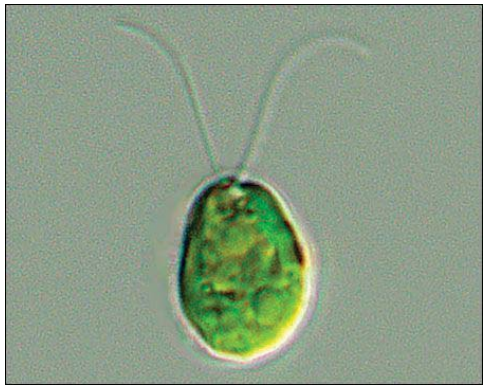
- Big Clients tend to request new features before buying
- Software and Hardware engineers need Scientific Know-how during development
- Sales and Marketing need to have confidence that they can advertise the feature (convincing reports!)





Expanding The Robots' Capabilities

- The robots are widely used for Bacteria and Yeasts, but expanding into other markets would increase sales!
- *Chlamydomonas rheinhardtii* is a model for Algae biotechnology
- Project: prove that PIXL can be reliably used for *Chlamydomonas rheinhardtii* manipulations



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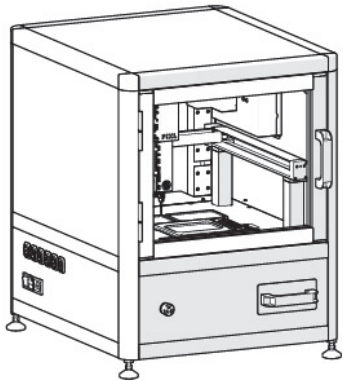
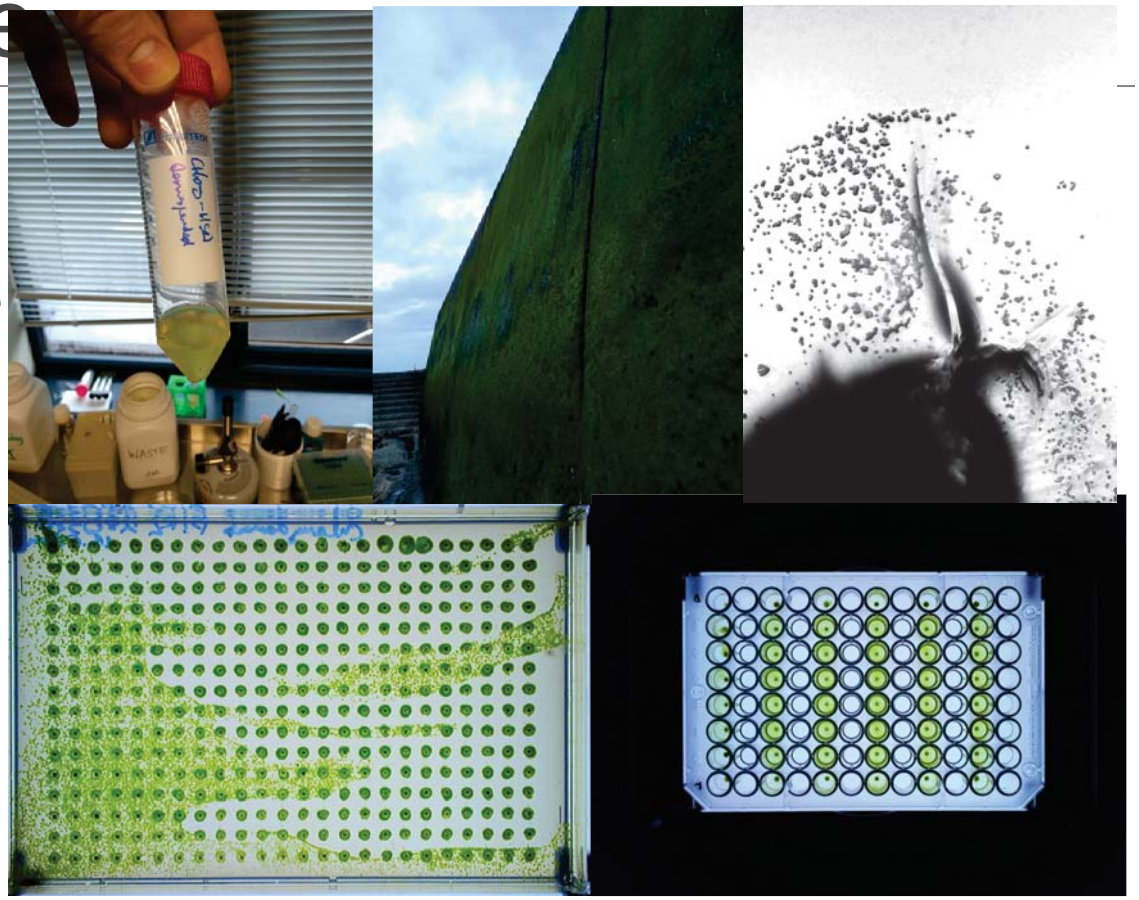


