MARC BEKOFF

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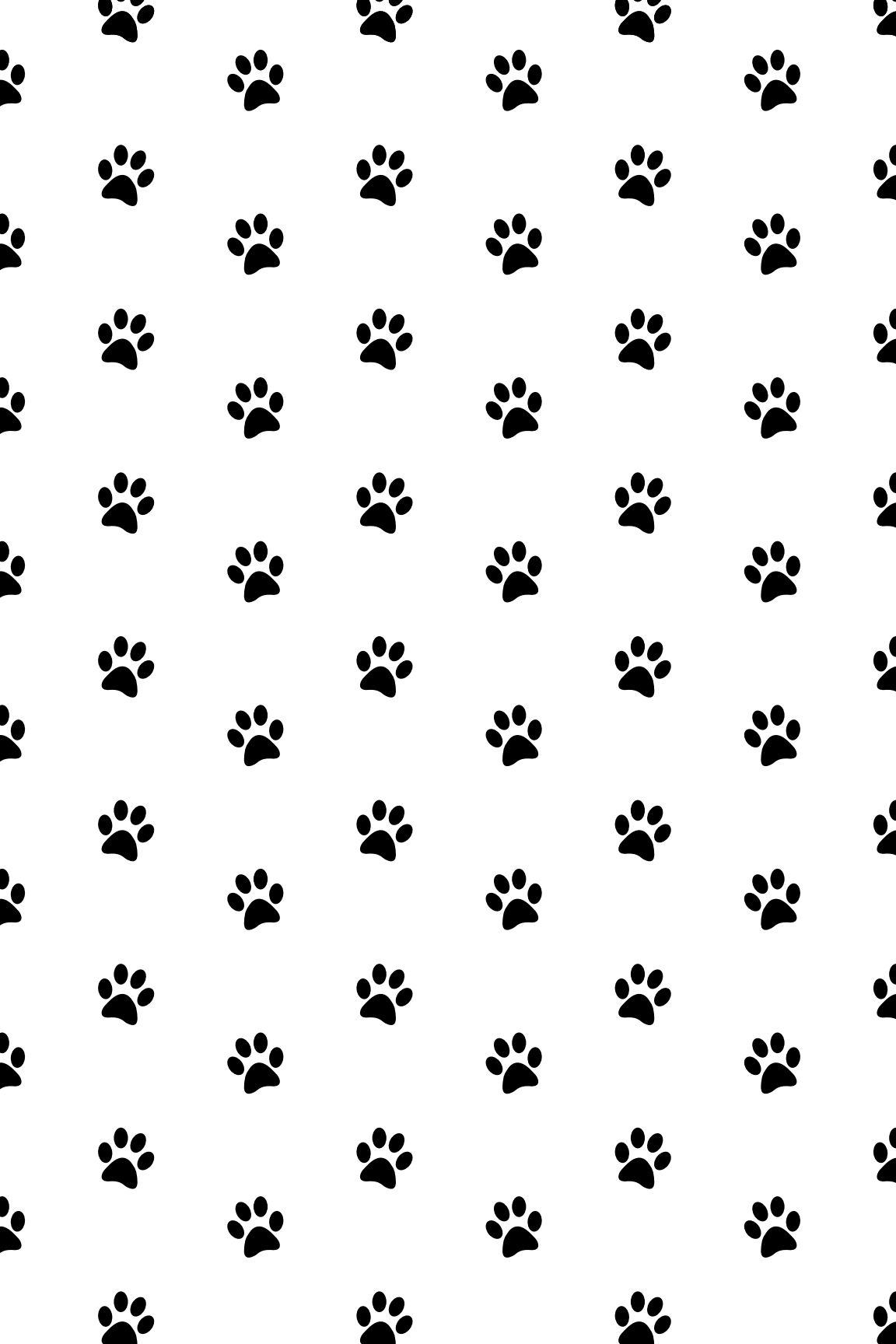

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Why Dogs Do What They Do

MARC BEKOFF

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For all of the wonderful dogs of all different colors, shapes, sizes, and personalities who have blessed my life over the years and who have constantly challenged me to continue to learn more about them—what's happening in their heads and hearts—and to use this information to provide them, all other dogs, and all nonhuman animals the very best lives possible—thank you and blessings to a fine crew of beings

CONTENTS

PREFACE

A Naturalist in a Dog Park

One afternoon, I walk through Central Park in New York City. I stop to watch some squirrels playing, and two young boys and their mother stroll by. One of the youngsters asks me what I am doing, and I tell him I am watching the squirrels play. He gets really interested and soon his brother joins us. Within five minutes, I've trained them to become ethologists. I explain to them that squirrels are mammals, just like the dog with whom they share their home, and they can learn a lot about their dog by watching him play and interact with his human and dog friends. They get really excited, and as they walk away, I hear one of them say to his mother, "Can we please come back and watch squirrels tomorrow?" I am pleased and amazed at how incredibly easy it is to pique their interests and curiosity. I hope that they do come back to watch the squirrels and, also, that they begin watching their dog. Not only is connecting with animals and nature good for us, but also the closer we pay attention to the dogs who share our homes, the better their lives will be.

Over the past forty years, as both an ethologist and a dog lover, I have experienced many encounters like this one: observing animals, answering questions about animals, and encouraging others to observe animals more closely. In particular, I've spent many hours—some would surely say far too many—at various dog parks, just hanging

out watching dogs do whatever they choose to do. It's been part of my job for decades, for which I have been forever grateful.

Dogs, whose preferred scientific name is *Canis lupus familiaris* (according to many of the experts with whom I've consulted), are fascinating animals, and one thing I discovered long ago is that dog parks are wonderfully educational experiences.[1] They're gold mines for learning about both dogs and people. Visits can serve as myth breakers and icebreakers. For hours on end, the interactions never stop: dogs are watching dogs, people are watching dogs, dogs are watching people, and people are watching one another as they care for, play with, and try to manage their dogs. I'm always amazed and pleased about how much I learn when I just hang out and watch dog-dog, dog-human, and human-human interactions.

Dog parks never lack for an extremely interesting cast of characters on either end of the leash or on either side of the fence. Discussions and debates always arise about what humans want and what dogs want, why dogs behave the way they do and what they understand, how to care for dogs and how to train them. People are always asking questions and offering advice, proposing theories and judging the behavior of others. They want to know how to treat various problems, such as shyness or aggressiveness, and why dogs sometimes ignore what their human asks them to do. They want to know why dogs roll in disgusting things and hump with impunity. They want to become dog literate.

In fact, I've probably heard every question there is about dogs. Such as, how do you measure a dog's quality of life? How do you know if a dog is in pain? Should you just say "good dog" for "nothing"? Why do dogs bow, bark, mark, snort, and shed? Why do dogs bury bones and other objects and immediately dig them up? Why do dogs try to bury bones on the carpet and act as if the bones are invisible? Do dogs get headaches? Do dogs have a sense of self? Do dogs grieve? Do dogs suffer from posttraumatic stress disorder (PTSD) and other psychological disorders? Do some dogs have a "little dog" complex? Why do dogs eat grass? Why do dogs circle before lying down or pooping? How do dogs sniff out human diseases? How does

a dog's nose work? How smart are dogs? Are dogs just using us to get them food? Do dogs understand language? Do dogs like music?[2] Do dogs like television?[3]

Over the years, I've realized I've become something of a canine and dog park "confidentialist." From time to time, people say to me, "Please don't tell anyone but . . ." Then they confide in me, telling me intimate stories about their dogs, other dogs, or other people at the dog park. I try merely to listen, since I don't want to get involved in gossip. And just when I think I've heard it all, someone tells me something I've never heard before. Surprises always abound at the dog park.

In fact, I also sometimes feel like the dogs confide in me as well. I try as hard as possible to take the dog's point of view when I visit dog parks because, obviously, they're called dog parks, not human parks. On occasion, dogs approach me as if to say, "Would you please tell my human that I simply have to roll in stinky stuff or pee all over the place or that rough play is okay? Remind them I can take care of myself."

Many people are keenly interested in all aspects of dog behavior, and my trips to the dog park often become a sort of extension class on dogs: I recommend articles and books for people to read, and I pepper our conversations with general principles of animal behavior, evolutionary biology, and conservation. One guy jokingly (I think) told me he learned more about biology and behavior on his visits to dog parks than he did in class. On a few occasions, groups of five or ten people have stood for hours discussing dogs, coyotes, and wolves from many different points of view.

Based on these encounters, I've noted that there is a need for a simple and straightforward book about dogs: one that explains their behavior; their cognitive, emotional, and moral lives; their interactions with other dogs and with humans; and how best to care for dogs in our homes and in our society. This book is written to fulfill that purpose. In it, I try to answer the questions I list above, but in some cases, we really don't know the answer. Ultimately, my hope is that this book will help you to develop and maintain enduring, pos-

itive, and compassionate relationships between dogs and dogs and between dogs and humans. Peaceful coexistence is a blessing for all involved, and we need to be sure we're doing all we can so that dogs can live in peace and safety.

I've studied dogs and their wild relatives for over four decades, but in a way I've been writing this book since I was around three years old. When I was a youngster, my parents always told me that I connected better with nonhumans than with humans. I was always asking them what other animals were thinking and feeling. I'd talk with the goldfish who lived in a small tank and wonder what was going on his small head. How did he feel about swimming in endless circles in a water cage? My parents told me that I "minded animals," in that I was always concerned about caring for them and never, ever thought they didn't have active minds. I knew that they did and that I could feel their feelings.[4]

Since then, I've studied dogs in a wide variety of circumstances and habitats, including at dog parks, and I've learned a lot about the behavior of these fascinating animal beings. I've studied dogs who are familiar because they've shared my home and dogs I didn't know at all, including feral dogs, in nearly every setting. I have also studied coyotes and wolves and other members of the genus *Canis*, and I feel comfortable discussing similarities and differences among species. Indeed, let me say right off, dogs are not wolves and neither are dogs coyotes or dingoes. Dogs are dogs, and they must be appreciated for who they are, not who or what we want them to be.

Naturally, dogs at dog parks are not free simply to be themselves, even when they are off leash. The humans who brought them are always watching and commenting; they are directing, correcting, and trying to control their dogs. At the dog park, you learn as much about dog-human relations, and about people, as about dogs as a species. As I watch people walk and care for their dogs—sometimes yanking their dogs here and there, and hurrying them along to do their business after being cooped up inside all day—I sometimes feel that the humans don't have any idea about who they brought into

their lives. Or, in some cases, that they don't have the first clue what a dog wants and needs, at a minimum, to have a good life.

This is why, like the story of the boys and the squirrels, I always encourage people to watch their animals and to wonder and learn and act like ethologists. As I will discuss, it's wrong to talk about "the dog" as if all dogs were the same. They're not. Dogs are as individual as people, and learning to care for your dog means paying attention to your dog, discovering his or her likes and dislikes, and so on. So, another purpose for this book is to encourage readers to become ethologists or "citizen scientists," and I have included lots of stories by everyday people describing their dogs in action. In other words, this book blends stories with science. I love both, and they can inform each other. Everyday questions and observations can often inspire rigorous, important scientific research, since we need answers to the problems that have an impact on our lives. When it comes to our life with dogs, citizen science can indeed, at times, improve our knowledge of the species, but it will always improve the person's life with their own companion animal.

For instance, while we know a lot about dogs, readers will discover that what we often take to be the gospel about dog behavior isn't all that well supported by empirical research. Dogs don't always circle before they lie down, they don't always eat grass to barf, peeing isn't always marking, humping isn't always an attempt to make babies (females do it), playing tug-of-war isn't always about aggression or dominance, though dominance is alive and well, it's okay to hug a dog on *their* terms, dogs don't sleep all day (only twelve to fourteen hours a day), and while we know dogs feel joy and grief, we don't really know if they experience emotions such as shame or guilt.[5] It's also a myth that using food to train or teach a dog means that they're using you and won't love you.[6]

What I find incredibly exciting is how much there still is to learn about these wonderful beings. While many of the questions I consider raise larger principles about the evolution of canine behavior, they also highlight just how variable dog behavior can be. We are still

Me, watching Zeke. I spent countless hours watching Zeke and his buddies frolicking and hanging out at my home in the mountains outside of Boulder, Colorado. (Credit: R. J. Sangosti/*Denver Post*/Getty Images)

figuring out why dogs stick their noses where they do, and why they play, bark, howl, pee, and eat turds. Not to mention the more lofty questions about whether dogs have a theory of mind, whether they feel jealousy, and whether they know who they are and have the capacity for self-awareness.

People with all sorts of different backgrounds are interested in and fascinated by dogs, so I wrote this book to be accessible to a broad audience. In essence, for all the people I meet at dog parks and on trails: academics, other professionals, devoted dog lovers, and everyday folks taking care of their family companion. The common denominator for them all is that they are trying hard to give their dog the best life possible, and many of them really want to learn about dog behavior. Further, I hope this book mirrors the conversations we have: personal and often light-hearted, and yet as detailed, critical, and evidence-based as I can possibly make them. It's important to highlight when we don't have enough data to support certain claims and where we need further study. We should use what we

know about dog behavior to care for them better, which includes dog training, or what I prefer to call dog "teaching." There is no need for the use of cruel and violent methods to get dogs to do what we want them to do in our human-dominated world.

Ultimately, I feel incredibly lucky to be "a naturalist in a dog park," and I hope I can inspire others to become one, too. I spend a lot of time reading and writing about dogs and in their company. While there always will be mysteries about what goes on in the heads and hearts of other animals, including dogs, we also know a lot about what they're thinking and feeling, and caring for them is often a matter of common sense.

Now, if you're ready, let's meet the dogs.

ONE

The Many Joys of Watching and Living with Dogs

Bernie and Beatrice are well known as "the butters" at a local dog park in Boulder, and it's easy to understand why. On their first approach to both unfamiliar and familiar dogs and humans alike, they go right for the butt. Gus and Greta, "the groiners," love to run up to dogs and humans and shove their noses into groins and unabashedly sniff and snort. I admit on more than one occasion I have been hit so hard by an inquisitive nose I thought my voice would change.

Sassy, the "poop eater," has a seemingly unquenchable taste for poop, according to her human, and Tammy "the tongue" and Louie "the licker" run up to people with their long tongues protruding and leave a trail of saliva.

Harry and Helen are happy humpers and unhesitatingly jump on other dogs, from all different orientations, some rather acrobatic, and hump away as if it were nothing. On more than one occasion, they have chosen one of my legs for their maniacal humping and misdirected thrusting. Helen's human often exclaims, "Oh my god, my dog was fixed to stop this stuff." Helen is a good example of what I fondly call an "ADD dog"—an attention-deficit disorder dog.

