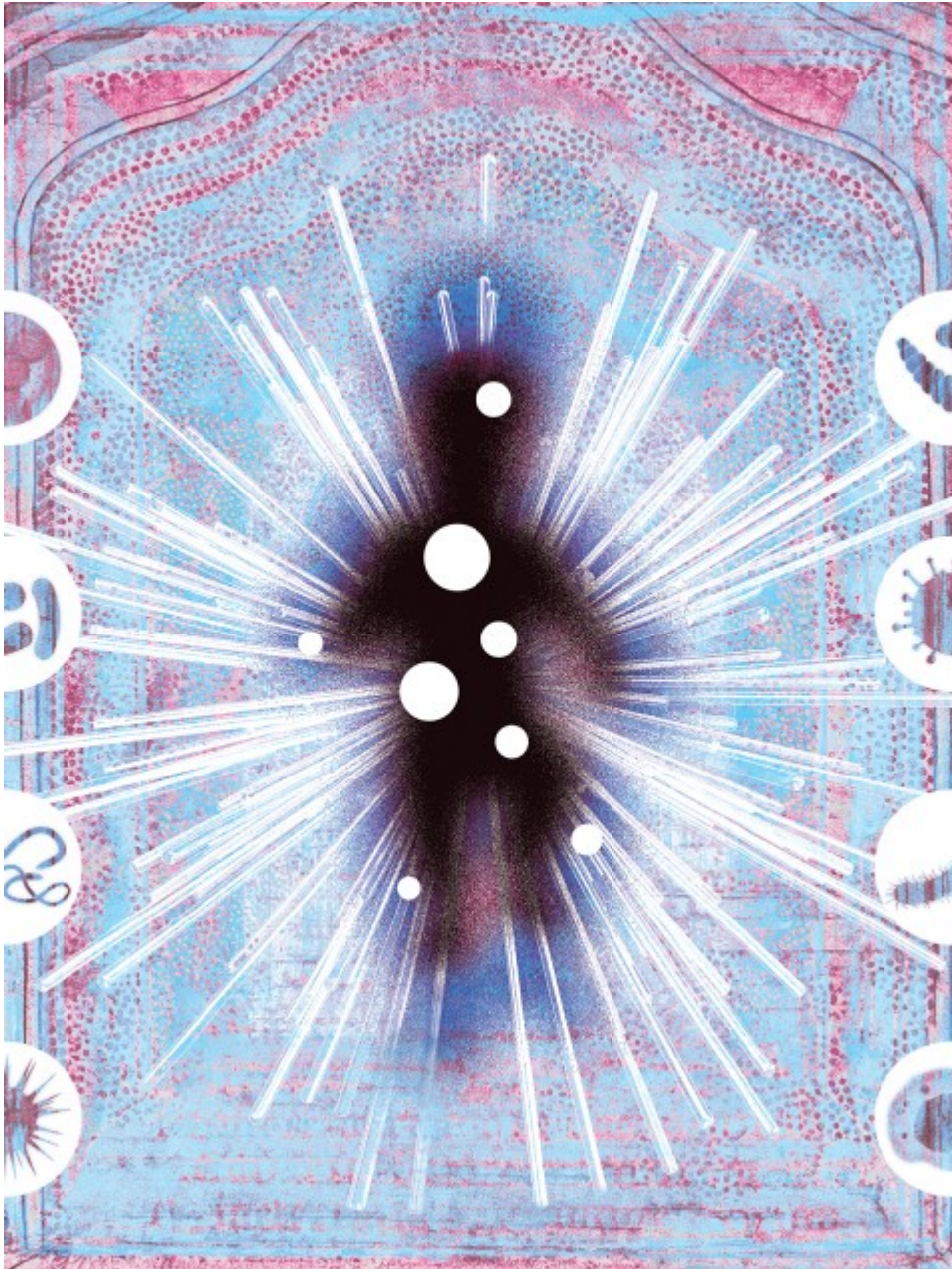


Microbes in the manger

God is humbly present in every living creature. Maybe closer than we've imagined.

by [Ragan Sutterfield](#) in the [December 2024](#) issue

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Century illustration by Daniel Richardson

When I was a child, a few weeks before Christmas each year my family would gather with friends and neighbors at a nearby barn. The barn was home to gentle trail-ride horses, a Shetland pony known for its bite, and a scattering of sheep, goats, and rabbits that made up a petting zoo. On the floor of the barn, hay bales would be arranged as seats, centered around a wooden rack. Us children would don towels on our heads cinched with neckties, along with bathrobes cut to fit our small frames. As an adult read from Luke's Gospel, we would act out the story of Christ's birth, a narrative made real by the smell of hay, the bleating of sheep, and the fermented scent of ruminant manure.

