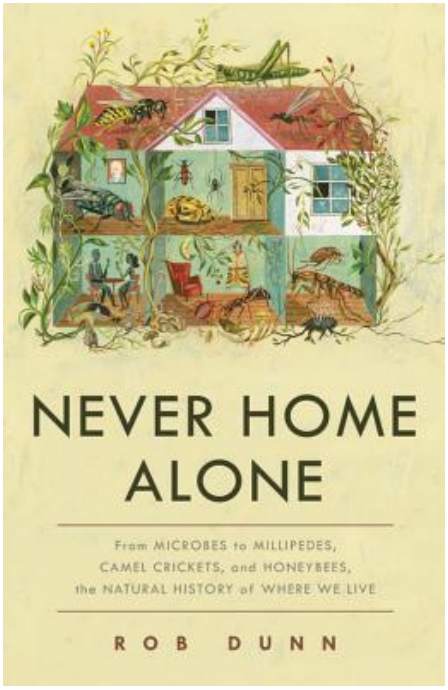


# Never Home Alone: From Microbes to Millipedes, Camel Crickets, and Honeybees, the Natural History of Where We Live

*Rob Dunn*

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**Never Home Alone: From Microbes to Millipedes, Camel Crickets, and Honeybees, the Natural History of Where We Live** Rob Dunn
**A natural history of the wilderness in our homes, from the microbes in our showers to the crickets in our basements**

Even when the floors are sparkling clean and the house seems silent, our domestic domain is wild beyond imagination. In *Never Home Alone*, biologist Rob Dunn introduces us to the nearly 200,000 species living with us in our own homes, from the Egyptian meal moths in our cupboards and camel crickets in our basements to the *lactobacillus* lounging on our kitchen counters. You are not alone. Yet, as we obsess over sterilizing our homes and separating our spaces from nature, we are unwittingly cultivating an entirely new playground for evolution. These changes are reshaping the organisms that live with us--prompting some to become more dangerous, while undermining those species that benefit our bodies or help us keep more threatening organisms at bay. No one who reads this engrossing, revelatory book will look at their homes in the same way again.

## Never Home Alone: From Microbes to Millipedes, Camel Crickets, and Honeybees, the Natural History of Where We Live Details

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# From Reader Review Never Home Alone: From Microbes to Millipedes, Camel Crickets, and Honeybees, the Natural History of Where We Live for online ebook

### kathy says

My basic understanding of microbes is that exposure to them at least outside enhances the immune system. I didn't appreciate that this also occurs within one's house. I've always been loathe to kill spiders and usually tenderly scoop them up tossing them outside gently covered with toilet paper so they can run away, probably right back into the house. Ron Dunn's book supports my theory: don't kill spiders! They're your friend, won't bite and generally mind their own business which is cleaning your house of pesky microbes, flies and undesirables.

I'm not too concerned about nasty critters except fungi exiting my shower head openings. I wonder if we should decrease our obsession with daily showers since we have a permanent armor of microbes on our skin that washing doesn't take care of.

Fermented food like kimchi and sourdough bread probably create healthy gut biome which is now a focus on mitigating inflammatory diseases. The book does go on a bit on camel crickets, German cockroaches and I glazed over some of this information. Do not keep an airtight house, leave windows cracked open, go outdoors and sit on a log, roll in the leaves and daydream on moss. You'll be healthier!

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### Maria says

This is the most interesting book I’ve ever read. Ever! I hope folks can get over the “ick” factor and read this. It has fascinating stories that has lit my desire to delve more into science. The author has a relaxed and humorous way of telling us about amazing discoveries he and others have found when studying what is right under our noses! Little did I know that what is inside our homes is still the
undiscovered frontier of science!

After reading, we fully understand how most of what we encounter in our homes, be it most kinds of bacteria or certain bugs, are actually very helpful to us and we need to keep as much biodiversity as possible in our lives. They kill off or compete with the few pathogens that harm us.

