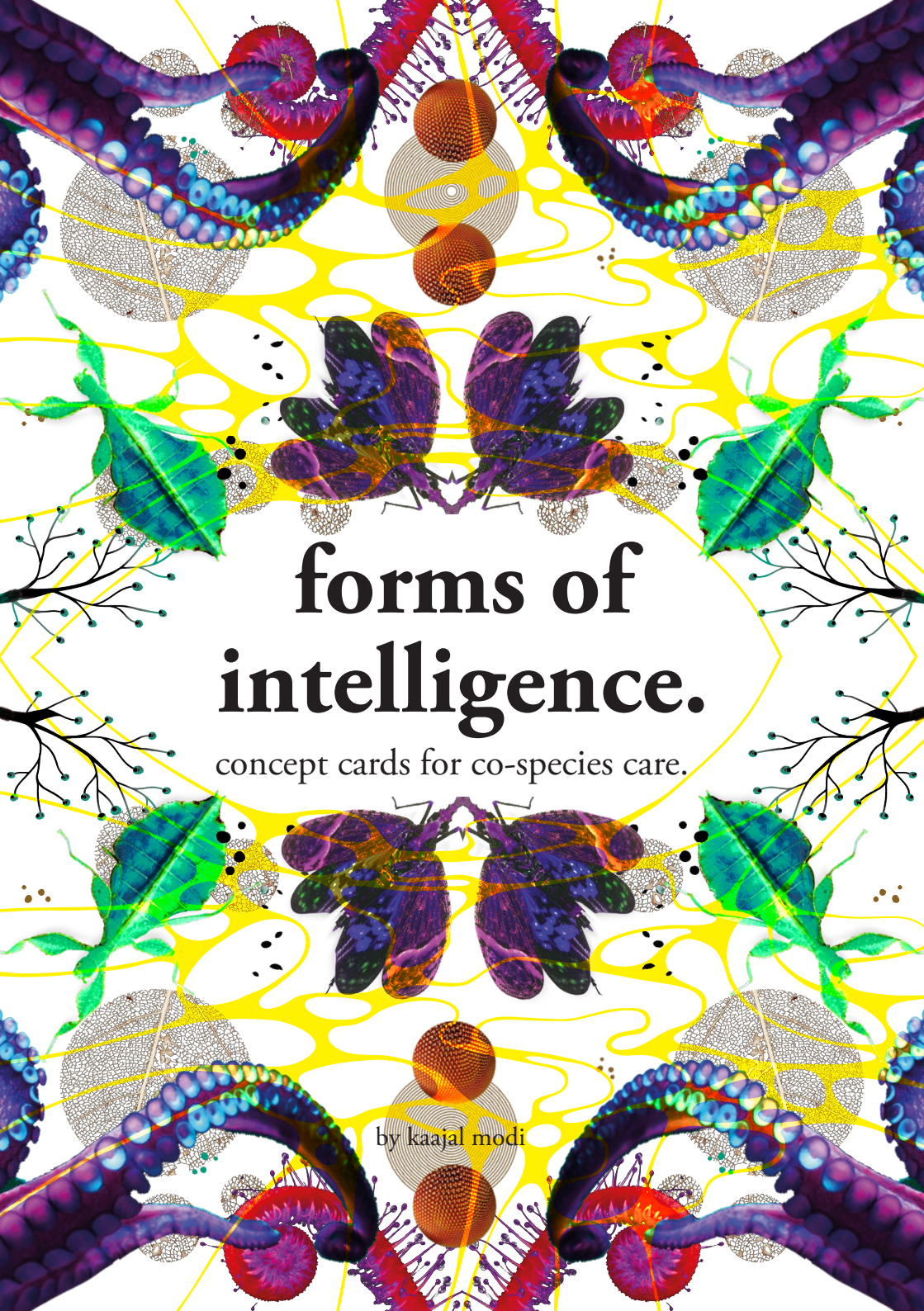
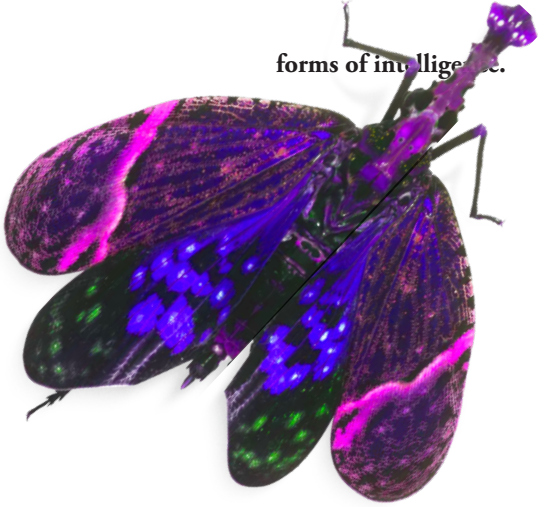


forms of intelligence.

concept cards for co-species care.

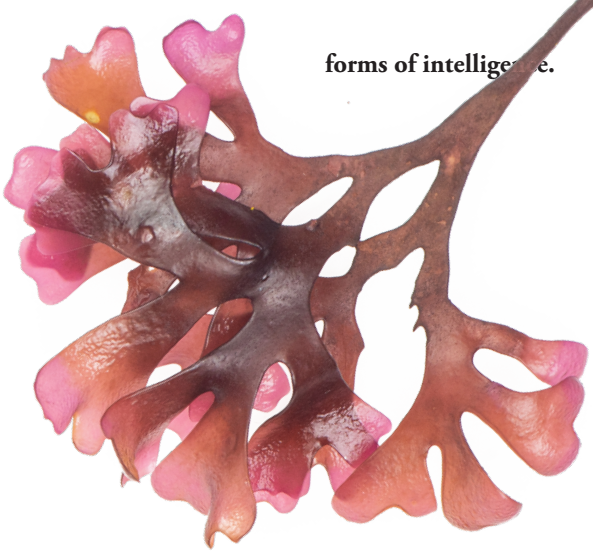
by kaajal modi



Forms of Intelligence is an ongoing project led by Knowle West Media Centre exploring how expanded understandings of 'intelligence' can inspire the design and creation of new technologies and systems for the benefit of all.