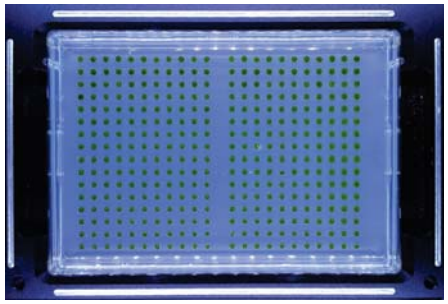
Chlamy timeline

- Establish viability of propagating the algae in the lab
- Preliminary testing to see if PIXL can pick colonies
- Robust characterization of PIXL's picking capabilities. Report and presentation

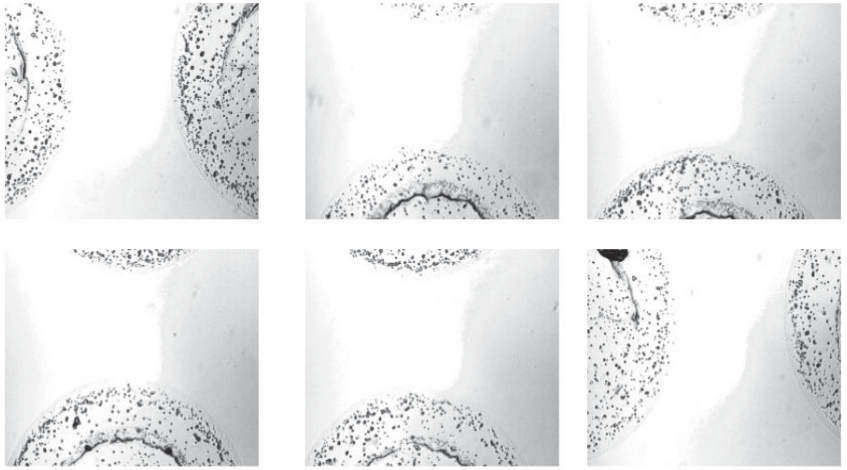