I said the words “wow, that is incredible” in my mind too many times to count while reading this book.

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### Melissa says

Just confirmation that we will never have a non- human animal living in our house!

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**Jenna says**

At first, I wasn't sure I wanted to read this book. A germ-o-phobe reading a book about all those creepy, crawly, microscopic *things* covering just about every surface on earth? Ugh, no. No way, no how. A book like this would be sure to give me nightmares and make me even more terrified to touch every doorknob, ink pen, faucet, groceries in the store that I'd starve for being too afraid to pick up and take home. Well, OK, that's going a bit *too* far but maybe reading this book would, even if I didn't stop grocery shopping, make me need to then sterilise everything once I brought it home. Because. You know. The cashier touched it after she touched that $5 bill of the person in front of me, and said money, who knows where it's been? Think about it; it just might have spent any number of minutes in the crack of some stripper's ass. I mean, you never know what they're going to talk about in a book about tiny things.

On second thought though, I decided to read the book for 3 reasons.

1. It's also about insects, most of which fascinate me

2. I love to learn anything new and the microscopic world is something I don't know much about.

3. I figured if there are good things to be known about bacteria, etc. it would probably also be in this book and maybe, just maybe, lessen my intense fear of microbes.

Well! This turned out to be the best non-fiction book I've read this year! Granted, I haven't read all that many yet this year, so let's say it's the best I've read in months. I learned something new on just about every single page. Rob Dunn talks a bit about so many different tiny things that inhabit our world, live with us and on us, and often help us. He found that there are over 200,000 species living with us and talks about several of them in this book. From bacteria to fungi and from camel crickets to German roaches, we are taken on a fascinating journey into the world of the small. As a germophobe, it was reassuring for me to learn that of the probable trillion species of bacteria on earth, there are only about 50 of them known to cause illness in human beings. Many of them are even helpful for us and the more microbes on our skin and in our homes, the healthier we usually are. Our war on "germs" and insects often create much bigger problems in the form of stronger and more resistant species. By using antibacterial soap, rather than old-fashioned regular soap and water, we are killing off the GOOD microbes, of which we WANT to have. I've heard before that we shouldn't use antibacterial soap, but never *why* we shouldn't. Now that I know, I'll never purchase it again.

For those who hate insects, Mr. Dunn points out the many benefits of having them around, especially spiders. By trying to keep all insects out of our homes, we are left with infestations of ever-resistant bedbugs and German cockroaches. It's actually very rare for most spiders to bite human beings and many of the "bites" people think they get and are often misdiagnosed with by doctors, are not bites at all but MRSA on the skin causing an infection. In general, spiders will refrain from biting anything that is not food; it is energy-expensive for them to waste their precious venom on humans.

I could go on and on and on about all of the things I learned in this book. Who knew (OK maybe *you* did, but I didn't) that the slime in our shower heads is actually bacteria poop??! Yeh, that's rather gross and we really don't want it in our shower heads but it's interesting to learn about. Another thing I found most interesting because roaches are one insect that really gross me out, is that there is not one documented case of a human becoming sick from microbes carried by a roach. Also, there is only one species of roach, the German

cockroach, that lives with us and the only problem it causes for us (aside from grossing us out) is that many people are allergic to them. Who knew (OK, maybe you did again, you who are nerdier than I!) that there are cheese mites which aid in the process of cheese-making, and breads and other foods that are made by hand acquire different tastes, even when made with the same ingredients, because the microbes living on our skin adds to the over-all flavour?

I found this book to be so exciting to read. Rob Dunn is a professor of applied ecology and carried out many experiments whilst writing this book. He is a well of information and writes in such a clear and passionate way that I now wish I was an ecologist! If you enjoy learning new things, you will not be disappointed with this book. I highly recommend it!

Oh, and just in case you're wondering -- Mr. Dunn does *NOT* discuss the various microbes on that dollar bill which spent time in the stripper's ass. Sorry, but if you're wondering about *that*, you'll have to look in another book.