Commissioned by Knowle West Media Centre and **Digital Cultures Research Centre**

contents.



the cards.

what are they?

The cards and this booklet were commissioned by Knowle West Media Centre as part of the Forms of Intelligence project, and were made by artist and researcher Kaajal Modi.

The cards have been made in response to and are inspired by a series of collaborative workshops between eight people from Knowle West, Bristol, Kent, and Colombia with expertise in different forms of animal and plant intelligence. These people ranged in age from 18-80 and included community activists, artists, and researchers with specialisms in spiders and ants, trees, funghi, butterflies and local wildlife, soil, coral, gardening, bees, dogs, birds, robotics, wearables, performance and visual arts.

The group came together on the project to share knowledge, create principles for collaborating well across species and to begin exploring what could be made that would benefit humans, animals, plants and environments in more connected ways.

The cards were inspired by, amongst other things, tarot and Brian Eno's Oblique Strategy cards, as well as other types of card games (such as Cards Against Humanity) and creative inspiration techniques.

who are they for?

The cards are designed to act as conversation starters and inspirational prompts for anyone involved in a making process.

How often do you challenge yourself to stop and think differently, to see from a different perspective, or think deeply about who or what is being impacted by your decisions?

The cards draw on different forms of animal, plant and microbial intelligences that often get overlooked in human-led projects and processes. They also invite you to reflect on the humans who are connected to these organisms, whether directly, by working with them, or indirectly, by sharing land and resources with them.

If you are looking for inspiration and ready to open your mind to think more expansively about all living beings, then these cards are for you.

A note about 'who': when you see 'who' on the cards, remember to think 'who or what'. We have purposefully written just 'who' to encourage broad thinking about who or what gets to be a 'who'.

when should I use them?

When you are stuck on a problem or when you need a new perspective. You could interpret them literally, use them as an inspiration to try something different or as a conversation starter. Whatever you are making or working on, you might benefit from the perspective of a non-human being, or from a different worldview to the one you currently inhabit.

There's no wrong way to use the cards, in the same way that there is no wrong way to live in the world. However, some of the ways people choose to live in the world cause harm and

force others to participate in harmful systems; so we encourage you to consider the impact of your actions and decisions on others as you experiment with these cards.

With that in mind, we hope you enjoy using these cards and learn from them, as we have. We hope this project will provoke people from all walks of life to think about how they live, make, and think in a world that belongs to more than (just) human beings.

how to use the cards.

Some of the cards are provocation statements, some are questions and others have two inverse statements on one card - to be read either way up.

There are different ways that the cards can be used:

- Shuffle the pack, pick a card at random and consider it in isolation
- Connect the visual sides of the cards to create fantastical creatures and plants - then flip them over and see the combination of statements that appears
- Draw different types of cards (provocation, inverse, question) and consider them side by side

On some cards you will find the names of plants, animals and organisms in [**square brackets**]. These are an invitation for you to replace the word in bold with another word - perhaps something closely related to what you are working on, or maybe totally unconnected - to help you think differently.

The numbers on the cards do not suggest any particular order, but instead point to footnotes that give context to the text on the card. You can interpret these literally, inspirationally, or simply as a signpost to your next step. The footnotes can be found in the next section of this booklet.

card footnotes.

1. be like lichen

"What's amazing about lichen is that it isn't one thing it is two organisms; algae and fungus - they live in 'symbiosis' (where two things work together to mutually help each other)... if you separated them they would both struggle to exist. They are also extremely resilient and can survive in almost all conditions. They cannot survive in polluted air though and in turn are therefore great indicators of air quality!"

Jim Smith

2. disrupt the straight path

"If you look at a butterfly they never fly in a straight line. The reason it is jiggling about and choosing a purposefully wiggly path is obviously to confuse birds and avoid being eaten."

Ben Barker

3. be aware of anthropomorphising, *but do it anyway*

"Anthropomorphising (attributing human characteristics or behaviour to something) can be useful to help increase empathy. But acknowledging and knowing that we are anthropomorphising is very important too– we should be aware of its limitations."

(discussion between Kasia, Charli, Ben and Luisa)

4. reconsider the edges and the boundaries

"Spiders webs can be understood as an extended mind. The extended mind is the idea that things outside of our body could be understood as part of our body if we look at them differently– for example our mobile phones which now store lots
of things we used to remember. You could also think of cooking as an extension of digestion, the pre-digestion that happens outside of the body."

Charli Clark

5. be specific

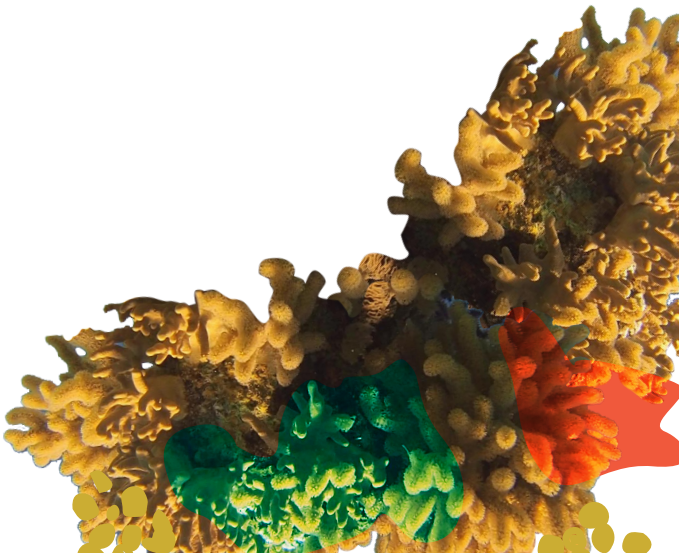
"The more specific you can be to make sure the result you have is actually improving the situation, the better. And from there, from a very high specificity in the design, you can start making it more general and opening it up to other populations."