I doubt anyone in that barn knew it then, but our gathering was in line with a tradition that began nearly 800 years earlier, in the Italian hill town of Greccio. It was there that St. Francis of Assisi was inspired to celebrate a remembrance of the birth of Christ in a living tableau: a hay-filled crib with a donkey and ox beside it. The event is considered the first living nativity, and as St. Bonaventure describes the scene in his biography of Francis, "the saint stood before the crib and his heart overflowed with tender compassion; he was bathed in tears but overcome with joy." Elated from this experience of Christ come near, Francis preached to the crowds that gathered about the "Babe of Bethlehem" who was born a "poor King."

For Francis that crib was a place where God's humility poured forth in radical connection, the Creator of all things coming to dwell among his creatures. To set a vision of the Christ Child among animals was not simply a nice medieval morality play, a faith-filled entertainment based on a historically dubious rendering of Christ's birth. Francis's imagination followed the implications of Christ's birth to include the animals that, though not mentioned in the scriptural accounts, were inevitably there, perhaps too obvious to even mention. To make them visible was to broaden the view of Christ's coming into the world, an Immanuel moment that extended God's being-with beyond the bounds of the human.

My encounters with nativity scenes in recent years have been of the ceramic sort—a chipped and glued crèche we lug up from the church's undercroft each Christmas Eve. Still, the menagerie around the manger reflects the Franciscan vision—there is a donkey and ox, as in Greccio, along with a couple of lambs carried by the shepherds. It requires an act of imagination to turn the now familiar scene toward that arresting experience that Francis hosted. I find myself longing to see the

nativity with fresh eyes, the familiar made strange. I want to go beyond all the Precious Moments images at play in my head so I can witness the radical reality of the Creator entering creation. I've found help for that not through some new art or reenactment, but by learning to pay attention to the abundant life beneath us and in us.

On my desk is a microscope, two eyepieces focused on a single rotating lens. Beneath the lens is a slide with a drop of water mixed with compost. Looking at the slide, illuminated from the opposite side by a strong beam of light, I watch the transparent movement of small circles swirl in a mass. There are hundreds of them in a single view, this one droplet of water magnified 400 times. A piece of aggregate comes into view—a particle of soil or sand. Around its edge, there are clusters of these circles glued to the surface. Then a larger form, its edges fluid like a cartoon ghost, appears. It seems to attack the circles, some of them becoming visible inside it.

What I am witnessing is a world of life so fundamental to our existence that microbiologist Paul Falkowski has called it “life’s engine”: those essential organisms that make all life on earth possible. These are microbes—life in its smallest form—and they occupy all parts of our planet. The small clusters I am seeing are bacteria, and that larger predator is a protozoon. Alongside nematodes and fungi, they are what enable plants to grow and flourish and dead things to return to the soil. But they exist on us and inside us as well. Both humus soil and human beings are alive with an abundance of creatures.

“Humans are not only externally dependent on relationships with other creatures, but also internally,” writes theologian Hannah Malcolm, “in the very meaning of what it is to be a body, and, by extension, what it is for us to be human.” This truth leads us to radical possibilities for our understanding of Christ among us. As Malcolm puts it, “if it is true that to be human is to be microbiome, it was certainly true of the incarnate Christ.”

What does it mean to be human? If we were to answer according to some integrity of cells, an organism made up of continuous genetic material, then we would be

wrong. We are not our own but rather a center of life where a whole community is gathered. In our gut we are host to *Escherichia coli*, *Faecalibacterium prausnitzii*, and hundreds of other species. Each of these microbes plays an essential part: aiding digestion, reducing inflammation, and even changing our moods.