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### Christina Dudley says

Even though I had to skim by the end because the book was due back, this was a funny and informative and even inspiring book about all the little species we share our homes with. Bacteria, fungi, insects. Hundreds and even thousands of species, a few of them harmful under the right circumstances, but the others still somewhat mysterious. After reading this book, I feel nervous about the drywall in the garage that got wet (drywall that gets wet is perfect for the flourishing of fungus spores already present in the materials); never want to catsit again (that sinister Toxoplasma gondii that can actually influence your behavior or increase your chances of developing schizophrenia); and feel faint concern about the showerhead spraying fungus all over me when I think I'm getting clean.

But the book will also make you want to take a walk outside in nature (or as much nature as you can find, in our urban environment), taking care to track all the outside back into the house with you. Biodiversity is our friend. So throw away the antibacterial soap and enjoy this book.

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### Jen says

This book is perfect for anyone high school age on up who have an interest in weird biology. Everything from Toxoplasma gondii which we already all try to ignore to the many, many little critters that we can't see and I'm all skeeved out by now. The microbes that live in hot water heaters and shower heads are particularly worrisome to me. I also enjoyed the chapter on the International Space Station. It is so exciting how most of the microbes caught a ride up there in the astronauts gut. You know, in a weird geeky way.

I'm planning on including parts of this book when my kid gets to high school Biology.

My thanks to NetGalley for the advance copy.

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### Tony says

NEVER HOME ALONE. (2018). Rob Dunn. ***1/2.
The author has grabbed his chance to explore his house and its unintended occupants. His day job is as a professor of applied ecology at North Carolina State University, along with a position at the Natural History Museum at the University of Copenhagen. He has written before, and demonstrates his skill through this book. We all live in houses that are also inhabited by a variety of other species. Some are bad for you, while others are good for you. Mostly, however, these co-residents are pretty harmless except for the annoyance factors that we heap upon them. He explores the worlds of microbes, millipedes, camel crickets, and honeybees, along with other resident species. I found a couple of the chapters very interesting because they related directly to situations at my house. Twice a year, in early Spring and in late Fall, we are invaded by crickets. The neighbors call them spider crickets, but I guess camel crickets as a name come close enough. They are harmless, but offer a quick scare as you get up in the morning and walk into the kitchen. They're already there! What they were after was the dog's water dish. Just that, and no more. It turns out that Dr. Dunn's description of all these critters help allay our fears of what horror they might be reaping while we are asleep. He does this for a great number of both harmful and helpful species. Set your minds at rest. You will come away from this book with a better understanding of the interactions between us humans and all the cohabitants of your house, and, likely, sleep better at night because of this added knowledge. This is a recommended book for those of you who like to know what's going on around you at all times – and there is always something going on!

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### Clare O'Beara says

I'm rating this highly for sheer quantity of content and number of researchers. Be aware though, that the book doesn't so much discuss household pests as microscopic life. Mice - yes, but mainly to analyse their parasites and likelihood of being eaten by cats. In an astounding correlation, the blood of people who took more risks, was found to have more likelihood of antibodies to the parasite that causes mouse brains to become hyperactive and not afraid of cats.

To get there, we have come through a Dutch early scientist Leeuwenhoek who made his own glass microscopes and tubes to study pepper grains in water; he explored living bacteria and protists. By way of John Snow and London's cholera, through the alleyways of tuberculosis and the slime inside shower heads. Eventually we turn up cockroaches and find that sweet baits caused a variant with a dislike for sweet tastes to evolve into the resident strain very fast, independently, in many homes. How do we know this? An unfortunate researcher spent three years... I'll let you read that for yourself. The range of scientists is astounding as we meet dung beetle experts, ant discoverers, fungi fans, termite troublers, house cleaning fanatics, prehistoric human specialists and more.