Luisa Ruge

6. describe it to the [**coral**]

"With humans, once the language kicks in, it becomes such a strong part of the way we communicate that it dampens our innate ability to communicate with nature. It doesn't mean you go and have a conversation with a tree, but that we have this innate ability to sense. When kids saying "the dog said that…", at that age the language hasn't kicked in so they might actually be telling the truth."

Luisa Ruge



7. embrace complexity

"As an artist I always aim to avoid creating a simple message. We shouldn't be reducing complexity."

Kasia Molga

8. imagine it has disappeared forever

"Even though [trees] are inanimate (they are living but they're inanimate, they're just standing there with their branches out), because they're sucking up energy and producing flowers and fruits and stuff like that, I suppose I do (deep down) feel an affinity with them. I don't feel like I need to go up and say "hello darling", and give them a kiss. But I do look at them and say "I'm so glad you're here" because it would be such a miss.... Sometimes we only value a tree when it is no longer there."

Jim Smith

9. imagine it had never existed

"What if humans had never invented shoes - would we have tarmac?"

Luisa Ruge

10. think about different time scales

(plant-time, micro-time, coronavirus-time, rock-time, revolutionary-time)

"One of the oldest trees on earth, a spruce in Sweden, is more than 9,500 years old."

(Peter Wohlleben, The Hidden Life of Trees)

"In Summer, honeybee workers live six weeks on average."

Charli Clark

11. imagine different value systems

"It is often difficult to talk about 'value' – as humans find it hard to change mindset and get away from thinking about value in terms of economics."

Kasia Molga

12. stop and listen

"My task was to go and observe the bees. I realised I'm not used to really listening to the soundtrack of the world. I often go out to the lavender in my garden now and just watch the bees."

Edmund Hunt

13. make it slower

"It is possible that *Time*, the essential element, matrix, and measure of all known animal art, does not enter into vegetable art at all. The plants may use the meter of eternity. We do not know."

Ursula Le Guinn, AURA Keynote

14. be messy

"With our wildlife group we encourage people to think about the important role their garden plays in creating green corridors - the more wild and messy the better for wildlife."

Ben Barker

15. vibrate at a different frequency

"Tomato plants release pollen best when they sense a certain frequency, this comes from bees flapping their wings at a specific rate... the most effective pollinators for tomatoes are bumble bees– humans can't compete."

Charli Clark

16. cross-contaminate

"Mistakes were made … and mushrooms popped up."

Anna Tsing, The Mushroom at the End of the World

"We often think of gulls as a nuisance, but we have made them like that - we don't think about this. They have evolved to be able to survive from humans."

Mya-Rose Craig

17. encourage contradictions

"Multispecies coflourishing requires simultaneous, contradictory truths if we take seriously *not* the command that grounds human exceptionalism, 'Though shalt not kill', but rather the command that makes us face nurturing and killing as an inescapable part of mortal companion species entanglements."

Donna Haraway, When Species Meet

'I don't think I will ever have a meaningful dialogue with my orchid... I do talk to it'

Kasia Molga

18. make new connections

"People forget that as humans we are animals too and having the level of separation we do from the natural world is really detrimental to us as animals"

Mya-Rose Craig

"We discovered more commonalities between humans, plants and animals than we had expected– finding new connections between marginalized humans and endangered species, especially in relation to who or what is often overlooked and 'not seen'."

(Ben, Luisa, kasia and Charli - from a group exercise mapping the harm caused to and by certain living organisms - including a coral reef, a migrant woman, silver birch tree and an orange tipped butterfly)

19. what forms could new metaphors take?

"A metaphor is a way of telling truth far greater than scientific data."

Robin Wall Kimmerer, Braiding Sweetgrass

"...one quickly loses track of whether the digital camera is a metaphor for brittlestar vision or the reverse, especially as the metaphor begins to take on a strikingly material form: "Instead of trying to come up with new ideas and technology, we can learn from this marine creature..."

Karen Barad, Invertebrate Visions

20. what would the [**trees**] ask?

"Trees are treated abominably by the human race, so if they could do it, I think they would develop a form of communication so that when people came up to them with a saw they could say, "please cut it close, it's much better for me… don't tear it off! You're a very naughty boy, you're breaking my branches!" So we didn't go around destroying things that were so important for our wellbeing."

Jim Smith

21. what do [**butterflies**] dream?

"If butterflies could make a piece of tech maybe they would create something to persuade me and my friends to garden for butterflies - to make sure there are a range of flowers and so on – to get humans to work for them... or maybe they would invent a technology that would wipe humans out!! Perhaps this whole (corona)virus stuff is a conspiracy by butterflies!"

Ben Barker

22. who can flourish?

"When I was three my grandfather used to take me out in Fulham– which was a slum at the time, it was cleared– he used to take me down to the river and point out wild plants growing in the cracks. And I think that was what initially got me interested in nature."

Jim Smith

"For the Baka tribe in Africa the village is the living room and the forest is the house– it is a totally different perception of the environment. They do hunt and forage of course, but they know that there are times they can't forage for certain fruits or vegetables as otherwise they would over exploit. They have an amazing understanding of how to collaborate with everything around so that everything is thriving."

Kasia Molga

23. can [**plants**] choose?

"In 'What a plant knows' by Daniel Chamovitz he argues that plants can make decisions. I guess it all comes down to definitions of wording, decision making or cognition or learning..."

Sylvia Rimat

"I'm not sure where you draw the line between things that can choose and those that can't. Is it right to use words like 'choose', maybe we need a new language?"

Ben Barker

"Things like lichen and certain plants can move very, very slowly through layering and over millenia– particularly with lichen, we can't see it, but they are moving– is this a kind of choosing?"

Charli Clark

"There's evidence to show that our decisions can be influenced by our gut microbes; so who is doing the choosing?"

Kaajal Modi

24. where is the struggle?

"We really have no idea of how corals might feel during the bleaching, we can only think that they suffer. They probably do but we don't know what is in their suffering, how they sense it."