I met Peter, the "pecker pecker," some years ago. No need to tell you what he loved to do, all with the blessings of the human who accompanied him. When I told Peter's human I preferred not to be peckered, the guy answered, "Well, he likes to do it to us, so what the hell . . ." Of course, all this barreling into groins, humping indiscriminately, and pecker pecking results in a lot of questions and useful conver-

sations about why dogs do these things without a care in the world and about what humans should or shouldn't do about it.

When I'm at the dog park, I enjoy nicknaming the dogs I meet (as well as the dogs I live with), and I often take an anatomical approach. Dog behavior often revolves around body parts: butts and noses, mouths, tongues and legs and groins. When dogs meet one another, or greet humans, they employ every form of address: they use eye-to-eye contact as well as nose-to-nose, nose-to-butt, and nose-to-groin. In fact, as we all know, dog noses roam widely, sniffing and snorting with abandon and joy. For dogs, following their noses around a dog park leads to a rich source of great stories and data.

This canine zest for what humans might avoid, consider inappropriate, or find disgusting rarely diminishes our fondness for dogs. For instance, "flatulent" Freddy and Abe, "the anal gland expresser," think nothing is more pleasant than sharing gases and pungent odors, Freddy farting and Abe blowing out globs from his anal gland, sometimes on a person's leg. When people laugh, the dogs take this as an invitation to do more of what they love to do, nose butting as many people as possible, trying to stimulate a gag response by shoving their tongue into people's mouths, passing wind here and there, and breathing right into someone's face.[1] I well remember a guy at a dog park who pulled me aside and quietly explained what was happening with a dog, Lucifer, who was notorious for his bad breath. Lucifer's human, he said, "just doesn't get it. Her dog has the 'zactly' disease, cause her breath smells 'zactly' like her butt. Everyone here will be better off when she realizes this."

Concerning bad breath in dogs, my friend Kimberly Nuffer shared this story with me about what she calls "stinky tongue syndrome," or STS:

> Zelda (Zipper, ZDog) came into our lives from the Aurora Animal Shelter. When I met her at the shelter, she climbed right into

my lap in the visitation room and cried once back in her shelter cage. When we brought her home, she couldn't have a bath for a week so that her spaying incision could heal, and it was clear the shelter hadn't bathed her since finding her roaming the streets of Aurora. The homeless, dumpster-diving dog smell did not deter my need to bond with my new pup, so she slept on our bed and I snuggled her endlessly. Finally, incisions from her spaying healed, and I gave her a much-needed bath. More snuggling ensued as I was bonding well with my new family member.

Yet a significant odor lingered despite the lavender dog wash and the eventual trim of her curly gray poodle fur. It was coming from her mouth! It smelled like a dead animal; there is really no other way to describe it. Inspection of her teeth showed pearly whites, not yellow, rotting, mildewed pickets. Inspection of her tongue revealed a supple and soft pink plank ready to kiss anyone nearby. To the vet she went for a teeth cleaning. No extractions needed. Everything was in good shape. Her breath improved . . . for a day.

Fast-forward ten years. The dead animal breath remains. It persists despite teeth brushing, weekly baths, fancy organic food, and doggie breath mints. Sometimes it's a little better, sometimes a lot worse, but generally, it is always there. The mystery remains unsolved. To help alleviate the shame she must feel when we recoil in disgust as she gives kisses, we named her disorder Stinky Tongue Syndrome or STS.

We could not ask for a more loyal, loving dog. People who spend time with her want to take her home as she snuggles up in a lap as soon as one is available. The reality is we are all flawed in some way, and these flaws make us unique and lovable. We often strive to fix those flaws, and sometimes the only fix is acceptance, not change. Thank you for this life lesson, Zelda and your STS.[2]

Ken Rodriguez, Kimberly's husband, sent me a follow-up email that he claimed Zelda dictated to him:

> Every year, thousands if not millions of dogs contract STS. Some are shamed by their people. Some are subjected to quack treatments. And some, lacking any sort of treatment, feel forced to run away and live a dangerous life on their own just to feel better about themselves as a person. But compassion is right now the best treatment for STS, and we all must be aware of the silent suffering of those who, like me [Zelda, that is], live with this condition.[3]

Sometimes, our "problems" with dogs are really *our* problems. There's no solution but acceptance, as Kimberly and Ken put it so compassionately. At times, I certainly have wished that dogs would turn their heads away when they breathe or burp. I've had a few dogs whose breath floored me—literally and metaphorically—and yet other dogs don't feel that way. From a dog's perspective, they can't wait to sniff around another dog's mouth and savor the odor, and on occasion the saliva, that spews out. While we don't know precisely why dogs do this, it's a safe bet that they're gathering information, and being that close to another individual could also be a social or potentially bonding event. Smelly places and private parts play a huge role in a dog's world, which can make us humans uneasy.

People are always asking me why dogs put their noses in such places, as if understanding might help us figure out how to get them to stop it. Dogs put their noses in places where people can't imagine there is anything of interest. We don't greet friends or strangers by immediately licking their mouths or with a nasal snort or genital sniff or slurp. What's perfectly normal dog-appropriate behavior might not be even marginally acceptable dog-human behavior, but dogs aren't especially interested in our social norms. One woman who was pretty open to a dog's investigative ways once said to me, "If you got it, use it," and dogs do just that.

Thus, if we want to learn about dogs, and we want to live with and love dogs, we must make our peace with an anatomical, body-parts approach to life. That's the only way to journey into the minds, sense

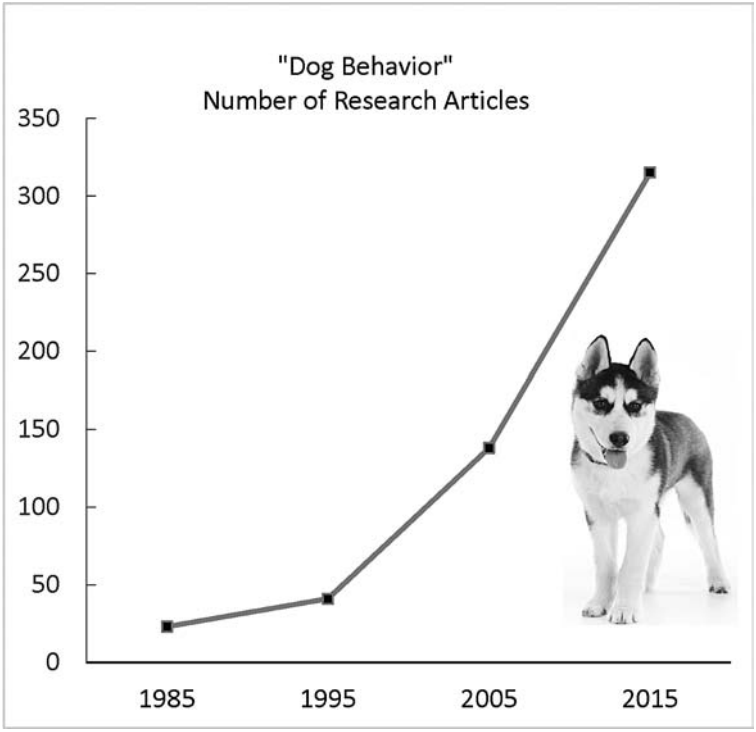
organs, and hearts of dogs. Not everything about a dog's cognitive, emotional, and moral life is anatomically based, but little happens that doesn't involve a body part.

In many ways, I think of myself not only as a canine confidentialist but also as a myth buster. I feel strongly that both first-time and lifelong dog people can benefit from what my friend and dog trainer Kimberly Beck calls "the beginner's mind." Kimberly founded an organization called the Canine Effect, which stresses the importance of looking at the relationship between dogs and humans.[4] To hold a beginner's mind means to make no assumptions and to take the time to relate to, and learn about, *this individual dog, here and now*. It's essential to recognize that myths harm dogs and dog-human interrelationships. When we pay close attention to what we know about dogs and dog-human relationships, it's beneficial for everyone concerned.

Choosing to share your life with a dog should be fun. Of course, because dogs, like so many other nonhuman animals, experience rich and deep emotions and are witty, wise, and temperamental, they can be a challenge. But the bottom line is that living with a dog should be enjoyable, if, on occasion, noisy, smelly, and frustrating. The challenges remind us that dogs are individuals. And judging from the number of books and scientific and popular essays focused on defining who dogs are and explaining why they do the things they do, there is a good deal of interest worldwide in understanding these fascinating beings.

The Big Question: Who Are Dogs?

Domesticated dogs are fascinating mammals. We created them in our own image, favoring the traits we liked or considered useful, even though at times these have compromised the health and longevity of dogs themselves. Perhaps it's stating the obvious, but dogs vary greatly in size, shape, mass, color, coat, behavior, and personality.[5] Because dogs are so variable and so common in our lives, they make wonderful subjects for evolutionary, biological, and etholog-



Graph showing a steady increase in studies of dog behavior over the past thirty years. Source: Hal Herzog, "25 Things You Probably Didn't Know about Dogs"; Used with permission. Dog photo courtesy flickr user alan schoolar, Creative Commons license CC BY 2.0.

ical studies, especially concerning social behaviors related to play, dominance, different types of communication, and social organization.

That said, it's interesting to note that for years "serious scientists" thought dogs weren't worth studying at all, precisely because they were considered "artifacts," products of human genetic engineering. Rather than naturally evolved beings, dogs are animals who were made to be what they are by humans, based on what we wanted or imagined. Veterinarians and geneticists could study dogs, but not serious researchers interested in behavior. Now things have really changed, and numerous renowned universities focus on dogs in

a range of incredibly interesting studies. The graph here shows a steady increase in studies of dog behavior over the last thirty years, with an especially sharp increase beginning around 1995.

Among regulars at the dog park, I often hear an enduring confusion about the difference between domestication and socialization. Dogs evolved from wolves to become a new domesticated species, which means that every dog is born a dog. But occasionally, people who share their home with a wolf who is friendly toward them will say, "I have a domesticated wolf." They really don't; if this "friendly wolf" gives birth, that child will be a wolf, a wild animal. Their friendly wolf is actually a *socialized* individual. Simply put, a "domesticated wolf" is a dog.[6]

As the section title above states, this book seeks to answer the question of *who* dogs are, not *what* dogs are. Dogs continually thwart attempts to characterize them as predictable stimulus-response machines. While the well-known Nobel Prize–winning Russian physiologist Ivan Pavlov surely made significant contributions to learning theory by studying dogs, what he did not prove is that dogs are automatons. It's clear from evolutionary theory, detailed scientific data, and common sense that dogs are *neither* merely mindless machines nor simply "bundles of instincts" who mainly rely on using hardwired behavior patterns. Rather, dogs are smart, thinking (sapient), and feeling (sentient) beings who assess different situations and experience a wide range of emotions similar to our own.[7] Dogs routinely make decisions about what they do, and they don't do things "for no reason at all."[8] Indeed, many current successful training (or teaching) methods are based on the rich and deep minds and hearts of dogs. They are mammals, just like us, and we can learn a lot about them by recognizing this fact.

Scientific research has shown us that numerous animals are intelligent and emotional beings, including dogs, fishes, and insects.[9] Throughout this book, but especially in chapters 6 and 7, we will consider the heads and hearts of dogs, and the secrets and mysteries they contain, but there is no question that they think and feel. This is well supported by scientific research, and we need to let this knowledge

influence how we care for dogs. Of course, this doesn't mean we need to embellish the mental life of dogs, or of other animals, to make them appear smarter than they really are.[10] But it isn't putting the cart before the horse, or the leash before the dog, to let the data drive our concern and compassion for dogs and other animals and to give them the best lives possible.

Some people—thankfully, not many anymore—still claim we really don't know what dogs want and need, but I always say, "Yes, we do." They want and need what we want and need, namely, to live in peace and safety and to coexist harmoniously with others.

Thus, throughout, I consider each aspect of what we know about dogs based on current research, and I note where we really need more information, which is just about everywhere. However, to make the book more readable, I cite most of this research in the notes; please turn to these if you want to know more. It's essential to use available evidence to understand and appreciate dogs, and I provide a fair representation, citing scientific studies, essays, and books, as appropriate.

That said, I also include numerous stories, both by scientists and everyday people.[11] Science writer Fred Pearce has written: "To change the world, scientists need to become storytellers."[12] I totally agree. Nonresearchers find it much easier to appreciate what researchers are doing when it's presented in accessible ways. Stories that "hit home" are very effective.

As importantly, good stories can point out all we don't yet know and lead us to question received wisdom, misplaced assumptions, and dogmatic certainty. It might surprise you that, while we know quite a lot about the behavior of dogs, about what they're thinking and feeling and what they want and need, much remains about which we don't have much of a clue. There are many holes in the database, despite claims to the contrary by many popular dog books that purport to tell it like it is.

The challenge at hand is to come to an appreciation and understanding of these fascinating individuals on their own terms and to use what we know on their behalf. What works for Fido might not

work for Annie, and what works for Annie might not work for Pluto. Among the many dogs with whom I have shared my home, I can name few generalities other than that they all had one tail, two ears, two eyes, one nose, one mouth, and voracious appetites.

As I like to say, beware "the mythical dog."

My Dog and Your Dog, Not "the Dog"

This is a major message I'll repeat throughout, namely, talking about "the dog" can be extremely misleading because of the incredible amount of variability among dogs, even among littermates and members of the same breed. I also avoid distinguishing "good dogs" from "bad dogs" because so much of how we label a dog (or a human, for that matter) depends on context. Most of all, good and bad are human judgments, and every person's criteria is different. I've seen dogs doing what dogs typically do being called both "good" and "bad." These judgments often make no sense to the dog or to me.

Individual dogs also vary in how much they are attracted to us. It might shock some people when I say this, but dogs aren't necessarily our best friends, nor do they give love unconditionally. Sure, dogs can love and play with and entertain us until we're laughing in tears, but they have needs and "conditions" that can be a huge challenge for us, hence the burgeoning dog training or teaching industry.

Furthermore, an individual dog can have a bad day, just like we can, and his or her behavior will reflect this. I remember a dog named Cheghi who I knew well who wasn't acting like himself. Rather than being a ball of high energy, he was laid-back and seemed out if it. I later discovered that an iron had fallen on his head. His human believed Cheghi had a headache or perhaps a minor concussion. Only after a few days did he return to himself, an effusive and high-energy guy. Once, one of the dogs with whom I shared my home rapidly gulped down a lot of icy cold water after a run, and I'm sure he got a cold headache. He squinted his eyes and shook his head from side to side as if he was trying to get rid of something. He also got grouchy and seemed on edge for a while. The exact same thing has happened

to me after I've gulped down some iced tea too fast after a long bike ride.