The theme boils down to the fact that the more we clean our indoor environments, the more we impoverish our outdoor environments from biodiverse farm and wood, the more diseases and auto-immune conditions we risk. We need biodiversity in the microbiome. The accounts of studies comparing Amish and Hutterite children, Finnish forest cabins and Helsinki apartments, come relatively early and we spend the rest of the book absorbing reinforcements. When I was growing up it was already well known that girls with brothers, and kids with dogs, were healthier because they had broader immune systems than those without.

This book won't be for everyone but it's readable, wry and packed. The references are on P263 - 307 in my ARC. As everyone is listed by first initial instead of name I was unable to count how many women were credited; but women researchers feature largely through the pages. Several photos, graphs and other illustrations are very helpful.
I downloaded this e-ARC from Net Galley. This is an unbiased review.

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## Elentarri says

**NOTE: I received an Advanced Readers Copy of this book from NetGalley. This review is my honest opinion of the book.**

*Never Home Alone* explores the variety of life that shares our living spaces with us, from microbes and fungi, to insects and other arthropods; as well as the ways in which those lifeforms are evolving. This is a well written, popular science book that shows us that the ecosystems in our homes are more diverse than we may suspect, and that most of our co-inhabitants are beneficial or benign as opposed to harmful. The author's enthusiasm for this subject is evident as he tells readers about various interesting studies about the creatures living with us.

The author discusses such things as swabbing the International Space station (ISS) for bacteria and fungi; chronic autoimmune diseases associated with lack of microbes; microbes living in water heaters, showerheads, tap water, dry-walling; technophilic fungi that eat metal and plastics; the "uses" that our co-inhabitants may provide in terms of health and industrial applications; the evolution of pesticide resistance and the use of social spiders as non-toxic fly catchers; pets and the additional creatures they bring indoors; fermented food and bread making (Herman the yeast starter makes an appearance here); and the inoculation of beneficial microbes to prevent colonization by harmful microbes.

I found the sections that deal with microbes and fungi on the Space Stations (ISS and Mir) to be especially interesting. Dunn points out that these fungi are more successful in establishing themselves in space in terms of procreation and living out many generations, that humans have been.

I really would have loved more scientific details, but that's just my preference. I found this book to be interesting and informative, with a chatty and informal writing style. Human houses provide living spaces and ecosystems for a myriad of organisms. After reading this book, you will never look at your home in the same way again.

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## Patty says

A nonfiction book about the various things that live in human houses, from bacteria and fungi on up. You would assume – certainly I assumed – that we already know what lives in our houses; that surely the creatures we come into contact with every day have been thoroughly studied. Dunn points out that, actually, every scientist has assumed the same thing since shortly after the invention of the microscope, and thus we know less about our daily companions than we do about what's hiding in the leaf litter of rainforest in Costa Rica. As an example, just a few years ago a new species of frog was discovered living in NYC – and if you know anything about biology, you know how rare it is for new vertebrate species to be discovered, much less new species in one of the most densely populated areas in the USA.

Dunn is himself a scientist who has been working to correct this, by studying human homes as a type of important and widespread habitat. He's led or participated in projects looking at topics as varied as microbes adapted to live in hot water heaters, the biofilm of bacteria in shower heads (yup, sorry, every time you shower you're dosing yourself with bacteria, though possibly some of them have a serotonin-boosting effect), camel crickets in basements and the bacteria in their guts, black mold in drywall, cockroach evolution (did you know German cockroaches – the main species who bother humans – no longer have any wild populations, anywhere in the world, but only live in human habitations?), bacteria in babies' noses, and the various fungi and microbes infesting the International Space Station, mostly carried there on astronauts' skin or in their guts.

But if you're feeling the urge to immediately douse yourself in bleach, don't. Dunn repeatedly makes the point that the vast majority of biodiversity around us is harmless, and cleaning it away may be doing us more damage than leaving it alone. Whether it's an uptick in rates of allergies and asthma as children are no longer exposed to potential triggers, or that the lack of predators and competitors gives the few actually dangerous pathogens (such as those cockroaches, not to mention antibiotic-resistant Staph) an advantage, all those gross-sounding but innocuous microbes around us are playing an important role.