Kasia Molga

"It's often a complicated choice to be made around who or what is harmed by which action? For example, a red admiral– it lays its eggs on nettles. Now if you are a gardener or a park keeper the first thing you do is clear out nettles (as they are weeds) but nettles are the only food that the red admirals caterpillars will eat."

Ben Barker

25. is it hidden, or just not seen?

"When you look at a tree how often do you think or know about the sophisticated fungus networks under the ground and what kind of mutually beneficial relationships they have with the trees?"

Sylvia Rimat

"Things often aren't really *hidden*– we just aren't looking."

Ben Barker

26. what changes when the flower blooms?

"We shouldn't underestimate the impact of aesthetics and the power of transformation. Really look at how do they behave around me and how do I behave around them?"

Kasia Molga

27. what could it become?

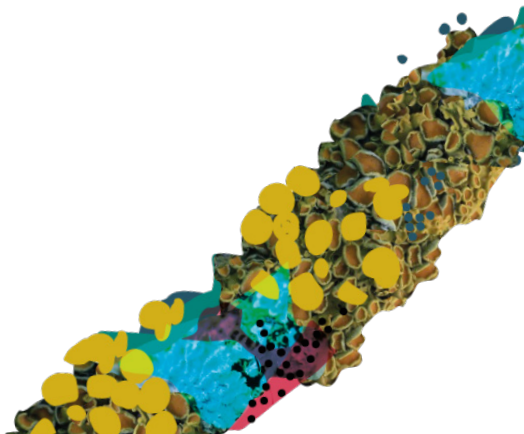
"Bacteria 'communicate' by sharing genetic information; they literally share DNA, which then gets "grafted" onto their bodies– so you could say that they are not distinct species... there's even some evidence to show that they can share DNA with animals."

Kaajal Modi

28. what is inside?

"There are many miles of fungus in one tiny spoon of forest soil and of course many bacteria and microbes are living inside all of us all of the time - which we often forget."

Sylvia Rimat



29. are you creating shared values?

"I try to think of nature as a partner not a product, and as a collaborator not the resource that is constantly exploited– not as something out there to serve humans, but rather as an equal partner."

Kasia Molga

"Often in nature you'll see examples of mutualistic arrangements between animals, where they're sort of helping each other, because they both benefit."

Edmund Hunt

30. what is success for a [**bird**]?

"By observing birds at different times of day in England and Columbia we started to learn more and notice new things - we wondered what counts as 'doing' something... what is success for a bird?"

Mya-Rose Craig and Luisa Ruge

31. are you taking notice?

"You just need to look up and then you can see what is flying around above your heads– usually there is more than you think there is going to be."

Mya-Rose Craig

"Things often happen at very specific times of the year and are massively affected by disruptions to cycles. How aware are people of this?"

Charli Clark

32. whats in a name? *consider histories, consider migrations*

"Many plants have moved through migrations and hold histories of colonialism."

Kasia Molga

"There is no such thing as *seagulls*; there are just many types of gulls."

Mya-Rose Craig

33. what resources can you share?

"So there's a certain species of ant that grows inside these trees (cecropia) they actually live inside the trees and the tree provides nodules of food for the ants to eat, which the ants especially enjoy. In return for this, the ants protect the tree, so if anything tries to bite down on the tree, the ants will come pouring out at the predator."

Edmund Hunt

34. what does it look like through different senses?

"With spiders they communicate through vibrations on the web. So they've got extremely sensitive sensory organs for detecting vibrations. They can 'see' from the nature of the vibrations what kind of prey has fallen into the web, or what other spiders are doing... where they are 'on the silk'."

Edmund Hunt

"Butterflies can smell through their feet."

Ben Barker

35. who/what could help you collaborate with [**ants**]?

"We can never directly translate, but maybe there are things that can help us understand, communicate or empathise more - perhaps technology can help here?"

Luisa Ruge

36. what are you exchanging?

"I believe my honey bees recognise me– perhaps the frequency of my voice? I often think of communication in terms of energy exchange– if you come calmly they won't be bothered. As humans I think we often discount these unconscious energy exchanges, which are very important when communicating across species."

Charli Clark

"Often it is a one way street with technologies - me asking all the questions. Usually other things ask me questions too."

Ben Barker

37. how will this benefit the next generation ... *and the next ... ?*

"Suzanne Simard (a professor of forest ecology) talks about hub trees or 'mother' trees who provide carbon to little trees, or 'baby trees' that come from that specific tree. The reason for that is if there are big trees in a forest they have access to all the sunlight so it's difficult for small trees to reach the sunlight. So they are basically being nurtured through those hub tree or 'mother' tree roots."

Sylvia Rimat

"Becoming indigenous to a place means living as if your children's future mattered, to take care of the land as if our lives, both material and spiritual, depended on it."

Robin Wall Kimmerer, Braiding Sweetgrass

38. what if it was being built by [**bees**]?

"If they can organise themselves effectively, maybe in human organisations we should be giving the workers more power to make their choices. You would assume it would be chaos, but actually it could be surprisingly effective."

Edmund Hunt

39. who cares?

"I run nature camps for young people from visible minority ethnic (VME) backgrounds in cities to engage with the natural world. Some of these people have never had the opportunity to connect with 'nature'... we are in the middle of an ecological crisis. Everyone needs to be on board to essentially save the world– but you can't expect everyone to want to save something they have never really come into contact with before. We have developed a strategy we call 'nature by stealth'– engaging people in nature without saying head on that's what it is we will be doing– e.g: doing a film making course in a park, so in turn people who don't think they are interested in 'nature' happen to be in nature and then get the benefits."

Mya-Rose Craig

40. how does a [**bird**] care?

"There are so many projects that try to just translate the senses of other things onto humans– but it can only ever be perceived from the senses that we have. We are trapped by our human senses– but we still need to find ways to make more emotional connections to things around us."

