Bioglossia

by
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BIOGLOSSIA

Summary

Bioglossia is a work of speculative fiction that presents a near future in which artificial intelligence can translate animal communication into human language. Its title joins the prefix *bio-*, referring to life, and the suffix *-glossia*, which typically denotes a noun concerned with speech.

In three parts, readers receive a narrative covering key developments of and reactions to bioglossia as a phenomenon and a product. First, we hear from a press outlet's' coverage of the breakthrough innovation, then from a professor's closing remarks in a soon-to-be published book, and finally from a president's broadcasted speech.

My primary inspirations include Carl Sagan's *Pale Blue Dot* (1994), Kurzgesagt's YouTube documentary, "The Horror of the Slaver Ant" (2022), and Bill Safire's memo, "In Event of Moon Disaster" (1969). Basic animal facts come from the Smithsonian.

Real institutions are used extensively, these can be changed to fictionalized versions in the future, if necessary. I intended only to increase realism.

As a piece of purely fictional writing, I do not assert any academic or factual claims.

Thank you for taking the time to read.

I. The Press

Whale Songs Deciphered

Updated 3:56 PM, July 18, 2030

Some observers are calling it the most consequential translation breakthrough since the Rosetta Stone.

Metazoaglot, the company behind the Bioglossia™ AI platform, and the K. Lisa Yang Center for Conservation Bioacoustics at Cornell University announced today that they have successfully 'solved' two humpback whale dialects. According to a multidisciplinary team composed of biologists, linguists, and cryptographers, this means that the songs of some humpback whales can be translated into English with a confidence level of 96% by using the artificially intelligent interpreter. To accomplish this, researchers say they constructed a large language model for the cetaceans from an extensive database of marine audio recordings.

Just last year, in a landmark study published in *Nature*, members of the Center's Sedna Project merely confirmed that the communication of most whale and dolphin species qualifies as 'linguistically complete', or in other words, that they use a language functionally equivalent to those used by humans. However, at that time, the content of their speech remained a mystery. Dr. Levy, lead biologist on the project, asserts that now "we know what they're talking about."

"This is essentially eavesdropping on a scale never before imaginable. Human beings have shared this planet with whales for hundreds of thousands of years and… I– perhaps ironically, I have no words. Just completely surreal," she added.

Despite this excitement, a somber tone also loomed over the presentation. In an example text used to illustrate the 'parallel speech' of the whales, where two or more phrases are uttered separately yet simultaneously, an adult female humpback whale recorded in the Gulf of the Farallones National Marine Sanctuary seems to mourn the death of her daughter, and in parallel, laments about frightening changes taking place in the sea, repetitively pleading to an

untranslatable entity for help. Bioglossia^{TM} simply uses the placeholder, '[Name],' for this entity.

Asked for comment, Dr. Tae-Woo, a project linguist, infers high emotional complexity and possibly even signs of spiritual belief in such expressions:

> "At its core, language is simply a vehicle for transmitting thoughts and feelings. Although imperfect in this task, we all know from experience that language can often serve as a reflection of our inner realities– how we understand, perceive, and ultimately relate with the world around us.

> In this case, we have a mother who has lost her calf, and even through translation, I can feel the immense pain in her words as she grasps at a severed connection. This whale is suffering, no different than a human mother.

> This parallel phrase that we have shared, to me, suggests something else that's really special– but also, let me just say first that speaking in parallel like this indicates an extremely high intelligence, something we already knew about in the cetaceans of course, but I think it really goes to show that we shouldn't assume that human speech is by default the most sophisticated in town.

> As I was saying, this message, it's an observation about change in the environment and it's also an appeal to someone, perhaps even a deity or other power. It certainly resembles speech patterns commonly used by humans in religious settings.

> At the moment, what I see in this text is immense desperation, it's almost apocalyptic. I mean, is this really a surprise? Humans are radically changing marine environments. We have nearly depleted global fish stocks. We have saturated every ocean with garbage and microplastics. Now we're mining the seafloor.

> All of these actions add up, and I believe we're finally seeing the emotional turmoil caused by this worldwide, multifaceted, ecological disaster."

Cornell scientists and Metazoaglot claim that translating the speech of whales will aid in conservation efforts, as it will provide a wealth of additional insights concerning their behavior and preferences. Moreover, researchers speculate that it may become possible to learn about a host of other organisms and marine conditions just by listening to the conversations of cetaceans, essentially a form of secondhand knowledge.

The Sedna Project aims even further. In the very near future, the team claims that Bioglossia™ will decipher the languages of additional organisms, and eventually, facilitate human-to-animal translations. On stage, Metazoaglot representatives argued that with fluid communication between humans and wildlife, people around the world will learn to coexist more peacefully and sustainably with nature.

Critics contend that such a rosy picture does not acknowledge inherent risks. Ariel Stevens, an animal rights activist who protested at the event, argues:

"Well first, there's the issue of privacy. If these animals are smart enough to have language, then they're definitely deserving of privacy. Second, how can we be certain that these AI tools won't be used to exploit animals? Imagine what the illegal whalers could do with this stuff. Also, I worry about militarizing wildlife. I want to see a ban on defense companies using this technology ASAP."