It's not a perfect book; I particularly was disappointed that Dunn spends a whole chapter on *Toxoplasma gondii* (the parasite that spreads through cat feces and triggers risky behavior in rats and mice, making them more likely to be eaten), since I think anyone with an interest in 'weird biology' is probably already very familiar with it. But despite that, I really enjoyed *Never Home Alone*, and would highly recommend to any other weird biology fans.
I read this as an ARC via NetGalley.

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### Jenni Link says

This is second only to *The Hidden Life of Trees* as the most eye-opening and inspiring popular science book I've read in the last five years. Not only is the average person completely oblivious to the wide variety of insects, arachnids, and microorganisms sharing our homes; it turns out that the scientific community is, too. Very little study has been done of indoor ecology, even though the average citizen of a developed nation now spends 93% of his or her time indoors. If you are interested in knowing more about your real environment - one that may seem too mundane to make it onto an episode of *Planet Earth* but is every bit as wild and unknown as the most remote rain forest - read this book! It's engagingly written for a general audience, and provides food for thought about everything from how our immune systems work to why some home cooks' kimchi is tastier than others'. You might just find yourself in the basement with a hand lens looking at crickets.

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### Christine says

Never Home Alone by biologist Rob Dunn is about all the life forms in our homes and how we interact with them. Mostly we try to kill them because we think they’re bad. The pathogens ARE nasty, and by eradicating them we have saved many lives - but now we’ve gone too far.

Some of the issues Dunn explores have penetrated my consciousness over the years, like how our sanitized indoor lifestyles deprive us of the biodiversity our bodies need to operate efficiently, leading to allergies,

asthma, and chronic inflammatory disorders. But reading about it here as opposed to, say, a CNN article means we get an in-depth look, both into Dunn's own research and that of other scientists who study life at the microscopic level (and so many are women! ??????).

We learn about how modern homes create conditions that bring ALL the microbial life to the party - tundras in freezers, deserts in ovens, hot springs in water heaters, swamps in shower heads (we bathe in microbes every day, enjoy). Trying to kill everything the way we've been doing - with pesticides, antimicrobial products, stronger and stronger antibiotics - has only destroyed the weak, beneficial microbes and allowed the strong, dangerous ones to develop resistance and thrive. In one lab experiment, it took just eleven days for bacteria to evolve complete resistance to antibiotics. In the real world, it's often much faster. Dunn also devotes one chapter to pets, and the irony of how we're so against microbes of any kind but welcome cats and dogs that can be carriers of the worst parasites (but he also notes the positives of pets, so don't get mad). His conclusion is that we MUST "rewild" our homes to bring biodiversity back into our lives, because competition from good microbes helps keep the bad at bay.

This is such a fascinating book, my review can't do it justice. Dunn is rather repetitive but I sympathize because I can sense his frustration. He really wants to hammer it in, STOP STERILIZING YOUR LIFE! Open your windows. Plant a garden. Drink biologically diverse water. Roll around in dirt (but don't eat it). I'm happy to not clean so often anymore!

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### Peggy McCoy says

I loved watching Rob Dunn's mind work as I went through this book. The sheer amount and diversity of living things in our homes was breathtaking.
Each chapter was a powerful argument for preserving biodiversity in our lives.
I loved that the bakers hand microbes were unique and matched those in their starters.
All of the research done in this book sounded like so much fun to plan and do, I'd like to be one of his citizen samplers!

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### Dorothy says

The full title of this book is quite a mouthful: *Never Home Alone: From Microbes to Millipedes, Camel Crickets, and Honeybees, the Natural History of Where We Live.* That's a tall order that the title promises to fulfill but Rob Dunn manages to do it.