Over the years I've had numerous emails and calls from researchers and nonresearchers alike who want reliable summary statements about what we know and don't know about the cognitive capacities of dogs. For example, do they follow human pointing? Do they follow human gazing? Are there breed differences? How do dogs compare with wolves? And so on.

I try to answer these question based on current research, but it's just not possible to do accurately without some strong qualifying statements about the variables of each study, including how many dogs were studied, their genders, their ages, their backgrounds, and the exact sorts of experiments that were conducted and where they were done. Emily Bray and her colleagues have discovered that temperament, in the form of increased arousal, can influence a dog's problem-solving cognitive performance.[13] They discovered differences between pet dogs and service dogs and, also, that experimenters could manipulate a dog's level of arousal. In the problem-solving tests that were used, highly aroused pet dogs showed a decline in performance, whereas highly aroused service dogs showed enhanced performance. Clearly, we must be careful of oversimplifying what we actually know about "the dog." And, of course, this isn't a criticism of the researchers or the work they do. Rather, it's a fascinating fact that makes the science of dog cognition, emotions, and behavior all the more interesting and captivating.

One dog expert wrote to me in October 2016 and asked, "Who are these dogs in all of these tests?" He was referring to the fact that studies frequently treat all dogs as equivalent, but they are not. It's just not possible to say all or even most or many dogs do this, or that all or even most or many dogs do that, or even that dogs and wolves are similar in this way and different in that way. If many of the people I meet at dog parks know this already, that's because their dogs already act like they're one of a kind!

Therefore, when people ask me about "the dog," I often say there's no such being. Research conducted in different dog labs and

in the field uniformly shows there is an incredible amount of within-species variability among dogs. Melissa Howse's master's thesis on the behavior of dogs at the Quidi Vidi Dog Park in St. John's, Newfoundland, Canada, shows this clearly when she compares her data with those of the few other studies of dogs at dog parks, including a later study in the same dog park.[14]

Clearly, more attention has to be paid to individual dogs. In a review essay that covered research on the cognitive abilities of dogs from 1911 to 2016, Rosalind Arden and her colleagues found only three studies that focused on individual differences.[15] They also found that the median sample size for studies was sixteen dogs.

Often, and understandably, people want quick fixes for this or that problem with their dog, but a rapid remedy is not always forthcoming because it depends on the individual dog. I hear the desire for a quick fix articulated over and over again at dog parks. I often feel that the quickest fix and the best take-home message I can offer is to pay close attention to the dog or dogs you care about and need to know the best. I've met a large number of dogs over the years, including a most lovely and loving pit bull. The dog's human told me he bought the pit bull to be a fighter, but the dog, turned out to be a wimp. Further, the man said he purchased the pit bull to "make some money in dog fights," but when his dog refused to fight and they were both ridiculed, he came to see his dog and others as individuals, and he vowed never again to engage in dog fighting.

I mention this story not to debate the merits of pit bulls or any breed but, rather, to make the point that rampant breedism—for example, claiming that all members of a breed are nice or all members of a breed are fighters—can be very misleading.[16] Normative thinking can be convenient, but acting on misinformed beliefs can have devastating consequences for the targets of these prejudices. As my friend Marty said to me one day at a local dog park, "Dogma about dogs don't work."

There's also an important practical side to being careful about generalizing about dog behavior. James Crosby, a certified behavior consultant and retired police lieutenant who also holds a master's

degree in veterinary forensics from the University of Florida, told me that in his studies of human fatalities resulting from dog bites it is essential to evaluate each case and each dog individually. There are no quick answers concerning the causes of these tragic events.[17]

I also don't like to talk about "the coyote" or "the wolf" or "the robin" or "the goldfish." Research has clearly shown that within-species variation—what scientists call intraspecific variation—is rampant among a wide variety of animals, including fish, insects, and spiders. After eight and a half years of studying wild coyotes in Grand Teton National Park just north of Jackson, Wyoming, my students and I continued to learn that general comments about coyote behavior had limited applicability, especially in the arena of social behavior and social interactions. Even three-week-old coyotes show distinct temperaments when they first emerge from the safety of their common den, some shy and some bold. Wild animals, like domestic dogs, also defy being tightly pigeonholed by overarching species-wide explanations of who they are and why they do the things they do.

Ultimately, we'll come to a deeper understanding and appreciation of the *individuals* we call dogs if we focus on the reciprocal relationships we form. We need to understand who they are as well as how they come to understand who we are. As you'll see, when we study dogs, including at dog parks, we form relationships with those dogs, as well as with other people, and these relationships influence what dogs do as well as what we understand about what they are doing. Getting into this mindset means leaving all expectations behind. I've always tried to place myself in the paws, heads, and hearts of *individuals*, to experience their highs and lows, ranging from exuberant joy to stifling grief, and to empathize with them as deeply as I can. Dogs openly share with us a lot about what they're thinking and feeling, and we just have to be keen enough to figure it all out.

Not surprisingly, I'm always wondering what is going on in the heads and hearts of dogs and thinking about the topics about which I write here. One morning, as I was riding my bike through Boulder, I spotted Vivienne Palmer and her companions Bartleby, a tiny dog, and Blue, a huge dog who towers over his little friend, walking down the

Vivienne Palmer and her dogs Bartleby (a four-year-old rescued Chiweenie, *at left*) and Blue (a six-and-a-half-year-old rescued Great Dane).

street. I smiled as I reflected on the fact that Bartleby and Blue are the same species, and I decided to do a U-turn and asked Vivienne if I could take their picture. She happily agreed. These companions are clear reminders that speaking about "the dog" can be extremely misleading.

Citizen Science in the Dog Park

> What if giving voice to the voiceless meant listening to them before pretending to know what they would say?
>
> **Matt Margini**[18]

> "Lots of people talk to animals," said Pooh.
> "Maybe, but . . ."
> "Not that many *listen* though" he said.
> "That's the problem," he added.
>
> **Benjamin Hoff, *The Tao of Pooh***[19]

Clearly, when you go to a dog park—or any other place where dogs and people visit, from backyards to hiking trails to bike paths—many different sorts of encounters, exchanges, and meetings are possible. Dogs tend to introduce themselves to anyone and everyone, which can lead to everyone becoming introduced to everyone else, and for this reason, dogs are often called "social catalysts" by researchers.[20] They grease the way for people to open up to one another, and this seems particularly true at dog parks. Most people go to dog parks to let their dogs have fun and meet other dogs, but people wind up meeting one another, too.

And, what do people talk about the most? Their dogs, of course. Most of the chatter is pretty routine. It centers on dog behavior, breeds, where the dogs came from before they wound up in this or that home, how to handle problems, and the relationship of each dog to his or her human friend. However, if we pay attention, our observations at the dog park can yield valuable data about our own canine companion, about dog-human relationships, about human-human relationships, and even about the capacities and proclivities of all the dogs who are lucky enough to romp here and there with friends.

I always encourage people to act like citizen scientists and to increase their knowledge, if nothing else, to improve their relationship with their own animal companion. Yet these casual observations can also inspire scientists and become the catalyst for systematic study, which I'll explore in chapter 8. Dog parks are wonderful places for studies in cognitive ethology, or the study of animal minds, and anthrozoology, or the study of human-animal interactions.

Citizen science in the dog park and at home can also inspire the creation of scientists. Consider the world-renowned primatologist and conservationist Jane Goodall, who was strongly influenced by her dog, Rusty. Rusty was instrumental in getting Dr. Goodall interested in animals when she was young.[21] Dr. Goodall once wrote, "I had had a marvelous teacher in animal behavior throughout my childhood—my dog, Rusty."[22] Elizabeth Abbott, author of *Dogs and Underdogs*, elaborates on how Dr. Goodall's dog helped shape her as a scientist:

Rusty taught young Jane that dogs remember and think about absent objects, for instance a ball tossed from an upstairs window that he could not see and could fetch only by figuring out a series of strategic moves inside the house and then outdoors. Rusty had a sense of justice that drove him to acknowledge his own bad behavior but not to accept Jane's occasional lapses into irritation or unfairness. He was clever at performing tricks and enjoyed being togged out in pajamas. But if anyone laughed at his attire, Rusty stalked off, trailing his garments behind him.

The most important lesson Rusty taught Jane was to ignore contemporary scientists, who denied that animals had individual characters, emotions and brainpower. Instead, she named her chimpanzee subjects—Fifi, Flo, Figan, David Greybeard—and documented and interpreted their behavior and activities in ways that ultimately changed the way science would come to understand animals. Her vision and her methods, once denounced as the scientific sin of anthropomorphism, were gradually accepted into the canons of scientific research and ultimately, adopted as the gold standard.[23]

Way back in 1928, Columbia University psychologists C. J. Warden and L. H. Warner wrote, "Much of what the average man 'knows' about his own dog, and about dogs in general is, of course, quite unknown to the animal psychologist."[24] This quotation shows how much we can learn about dogs from citizen scientists. We now realize how much the observations of people who share their lives with dogs can support and supplement rigorous data from detailed scientific studies. In 2015, an international group of researchers concluded that, "in the future, citizen scientists will generate useful datasets that test hypotheses and answer questions as a complement to conventional laboratory techniques used to study dog psychology."[25]

Years ago, a woman told me that her male dog would often look around, lift one of his rear legs, and act as if he was peeing, but without actually peeing at all. Then, a few seconds later, he'd pee out a bucket's worth. The woman also thought he only did this when other

dogs were around. I'd seen this same pattern of behavior from time to time in dogs and coyotes but never paid much attention to it. Afterward, my students and I began a study of this phenomenon, which we called "dry marking," during which a dog, usually a male, lifts a leg but doesn't pee. As I explain in chapter 5, this woman was right on the mark, so to speak, about her observations of her dog.

This interest in and even devotion to dogs takes many forms. For instance, once during a bike ride with world-class racer Rohan Dennis, I learned he had a tattoo of a dog, a pit bull/staffy mix, which he got after seeing the dog being walked by an "evil clown."[26] When I asked Rohan if he knew the dog or loved that mix of breeds, he said, "Nope." But somehow that dog touched him, and he just wanted to get a tattoo. He later wrote to me, "I really didn't want anything meaningful to me at the time either because I was only eighteen, and we are all pretty naive about life at that age." I love this story because of how Rohan chose to keep the dog in mind with a tattoo that is permanently displayed on his right bicep. Dogs inspire us and really bring feelings out of us, and sometimes we don't even know why.

Other people have also shown me tattoos of their dogs, and from time to time, people also share tables and graphs charting their dog's behavior in vastly different situations. They love what they do, and I'm sure their dogs have benefited from their keen observations. Whether you go as far as Rohan or these budding ethologists, I encourage you to spend a good deal of time with dogs, yours and others. We need to watch them and learn to read them, as they watch us and learn to read us. For anyone interested in what it means to observe like an ethologist, I've included a brief primer in the appendix.

In short, in order to discover what I call the essential ethology of dogs, we must focus on what dogs know, feel, and do, and to do this we must become dog literate and also "become a dog" as much as possible. I don't mean that we have to act like a dog; we don't need to sniff where they sniff or try to engage in dog behaviors. What I mean is, by carefully watching dogs, we learn to read them and recognize their perspective. We merge what research tells us about dog behavior with what we see actual dogs doing in specific contexts, and

then we add in our own common sense. To understand what a certain dog feels, and why they do what they do, the challenge is to blend all these perspectives, and all the relevant data, and make sure that together they match the dog in question. There is always more to learn.

I'll be upfront here and tell you that I'm always surprised at how few people actually watch their dogs carefully. I'm also frequently shocked to learn how few dog trainers—I like to call them teachers—have spent time studying dogs independently of their work environments. Of course, this doesn't mean they're bad at their jobs, but I can't help but think this limits their understanding of dogs, dog-human relationships, and how to solve problems. If we live with or work with dogs, it's essential to watch dogs in all sorts of situations. Not only is it fun, but this is also how we learn what makes dogs tick, by observing them both in the situations they savor and in the instances when problems arise.

This knowledge isn't esoteric or academic. We use it to do our job better, the job of caring for our companion animals. As Q. Sonntag and K. Overall write, "A better understanding of animal behaviour by both pet owners and professionals, to more effectively meet the needs of dogs and cats and recognise their problems, should inform the formulation of objective welfare assessments to ensure a better quality of life for the animals. Responsible breeding practices that increase genetic diversity and select for traits that help dogs and cats fill their niche in a changing world should be based on evidence to minimise welfare risk."[27]

Minding Dogs: A Dog Companion's Guide

In the same way that, when I was a child, my parents said I "minded animals," I always encourage people to "mind dogs," along with all the animal companions who share our homes. As I've said, this means seeking a thorough understanding of their cognitive and emotional lives—what they know and what they feel—and appreciating that they also mind us. Yet this attitude also means appreciating that we are totally responsible for the well-being of dogs. We are

their lifelines, and along with this power comes incredible responsibility, for this power is not a license to do whatever we like to suit ourselves. We must respect and love dogs for *who* they are, not for *what* we want them to be.

Minding animals starts with the language we use. I prefer to use the terms "companion animals" and "guardians" to refer to dogs, cats, and the other nonhuman animals who live with us. Often, people use the word "animals" to refer to all living beings except us, but of course, humans are animals too, and we should be proud of our membership in the animal kingdom.[28] When I use the word "animals," I usually intend to include humans, and when I don't, I prefer the term "nonhuman animals." When discussing any animal, I prefer to use subjective pronouns—"he," "she," and "they," "who" or "whom"—rather than objective pronouns like "it," "that," or "which."[29] In this book, I haven't changed direct quotes to reflect these preferences, and occasionally I use the words "pet" and "owner" myself, when these are appropriate or clearer. Yet I have long spoken out about how the media, journalists, and scientists should pay more attention to how language can reflect an unspoken bias, one that treats nonhuman animals like objects, and I'm pleased that there is a trend away from this.

To put this another way, in this book, when I discuss dog behavior, I often focus on the "practical turn," or using what we know to give dogs the best lives we can, while factoring in who they are as *individuals* and what they need and want as unique beings. If we choose to bring a dog into our homes and hearts, we are obligated to do all we can to give them the best life possible; this, to me, is nonnegotiable. Being too busy or assuming our lives are more important than theirs doesn't cut it when we can easily make choices that offer them what they want and need. Dogs have much to teach us about life in general.

Thus, while this entire book is meant as an illuminating "field guide" to dogs, my hope is that this knowledge is put to good use. In chapter 9, "A Dog Companion's Guide," I provide specific advice concerning caring for and living with dogs, along with some thoughts

on training or teaching. Some even suggested I call the entire book a "dog owner's manual," but of course, that's not quite right. From a dog's perspective, they aren't "owned," and "ownership" doesn't and shouldn't reflect the nature of the relationship. You own a couch or a stove, and if these break down, you fix them or get rid of them and buy new ones. Living with a dog is a lifelong commitment that involves countless ongoing negotiations.