The soil is a source of many of our essential bacteria. From the garden we carry those creatures that help us live into health. Science is only now beginning to understand all the links, but the initial studies are astounding. For instance, in a 2016 study the common soil microbe *Mycobacterium vaccae* was shown to reduce stress and improve happiness in mice. The species had first been identified in Uganda, where immunologists noticed that certain communities of people that were regularly exposed to the bacterium responded better to leprosy vaccines. *M. vaccae*, they realized, had an important immune modulating role in the body.

It is not only bacteria that populate our bodies. Beneficial fungi and viruses can also be found throughout our organs. In our lungs, species of fungi such as candida work to enable healthy respiration; they also cooperate with bacteria in creating a healthy community of life. When disease comes, it is not brought on by the sudden introduction of microbes but rather by a change in the microbial community. This is why the language of disease is increasingly turning from infection to dysbiosis: the problem is more an imbalance of microbes than their mere presence.

It is even possible that our own cells are entangled with a creaturely otherness. Many have come to accept the theory, first proposed by the pioneering biologist Lynn Margulis, of symbiogenesis—in which complex life arose through a cooperative mutuality of varied organisms. As an example, Margulis argued that mitochondria, the power generators of our cells, are in a kind of permanent symbiosis with our bodies, the result of two organisms merging. This helps explain the odd fact that mitochondria have their own DNA—passed in its entirety from mother to child and distinct from the rest of the human body's genetic code.

Being human means being entangled with a whole community of life. And Jesus was fully human.

If we are to take seriously the Chalcedonian theology that Christ was fully God and fully human, then this entangled reality of the human person should change how we understand the nature of Jesus. It has long been understood that for God to become incarnate means that God not only took on human flesh but became entangled with

the creation itself. As Irenaeus wrote in the second century, the “only-begotten Word, who is always present with the human race, [is] united to and mingled with His own creation.” When we pair this with our growing understanding of the human microbiome and symbiogenesis, then we might easily say that microbes were the first members of the body of Christ. It is a truth that began at the nativity.

Birth is a moment of separation and connection. This life that was wholly dependent upon its mother, fed in her womb, built by the foods she ate from the earth, now comes into its own. The infant, of course, is still deeply dependent. But from that moment of birth—for the first time—it takes on a reality in which its care is widened to a larger community. Another woman could now nurse this baby. Any man could now hold it and rock it to sleep.

In those first moments of delivery and its aftermath a child joins with the wider life of the creation. It is in delivery that the first significant inoculation of bacterial life begins. As the baby emerges through the birth canal it is becoming colonized. This process is so important that researchers are now working to understand how to counterbalance the disadvantages of cesarean section for the microbiome of infants.

After delivery, breastfeeding becomes the next major contributor to an infant’s microbiome. Human milk creates a favorable environment for particular health-inducing bacteria, including those that help break down fats and sugars as well as those that synthesize vitamin B and essential fatty acids. Such an early colonization of healthy bacteria produces lifelong health benefits for the child.

And yet, only about half of the microbes that join in the body of an infant come from the mother. Other close family members also have an important role to play. Once a baby is born, all of the holding and kissing of the infant by a spouse, siblings, and other family and friends help to populate the microbiome of the child. Researchers at the University of Helsinki studied the role of fathers in the development of the gut microbiome and found that strains of *Bifidobacterium longum*, a bacteria that helps enhance the utilization of breast milk, are primarily given to the infant by fathers and other family members, not by birth mothers.

The setting of a birth also affects the colonization of bacteria. Though vaginally delivered and breastfed infants generally end up with a similar microbiota, colonization is accomplished sooner among infants who were delivered at home rather than in a hospital. If the home includes furry pets, then additional positive

contributions to the microbiome are possible, including a significant increase in bacteria that are associated with the reduction of obesity, asthma, and other inflammatory allergies. If, as Francis imagined, a donkey and ox were present at Christ's birth, then they served the body of Christ with a gift of healthy microbes for years to come.