The aim of his book is to explore the biosphere that comprises all the critters that live on and in our bodies and that share our houses with us. After years of sampling and cataloging this biosphere, he and his colleagues found what he describes as a "floating, leaping, crawling circus of thousands of species," perhaps as many as 200,000 altogether. Many of their discoveries were previously unknown to science.

Dunn and his team sampled and analyzed such areas around the house as shower heads, door frames, refrigerators, hot water heaters, cellars, toilets, pillowcases, and the list goes on and on. Some of the findings are rather disgusting and occasionally alarming but always fascinating. The bottom-line finding of their research is that most of our fellow travelers and cohabitators are either benign or actually beneficial to us in some way. Only a few are actually harmful.

The problem is that we have become so paranoid about making our living spaces as pristine as possible, using pesticides and antimicrobials and sealing off our homes from the outdoors, that we have upset the balance between the good guys and the bad guys. In fact, we have tipped the scales in favor of some of the bad guys.

The microbes that live with us are able to evolve incredibly fast. They adjust to live in ecological niches which we can hardly even imagine and thus they are able to survive our chemical assaults against them and to evolve their way out of every trap we set for them. That is how we get pesticide-resistant German cockroaches and bedbugs as well as antibiotic-resistant bacteria.

The research team's findings regarding our indoor biosphere is much the same as ecologists' findings about the larger environment: Biodiversity rocks! The richer the diversity of life in our houses the better. A diverse biosphere keeps things in balance; the benign, the beneficial, and the detrimental fill their appropriate niches and an equlibrium is achieved.

One interesting hypothesis arising from the team's research concerns the relationship between a degraded and less diverse biosphere and the incidence of certain inflammation-associated diseases such as Crohn's disease, asthma, allergies, etc. They found a correlation between areas where the biosphere had been interfered with (i.e., excessively cleaned) and a higher incidence of those diseases. They had not set out to prove any such link, but their findings were highly suggestive. All of which led me to wonder about environmental factors related to some other diseases that are rampant in our modern society - things like autism, e.g.

There's a lot to digest here and Dunn makes it all perfectly palatable. His writing has a kind of folksiness quality to it. He keeps it all on a level that would seem to be easily understandable for the average reader. He's writing for the general public, not for his fellow scientists, after all, and his goal is to proselytize for the preservation of biodiversity, not only in our larger world but also in those smaller spaces where we live our daily lives.

I did have one quibble with his book. In listing critters that share our houses with us, he kept referring to things like cockroaches, mosquitoes, silverfish, bedbugs, and spiders, and he repeatedly referred to them all as insects. I was quite offended on behalf of our friends and allies, the spiders.

Since reading this book, I have noticed one effect it has had on my behavior: I now wash my hands more often and more assiduously than before!

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### Sondra Brooks says

I bet you didn't know you have hundreds and possibly thousands of...um...bugs living in your home. Good thing having such diversity in your living quarters is actually good for you! Apparently, the more we try to kill, sweep away, clean, and poison all those critters, the more of a disservice we do ourselves. I, for one, am more than happy to jump on the bandwagon and leave more germs, bugs, and dust in my home. Hey, I do anyway, and it's great for your immune system to expose yourself to dirt and critters. Problem solved!

I love science, probably more than most, but found much of the experimental data to drone on a bit too much. Why was there such concentration on the camel cricket? Does the reader really need to know that much about a cricket? Good thing there was a great deal of info on the German cockroach, and I was pleased

to learn that they're not quite as filthy as we've been taught. And, studies show they even get lonely. Who knew? So be a little kinder to them, won't you? I know I will from now on. Perhaps I will speak gently to them before my husband does them in. Or grant them a final meal, at least.

Anyone who cooks will be fascinated to learn of the varying tastes the resident bacteria on our hands adds to the food we prepare. It may really be true that food really DOES taste better when someone else makes it.

A bit too "sciencey" in places, but the subject matter overall and the author's sense of humor make for an enlightening read.

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