In many ways this book also can be viewed as a field guide to freedom, for when we learn more about what it is like to be a dog in a human-dominated world and that living with a dog requires trade-offs by all involved, with that understanding, dogs and their people will enjoy more freedom. Recognizing that an enduring positive and mutually rewarding relationship requires give and take is a freedom enhancer for dogs and humans alike.

Even though I am not a professional dog trainer, I am a scientist who is committed to supporting positive training methods that don't involve domination or intimidation. However, there is no one-size-fits-all approach. Like children, some dogs need that extra bit of teaching, care, and love in order to learn how to get along with other dogs, or with their human companions, but all dogs need kindness. When I write about what dogs want and need, I focus more on what dogs *feel* as the marker for how they should be treated. Intelligence doesn't really factor into how much an individual suffers, so asking if so-called less intelligent dogs suffer less than so-called more intelligent dogs isn't a meaningful question. What about people with varying smarts? The most useful guideline is that every being's capacity for suffering is the same, and dogs don't suffer more than rats or mice, nor do they suffer less than humans.

For those who choose to share their homes with dogs or other animals, I view this book as providing what I like to call preemptive humane education. Caring for a dog (or any other animal) is not enough. It's essential to turn feelings of caring into action to make the lives of all individuals the best they can be. At the end, this book includes a call for advocacy and activism on dogs' behalf.

The decision to bring another animal into our homes and hearts

is oftentimes profoundly basic: we seek a companion to love and whom we hope will love us. But this relationship and our obligations can quickly become complicated. My colleague Dr. Jessica Pierce, in her book *Run, Spot, Run: The Ethics of Keeping Pets*, boils this down to a basic question: "Are you ready to give another animal the best life possible?" For example, does your home environment suit the animal? Does your lifestyle? Have you calculated lifetime expenses? Will you be able to make end-of-life decisions? Difficult practical and ethical questions await, and sometimes people realize that perhaps they didn't think deeply enough about what it means to take total responsibility for another being's life.

As an example of all this—particularly of how citizen science and observing like an ethologist can help us ask good questions, which can then inform our caretaking and help us give dogs the best life possible—here is an email that my colleague Jessica Pierce received in 2016. She shared it with me, and now I share it with you:

> My grandson of eleven has a dog which he adopted several years ago. They live in New York City and I in New Jersey. On many occasions, I take the dog for a walk. There are two places I take him to. One is the dog run and the other is Central Park.
>
> In the dog run, he would jostle with other dogs and run around, sometimes quite wild. He sniffs at other dogs and sometimes even tries to mount them. When the latter happens, almost every dog owner would discourage that behavior.
>
> In Central Park, my dog would simply walk along with me and he would acknowledge the presence of other dogs by looking at them most of the time. Only occasionally, he would try to jostle with them.
>
> Lately, I got to thinking there may be something wrong with the way we are raising our dogs and cats, especially those who live in the city.
>
> My thinking started this way. How does a dog grow up, intellectually? Even though dogs are domesticated animals, do they learn everything from us, the human being? Even if they are not

social animals, don't they have to learn something from other dogs? The intellect and knowledge of human beings are passed down through the generations, and they are accumulated in that process. My grandson certainly is going to know a lot more things than I know now. But, my grandson's dog is isolated most of the time from other dogs, except when he was taken to the dog run.

So, my question is how could a dog grow up intellectually if he has no other dogs to learn from? Does a dog end up thinking and behaving like his constant companion, a human being? And he has only his own lifetime to learn and cannot take advantage of the learning that other dogs had acquired.

Is the deprivation of a dog from learning from other dogs the greatest tragedy of being a dog?[30]

The Big Picture: Dogs in Society and the World

Dogs are amazing beings, and I appreciate all the people who try hard to make the lives of so many dogs the best they can possibly be in a world that places a lot of demands on them. At the end of this chapter, and at the end of this book, I want to step back and consider the larger context of dogs in our world, because many discussions at dog parks come back to this essential topic.

Not only do dogs make our individual lives better, but they also inspire us to make the world better. For instance, in 1925, Heinrich Zimmermann, the German writer and publisher of the magazine *Mensch und Hund* (*Man and Dog*), conceived and organized the first World Animal Day, which is still celebrated every October 4.[31] A dog named Pepper played a huge role in fostering animal welfare legislation in the United States by motivating the passage of the federal Animal Welfare Act in 1966. Pepper, a Dalmatian, was dognapped from a Pennsylvania farm in 1965 and sold to a hospital in the Bronx, where she died in an experimental test of pacemakers. Pepper and her plight helped to bridge the empathy gap; she inspired our empathy and helped us see that all species feel and suffer.

Dogs help us span all sorts of divides, even political ones. One of the few things Democrats and Republicans in the U.S. Congress agree on is that companion dogs are welcome to join lawmakers in the Capitol, and it's been that way since the 1800s. In August 2016, the town of Cormorant, Minnesota, elected Duke, a nine-year-old Great Pyrenees, to serve a third term as its mayor.[32] Afterward, I heard from a number of people who felt that putting dogs in charge of government made a lot of sense.

Dogs are "in," as I often say. As of this writing, nearly eighty million American households, or nearly 65 percent of all U.S. households, share space and time with a pet, and about 44 percent of households have a dog.[33] In total, about seventy-eight million dogs are considered to be pets in the United States. This means dogs are also big business, and the amount of money spent in the "dog-industrial complex" is staggering. Americans alone spend almost $70 billion each year on their pets, including $30 billion on pet food and over $16 billion on veterinary care.[34] Living with dogs can be expensive, with annual costs estimated at around $1,600.[35] In fact, in the United States, spending on health care for pets is rising faster than the rate of spending on people.[36] From 1996 to 2012, spending on pet purchases, medical supplies, and veterinary services rose about 60 percent compared to 50 percent for human health care. People around the world also will take risks to save their companion animals and others when the animals' lives are endangered.[37]

Dog ownership is rising in many countries around the world. As of 2012, Brazil had thirty-five million dogs, China had twenty-seven million, and Russia had fifteen million. In India, dog ownership has increased by well over 50 percent since 2007, and in Venezuela and the Philippines it has increased by 30 percent or more.[38]

Not only do people often offer dogs special treatment when compared with their attitudes toward other animals, some people are known to take care of their dogs above other family members.[39] One study showed that children get along better with their pet dog than with their siblings.[40] Perhaps this not all that surprising, given that research shows that dogs, by providing social support when things

are tough, create a greater reduction in stress in youngsters than does having a parent present.[41] Numerous people decide where they can live based on whether places are animal friendly, and there is a move for residential master plans to include accommodations for the needs of companion dogs.[42]

Unfortunately, this doesn't mean that today dogs lead pampered lives. Dogs may be "in," but like so many other animals, they are caught up in our current human-dominated epoch, which has been called the Anthropocene, or "the age of humanity." In reality, the Anthropocene could be called "the rage of inhumanity," since what it means is that there are far too many of us, and other animals all too often get the short end of the stick. Or in the case of dogs, the short end of an already short leash.

Despite all the dogs who are cared for in loving homes, it's estimated that about 75 percent of the world's dogs are on their own, often living desperately hard lives in utter squalor, gravely ill, and in deep physical and psychological pain.[43] In Yangon, Myanmar, there are around 120,000 stray dogs who carry rabies and attack children.[44] In Taiwan, around 10,900 stray dogs were euthanized in 2015, and in 2016, about 8,600 shelter dogs died due to diseases and other causes.[45]

In addition to suffering human neglect, dogs are harmed more directly. Dogs are still used in blood sports, run to death in dog races, and forced to perform in shows and movies.[46] While so-called designer dogs, such as labradoodles and goldendoodles, are very popular and trendy today, intentionally crossbreeding to produce certain traits in a dog can also produce unhealthy traits.[47] In Scotland, the demand for designer dogs has been so high that there is a good deal of unlicensed breeding. Mark Rafferty of Scotland's Society for the Prevention of Cruelty to Animals noted that they're viewed by some people as "throwaway commodities."[48]

People still breed dogs who they know will have short and likely miserable lives because of inbreeding and selecting for traits that make it difficult for them to breathe or to walk.[49] These people are essentially breeding, as one observer put it, for "beauty over health . . .

at the cost of empathy."[50] Humans spend millions of dollars to get rid of their own wrinkles, yet we intentionally produce dogs with wrinkled faces who we know will suffer and die young. But it doesn't stop there. At Texas A&M University, dogs are intentionally bred with deformities to study various forms of muscular dystrophy. Many of these experimental dogs are profoundly crippled by six months of age, and half of them don't live more than ten months.[51] This surely isn't any way to treat one's "best friend." I like to say that some people love some dogs to early deaths; for example, the median life span for French bulldogs is 2.5 years for males and 3.8 for females.[52]

So it's essential to keep in mind that if dogs don't necessarily act like our best friends all the time, neither are we theirs. Dogs do not love unconditionally, and neither do we. Sure, it often seems difficult to find a dog who isn't friendly to some extent, but dogs discriminate among humans just as we discriminate among dogs. In addition, dogs who have been severely abused sometimes never regain the trust that underlies unconditional love for humans or, in some cases, for other dogs.[53]

It also bears repeating that, on both personal and societal levels, dogs depend on us much more than we depend on them. Elise Gatti, a graduate student at the University of Utah, wrote to me with the observation that "we are our dogs' whole lives but our dogs are only part of our lives."[54] I agree, and we should never forget this. That dependence places the highest obligation on us to make the lives of dogs as good as possible.

Having said that, we must ask how well we really know what goes on in the minds, hearts, and noses of our canine companions. What does it mean to be a dog? To begin, let's consider how dogs use their five senses to understand the world. Of course, how dogs sense the world is intimately connected to their behavior and why they do what they do in various situations. To appreciate what it is like to be a dog, we need to understand how they see, hear, touch, taste, and most of all, smell. Dogs are animals for whom the nose knows everything.

TWO

The World According to Dogs

Everyone knows dogs have noses of all different shapes and sizes, often depending on the shape and size of their heads and faces. One of my favorite dogs was Sammy "the schnozzola," a huge blended mutt who had the biggest nose I've ever seen on a dog. Sammy looked like an anteater, and he seemed to know it. His nose went everywhere, including the butt, ears, body, and face of other dogs and the groins, ears, and mouth of unsuspecting humans. People at the dog park called him Hoover because he really acted like a canine vacuum cleaner. Once, while I was deeply absorbed in watching two dogs playing, Sammy approached me from behind, and before I knew it his nose was exiting the front of my legs. I'd never been skewered by a dog's nose, and I broke up laughing, and Sammy, thinking I enjoyed it, kept on walking into me. I felt he could have lifted me off the ground with his oversized snout.

One day a woman who had rescued her first dog learned that I studied dogs, and she asked me, "Why does she sniff everything, get confused when she can't see something that looks fine to me, and get restless and agitated when she hears noises I can't hear?" I get questions like this quite a lot, and I explain that the world according to dogs is rather different from ours.

The best way to start learning about how dogs understand their world is to imagine what it's like to be a dog and have a dog's senses. Of course, dogs have the same five senses as humans, but they are not experienced or used equivalently. I fully realize suggesting you imagine what it's like to be a dog is a big ask. Not only is it impossible for us to fully appreciate all the information that a dog's wondrous nose and eager tongue provide, but dogs routinely put them both in places we find unimaginable and utterly off-putting!

So, staying within the confines of what we might call appropriate behavior, here I offer an "ethology of the senses," or a brief picture of how dogs sense their world through smell, sight, sound, taste, and touch. Of course, like other animals, including humans, dogs often process a cocktail of stimuli coming in simultaneously and sequentially. Ethologists call these composite signals, and they usually contain more information than signals in a single sensory modality.

The emerging and changing cacophony of sensory stimuli allows dogs to gather a good deal of detailed information about what's happening in the moment. It might even tell them what happened in the past and what is likely to occur in the future. This information is vital in order for them to figure out what to do in any given situation. While dogs bark (which I discuss in chapter 7), dogs don't actually talk, as do humans, to understand others and to communicate and express their feelings. Rather, they mainly use their five senses and nonverbal communication.

A Dog's Nose Is a Work of Art

Odors are everywhere. Humans can't detect them all—and we often don't need to or want to—but dogs are different. Scents mean everything to dogs, and their noses are expert at finding them. In *Being a Dog*, Dr. Alexandra Horowitz calls dogs "nosed animals"—or "a nose with a body attached"—and researchers refer to dogs as macrosmatic mammals because smell is so important, really essential, to their way of life.[1] I always think that a dog without a working nose isn't a dog. In fact, dogs also have what's called a vomeronasal organ, also called Ja-

cobson's organ, that functions as a second nose. This is part of a dog's accessory olfactory system, and it responds to stimuli that are liquid rather than volatile vapors.[2]

We all know dogs like to stick their noses everywhere, and they often snort when they're doing it or shortly thereafter. Their supersensitive noses are legendary, so much so that their approach to life could be summed up as "sniff first, ask questions later." It's not clear why dogs' noses evolved to be so sensitive. When I ask researchers, some suggest that it's related to the fact that their noses are so close to the ground. Others simply say that it's evidence of evolution selecting for an adaptation that benefited the animal, and now "that's the way it is." Be that as it may, dogs put their noses to work seemingly every single second.

This is troubling to us when dogs sniff places and things we consider taboo. On my forays at dog parks, I often hear something like, "Stop it, don't put your nose there." Or, "Geez, that's disgusting. Get your nose out of his butt." Dogs also like to sniff private parts, pee, and poop in order to learn a lot of pretty exciting information for them. When it comes to smells, we should let dogs be dogs and not hold them to human standards of propriety. This means we should let them sniff one another to their nose's content and we must let their walks be *their* walks, not ours, as frustrating and challenging as this might be. Their sense organs, like their muscles, heart, and lungs, need to be exercised.

WHAT CAN DOGS SMELL?

I've already introduced you to several dogs—including Bernie and Beatrice, the butters, and Gus and Greta, the groiners, along with Sammy the schnozzola—whose noses know no bounds. These dogs can't stop shamelessly running up nose first into everyone's privates, which always ignites many questions about what dogs are smelling and why, since they clearly enjoy it.

The truth is, while we know that dogs are gathering all sorts of important information, it's not always clear what exactly that infor-

mation is. It's well known that male dogs pick up information about the receptivity of females using odor, and all dogs seem to be able to identify other dogs by their smell. They can also discriminate their own scent from that of other dogs and may learn where other dogs have been, who else they've been with, and how they're feeling. Given that so many people spend a good deal of time marveling and often laughing as dogs intensely vacuum different substrates and inanimate items, along with the body parts of other dogs and humans, it's odd how little we actually know. Citizen science can surely motivate more formal research in this area.