Dr. Jonathan Hill, a Duke bioethicist unaffiliated with the Sedna Project, respects the hesitation but remains optimistic:

> "Concerns are valid here. In the event of human-to-animal translation, there is a huge risk of mass ecological manipulation, including the militarization of wildlife. I believe the political willpower is there, in the Congress, to take this slowly. I would expect a ban on human-to-animal translation in the near term, at least out in the field. With the right controls, it should be straightforward to prevent this misuse and abuse.
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> However, with regard to listening alone, we're probably going to see immediate implementation, and to me, there's no problem with that. On balance, I expect an exponentially better understanding of these animals' lives, which will advance both science for science's sake and conservation.

Perhaps most importantly, this technology offers us, humanity, a better shot at understanding ourselves and our place in nature. I just hope we'll be able to handle it."

The public can expect 'pages' of humpback whale speech next week on Metazoaglot's webpage.

II. The Professor

... Now, as we close our investigation into the world of advanced animal communication, let us examine the rapidly emerging evidence for language use in an unexpected realm of the animal kingdom, the insects.

But before that, I would like to take a moment to address those who still struggle with this issue of language in supposedly lesser species, for fear that these acknowledgements somehow devalue humanity, I ask you to briefly consider the very long history of flight.

Insects were the first group of animals to take to the air, approximately 300 million years ago, long before any human ever walked on Earth. The pterosaurs came next, some as large as giraffes, dominating the skies for nearly 100 million years during the age of the dinosaurs. From the dinosaurs descend the birds, starting about 150 million years ago, whose members today can fly as much as 18,000 miles in a single year (*Sterna paradisaea*) and control themselves in aerial dives as fast as 240 miles per hour (*Falco peregrinus*). More recently, but still over 45 million years before our species appeared, bats became the first mammals capable of powered flight.[1]

Humans, a wingless creature, might initially seem out of sorts in such a timeline. But we know different. Through mind and hand, our species quite literally soars above and beyond all of our animal neighbors. We began flying a measly 120 years ago, in a wooden plane, that sustained itself in the air for just twelve *seconds*. Sixty-six years later, in the fraction of a fraction of the blink of Earth's eye, we flew out of the atmosphere and to the Moon.

Late last year, researchers affiliated with the Intelligence and Sensing Lab (ISLab) at Osaka University preprinted results in arXiv indicating an extraordinarily high linguistic capacity in ants (*Polyergus*). Lending credibility to their discovery, ISLab scientists had employed the very same AI language-detection program, Bioglossia™, first used to confirm linguistic completeness in the majority of cetaceans by the K. Lisa Yang Center for Conservation Bioacoustics at Cornell

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[1]Basic animal facts taken from Smithsonian online resources

University in 2029 and some corvid species by the same group in 2031, as discussed in the introductory chapters of this book.

For those unaware, *Polyergus* represents a particularly ruthless assemblage of ants. Known to entomologists as slave-making or slaver ants, members of this genus participate in a practice called brood raiding, where colonies of *Polyergus* capture and return the pupae and larvae of other colonies for the purpose of later enslavement. To do this, scouting slaver ants must identify a brood suitable for raiding, communicate this opportunity to their own colony, and then coordinate a mass assault and seizure of the brood against the defenses of the victim colony.[2]

Finally, having secured a brood, the slavers must in some way subjugate their abductees, compelling them to work for the benefit of their captors. Scientists had long established pheromone communication as the mechanism of action in *Polyergus*,[3] but even with detailed chemical analyses of their excretions, this alone constituted only a minimally satisfactory explanation for the complexity of the observed behaviors.

That is, until the Japanese researchers reconfigured Bioglossia™ to receive data from another breakthrough technology of the late 2020s: machine learning-enabled infrared spectrometric cameras, not entirely distinct from the so-called 'ChemCam' first deployed on the Mars *Curiosity* rover in 2011. Though not identical in function, the now genericized name refers to devices capable of identifying myriad biochemicals and characterizing their gradients in three dimensional space.

After constructing sixteen large *Polyergus* enclosures, each given access to a victim colony, the team installed an extensive network of ChemCams which monitored the ants' pheromone excretions around the clock, feeding collected data into a Bioglossia™ mainframe. Results astonished ISLab, and the world. Within three months, the AI had rendered invisible biomolecular clouds into human-readable text. The ants are speaking.

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[2] Basic details inspired by Kurzgesagt's YouTube documentary, "The Horror of the Slaver Ant" (2022)
[3] Basic details inspired by Kurzgesagt's YouTube documentary, "The Horror of the Slaver Ant" (2022)

Their battle cry? "FOLLOW-FOLLOW-NOW-FOUR-THREE-NINE-FORMICA."

Sentences like this, if we can indeed call them that, may seem too simple to qualify as language, especially next to the works of Shakespeare or the vast corpus of recently deciphered whale poetry. But like it or not, according to Bioglossia™ and ISLab analysis, these are abstract and interchangeable words arranged in an obvious, albeit alien, syntax. These are not merely biochemical noises, rather, they meet our current definition of language.