Kasia Molga

"Because it takes so much energy, [trees] only need to [send warnings] when they're attacked. So the first tree sacrifices themselves, there's nothing they can do about it, but at least they can care for their fellow trees."

Jim Smith

41. who has rights? / who has responsibility?

"Could land, trees, soil have legal status? People are starting to really debate this on lawyers forums – the idea of 'personhood'. Legal status is given to 'personhood', but what is 'personhood', it could be defined in so many ways. An AI (Artificial Intelligence) robot called 'Sophia' got legal status as a person– it doesn't have consciousness, it is programmed by humans– it is still manmade, but if that can get legal status, why not trees? They wouldn't be able to represent themselves, but could they have legal representatives?"

Kasia Molga

"It's an added layer of responsibility, because in designing for an animal I now become the interpreter or the animal throughout the whole process, because there's never a point where the animal can tell you "hey, this", there is no verbal feedback provided."

Luisa Ruge

"...however the bounds of 'we' are drawn, we are not, ever, pure. We're complicit, implicated, tied into the things we abjure."

Alexis Shotwell, Against Purity

42. does this need to be made? / does there need to be a need?

"It'd be great to be able to do something useful with the engineering as a long term aspiration... (but) a lot of it for me as a scientist is because I enjoy it, it's cool to think about and understand how nature works, and think 'can we replicate this in robots?', but in terms of making a bigger impact it is important to have useful things to give to the world."

Edmund Hunt

43. what does it do? / what else could it be doing?

"A combination of human, animal and tech can sometimes create the best mix; drawing on everyone and everything's best skills. For example, in dog training the exact repeatability of a machine - in terms of giving a command or performing an action- is very useful for a dog who could be confused by the nuances of human error. Although humans of course are much better at responding live and are essential to be kept in the loop."

Luisa Ruge

44. be sensory / be cerebral

"Frantisek Baluska believes tree root apices function similarly to neurons in the brains, or at least he makes connections or references, which is in a way quite provocative. Of course trees have no brain, so to talk about neuronal aspects is quite a statement!"

Sylvia Rimat

45. consider the individual / consider the collective

"...more and more in biology people are recognising that (actually) it's the differences in the individuals that are important for making the group work effectively."

Edmund Hunt

"Certain tree species support each other in various ways, for instance through those electrical signals they can warn each other (e.g. if there is a parasite coming) and other trees who receive the signals they can pump some chemicals into their leaves to make them unpalatable for certain insects. It's a huge advantage as those chemicals can take hours to pump into the leaves… trees can also share a sugar solution with each other, so if there are some trees that are not doing that well they can be supported by other trees, so it's about communication, but it's also really about living in community. So the community is more than the individual plant."

Sylvia Rimat

46. make complex webs / draw simple connections

"One of the aims of the BS3 Wildlife Group... is to draw people's attention to the links between creatures that live in our neighbourhood and how life forms that we approve of may be dependent upon ones for which we have no regard. One of our slogans is 'no stinging nettles, no red admirals', but it could be 'no garlic mustard, no orange tips' or 'no ragwort, no cinnabars'. One of our tasks is to encourage people to leave patches of 'weeds' in their gardens and public spaces. Some people are getting the message."

Ben Barker

"I'm really interested in exploring our connectivity with the forest, and with the natural world around us because I made this connection to how we function in our brain, e.g. the signaling in our brain that's very similar to plant signaling. I'm interested in how we might be much closer related than we thought."

Sylvia Rimat

47. do less *harm* / do more *care-fully*

"When you start being interested in something in general... it doesn't mean you have to look at something all the time, but just be more aware of it and that immediately, I think in everybody, brings a bit more caring, not even a conscious one, but if you are aware of its presence and then you immediately care a little bit more."

Kasia Molga

"I think back to when I was designing for humans and a lot of the times I made assumptions, because I'm dealing with a species that is the same as mine. So in designing for animals I've learned to be more aware of what it is like to design for humans, and that has helped me understand what biases I might be coming in [with] when I am designing for animals."

Luisa Ruge

48. be critical / be accepting

"I try to get responsibly sourced fish, but what does that really mean? Is it really responsible? I think, should I become a vegan, but you can't really ask everyone to be a vegan. There are so many facets to this conversation."

Kasia Molga

49. look at the tiny things / look at the huge things

"Under the microscope you'll see some pollens are spiky some are tiny and smooth, they all have unique markings depending on the plant."

Charli Clark

"Its when you zoom out to the macro that you often see more commonalities and connections."

Luisa Ruge

50. play / with purpose

"We sometimes used to play a game with the Woodcraft Folk where some of the children were either grass or rabbits or foxes and if all the grass was eaten there were no more rabbits and then there were no more foxes."

Jim Smith

51. mystify / demystify

"People often talk about AI as being a 'black box' sometimes. You put in the information, and it comes out with something, but it's not really explainable, or transparent. With collective intelligence, one would hope, you can at least understand how they've collected all the different information and shared it amongst themselves to come to a decision."

Edmund Hunt

"There is lots you just don't know and you can't watch [honey bees] all the time, especially as they are in the dark hive– they need that darkness– we have to assume everything has a reason we just don't understand it."

Charli Clark

52. make it uncomfortable / make it comfortable

"When I communicate with a bird, I change myself to make them feel happy in my presence– when I communicate with AI (Artificial Intelligence) I would expect it to tailor itself to me– I want to make wildlife comfortable with me, but I would expect AI to make me comfortable."

Mya-Rose Craig

cross-species collaborators.