Some have even wondered if dogs can smell time. Dogs surely have some sense of time, since most dogs know when it's dinnertime and they seem to be able to anticipate when their owners are coming home. But we don't know how they tell time or with what understanding of time. Alexandra Horowitz suggests that dogs can smell odors that are in the process of evaporating, and in this way they can track time (and perhaps that's why they have a good sense of when their human is coming home).[3] I don't know if this is so; perhaps they can do this in certain instances. Given my own and others' observations, it seems as if dogs can tell not only who peed but also how long ago with real accuracy. Still, this hasn't been proven, and so we really need more research to tackle this daunting but interesting possibility.

Whatever dogs are learning, they never don't smell, perhaps even when they sleep. Dogs often sniff their friends as vigorously as they do less familiar individuals and strangers, even if they've been apart for only a few seconds. Jessica Pierce told me that her dog Bella would sniff her housemate Maya after Maya paid a visit to the veterinarian. I remember smiling as Jethro, a dog with whom I shared my home, would vigorously sniff Zeke after Zeke was gone for less than a minute. Zeke would patiently allow Jethro to run his nose all over him, and on occasion Zeke seemed to be saying, "Hey, I just went down the road to pee and to see Lolo, our friend." Dogs don't seem to question the need to sniff, and I'm sure they know what they're doing. Perhaps it's like when people text message only seconds after leaving a party. What else is there to say? Sometimes, you just want to check in again.

Whatever dogs learn, they are compelled to investigate with their noses, and they can get so into odors that they can lose awareness of their surroundings or what they are doing. So many times I've come upon a dog who's sniffing and snorting and totally oblivious, or so it seems, that I'm right behind her or him. During the time I was writing this chapter, I watched a dog on a Boulder bike path follow his nose right into the creek! Once, as I was walking up the dirt road near my mountain home, I saw my companion Jethro follow his well-equipped nose directly into a field of cactuses. I screamed for him to stop, but it was too late. I'd like to say he learned something from this prickly encounter, but sadly he didn't. Next day, same place, nose to cactuses. I have no idea whatever or whomever Jethro was savoring, but it surely took precedence over everything else. And, none of his dog friends with whom he was hanging out paid any attention to the smelly cactuses.

The skill of a dog's nose leads us to wonder about how odors travel. As I discuss next, a dog's nose can distinguish scents with a refinement that puts humans to shame. They can discern minute differences between odors that all smell the same to us. As we know, trained dogs are employed to sniff for bombs, drugs, and banned food items—and not just any and all food, but only alerting for specific kinds. Trained dogs use their fine sense of smell to sniff out different human diseases and to help doctors diagnose them. They can follow scent trails and track smells in various situations, such as in and around crime scenes or to locate a missing person, during which they detect the direction from which an odor is coming and if it is becoming diluted.

Dogs also serve as conservation biologists. They are used to track animals without having to trap and collar the individuals of interest; to find rare species; to locate scats to learn about what animals are eating and the presence of pharmaceuticals, heavy metals, and poisons; and to stop the poaching and the trafficking of animals such as elephants and rhinos who are ruthlessly killed for their ivory or their horns. What's really interesting about conservation dogs is that many come from shelters and go on to have exciting and rich lives helping human conservationists and wildlife managers. When I lived

in the mountains outside of Boulder, Colorado, the dogs with whom I shared my home and land were very good at letting me know when black bears or cougars were around. I'd follow them to where their noses were going crazy, see what a scat looked like, and head home when it was clear bears or cougars were around.[4] One of my dogs also alerted me to the presence of a bobcat who I had never seen but knew was around. Good dog!

Because of trained dogs, we also know something of what dogs learn about people using smell: dogs discern our emotions and can identify certain illnesses and diseases. In fact, most of the time, dogs showed us they could detect medical conditions on their own, and only then did we think to train them to do so. One interesting point is that human diseases are not all necessarily detected the same way.[5]

In 2016, Mathew Reichertz, a professor at the Nova Scotia College of Art & Design, created an art exhibit called *Dog Park*, which is a series of paintings that show a dog's view of how different odors move around in the atmosphere. Professor Reichertz explained, "I did research about how smells move over uneven terrain, how a dog's nose works, and how they behave when they are tracking a smell. The more I sought to understand a dog's sense of smell, the more I realized that their olfactory experience creates a kind of architecture that they inhabit and move through."[6]

I have also wondered what happens when dogs are asleep. Many times I've watched dogs snoozing—or at least it looked like they were asleep—with their noses moving slowly from side to side, often accompanied or followed by a snort, another sound, or eye movements. I've also heard loud snorts and expected to see nose goo flying across the room as a dog peacefully slept, perhaps dreaming of a previous delicious meal or a day spent with friends.

HOW DOES A DOG'S NOSE WORK?

Because we all have a pretty good idea of what humans can smell, it's helpful to compare dogs and ourselves.[7] The sense of smell is the

dog's most highly evolved sense. A dog's olfactory cortex, which is part of their brain, is about forty times larger in dogs than it is in humans, and about 35 percent of a dog's brain deals with odors (while only 5 percent of a human brain is devoted to smell). Dogs can use each nostril separately to further increase their smelling abilities. Researchers studying airflow in dogs' noses have discovered that they inhale through the nostrils and exhale through slits on the side of their nose. This allows odors to remain in the back of the nose. Dogs also don't push out all the odor molecules with one snort.[8] While the human nose can sense from four to ten thousand different smells, dogs can sense from thirty to a hundred thousand different odors, which makes a dog's nose about a hundred thousand to a million times more sensitive than ours.

Alexandra Horowitz has said that if we spread out a dog's nasal epithelium (the lining of a dog's nose), it would cover their entire body, while ours would only cover a mole on our shoulder.[9] Dogs sniff about five times per second, and when allowed to pursue their fancy, they spend around a third of their time sniffing. They don't exhale when trying to sniff, so they can sniff faint odors; they can move and use their two nostrils independently; and if dogs eat less protein and more fat, their sense of smell is improved.[10]

In fact, dogs can get what's called nose fatigue from smelling too much, which makes me wonder and worry about olfactory overload. For example, how do dog perfumes, shampoos, and soaps influence a dog's perception of more biologically relevant odors, and do they even like these soaps in the first place or are these really for humans? Carefully paying attention to how a dog reacts to these human-placed odors is critical.[11]

According to Norwegian researcher and dog nose specialist Dr. Frank Rosell, a dog's nostrils also aid with tempering, filtering, and humidifying the air that is inhaled as it passes down into the lungs. Even if the nostrils of all beings function for both breathing and sniffing, a dog's nostrils are remarkably well organized and far more advanced than our own.

Dr. Rosell writes:

> When the dog breathes through its nose, the air passes through the respiratory region in the dog's long snout and subsequently directly into the lungs. When a dog sniffs, the air follows a side route, entering what we call the olfactory recess. The olfactory recess is covered by an olfactory epithelium containing genes for olfactory receptors (every single one of which is a protein produced by a specific gene), and olfactory receptor cells that absorb odorants. Microsomatic mammals, such as humans and primates, have a different makeup, lacking this olfactory recess. The dog has agile nostrils that stretch when it is sniffing, and this movement opens an upper passageway that sends the air directly into the part of the olfactory recess farthest in the back. An enlarged olfactory recess very likely also increases the airstream for both inhalation and exhalation. The air is filtered slowly forward through the sensory apparatus before it finds its way into the lungs.[12]

There also are breed differences. Dr. Rosell notes that "the olfactory mucous membrane varies from one breed to the next, within each breed, and with age. The German shepherd has the largest olfactory mucous membrane area, ranging from 96 cm^2 to 200 cm^2. A cocker spaniel has an olfactory mucous membrane area of 67 cm^2, and a fox terrier puppy can have an area as small as 11 cm^2. The larger the surface area of the olfactory mucous membrane, the greater the potential for absorbing weak odor signals."[13] In addition to measuring surface area, researchers also have determined the number of olfactory receptor cells for different breeds. For the record, bloodhounds have the most olfactory receptor cells, numbering in the neighborhood of three hundred million! Thus, bloodhounds have the best nose among dogs, one that is ten to a hundred million times more sensitive than ours. Meanwhile, German shepherds have 220 million, the fox terrier 147 million, and the dachshund 125 million olfactory receptor cells.

The Best Nose: Dogs versus Humans

How much more important is a dog's nose to a dog than a human's nose to a human? Consider these comparisons:

- A dog's rhinencephalon (smell brain) is almost seven times larger than a human being's.
- Dogs have an olfactory mucous membrane measuring 67–200 square centimeters, while the olfactory mucous membrane of humans is only three to ten square centimeters.
- Dogs can have 125–300 million olfactory cells. Humans have five million olfactory cells.
- Dogs have 100–150 olfactory hairs per olfactory cell. Humans have six to eight olfactory hairs per olfactory cell.
- Dogs can smell some compounds at concentrations as low as one part per trillion. For humans, the lowest concentration detected is one part per billion.

Dr. Rosell writes:

When a dog inhales, the air close to the nostril is drawn in, and the dog knows which nostril the air enters. The dog's nostril is more sophisticated than a pair of simple openings. Dogs have a wing-like flap in each nostril that opens for and shuts off the airstream moving through the nose. This flap determines the direction of the airstream in and out of the nose. When the dog inhales, there is an opening above and beside this flap. When the dog exhales, this opening closes and the air comes out below and beside this flap through another opening, enabling the dog to increase its collection of further odors. As a result, the warm air that is exhaled flows backwards and away from the odor being sniffed and prevents the odor from being mixed into the air being breathed out. Because the air is warm, odorants are heated up and more easily converted into gas form, thereby reinforcing

> the gathering of odors. By keeping its nose close to the ground and sniffing in quickly, a dog can blow the heavier, non-volatile odorants up from the ground, bringing the odorants up into the air and into its nose.[14]

All in all, a dog's nose is a work of art, an exquisite adaptation, evolution at its best. And all without a plan or goal. When people tell me they wish they had a dog's nose, I hasten to add they should be careful what they wish for. I'm happy to know about this most remarkable adaptation, but even I don't have any desire to experience all of the many odors dogs take in and clearly savor.

A Dog's-Eye View of the World

Dogs clearly have a keen and highly evolved sense of smell. They also have a good set of eyes, which are also important for negotiating their social world. I'm sure I'm not alone in having been stared down by a dog who has locked eyes and won't let go. Dogs are not the only nonhumans to look people in the eye. I've also had similar stare downs with wild coyotes, black bears, and cougars around my mountain home.

John Bradshaw and Nicola Rooney note: "Dogs are visual generalists, able to operate in a range of ambient light levels. Dogs have dichromatic color vision; they cannot distinguish between green and grey, or between yellow and orange, and red likely appears as black. There is little evidence for any role of color in visual communication. The visual abilities of a dog vary by breed. Greyhounds have been touted as having the best eyesight compared to other breeds, however, it hasn't been thoroughly proven."[15]

Humans have better close-up vision than dogs, who often use a cocktail of scents and sounds to help them sort close-up stimuli. Dogs also are more sensitive to moving, as compared to stationary, stimuli. Obviously, this is important in reading social signals such as tail wagging (which I consider in chapter 7). We also know that dogs can differentiate species based on visual images of heads.

People also are constantly telling me that their dog can "read" other dogs from afar and seem to be able to make reliable, long-distance assessments about whether another dog is friendly, wants to play, or is saying back off. However, dogs have a visual acuity of around 20/75, which means that when we can see something from seventy-five feet away, a dog can only see it at twenty feet. They'd do well to wear glasses! As such, I'm always amazed at how dogs know other dogs at a long distance. C. Claiborne Ray, discussing a study done by Dominique Autier-Dérian and her colleagues, says: "Ranging in size from a tiny Maltese to a giant St. Bernard, and showing myriad differences in coats, snouts, ears, tails and bone structure, dogs might not always appear to belong to one species. Yet other dogs recognize them easily, even in the absence of clues like odor, movement and vocalizations."[16]

Many people report that, on their dogs' first encounter with other dogs, members of the same breed prefer one another and that dogs treat breed members differently than individuals of other breeds. Is this odor based, as is kin recognition in some rodents? While dogs know what they themselves smell like, they don't necessarily know what they look like—or might they? Research done on birds in the 1960s suggests that they might learn their own color from reflections in water.

We also know dogs aren't color blind, but the color range they're able to perceive is limited when compared to ours. Dogs typically can see in ranges that are similar to red-green color blindness in humans. Dogs also are able to see better at night than are humans. It's estimated that dogs can see in light around five times dimmer than humans can.

Dog Ears: Sounds Canines Can Hear

The ears of dogs come in a wide variety of shapes and sizes: from long and floppy to short and erect. But whatever the shape, they hear sounds of which humans are totally unaware. Their ears are rather mobile and capable of turret-like movements, which allow them to

more precisely locate a sound. Depending on the breed and age, dogs can hear in frequencies ranging from around forty to sixty thousand hertz (one hertz equals one cycle per second). Humans can hear sounds around twelve to twenty thousand hertz. Dog whistles produce a sound that's usually in the range of twenty-three to fifty-four thousand hertz.

Dogs have more than eighteen muscles that control their flexible pinna (the external part of the ears). Overall, dogs perceive frequencies approximately twice that of humans, and it's been widely reported that they can detect and distinguish sounds about four times as far as humans. This means that what a human can hear at twenty feet a dog can hear at roughly eighty feet.[17] Of course, dogs' ears are adapted to the sounds they themselves make. John Bradshaw and Nicola Rooney report that research has shown that wild canids produce twelve sounds, and dogs produce ten of these. However, researchers still debate exactly how many sounds dogs make, since some scientists lump a variety of sounds together, whereas others split them more finely.

Taste, Touch, and the Potpourri of Sensations

This chapter focuses mainly on dogs' noses, ears, and eyes, since these are their most important senses and the ones we know the most about. We know comparatively little about a dog's sense of taste and that of touch.

Concerning taste, a dog's sense of taste, as it turns out, is far less sensitive than ours. Dogs have around seventeen hundred taste buds, whereas we have around nine thousand. When you consider what dogs lick and gobble into their mouths, perhaps this is a blessing in disguise.

Touch also is important to dogs, but more so for some than others. Some dogs like to be hugged, as long as it's done on their terms, and it seems that petting or caressing an anxious or nervous dog, one who likes to be petted or caressed, calms them down. However, some

dogs don't like being hugged much at all. In these cases, a dog's aversion to being touched needs to be honored.

Between dogs, touching often accompanies close encounters, and it's possible that it can add or detract from the message that is being shared. I've seen a dog slowly walk over to a stressed dog, lie down next to them, and lay a paw over their back, as if saying something like "all's well" or "I'm here, so relax." On occasion, dogs will groom one another, and often they sleep belly to back. However, we really do not know much about canine touch, other than that some dogs like it and some don't.