And as it turns out, these sentences may finally provide the key to understanding these ants' success. Although, at time of writing, we are still waiting on full decipherment, we now know that *Polyergus* almost certainly uses linguistically complete sentences and paragraphs to convey details about available broods, to plan and manage their raids in real time, and perhaps most striking, to propagandize, threaten, and coerce their victims. Upon invasion, slaver ants begin chattering and according to ISLab, the intricacy and volume of their statements correlate strongly with the passivity of the invaded. This tactic continues with the stolen brood, captors verbally manipulate their young prisoners to cultivate obedient workers who sustain the colony.

This suggestion, that ants may speak to one another, not just for information's sake but inter-species influence and cruelty, more than any other example of bioglossia, has sparked the most extensive controversy. A public who readily accepted the original claim in cetaceans has violently objected in this case.

But why?

Perhaps it is because it strikes so close to the heart of human self-perception as the pinnacle of emotional and creative sophistication of Earth, if not the entire cosmos. And perhaps if even a simple, tiny, and insignificant ant utilizes language in these ways, then we are forced to reconsider the status of each and every organism that stands between us and that ant in our imagined value hierarchy. And why would it ever stop there? How will we cope when the AI tells us that the grasses in our yards

sing ballads or that molds hold philosophical debates? If we all share language, where does that leave humanity?

In this way, recognition feels a lot more like reckoning. This can challenge even the most open-minded people. But I encourage my readers to remember that just next year, human beings will set foot on Mars and that that accomplishment is in no way diminished by the wondrous and majestic flights of this planet's many bugs, birds, and bats.

Yes, we may only be fifth in flight, but we fly to other worlds. Likewise, our voices are not lost in the great chorus of planet Earth.

III. The President

Good evening, my fellow Americans.

Early this morning, in violation of recent amendments to the Endangered Species Act and the National Marine Sanctuaries Act, a group of students at the University of California, Berkeley posted a video online that appeared to show, for the first time, human beings conversing with a whale by means of machine translation software.

So tonight, I want to take a moment to address the significance of this action, the implications for this country. However, in order to continue in a productive manner, I will first speak to the circumstances of that video and the validity of its claims.

Taking advantage of a lapse in security during the Thanksgiving holiday break, last Thursday, November the 24th, four PhD students affiliated with UC Berkeley's Artificial Intelligence Research Group, a federally funded laboratory, misappropriated equipment intended for the study of language use in non-human animals, or bioglossia, as it is commonly known to the public.

This equipment included an advanced aquatic microphone, a computer system containing a controlled version of the Bioglossia™ software capable of human-to-animal translation, and a specialized speaker device suitable for transmitting sounds at frequencies audible to whales.

Here, I must note that research and development with respect to any of these three tools has never been classified, however, their deployment, particularly in combination, is subject to strict regulation.

These students smuggled this equipment onto a privately owned vessel and sailed to the Gulf of the Farallones National Marine Sanctuary, a protected area known for its whale sightings. There, they began recording a video of their linguistic contact with a humpback whale. For approximately one and one half hours, the students

exchanged words with the animal, facilitated by generative artificial intelligence, before the speaker component failed.

The students, in coordination with a major news outlet, waited five days, until today, November 29th, to go public with their recording. Earlier this afternoon, federal authorities apprehended all four students on charges relating to theft and illegal AI-facilitated interactions with wildlife .

A complete transcript of their conversation will be posted to the White House [dot] [gov] website very soon for anyone to view. But for now, my administration, informed by analysis from scientists at NOAA and NSA, is confirming the authenticity of that conversation.

In short, we have spoken to whales, and they have answered.

Notwithstanding the unfortunate circumstances surrounding this act, it is indeed an extraordinary accomplishment of science and a momentous cause for celebration.

So you would be right to ask:

Why do universities and other institutions across this country have access to all of the tools necessary to conduct human-to-animal translations if such an activity is prohibited under federal law?

In short, it is simply because we have no other choice.

Where there is discovery, there is America. From personal computers to space exploration to genomic sequencing and beyond, we thrive at the forefront of scientific and technological innovation. And now, as it becomes possible to converse in the many languages of life on Earth, we must move toward greater knowledge, lest we forgo important progress in the sciences and become content in our ignorance.

Should the day come that this planet receives visitors from a distant world, I would like to think that, having perfected these tools, we may greet them as understanding neighbors rather than suspicious adversaries.

That being said, the legal status of this technology has always been a temporary measure to forestall its premature implementation. Like a new vaccine or vehicle, we must ensure a minimum standard of safety before exposing our communities and environment to substantial risk.

Right now, we cannot afford to live in a world in which nefarious actors control, or otherwise manipulate, wild animals for their private gain. Equally so, we cannot sacrifice this opportunity to better appreciate nature and our place in it.

Momentarily, I will sign an executive order that tightens controls and increases monitoring on designated research facilities across the country.

In the interim, I hope that you find optimism, as I do, in knowing that when the time is right, we will be strangers no more.

Thank you and goodnight.