Chlamy Finish

- Got a list of deliverables From The Marketing team

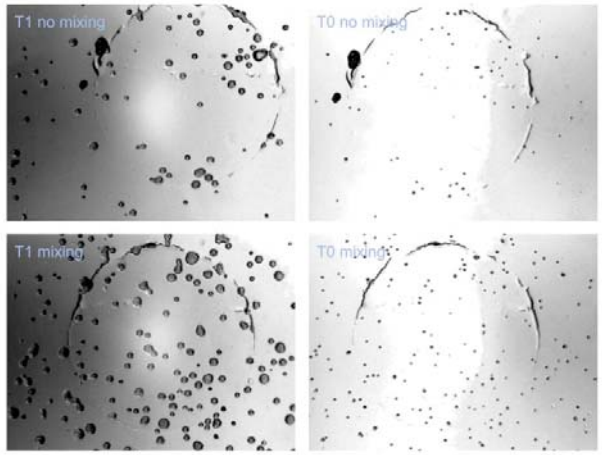


Visual display of colonies grown



1534 array using PIXL

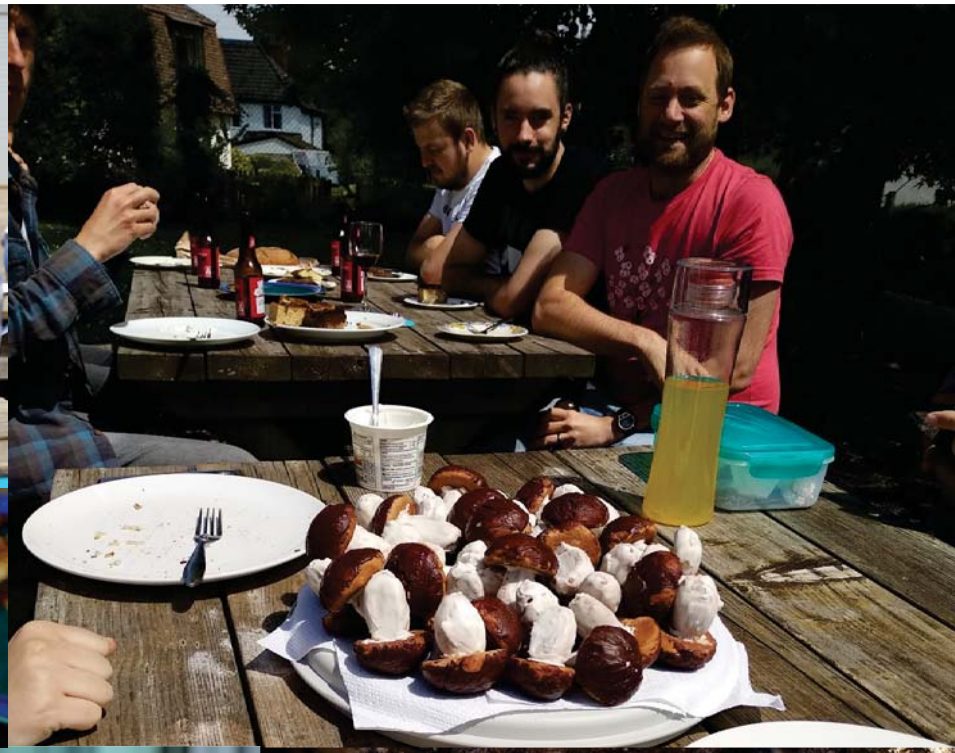
Prove discreet picking at higher densities