The real challenge for future research with dogs is to learn not only how each sense works but also how they combine the input from the different senses—the composite signals—in order to understand the world and make decisions. For instance, one study by dog researcher Ludwig Huber discovered that captive dogs are able to integrate information from sight and sound to identify other dog breeds correctly. In the study, dogs matched a projected visual image of dogs of different sizes with the vocalization that is usually made by dogs of each size.[18]

Eventually, additional research will help us figure out more precisely how smells, sights, and sounds are important on their own and how they work together, providing us with a richer view of how dogs sense their worlds. In the meantime, what we know is this: however dogs process the constant bombardment of stimuli from different modalities, when dogs have their noses to the ground or pinned to the butt of another dog, they seem lost in a symphony of smells.

THREE

Dogs Just Want to Have Fun

Jethro bounds toward Zeke, stops immediately in front of him, crouches on his forelimbs, wags his tail, barks, and immediately lunges at him, bites his scruff and shakes his head rapidly from side to side, works his way around to his backside and mounts him, jumps off, does a rapid bow, lunges at his side and slams him with his hips, leaps up and bites his neck, and runs away. Zeke takes off in wild pursuit of Jethro and leaps on his back and bites his muzzle and then his scruff and shakes his head rapidly from side to side. Suki bounds in and chases Jethro and Zeke, and they all wrestle with one another. They part for a few minutes, sniffing here and there and resting. Then, Jethro walks slowly over to Zeke, extends his paw toward Zeke's head, and nips at his ears. Zeke gets up and jumps on Jethro's back, bites him, and grasps him around his waist. They then fall to the ground and mouth wrestle. Then they chase one another and roll over and play. Suki decides to jump in, and the three of them frolic until they're exhausted. When it's over, they all look like couldn't have been happier. And then, Lolo comes, too, and it all happens once again.

These are some of my field notes, which have been mirrored in thousands of other observations of dogs at play. I've been nose deep in dog play for decades, and I never get bored thinking about it or watch-

ing dogs romping here and there. Dogs just want to have fun. And why not?

In fact, I often go to dog parks alone and just cruise around to watch dogs play. When I hear people tell their dog to go have fun and sniff to their heart's content—just go be a dog—it warms my heart. For a dog, that's providing Freedom with a capital *F*: they can sniff, run, romp, pee, and play without constantly being stopped, called back, or corrected every thirty seconds. Of course, dogs are never entirely free, not even in dog parks, but they need their own "dog time," which isn't measured by human clocks.

I also silently chuckle whenever I hear someone give their dog a two-minute warning, as if the dog has his or her own stopwatch or mobile phone or some sort of internal clock. People will say, "You have five more minutes, so hurry up and pee or play with your friends. Then we have to go." Then, if people have to call their dog more than once, they get testy: "What took you so long? I've been calling you for ten minutes. We need to leave now." I often wonder if dogs think something like, "Huh, how long is ten minutes? How long is now?" Even if dogs actually can "smell time," tracking the faintness of odors to learn how long ago something happened, they certainly don't tell time in human terms. Play is an activity that dogs love almost above everything else, during which time rapidly melts away. For many dogs there simply isn't enough time to play.

In addition to freedom, play requires two other important ingredients: fun and friends. In itself, play is a rich area of study, since it sheds light on so much that goes on in a dog's head and heart. For instance, I know two dogs—Sadie, a small hairy mix of lots of different genes, and Roxy, a lean boxer mix—who are clearly best friends. When Sadie arrives at the dog park, she immediately sniffs and pees, checks out who's there by lifting her head and sniffing, and then almost invariably runs back to the entrance to wait for Roxy, who, if she's already at the dog park, races up to Sadie around 95 percent of the time (according to Roxy and Sadie's humans). Then they play as if they were the only two dogs in the world.

However, an interesting thing happens on the days when Roxy

doesn't show. Sadie will pace along the fence line and look around, clearly wondering where Roxy is, even as other dogs come up to say hello and ask her to play. Sadie usually paces for around twenty seconds or so, which is all the time she needs to establish that Roxy is absent. At that point, Sadie goes off and finds other dogs to play with.

How does Sadie know so quickly that Roxy isn't there? I have no idea, but when Sadie chooses to give up waiting and go find other friends to romp with, she is correct 99 percent of the time; Roxie isn't coming. Is it safe to say that Sadie and Roxy are friends, and that they prefer to hang out and play together? Yes, it is, and their humans agree. Using her senses, and perhaps even a sense of time, does Sadie display an uncanny knack for identifying Roxie's presence or absence? Surely. And if Roxie is missing, does Sadie ever let her freedom in the dog park go to waste? Never. What dog would ever do that?

Canis ludens: Play Is Universal

Dogs sometimes play just for the hell of it, just for the fun of it, having a ball as they run around frenetically as if no one and nothing else existed except themselves in the present moment. When dogs see others playing, they often want to jump right in. Play is socially contagious and can spread rapidly as a play epidemic. Watching dogs, I often want to enter the fray, but I don't, and I know I might not be welcomed. I've often seen a dog trying to join a play group by running around and barking until they're either exhausted or welcomed into the fray. Play surely is fun, but it also can be serious business.

Not surprisingly I'm often asked lots of questions about dog play: what it is, how dogs do it, and why. People want to know how dogs keep playing even when it gets rough, whether dogs can play too much, and if dogs play fair. There's also no shortage of opinions among some dog park dwellers concerning dog play. I often hear statements like, "If they keep playing like that, it's gonna escalate into a fight." "He's gonna hump her because he really wants to mate with her, not play with her." And, "They're not playing right now because

he feels badly for biting so hard while they were playing, and he's ashamed."

This chapter will answer these and many other questions about play. By carefully analyzing what dogs do when they play, we can learn about their sense of empathy, cooperation, justice, fairness, and morality, among other things. In his book *The Descent of Man and Selection in Relation to Sex*, Charles Darwin wrote: "Happiness is never better exhibited than by young animals, such as puppies, kittens, lambs, etc., when playing together, like our own children."[1] In the same book Darwin also wrote: "It is a significant fact, that the more the habits of any particular animal are studied by a naturalist, the more he attributes to reason and the less to unlearned instincts."[2]

Social play is not accidental or automatic, and dogs engage in it almost universally. The desire to play seems inherent to a dog's nature, as if it were a biological drive. I often think that the scientific name of dogs should be changed from *Canis lupus familiaris* to *Canis ludens*. The Latin word *ludens* refers to sport and play, which dogs enjoy literally to the point of exhaustion. Then, after resting for a few seconds, they are up and at it for more.

In fact, many other animals play. Even rats, who laugh when they're tickled.[3] Tickling calms them down! Play releases neurochemicals in the brain, such as dopamine (and perhaps serotonin and norepinephrine), which make play desirable and also help regulate play itself. Rats show an increase in dopamine activity when anticipating the opportunity to play, and they enjoy being playfully tickled.

Indeed, dogs frequently play with such reckless abandon that I'm often asked how dogs keep play in mind as they fly around, tumble, tackle, bite, and run, often with unbelievable rapidity. How do playmates not harm one another? It's incredible to watch dogs play, yet they typically know the bounds of their own body—or where their body is in relation to other playmates, dog park traffic, and objects. Despite what it seems, dogs are mindful and "bodyful," as Naropa University psychologist Christine Caldwell calls it.[4]

As I'm about to discuss, detailed analyses of film shows that play-

ing dogs engage in ongoing negotiations and can read others' intentions and desires. This maintains play even when things get rough. Once, when I was being filmed for a news piece on play in dogs, one of the film crew fit his dog with GoPro cameras on his head and neck. When I saw the films from the dog's point of view, it blew my mind. There's a project waiting to be done using these cameras.

DO DOGS PLAY ON THEIR OWN?

This chapter focuses mostly on social play, but it's important to acknowledge that dogs will play all by themselves. Play is its own reward and doesn't need a social context. Anyone who lives with a dog knows they sometimes play for the hell of it, just to have fun.

One of my favorite stories of self-play involves a wonderful dog who was aptly named Darwin, a.k.a. "the water fountain dog." According to his human, Sarah Bexell, Darwin, "an Australian Shepard-Catahoula Hound mix, is high energy and wickedly smart, willing to work 24/7/365 for the person with the highest treat bid."[5] I agree! I have seen Darwin in action countless times. Sarah wrote:

> Darwin has multiple fascinations, but other than for food and squirrels, water is his strongest motivator. He is well known for not being willing to come out of swimming holes; I have to bring water sandals to walk out to get him if two hours have passed. Even beyond this addiction is his fervent desire to drink fast-moving water. This was first discovered at a shooting water display in the square of Old Town in Ft. Collins, Colorado, where he would entertain passersby with his antics of chasing the shooting plumes of water, drinking them head on when he could catch them, which was more often than not. This drinking desire manifests every day at shower time, too, and the word "shower" must never be mentioned in his presence. At the slightest hint of a shower about to be taken (such as a set of clean clothes being placed in the bathroom), Darwin rushes to the tub and sticks his snout under the spout with anticipation. If said person decides to

Dr. Carl Safina's dog Chula having fun running on a beach in Amagansett on Long Island. (Courtesy of Carl Safina)

> get a few more tasks done before the shower, Darwin often disappears. Where is Darwin? Fully in the tub behind the shower curtain, waiting in anguish for his shot of water. Garden time is another favorite, oh my, the hose!!!!

Darwin truly represents *Canis ludens* in all his glory. Watching Darwin, I often laughed uncontrollably, and I always thought it would be a wonderful project to study his obsession with water in more detail. Different types of play provide excellent windows into the minds, emotions, and hearts of dogs and other animals.

Of course, some dogs love to chase their own tails, to play with various objects, and to dash frantically here and there as if they're having a fit or suffering from Sydenham's chorea, otherwise known as Saint Vitus's dance. And they enjoy engaging in these "zoomies" entirely alone. A picture of Chula, one of Dr. Carl Safina's dogs, shows her clearly having fun running frenetically on a beach in Amagansett on Long Island. It's easy to feel Chula's joy. Dr. Safina, author of *Beyond Words: What Animals Think and Feel*, sent me several pictures

of his dogs Chula and Jude playing, and he wrote, "I hope you enjoy their joy (and Chula's tongue) as much as we do."[6]

DO ALL DOGS PLAY?

"I want to play, play, and play some more." I have heard and seen this desire in all of the dogs with whom I have shared my home and at the vast majority of dog parks and areas where dogs are allowed to run free. Some dogs are more enthusiastic than others, and there are dogs who are more "people dogs" than "dog dogs." I must admit I was utterly shocked when I learned that an ethologist once claimed that dogs and other animals don't play. As far as I know, he was, and remains, an *n* of 1, so I immediately tossed out that claim.

Similarly, early in my career, some people, including researchers, told me that it was a waste of time to study play behavior. Some people said that "real ethologists" do not study dogs because they are artifacts—merely "creations of humans"—and we cannot really learn much about the behavior of wild animals by studying them. Some added that the study of play was a mess and that we'll never learn much about this activity because it was a wastebasket into which people tossed data that were difficult or impossible to deal with. At that time, pretty much only veterinarians and people interested in practical applications of behavioral data studied dogs. Since then, these historical mistakes have been revisited and soundly rejected. Clearly, play can be an ethologist's dream, and I have been involved studying social play in dogs and their wild relatives for more than four decades, for my entire career. Today, many other researchers have joined me in taking seriously the various aspects of play in dogs, asking why it evolved, why it's adaptive, what causes play, how it develops, and what animals are feeling when they play.

Play also is a voluntary activity, and if a dog doesn't want to play, he or she can opt out. During play, dogs can quit whenever they want to, and others often seem to know when one dog has had enough for the moment. Perhaps it could be said that all dogs play, but they

Ari, an indefatigable Frisbee player. (Courtesy of Katie Simmons)

don't play all the time. In my experience, the only exceptions to this maxim are dogs who suffered extreme trauma early in life. The vast majority of dogs I've known and watched love to play, but some dogs who suffered abuse when they were young seem not to know how to play, even if they later share homes with loving humans. This is sad. As Jessica Pierce puts it, their play lives were stolen away by early abuse, and some dogs never recover enough to feel comfortable playing with other dogs or with humans. In addition, some dogs can be extremely picky about their playmates. I lived with two dogs who loved to play, but not always and not with just any dog.

Along the way I've also met some street dogs and feral dogs who just aren't sure about how to play. They seem entirely focused on just trying to survive for their next meal. However, the norm is that most dogs I've met love to play, whether alone or with others. And, of course, we all know dogs who love playing Frisbee.

DO DOGS MAKE FRIENDS?

If there's anything that many dogs do and do well, it's playing with friends, which along with "fun," is one of the *F* words that is being used by more and more researchers. I have to say that when some researchers debate whether dogs and other animals form friendships or feel fun, it strikes me as one of the most absurd wastes of time I can imagine. Of course they do, and detailed comparative research confirms it in a wide variety of species. I've had a number of people, including a few dog trainers, tell me that debates like this turn them off to science. Anyone who knows a dog knows that dogs make friends.

I once asked a woman why she came to the dog park every day, and she said, "I come to the dog park every single day, regardless of how busy I am or regardless of the weather, so that Lolita and Rondo can have fun with friends. I can't give them what they need, so here I am, a regular." As the story of Roxy and Sadie shows, some dogs really do have preferred play partners. I can't count the number of times I've seen dogs searching out a specific individual with whom to hang out and play, although numerous others are readily available. I always laugh when I see a dog searching for his or her best play partner, ignoring the invitations to play coming from many other dogs as they search far and wide for that special friend.

To me, when people seriously question whether dogs can have fun or make friends, I think it says more about the humans doing the questioning. They ignore what's self-evident at any dog park. That said, there are important questions to ask about why dogs and other animals evolved to value fun and friendships. This topic is neither frivolous nor unscientific. Indeed, the journal *Current Biology* devoted an entire section of one of its issues to discussions about the biology of fun, and many of the essays by renowned scientists centered on play behavior in various animals.[7] When it comes to fun and friendships in a wide variety of nonhumans, true skeptics are in an ever-dwindling minority. Nevertheless, I hope this arena will remain

a robust focus of scientific research, since it's critical for understanding dogs and learning how to give them the best lives possible.

CAN DOGS PLAY TOO MUCH?