Ben Barker | *butterflies + plants*

Ben and his wife Jo live in Southville. Ben retired from paid work long ago, but is a community activist (also known as a 'busy body'). Among his current enthusiasms are the Let's Walk Bedminster project which encourages people to keep the pavement outside their homes and businesses clear of obstructions and My Wild South Bristol which works with gardeners, allotment holders, park support groups and others to raise people's awareness of the wildlife around them and to improve the environment for our wild neighbours.

tresa.org.uk/bs3-wildlife-my-wild-south-bristol-2

Charli Clark | *bees*

Charli Clark is a Bristol based artist, gardener and beekeeper working across a variety of media including painting, film, performance, sculpture, socially engaged and biological art. Charli graduated with a Master's in Environmental Art from Aalto University of Art, Design and Architecture, Helsinki, in 2015. Since then, she has been involved with exhibitions, residencies and workshops internationally, and is currently based at artists' cooperative Centrespace Studios. Alongside her artistic practice, she has spent time training and working as a gardener to further understand how humans impact on environments and gain a greater appreciation of the natural cycle of a year.

charliclark.co.uk

Mya-Rose Craig | *birds + humans*

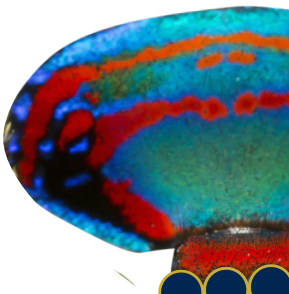
18-year-old Mya-Rose Craig is a prominent British Bangladeshi birder and environmentalist. She is committed to conservation and saving our planet, whilst respecting indigenous peoples, and highlighting Global Climate Justice as it intersects with Climate Change Action. She writes a blog, Birdgirl, gives talks (having spoken with Greta Thunberg), writes articles, and has appeared on TV and radio. As President of Black2Nature, which she founded age 13, she is the youngest person to be awarded an honorary Doctorate of Science for fighting for equal access to nature and ethnic diversity in the environmental sector.

birdgirluk.com | *@Birdgirl.UK* | *@birdgirluk*

Edmund Hunt | *spiders + ants*

Dr Edmund Hunt is a researcher at the University of Bristol in the Department of Engineering Mathematics, where he is part of the Collective Dynamics group. He is interested in how 'swarms' of agents, in biology and robotics, can organise together to achieve capabilities that are 'more than the sum of their parts'. For example, together a colony of ants can explore their environment and find the best quality food sources. We could take inspiration from this to design a team of robots to look for sources of pollution to protect our environment. Edmund is also a resident of Knowle, Bristol.

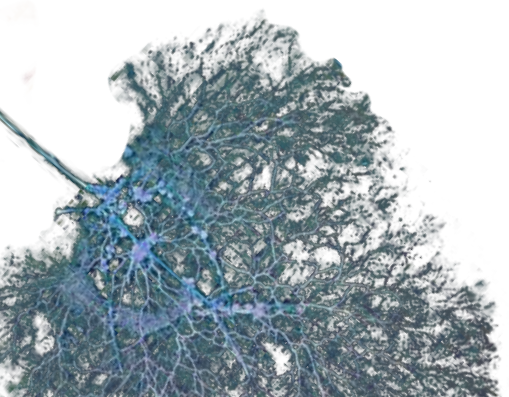
bris.ac.uk/engineering/people/edmund-r-hunt



Kasia Molga | *soil + plants*

Kasia Molga is a design fusionist and artist working on the intersection of art, science and engineering. She examines our - human - perception of "nature" in the constantly growing and increasingly technologically mediated environments. She creates tangible, multisensory and visual experiences, immersive environments, installations and speculative fiction stories. Kasia exhibits worldwide (Tate Modern, Centre Pompidou, MoMA and MIS among others) and has received many international awards and grants including Ars Electronica Honorary Mention, Wellcome Trust, Creative Industries NL and more. Her work has attracted the attention of press such as The Guardian, BBC and The Washington Post. Kasia is a co-founder of World Wilder Lab Collective *(www.worldwilderlab.net)*, funding member of Open H2O (former Protei Collective), and holds an MA in Interdisciplinary Design Studies (UAL, London). She regularly lectures and consults within academia and industry. She is a licensed Scuba Diver, avid traveller, aerial photographer and spent her childhood sailing on merchant navy vessels.

studiomolga.com



Sylvia Rimat | *trees + fungus*

Sylvia deftly blends theatre and performance art. She encourages her audience to interact playfully with elements of video, audio, new technologies, animals (imagined and real) and fragments of dance. Consciousness, memory, imagination and our connectivity with the natural world are recurring areas of interest, coupled with personal experiences. She collaborates with specialists from fields including Neuroscience, Mathematics, Psychology and from various communities, culminating in entertaining and thought-provoking performances. Her work has been presented throughout the UK, including the British Council Showcase at Edinburgh Fringe Festival and London's Barbican Centre in SPILL Festival, and internationally in Europe and Australia (Proximity Festival Perth; Sydney Festival).

sylviarimat.com

Luisa Ruge | *dogs + humans*

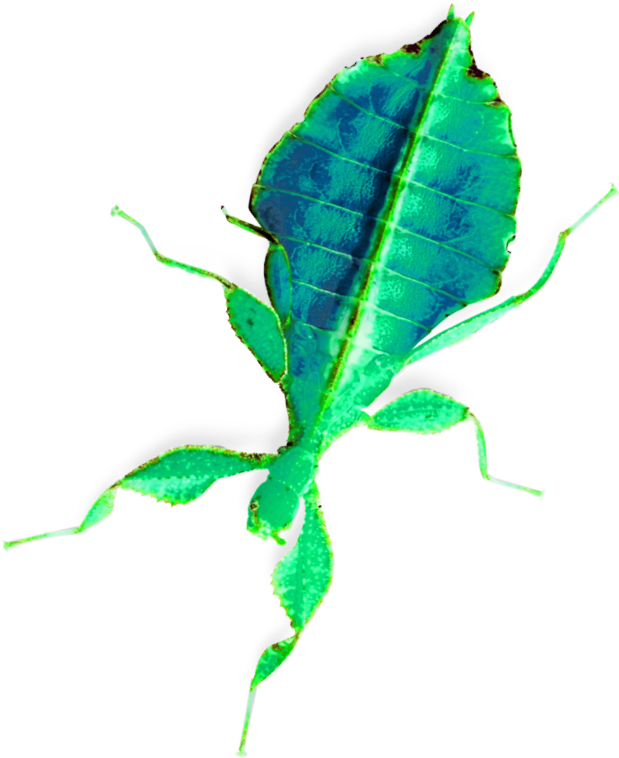
Luisa is a user-centred designer and a creative entrepreneur with more than 15 years of experience helping companies of all sizes design compelling user experiences. She has lived and worked in the US, Latin America, Europe, and Australia. Her mission lies in establishing the field of animal-centred design (ACD) with the aim to legitimize animals as users of products and services and develop exceptional animal-centric user experiences. As she states: "animals are an integral part of society: understanding and designing towards meeting their unique and individual needs will allow us to better serve them and us in our evolving human-focused landscapes".