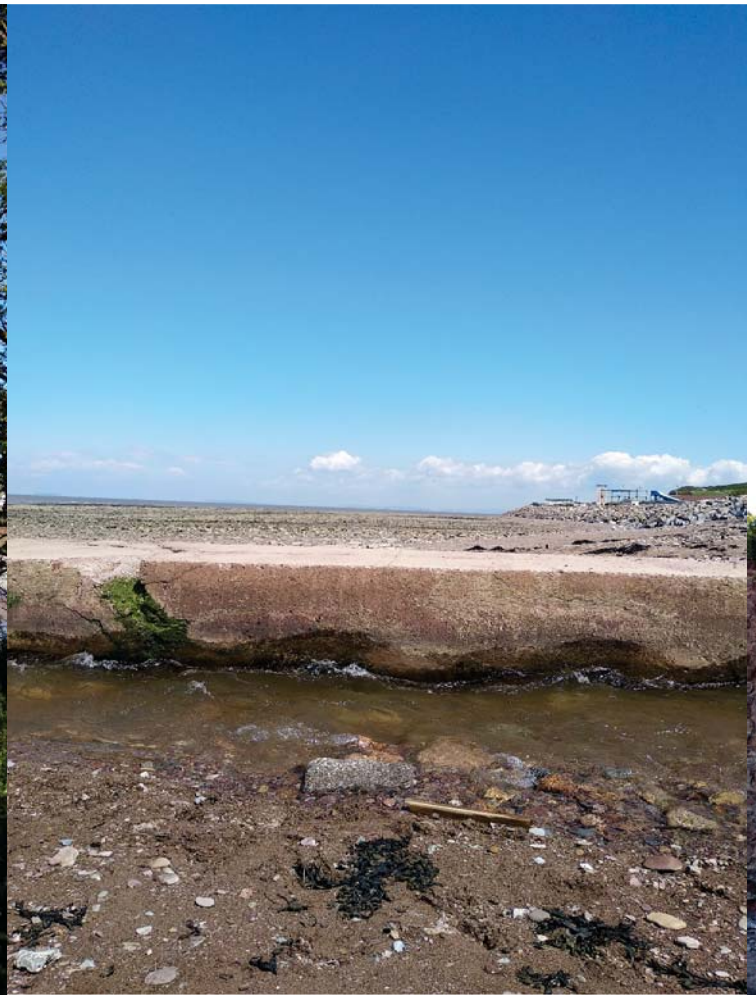
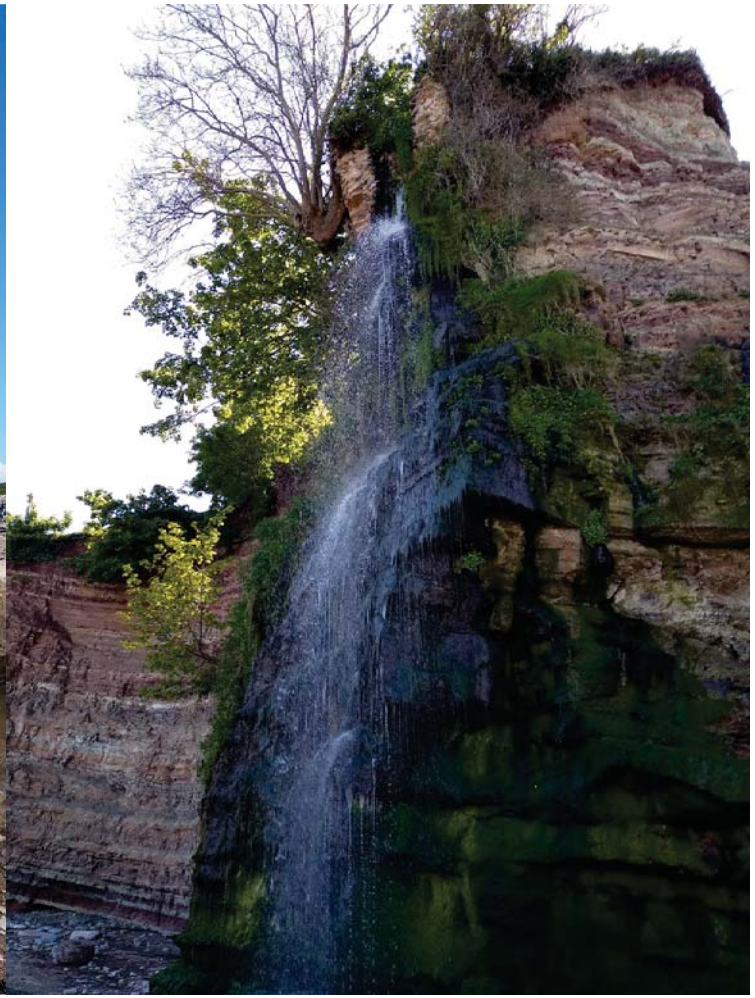
Display viability