On a few occasions people have asked me if dogs can play too much. The short, everyday answer is "not really," though it's entirely possible that dogs can get carried away and ignore that they're getting exhausted or dehydrated. Dogs sometimes do need to pay more attention to what they are doing and to what else is happening around them. I was most fortunate to be able to talk about this topic with Dr. June Gruber, an expert on the downside of being "too happy" in humans. Our discussions resulted in a research paper called "A Cross-Species Comparative Approach to Positive Emotion Disturbance."[8]

While dogs generally don't have to worry about predators or risk being beaten up by another animal when they're too wired or too fatigued, field observations of golden marmots living in Pakistan's Khunjerab National Park show that the marmots might be exposed to higher rates of predation while playing. In addition, southern fur seals are more likely to be killed by southern sea lions when they're playing in the sea than at other times because they're less vigilant. On two occasions I saw Rocky, a medium-size mutt, get so wired and "lost in play" that he wound up playing with unfamiliar dogs who made it clear that they didn't want to play as roughly as Rocky did. What fascinated me was that Rocky clearly understood what the other dogs were telling him, and it didn't take but one or two mild reprimands, one being an almost inaudible and short growl, before Rocky adjusted and they were all playing at a level that everyone enjoyed. They all were still playing when I left the dog park ten minutes later. Research shows that dogs growl what they mean to say.[9]

These observations beg the question: How did play evolve in this particular way, so that all dogs seem to know intuitively what works and what doesn't work and how to play successfully? In evolutionary terms, keeping play within certain bounds falls under the type of se-

lection called stabilizing selection. Basically, stabilizing selection is "a type of natural selection in which genetic diversity decreases and the population mean stabilizes on a particular trait value."[10] Stabilizing works against extremes in different traits (for example, activity levels, size, and color). Thus, playing too much or too little is selected against, just as would an individual being too wimpy or too aggressive, too big or too small, or too brightly colored or too dull.[11]

Watching dogs in a dog park, I love when these sorts of conversations arise, since they lead to informal lessons about general principles of evolutionary biology, psychology, and different types of social behavior. These lessons are a plus for dogs as well, since people tell me that the more they learn about basic ethology and evolution—why and how dogs do what they do—the more they appreciate dogs in general.

Social Play in Dogs

The rest of this chapter is devoted to social play in dogs. First, we'll learn what social play is and why dogs do it. Then we'll analyze the landscape of play, if you will, and focus on how dogs tell other dogs "I want to play with you," and how they carefully negotiate play on the run so that it remains a fair game. As we'll see, play rarely escalates into serious aggression, despite the impression that it happens frequently. Most dogs are "moral mutts," and when fairness breaks down, so too does play. This is an interesting scenario to observe, especially in large groups of dogs, where the ability to read one another is compromised because there are too many social signals at once. When dogs have difficulty reading or interpreting behavior on the fly, mistakes can happen. I'll also discuss how play differs between familiar and unfamiliar dogs using new data. It may come as a surprise to many people that there haven't been any formal studies that center on this question.

Let me say right up front that, while I focus on the general principles of play, exceptions to the "rules" abound. Indeed, this is what

makes studying play so much fun and so challenging. If your dog is different, or doesn't fit some or all of what's said, regard this as a challenge to figure out why. Many dogs exhibit the trends I describe when they play, but not all do, and not every dog all the time. Always be ready to tweak what you know to fit each dog's personality and biography.

WHAT IS PLAY?

To answer the question "What is play?" we must, of course, look closely at how dogs and other animals act when they play. So, when you study play, get down and dirty with your dog, and even play with them. You can learn a lot about your dog, such as what your dog considers playful, and who your dog likes to play with and who's not their favorite playmate. It's really easy, and you'll discover more about what your dog wants and needs and who they love to hang out and romp around with.

Generally speaking, though, the deceptively simple question "What is play?" has troubled researchers for many years. The following definition of social play resulted from research on play that I did with behavioral ecologist John Byers. John studied wild pigs, or peccaries, and I studied various canids, or members of the dog family, including domestic dogs, wolves, coyotes, jackals, and foxes. We (and other researchers) discovered many common features of play among these various mammals. This is the definition we came up with: social play is an activity directed toward another individual in which actions from other contexts are used in modified forms and in altered sequences. Some actions also are not performed for the same amount of time during play as they are when animals are not playing.

As you may notice, our definition centers on what animals do when they play, or the structure of play. In his book *The Genesis of Play*, University of Tennessee psychologist Gordon Burghardt characterized play activities as having five criteria: play is voluntary,

Top left: Two dogs, Molly (*left*) and Charlotte, playing tug-of-war. This game went on for more than five minutes and was interspersed with social and self-play. *Top right*: Three dogs (*left to right*), Yekeela, Charlotte, and Molly, playing, during which they rapidly changed positions and used a variety of actions including bows, biting accompanied by head shaking, and body slamming. *Bottom left*: Ruby (*left*) performing a play bow in front of Scone. *Bottom right*: Scone (*right*) mounting Ruby.

pleasurable, self-rewarding, different structurally or temporally from related serious behavior systems, and initiated in benign situations.[12]

What this all means is that when animals play, they use or mimic actions that are used in other activities, such as predation (hunting), reproduction (mating), and aggression. Full-blown threats and submission occur only rarely, if ever, during play. Behavior patterns that

Dr. Carl Safina's dogs Chula (*right*) and Jude playing on the water in Amagansett on Long Island. (Courtesy of Carl Safina)

Dr. Carl Safina's dogs Chula (*left*) and Jude playing on a beach in Amagansett on Long Island. If you didn't know they were playing, you might think they were fighting. Using actions from different contexts is one of the characteristics of social play in dogs and other animals. (Courtesy of Carl Safina)

are used in antipredatory behavior are also observed in play. This occurs especially among prey animals such as ungulates (deer, elk, moose, gazelles), who run about in unpredictable zigzag patterns during play. When animals play, these actions may be changed in their form and intensity and combined in a wide variety of unpredictable sequences. For example, in polecats, coyotes, and American black bears, biting during play fighting is inhibited when compared to biting in real fighting. Clawing in bears is also inhibited and less intense. Play in bears is also typically nonvocal, and biting and clawing during play are directed to more parts of the other individual's body than during aggression. Play sequences may also be more variable and less predictable.

I always call play a kaleidoscope, a mixed bag of actions borrowed from other contexts, and a rigorous analysis has shown this to be the case. In his book *Religious Affects: Animality, Evolution, and Power*, science and religion scholar Donovan Schaefer calls play an "affective concoction."[13] Indeed, the variability in play sequences when compared with sequences of behavior in other contexts may be one cue to dogs that play is the name of the game, rather than mating or fighting. Solid scientific research supports the claim that play is a kaleidoscope of frenetic frivolity.

We've all seen it. When dogs play, they look like they're going crazy, frenetically wrestling, mouthing, biting, chasing, and rolling over. They use actions from other contexts in random, unpredictable ways. Play sequences don't reflect the sequences of behavior seen in mating, real fighting, and predation. Years ago, play expert Robert Fagen, author of the classic book *Animal Play Behavior*, analyzed data my students and I had collected on sequences of play and aggression in young dogs, coyotes, and wolves, and he showed that play sequences were significantly more variable than sequences we recorded during aggressive encounters.

Play sequences are more variable and less predictable than sequences of actions in other contexts because individuals are mixing actions from a number of different contexts. More actions are available to playing dogs, and therefore, during any single play sequence,

it is more difficult to predict which actions will follow one another. For example, during real aggression or mating, sequences of actions are more highly structured and predictable. These actions have specific end goals. A dog who's being aggressive typically exhibits a common escalating sequence, first threatening, chasing, lunging, attacking, biting, and then wrestling, until one individual submits to the other. When dogs, coyotes, or wolves play, the action sequence is significantly more variable: one sequence might be biting, chasing, wrestling, body slamming, wrestling again, mouthing, chasing, lunging, more biting, more wrestling, and so on.

Finally, people often ask me if there are gender differences in dog play. For dogs and other canids, the answer is no; they don't typically show gender differences in play. However, many other animals, including great apes and mountain sheep, do.

WHY DO DOGS PLAY?

It's important for all dogs to play but perhaps especially youngsters. Play is highly important from about three to twelve weeks of age as dogs become socialized, both to other dogs and to humans. This does not mean that dogs who don't play will never play; it simply means that during the period when they are developing social skills, it's important to play with other dogs and humans.[14] Because many dogs are taken care of by us, dog play persists into adulthood, whereas in many species in which individuals are on their own when they get older, youngsters play more than older individuals.

Of course, there is no single reason why dogs or other animals play. There are no right or wrong explanations but, rather, different reasons why play has evolved and persisted in numerous animals.

Play likely serves a number of functions simultaneously. Detailed studies show play is important in social development, physical development—the development of joints, muscles, tendons, and bones, plus aerobic and anaerobic conditioning—cognitive development, and training for the unexpected. Moreover, neurobiological research strongly suggests play can be pleasurable and fun, and an-

imals may simply play because it feels good. One aspect of fun that is relevant is the element of surprise, and this is related to the idea that play has evolved as training for unexpected situations.[15]

This last theory of play is based on the kaleidoscopic and unpredictable nature of play sequences. Play may also be an icebreaker and have what's called an anxiolytic effect by reducing anxiety during tense situations and preventing escalation to an aggressive encounter. I've seen many encounters where a dog approaches another dog or human slowly, clearly unsure, at least to my eyes, of what to expect. Then, the approaching dog stops slinking or walking, does a bow, and play happens instantaneously. Chimpanzees, bonobos, and juvenile gorillas show an increase in social play during prefeeding periods compared to other times, and humans also use play to reduce tension.

No matter what the other functions of play may be, many researchers believe play provides important nourishment for brain growth and helps to rewire the brain, increasing the connections between neurons in the cerebral cortex.

How Dogs Play

There's great interest in how dogs play—for example, what they do to ask another dog to play, how they maintain the play mood, how they negotiate play on the run, how they manage to play fairly despite all the frenetic action, and how they resolve potential conflicts.

Dogs use a number of different actions to signal their desire to play. These include bowing, face pawing, approaching and rapidly withdrawing, faking one direction and going the other, mouthing, and running right at a potential playmate. Play signals are an example of what ethologists call honest signals. Across different and diverse species, there's little evidence that social play evolved as a manipulative activity. Play signals are rarely used to deceive others, whether in canids or other species. My own long-term studies indicate that deceptive signaling is so rare I cannot recall more than a few

occurrences in observations of thousands of play sequences in dogs, captive young coyotes and wolves, and wild coyotes.

However, as before, I want to remind readers that variability exists among different studies, and this is fully expected for all sorts of reasons: different dogs are studied in different contexts; age and gender differences can lead to varying results; and each dog's biography is unique. Rather than seeing variability as a problem, it should serve as a stimulus for further studies.

HOW DO DOGS DECIDE TO PLAY?

We tend to notice and study visual signals of play, particularly the play bow, but as dog researchers John Bradshaw and Nicola Rooney point out, not all play signals are visual. Dogs do what's called the play-pant, and they bark and growl when they want to play. I often wonder if there is a play scent, as there is in bank voles who live along the banks of the Thames River, among other places. In dogs, like in other animals, play itself may be so contagious as to stimulate others to play, even dogs who were not so eager to play previously. This social contagion might be due to a strong composite signal associated with dogs having a good time with their friends. And this contagion can cross species lines, not just to include humans, but even—hmm—a cockatoo?

Jennifer Miller, a tireless animal advocate and student of cockatoo behavior, told me how Malcolm, a Goffin's cockatoo whom she rescued in January 2009, loved to mimic the behavior of her dog, Lucky. She wrote:

> Malcolm and Lucky came to me as abandoned animals, passing through my home as "fosters"—in a never ending line of other animals hoping to find a forever home. They arrived at different times, Malcolm in January 2009 and Lucky in September 2012. In true foster-fail-form, both Malcolm and Lucky are still with me. I have joined the flock and I have joined the pack, my home

> is now their forever home. . . . Malcolm is also known to mimic dog behavior. The familiar sequence of play bow and shuffle is one Malcolm knows and loves. Somehow he can decipher this behavior as "friendly" and not "hyper aggressive." When dogs play, he lifts his wings up, stretches them out and bounces. This is his play bow.[16]

WHAT IS A PLAY BOW?

I haven't met anyone who hasn't seen a dog do a bow—crouching on forelimbs and perhaps wagging their tail and barking. Bows are easy to film and to study, and we actually know quite a bit about them.

Bows essentially are contracts to play. They are highly stereotyped and recognizable signals used to solicit and maintain play. Bows may also be calming signals.[17] While bows are used predominantly in play by young and adult dogs, different studies, not unexpectedly, have uncovered different functions. Bows can work differently during play among young dogs, among older dogs, and among young and old dogs. As Patricia McConnell rightly notes, science should generate and test hypotheses, and different results are not unexpected.[18]

When young dogs, coyotes, and wolves perform bows to ask another dog to play, they are more stereotyped (less variable) in form and duration than when they are performed during a play bout.[19] This might be because the dogs need to indicate they want to play, rather than reinforcing that they are indeed continuing to play and not changing behaviors to do something else. In a sense, bows change the meaning of the actions that follow, such as biting and mounting. Bows also allow dogs to perform a wide variety of different actions as they spring up after bowing.

In a study of pairs of adult dogs, Sarah-Elizabeth Byosiere and her colleagues discovered that play bows serve to reinitiate play after a pause rather than to mediate offensive or ambiguous actions.[20] They also reported that 409 of 415 bows were used when the dogs could see one another. These results fit in well with, and complement, what

others have observed, in that bows are a sort of punctuation mark, a comma if you will, that is used strategically during ongoing play.[21] Many studies have shown that bows are not performed randomly, and this is related to how they may be used to maintain fair play.

HOW DO DOGS PLAY FAIR?

In dog parks, it's remarkable to watch dogs of vastly different shapes, sizes, speeds, and strengths playing together successfully, without conflict or injury. How do they do this? Dogs and other animals know they must play fair for play to work, so bigger, stronger, and more dominant dogs hold back through role reversing and self-handicapping. These trade-offs help to maintain fair play. Role reversing occurs when a dominant animal performs an action during play that would not normally occur during real aggression. For example, a dominant or higher-ranking dog, coyote, or wolf would not roll over on their back during fighting, but they will do so while playing. Erika Bauer and Barbara Smuts discovered that role reversals are not always necessary to maintain play, but they probably do facilitate play. They discovered that "role reversals occurred during chases and tackles, but never during mounts, muzzle bites or muzzle licks, suggesting that these latter behaviours may be invariant indicators of formal dominance during play in domestic dogs."[22]

Self-handicapping also can be used to maintain play and to keep it fair. For example, individuals of many species will inhibit the intensity of their bites during play, thus abiding by the rules and helping to maintain the play mood. Rolling over can be role reversing as well as self-handicapping, and different studies, not surprisingly, have produced different results. Rolling over is not a straightforward action, and no one should expect a simple one-to-one relationship in any behavior, especially one as variable as play. For example, Kerri Norman and her colleagues noted that supine postures, such as rolling over, could facilitate play in dogs and that none of the postures were submissive. Smaller dogs were no more likely to roll over than were larger dogs, and "most rollovers were either defensive (evading

a nape bite) or offensive (launching an attack). None could be categorized as submissive."[23] In this study, supine did not mean subordinate.