linkedin.com/in/luisa-ruge-2271a83 | luisaruge.com

Jim Smith | *trees*

Jim started as a young garden labourer and became head gardener at Oxford Brookes University and Wookey Holes Caves Limited. He moved to Bristol and now lives in Filwood (Knowle West) – due to his background in gardening he volunteered to be Filwood's tree champion and in this role he looks after, replaces or puts in new trees in the area.

knowlewest.co.uk/filwood-has-its-own-tree-champion



the team.

Martha King | *kwmc*

Arts Programme Manager at Knowle West Media Centre and Forms of Intelligence project lead.

Martha supports artists to develop participatory arts projects, performances, exhibitions and digital work in both community, public realm and arts venue contexts. She also facilitates co-design and design thinking processes with communities, academics, NGOs (non-government organisations) and industry professionals.

She has a background in performance making including an MA in Performance Design and Practice (Central Saint Martins) and a BA in Drama (Exeter University), which has given her a grounding in collaborative processes and embodied practices. She has a UCL accredited service design qualification and is a 2016 Clore alumni.

Nicole Foster | *dcrc*

Research lead for the UWE Digital Cultures Research Centre.

Nicole's research involves using both qualitative and quantitative methodologies to identify, evaluate and build capacity for creating more just, inclusive and sustainable cities, focusing on the role arts, culture and creativity play in urban revitalisation, economic and community development. Her research has been published in Urban Studies, the Journal of Urban Affairs, Journal of the American Planning Association, Journal of Planning Education and Research, and Sustainable Cities and Society. Her work has also featured on The Atlantic's CityLab and LSE's US Policy Centre blog.

Tatiana Powell | *kwmc*

Creator of the Forms of Intelligence podcasts – made during a journalist internship programme at KWMC as part of the Forms of Intelligence project.

Tatiana is a 2019 graduate from the University of Bristol, completing a degree in Social Policy with quantitative research method with honours.

She is director of TP Research (freelance research and project management), Creative Director of PPA (virtual assistance and business growth), and a freelance journalist and editor at KWMC, as well as sitting on the Board of Trustees at the Full Circle Project at the Docklands Community Centre in Bristol. She is passionate about diversity and inclusion, specialising in working with BME [Black and Minority Ethnic] males in Britain, and aims to support the above in a qualitative and quantitative way.

Lewis Campbell | *kwmc*

Knowle West Media Centre Digital Community Projects Coordinator. Managed and supported the FOI internship and podcast creation.

Lewis is the Digital Community Projects Coordinator at KWMC, helping to develop and deliver new projects as a part of the Our Digital City team. His work focuses on engaging with adults and older people, delivering training locally and across the city using creative technology, and supporting people to develop digital skills, including music production, introductory video and film making and computer literacy. He is also a part of the team developing and creating digital content for the Knowledge, Knowle West's community website and newsletter.

symbols & symbioses.

Co-species care in more-than-human worlds

Kaajal Modi

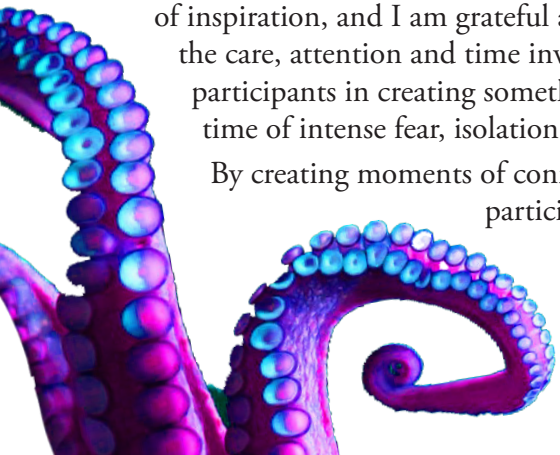
What makes an organism symbiotic? Are trees individuals, or colonies (is that too anthropocentric a question?). Scientists will measure some species in terms of their lifespans as colonies, rather than the organisms that make up that colony. Hub trees will share resources with trees from their own seedlings[9], like a mother nursing a child, yet mycorrhizae facilitate energy transfer between different tree species within the same forest[8]. Colony spiders will engage in collective decision making 'on the web', then act as individuals to the benefit of the colony. Orange tip butterflies will eat mustard as larvae so as to taste unpleasant to birds, their last act one for the good of the flight. It seems counter-intuitive today, but wherever we turn, it seems as though the story of life on earth is one of a mutualism based on co-operation and cross-pollination, rather than competition and individualism.

Humans are a colony of bacteria, and we are also individuals who make up cultures and societies. We are a result of millennia of bacterial development and co-constitution that allow us to digest food, and of viral infections that shaped our ancestors' placenta[7]. If, as microbiologist Scott F Gilbert notes, life is symbiosis "all-the-way down"[3], then what does it mean for our conceptions of collaborating across difference

forms of knowledge, intelligence and being? The 'forms of intelligence' at play in this project situate human and non-human beings as part of complex webs of interdependence and shared kinship, and challenge essentialising categories such as 'human' and 'other'. Humans are a part of nature, and nature is part of us; thinking through more-than-human intelligences might offer novel modes through which to re-imagine our relationships with other organisms, and with each other.