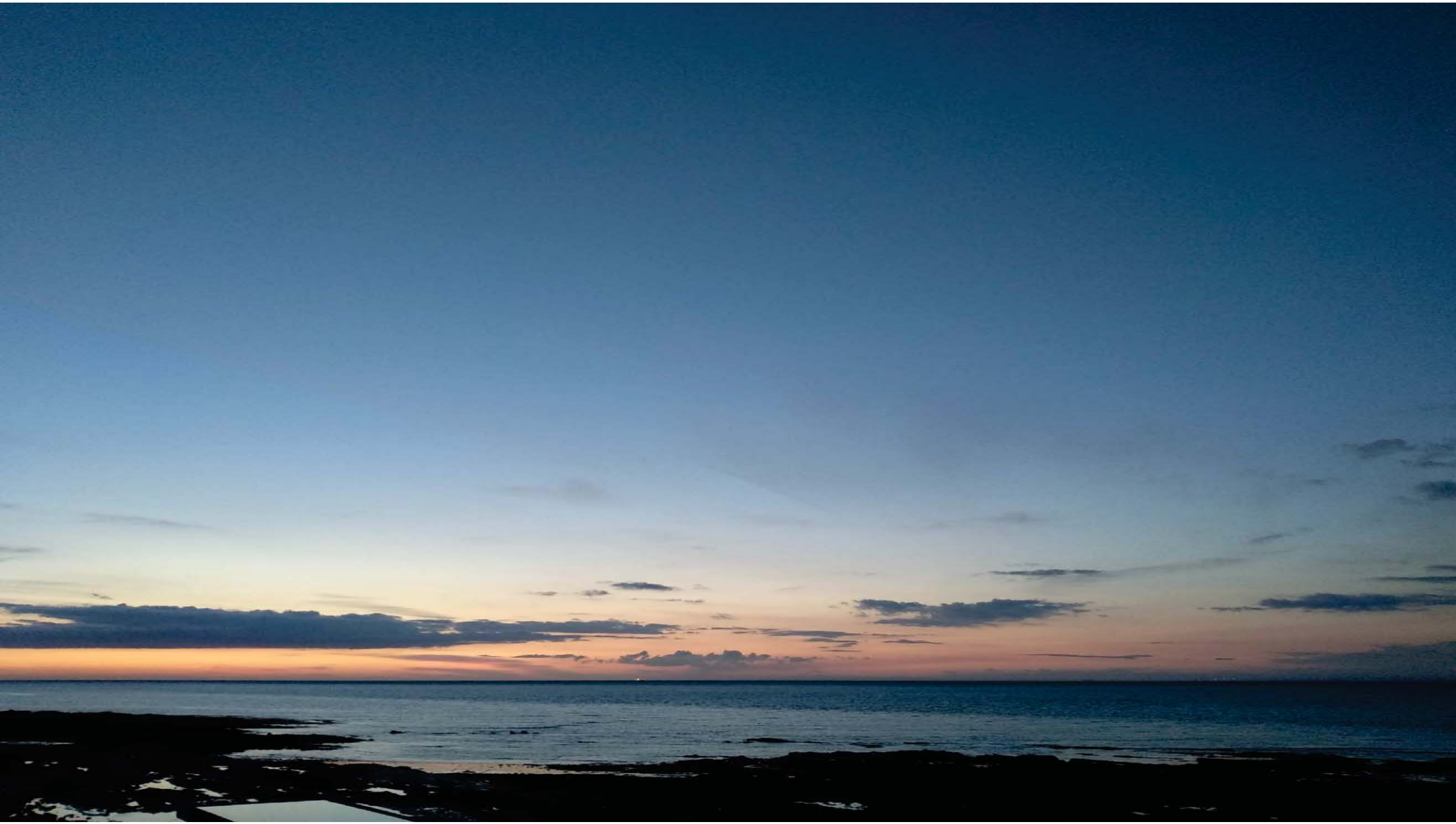
Main Takeaways From my role

- Skills learned as scientist are widely applicable in RnD; a thorough methodological troubleshooting goes a long way
- Quality Assurance and Reliability tracking is way more interesting than I previously though (What is Quality? What is Reliable?)
- Starting a mini-research project in an environment with no expertise has its own challenges and rewards.



That one photo where we're all in the lab before Heather left



Conclusion

- 9 to 5 is amazing
- PIPS resets one's mind – recommend to do it right before the end (as close as allowed)
- There are good ways to run a business
- Automation can be a welcome change if done with the right people
- I want you to write them an email (Ollie's email)