The research is still evolving on all of this. Many of the studies cited above were published this year, and more research into the creatures that share our bodies and shape our lives is happening all the time. The result, however, is a redrawn understanding of the human person. Each of us, from conception to death, is connected to a wide array of lives. We are hosts, whether we like it or not, and our tending of that hospitality can lend itself toward mutual health in an entangled community of life.

On the wall before me, just behind my writing desk, I have a collection of icons. They were haphazardly collected and are randomly arranged. Most are gifts, some were picked up here and there over time. To my left is a mounted image of the Holy Family, Joseph with his head against Mary, Mary with her eyes on the strangely adult-looking child in her lap. On my right is a hand-painted icon of the Madonna and Child—Mary adoring the infant Christ in her arms, the infant looking above where an angel waits, holding a cross.

At the Council of Chalcedon, in addition to proclaiming Christ to be fully human and fully God, Mary was given the title Theotokos, the Mother of God. It was from her, the council agreed, that the fullness of humanity came to dwell in Jesus. This fullness of humanity has changed its sense over time. Philosophical and scientific trends are always redrawing the definitions of being human, and with each insight the mystery of the incarnation deepens. Knowing that our bodies are not our own, that they are the shared space for a multitude of life, offers us a chance to renew our understanding of what this theological claim means.

Mary, as the mother of this God-human, not only gave her son the stuff of flesh and bones, the life breath and mind of a human person. From her own shared existence she gave Jesus the community that would become integral to his body—Lactobacillus, Bifidobacteria, and a multitude of other microbes. In return, some of the cells from Jesus' gestating body would have crossed the placenta,

taking up permanent residence in Mary and creating a lasting impact on her health. The image of the Madonna and Child, we might say, is already a place of creation joining with God come near, a nativity scene of invisible creatures and shared life. We simply have to open our imaginations to these hidden presences, too small to picture on a block of wood.

And if this is true of the mother and child, then it is a truth multiplied in how we imagine the larger nativity scene. The ox with its rumen, each chamber host to a different mix of life, and the donkey, with its gray bristled hair a dwelling place for invisible cities of cells—these are each sites where the visible nativity is joined by a grander and more varied hidden one. We can understand now that not only were the heavens filled with a multitude at the arrival of Jesus, but also the manger was a gathering of billions—all connected in the flourishing mix that had come among them.

In 2019, Pope Francis traveled to Greccio, that village where his namesake set up the first nativity scene. There the pope reflected on the enduring attraction of the Christmas crèche, born from St. Francis's desire to bring the events of God's coming so close that we could touch them. In the apostolic letter that was eventually released from Pope Francis's talk, *Admirabile signum*, he writes:

Why does the Christmas crèche arouse such wonder and move us so deeply? First, because it shows God's tender love: the Creator of the universe lowered himself to take up our littleness. The gift of life, in all its mystery, becomes all the more wondrous as we realize that the Son of Mary is the source and sustenance of all life.

Thinking about the reality of our entangled lives, the ways in which the event of birth mixes our bodies with those of billions, the wonder of the "Creator of the universe" coming down to "take up our littleness," becomes all the more amazing.

Those microbes within us do not simply occupy and interact with our cells—they participate in an interchange, one that has slowly but surely altered the trajectory of human life over millennia. Genetics is not simply a linear process of passing DNA from parent to child. Bacteria and viruses evolve through a more rapid process, swapping genes horizontally. This allows bacteria to quickly adapt to new

situations—say, an antibiotic—without having to go through a whole new generation of reproduction. But this horizontal gene transfer can also happen in a more limited way between species. In a 2015 study, scientists at the University of Cambridge showed that human genes could include elements of up to 145 nonhuman species that we may have picked up through the process of horizontal gene transfer, largely facilitated by microbes.

This makes me wonder about horizontal gene transfer in the opposite direction, from humans rather than to them. What if, in taking up the littleness of life, Christ's genes are now mixed with the microbiota of our planet? Could we look out and witness in the trees and soil and animals a remainder of Christ's body—an enduring presence of the Word become flesh among us?