At a time when a zoonotic virus thought to have originated in bat populations in Wuhan is forcing the entire human population to change how we live and connect, it feels more important than ever that we reconsider our relationships, and find more hopeful paradigms through which to connect with our environments and the beings we share them with. Multispecies perspectives offer us lively and responsive ways of 'knowing' the complex human and more-than-human entanglements that make up life at multiple scales.

This project grew out of a need; and that need was to reconnect. After having gone into lockdown early in March, by June I was feeling an urgent need to be around others– other people, ideas, organisms– and to be inspired. Looking at all of the tarot-inspired projects that have flourished during the COVID-19 pandemic, I think I wasn't alone in my need. This project gave me so many moments of inspiration, and I am grateful and humbled by the care, attention and time invested by all of the participants in creating something hopeful in a time of intense fear, isolation and grief.



By creating moments of connection between the participants, their co-

species organisms, and each other, this project became what it sought to represent: itself a set of symbols that offer symbiotic ways of knowing and living in the world. As such, these cards do not simply represent the Forms of Intelligence project, but embody all of the diverse collections of connections and complexity and contradictions that make up our more-than-human worlds, and turn them into a set of ideas/prompts/talking points/urgent ethical moments that will inform further iterations.

There is a strong strand that weaves through the project and all of its constitutive relationships, and that is one of care. A question we often find ourselves asking in ecological discourse is "how can we care for, or make people care about the environment?". You could argue that this puts undue emphasis on individual actions, and one-way relationships framed through an anthropocentric paradigm of care.

The humans and other organisms who make up this project, with expertise ranging from spider behavioural research for SWARM robotics, to tree guardians, to local wildlife experts, to birdwatchers, as well as artists working with soil, fungi and plants, with ages ranging from 18 to 80(-something), frame care as variously: a responsibility, a privilege, and an obligation; a job that we do despite ourselves, and a job we can't not do. Climate change is a systemic issue, that demands collective attention and action.

The collaboration and exchange that is necessary for this kind of care may not fit with ecological activism in the vein of direct action of organisations such as Extinction Rebellion, Friends of the Earth, or Greenpeace, but they nonetheless form an integral part of the ecosystem of action that may be required in order to combat the climate emergency our present epoch faces. In the

same way that any real mass mobilisation of the people against unjust political systems requires infrastructural organising based on collective care to sustain (e.g. street kitchens, shelters, libraries, child and elderly care and systems of democratic decision making), perhaps we can see the people who work with other species as doing the less glamorous work that creates systems of mutuality through which we can relate to other-than-humans, a mutual aid network for a more-than-human world.

It is however important to note that the ecological crisis we face is itself deeply political. With over 70% of world carbon emissions being produced by just 100 corporations, and the majority of the remainder by unsustainable lifestyles in the global north, we cannot afford to act as though climate activism is a non-partisan activity in which all humans are implicated equally. Capitalism, corporatism and neoliberal economic policies have much to answer for. Resources extracted from the global south fuel the technology industry in Silicon Valley via products made in sweat shops in China and Bangladesh, which are then sold in slick lifestyle branded shops staffed by underpaid workers, so that we may buy their outputs at vastly inflated prices in order to fully participate in modernity.

The economic costs of the tech industry are felt disproportionately by workers globally, and the resulting climate catastrophes are creating under-resourced dystopias in the very places from which the resources fuelling this economic growth are extracted. The wealth of the first world is built on the land, labour and lost lives of people who will never benefit from that wealth, and whose children carry the debt of that loss. Some people are living the impacts of this loss more acutely, and much more materially, than others.

For those of us from the South, the legacy of colonisation

on our natural resources meant many of us (our parents, grandparents) moved to Europe to provide better opportunities for our children; we come from cultures that think intergenerationally and many of us come from traditions where we see the natural world (trees, rivers, rocks, animals) as part of these communities. By working collaboratively with others, and by drawing attention to the organisms in our environment and in/on our bodies who we collaborate with daily, I want to create conversations about what it means to care for each other when resources and opportunities globally are scarce for all species.

We live in a geological era notionally determined by human impact on the climate, where the boundaries of that impact are drawn by colonial genocides (both sudden and protracted). In comprehending our responsibilities and complicities with animals and technology, microbes and fungi, with medicine and science, we might begin to know what it means to be ethically human in more-than-human worlds. In learning to think through other-human and other-than-human perspectives, we might also find alternatives to current exploitative and extractive forms of capitalist and colonial violence as enacted on land and on marginalised bodies.

We cannot presume to know the mind of a bird, or a fish, and we do not know how trees experience the world. If a tree falls in the forest, and other trees hear it fall, will they be suddenly fearful, overtaken with worries about their own mortality? Like a human death, do family members celebrate that individual tree, and in doing so remember that their lifetime is finite, that every moment is a precious? Some trees live for millennia, and certain colonies of trees are thought to have lived for tens of millennia. Anthropocentric perspectives on

life, death, and morality do not serve us when trying to find new modes through which to connect to other species.

In creating these cards, and this book, I wanted to maintain the contradictory complexity that cross-pollinated all aspects of the project, and to become comfortable with not knowing, and with not presuming to know. I wanted to create something that evoked the moments that inspired me in a time when I was feeling lost, when I couldn't imagine the moment we were in (let alone the one that could come after). The pandemic mobilised mutual aid networks across the world, and taught us to conceptualise care as a collective act in a moment collective grief, confusion, and transformation. I hope that these cards will help you to navigate this moment, like they helped me, or at least bring you comfort and joy in knowing that you are part of a complex, magical, and unknowable world full of life that is at once gracious and monstrous. We should never forget that we are part of this web of care, and as such, are capable of both monstrousness, and of monstrous grace.

Kaajal Modi | *microbes + humans*

Artist, designer and researcher with a background in graphic design & illustration, participatory social design and community food activism in Glasgow, London and Bristol.

Currently completing a PhD at the Digital Cultures Research Centre, and co-supervised through the Science Communication Unit at UWE, Bristol. My research works through a collaborative creative practice that speculates just and sustainable climate futures through food fermentation with diverse cultural communities (human *and* microbial).

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