This possibility is resonant with the mystery of Christ as “the source and sustenance of all life.” It is a possibility that reflects the incarnate reality St. Francis was drawing our attention to long before Van Leeuwenhoek, with his invention of the microscope, opened our eyes to the invisible worlds within us. Franciscan theologian Ilia Delio, OSF, writes that if we could truly recognize the incarnation for what it is, “we would see that God is humbly present in every living creature and in all things because God has bent low in love for us, his beloved creation.” Paying attention to the microbes of the manger opens us to realizing that this humble presence may be closer to our bodies than we imagined.

The nativity is a remembrance of the beginning of a reality that continued—the Word became flesh, and flesh the Word remained. As a result, Christianity has always regarded the body as an integral aspect of the human person. As confused as our theology of the life to come has been, there is no escaping the biblical emphasis on the resurrection of the whole person as the culmination of God's work or the bodily ascension of Jesus into the heavens. To be wholly Christ, Jesus needs flesh, and to be wholly human, that flesh needs microbes.

What does this truth that began in the nativity do to change our vision of Christ's presence in our world? How could Christ's reality as an ascended person with microbes change our Advent waiting? When we see the nativity through this radical new understanding of the human person, it creates a change in what remains and what is to come.

On my icon of the Madonna and Child, there is, as I mentioned, an angel carrying a cross. It is common for images of the Christ Child to include a cross, somewhere hidden, a nod to his destiny. Though he did not think in terms of microbes, the early 20th-century Orthodox theologian Sergei Bulgakov recognized the radical and transformative reality of the incarnation—a permanent and permeating presence of Christ in the world. In a creative and beautiful move, Bulgakov reflects on this reality through the legend of the Holy Grail, the cup that received the blood of Christ.

For Bulgakov, Christ's blood pouring from his side and falling to the ground created a transformative remainder of Christ's presence in the world. "The image of the Holy Grail, in which the holy blood of Christ is kept," he writes, "expresses precisely the idea that, even though the Lord ascended in His honorable flesh to heaven, the world received His holy relic in the blood and water that flowed out of his side. . . . And the whole world is the chalice of the Holy Grail."

Bulgakov then teases out the implications of the radical truth. "Through the precious streams of Christ's blood and water that flowed out of His side," he writes, "all creation was sanctified—heaven and earth, our earthly world, and all the stellar worlds." This means that "the world has become Christ."

If we take the incarnation seriously, acknowledging those microbes that accompanied Christ from the beginning, then this reality to which Bulgakov draws our attention through the image of the grail precedes the blood that poured from Christ's side. It was in the nativity itself that the world began its entanglement with its Creator, a reality that continues even after Christ's ascension into heaven.

From Francis in Greccio to my childhood nativity in an East Texas barn, the Christmas crèche has continued to be a way to bring the mysteries of the incarnation near, in all their concrete realities. There is a persistent gnostic tendency in our lives, one that works to turn this God who became flesh and bone into a cosmic Christ. The ascension, in this view, wasn't a new mode of creational connection but rather a spiritualizing of material reality, akin more to the virtual than the messy ground where microbes thrive. This vision, as Hannah Malcolm points out, "imagines that the ascended Christ, no longer tied to the tedious business of being a Jewish man under Roman occupation, is now found in all creation and as such is bringing it to its completion."

Perhaps we can find a way beyond this sanitized, disembodied vision if we come to see Christ as entangled rather than cosmic. Through the Creator becoming a creature, Christ began to share his very body with the world made from his Word. In that sharing the creation and Christ became a part of one another, just as much as God became human. Because of this entanglement, it becomes unimaginable for me to think of a resurrected life without creation, of my body or Christ's body or any truly human person without those microbes that have so long sustained us. The end of all things to which the incarnation points us includes, I must hope, that shared life and substance we call creation, without which we cannot exist in fullness.

I am not a theologian, so I'm not equipped to pull out all the implications of this truth. Instead, like Francis, I feel drawn to gaze in wonder at the reality of Christ's coming among us with an imagination that includes all those animals close at hand. In that wonder I feel the invitation not only to gaze with my given sight but also to pull over the microscope on my desk, sitting just beyond my icons. Through it the mystery of Christ's coming only deepens as I look and see that hidden, shared life that makes us all fully human.

This article was edited on December 18, 2024, to correctly identify Admirabile signum as an apostolic letter, not a papal encyclical.