In contrast to these findings, Barbara Smuts and her colleagues note that older and bigger dogs "tended to end up as top dog during rollovers" and that rollovers could be defensive.[24]

Dog researcher Julie Hecht has also weighed in on the topic of rollovers:

1) When two dogs are playing, rollovers most often *facilitate* play. For example, a dog on its back often engages in playful sparring with another dog, delivering or avoiding neck bites, or engaging in open-mouth lunges. The researchers . . . found that the majority of in-play rollovers were part of *play* fighting (meaning the "fighting" was itself playful, not *real* fighting). The important takeaway is that rolling over during play is about play, it is NOT about "aggression." . . .
2) Another way to think about rolling over in play is as a self-handicapping behavior because it helps dogs of different sizes or sociabilities play together. Self-handicapping is instrumental to play, and it implies that a dog is tempering his or her behavior in some way. For example, during play, dogs do not deliver bites at full force, and a larger dog might roll over to allow a smaller dog to jump on or mouth him. In *Inside of a Dog: What Dogs See, Smell, and Know*, Alexandra Horowitz describes the behavior: "Some of the largest dogs regularly flop themselves on the ground, revealing their bellies for their smaller playmates to maul for a while—what I called a *self-takedown.*" . . . Self-takedowns can be a type of self-handicapping behavior that promote play.[25]

All in all, a lot more research has to be done on bows, role reversing, and self-handicapping. For instance, I received the following note from one early reader of this book indicating that rolling over isn't

always a benign play indicator: "I once had a 35-pound dog who loved yellow Labradors to the point that she would charge across the park to greet them—she was not a Lab. She also hated Rottweilers with singular passion. She would use rollover to expose her underside and entice them—and other dogs she found unacceptable to her—but as soon as they approached to investigate, she would flip to her feet and attack without fear or doubt dogs weighing 60 pounds more than her. What was she up to? How common is such behavior?"

I honestly don't know. And this is a perfect example of one of the major messages in this book, namely, beware the mythical dog. Not every dog plays fair, or not in every situation. Dogs make messes of prescriptive theories about how and why they do the things they do.

ARE THERE WINNERS AND LOSERS IN PLAY?

In their study of third-party interventions in play between littermates of dogs, Camille Ward, Rebecca Trisko, and Barbara Smuts discovered that littermates "use interventions opportunistically to practice offence behaviours directed at littermates already behaving subordinately."[26] They conclude that these sorts of interventions may help structure dominance relationships among littermates.

In my own research, I did not look at play bouts as having been "won" or "lost" mainly because they were not in any obvious way related to an individual's position in the social/dominance hierarchy, to the leadership of their group, or to their social status with the individual with whom they were playing. Giada Cordoni and her colleagues agree, based on their study of dogs at an off-leash dog park in Palermo, Italy. They note that, if anything, play plays a limited role in forming dominance relationships in dogs.[27] In his book *The Genesis of Play*, Gordon Burghardt has also noted that there are no individual winners and losers in play. Likewise, in their book *The Playful Brain*, Sergio and Vivien Pellis report that play fighting (also called rough-and-tumble play) does not appear to be important in the development of motor training for fighting skills in laboratory rats. And, along

these lines, John Bradshaw and Nicola Rooney have noted that when dogs play, there seems to be little desire to enhance social status.[28]

While writing this book, I wanted to know more about play and dominance, so I asked Dr. Sergio Pellis, a play expert. Along with his wife and various students, he has studied social play in a number of different species including rats, dogs, and Visayan pigs. He wrote to me in an email:

> I think that the data are there to show that an individual trying to dominate play leads to either escalation to serious fighting or to that individual being ostracized as a play partner (e.g., as shown in studies of children, rhesus monkeys, and rats). This means that there are rules the animals follow and monitor that keeps the play mood going and the play bouts relatively reciprocal. That I think is a fairly likely general principle.
>
> However, I think you are correct about the messes dogs make. It is clear that we are far from being privy to the individual dog's mind as to what is important to them in a playful contest, making any simple-minded theoretical prescription on our behalf [is] bound to be inadequate. Indeed, we have recently shown that across strains of rats there is a stable 30 percent role-reversal rate in playful contests, even though there can be marked strain differences in the combat tactics used. To me this suggests that while focusing on the actions themselves may be useful, it can also be misleading; actions can only be meaningfully interpreted when viewed from the participants' perspective. This is why I find using outcome measures to assess asymmetry as being limited in what they can tell us. *The dog has to view it as being asymmetrical, not the human observer* [my emphasis].[29]

In his email, Dr. Pellis uses the word "asymmetry" to mean that the dogs themselves have to view a social interaction as being unequal or unfair. Each participant, not the human who is watching them, would have to think their play resulted in a different outcome for each.

DO FAMILIAR DOGS PLAY DIFFERENTLY THAN UNFAMILIAR DOGS?

A few years ago, I was thrilled when Alexandra Weber, an eighth grader at a Boulder middle school, emailed me to ask if I would help her with a science fair project on play in dogs. After enlisting her mother, Lisa, and her younger sister, Sophia, to become her field assistants, Alexandra and I decided to focus on the question of whether familiar dogs play differently than unfamiliar dogs. Alexandra thought that simple question had been studied extensively, but it hasn't been. There are tidbits of ideas scattered about in the research, but no one has really studied this question in depth. For example, Patricia McConnell notes: "My observations suggest that dogs who are less familiar tend to play bow more to each other than familiar dogs do."[30]

Alexandra studied her two dogs—Tinkerbell, a highly social dog who loves to play with any dog, and Huggins, who is more picky about his playmates—as confederates in her study, which she conducted at a local dog park in Boulder. Alexandra discovered that play was more rough-and-tumble when familiar dogs play. When they know the dog with whom they're playing, dogs aren't as worried about formalities, and they jump right into play. All dogs in the study showed similar behavior, and they treated both dogs they knew and dogs they didn't know in almost the exact same ways as the dogs with whom I personally am more familiar. Overall, dogs who know each other play rougher and don't take the time to sniff and greet each other. Dogs who don't know each other are more formal and respectful, and they take the time to get to know the dog with whom they are about to play by sniffing and lots of nose bumping.

Obviously, this question needs further research, but I'm proud that Alexandra and her family became ethologists to help answer it, and her father also became much more interested in dogs. As they all told me countless times, it was a lot of fun to do, and they learned a lot about dogs and people at dog parks. And Alexandra won a science fair award for her research.

WHAT ARE THE RULES OF FAIR PLAY?

Research with domestic dogs provides a unique approach for exploring the evolution of fairness and justice. Not only are dogs descended from highly social canids, but they have also been bred for cooperative tasks with humans. Dogs act cooperatively in social play and are skilled on other social cognitive tasks. It's reasonable to ask whether dogs behave in ways similar to primates in other social contexts. In particular, do dogs perceive and respond to unfairness or injustice, a skill potentially borne of long-term affiliation with and selection by humans?

Play only very rarely escalates into real aggression. This is so in various settings. Based on extensive research, we have discovered that there are four basic aspects of fair play in animals: ask first, be honest, follow the rules, and admit when you're wrong. Dogs and other animals share these norms of play. When the rules of play are violated and when fairness breaks down, so, too, does play. Dogs and other animals keep track of what is happening when they play, so we need to keep track also.

Of course, dogs sometimes do break the rules, and studies show that cheaters are indeed "punished" in their own way. Cheaters are less likely to be chosen as play partners in the future, since other dogs can simply refuse to play with them and choose others. Infant wild coyotes who mislead others into playing so that they can dominate their partners have difficulty getting other young coyotes to play with them. This can have real effects, since some of these "cheaters" disperse from their natal group and suffer higher mortality. So, perhaps there are reproductive fitness consequences associated with being labeled as an individual who doesn't play fairly and obey the rules of the game. There isn't much information on this, but it would be fascinating to know just how robust this relationship really is.

In addition, these four rules of fair play are one reason that dogs are believed to possess a "theory of mind," or the concept that others have separate thoughts and feelings, which I discuss in chapter 6.

HOW OFTEN DOES SOCIAL PLAY ESCALATE INTO FIGHTING?

I'm often asked some version of the question, "How often does social play escalate into fighting?" Many people are quick to declare: "Oh whenever dogs play, it turns into aggression."

It doesn't. Play escalating to serious aggression is extremely rare, but when it does occur, it's an attention-getter, and these rare instances are often used to criticize dog parks and people whose dogs get nasty when play gets rough. People also ask how they can recognize the signs of play escalating into fighting, but it's difficult to come up with any hard-and-fast rules because so much depends on the individuals who are playing. Some variables include how well the dogs know one another, how much they've previously played, and perhaps their relative sizes. Thus, it is important to stress that it's essential to pay close attention to who the dogs are and how they typically play. Because escalation occurs so rarely, it's difficult to get enough data that can be used to make accurate predictions.

Although my students and I haven't kept detailed records on this aspect of play for dogs, we all agree that play hasn't turned into serious fighting more than around 2 percent of the time among the thousands of play bouts we've observed. Current observations at dog parks around Boulder, Colorado, support our conclusion. Additionally, my students and I observed about a thousand play bouts among wild coyotes, mainly youngsters, and on only about five occasions did we see play fighting escalate into serious fighting. Likewise, Melissa Shyan and her colleagues discovered that fewer than 0.5 percent of play fights in dogs developed into conflict, and only half of these were clearly aggressive encounters.[31]

Lindsay Mehrkam has also studied this issue in dog parks, and in an email to me, she wrote:

> In our study, we saw almost no serious fighting, and we witnessed only one observable injury stemming from play out of

> the over seven hundred play bouts we analyzed. Interestingly, we found a significantly higher likelihood of aggression/conflict in the smaller dog park than in the larger dog park (possibly due to crowding or relative inattentiveness of the owners, but certainly there are many other variables that could be contributing to that difference). So, what I've taken from our data is that inter-dog aggression certainly does happen in the dog parks, and can be a risk (as could any scenario where two or more dogs interact), but the data do not suggest that it is quite as prevalent as many trainers, etc., make it out to be.[32]

Of course, at times, a certain dog may get highly aroused and lost in play and simply bite too hard or slam too hard into their play partners, and this can result in an aggressive moment of varying intensity. I've also seen a dog get excited and rambunctious and, as a result, "get into the face of other dogs" when his human yelled something like, "Stop playing so roughly." All was fair and well before the human got involved. But these are exceptions that prove the rule, as it were. Play is founded on fairness and involves a good deal of cooperation among the players as they negotiate the ongoing interaction so that it remains playful. So long as the rules of play are followed, play fighting only rarely escalates into real fighting.

DOES GROUP SIZE INFLUENCE PLAY?

People often ask me how well dogs read one another when large groups are running around like they're in a daze. My answer is that while no one has carefully studied this yet, it seems as if they do it pretty well. Research of dogs during play and other contexts finds low levels of escalation, and the rapid-fire exchange of signals—those cocktails of composite signals—contain a lot of information about what is happening and what is likely to happen.

In an ongoing study I'm currently involved with, our preliminary data show two somewhat different conclusions. One is that group size doesn't seem to be a factor in the extremely rare occasions when

play escalates into fighting or aggression. There is no real difference comparing groups of two, three, four, and five or more dogs. Yet we've also noticed that play in large groups breaks down more rapidly than play in smaller groups. This happens not because play escalates into aggression but, rather, because the dogs can't always read one another as well in large groups, so play ends before a fight might ensue. I'm hoping that, as this study continues, more data will clarify just what is happening. Elisabetta Palagi and her colleagues have data that strongly suggest that dogs maintain a play mood based on rapid mimicry and emotional contagion, a building block of empathy.[33] Perhaps rapid mimicry and emotional contagion break down in large groups of dogs.

An interesting aspect of Dr. Palagi's study is that "the distribution of rapid mimicry was strongly affected by the familiarity linking the subjects: the stronger the social bonding, the higher the level of rapid mimicry."[34] This supports the conclusions of Alexandra Weber's science-fair project: familiar dogs play more quickly and roughly than unfamiliar dogs.

Play Means Improvising: One Size Doesn't Fit All

Play looks like a messy behavior, and it is. It's inherently variable, using a hodgepodge of actions from various other contexts. In other words, play is about improvising, and every dog improvises in his or her own way. As such, and as I've said, play makes messes of our prescriptive theories of why dogs do this or that when they romp around with their friends.

Clearly, much more research is needed on play behavior in dogs. I can tell you firsthand, studying play is fun, and I hope many other researchers will take play seriously. For example, in a fascinating research paper called "Beware, I Am Big and Non-dangerous!" Anna Bálint and her colleagues discovered that "dogs may communicate an exaggerated body size by the means of their growls during play, which may help in maintaining or enhancing the playful interaction." Since the growls of genuinely aggressive dogs "were proven to

be honest regarding their referential and size-related information content, our results gave evidence that exaggeration may work as a play signal in the case of animal vocalizations."[35]

Dogma about play doesn't work. Varying results are to be expected for a number of reasons. For instance, I recently was told that in a study of play in adult dogs that biting accompanied by head shaking was never observed. However, my students and I have seen it many times among dogs, adults as well as youngsters, and among wild coyotes, wolves, and red foxes of all ages. When I asked others about this, they, too, were surprised that it wasn't observed in the study. Why might this be so? Are we talking about the same behavior? Just recently I watched three dogs playing on campus, and they were jumping on one another's back and biting and head shaking rather vigorously. The guy who was with them told me that they play like this all of the time and never once has it escalated into an assertion of dominance. Yet to the untrained eye, it looked as if they really were beating the hell out of one another.

Comparative ethological studies on dogs and many other animals show that this variability is actually to be expected. Even ritualized signals like play bows will be used differently, depending on the individual dogs being studied, the social context, and the study conditions. The same is true for ritualized signals that are used in aggressive encounters. While they share certain features, they are used differently depending on the individuals who are quarreling and the context in which the disagreements are taking place. So perhaps some dogs simply do not bite and shake their heads from side to side.

Yet even variability has limits. One trend that emerges from all studies is that play bows are highly ritualized signals that have been shaped through evolution to be clear and unambiguous. They communicate either the intention to play or the intention to continue playing after an interruption. Dogs love to play, and so differentiating the desire to play from other intentions is extremely important to them. Thus, if we've learned just one thing from all the studies of dogs at play, it's that you don't bow if you don't want to play. *Canis ludens* also loves fairness.

FOUR

Dominance and the Society of Dogs

William, a seventy-five-pound mutt, arrives at the dog park each day around 7 A.M. Milly, a fifteen-pound mutt, usually arrives a few minutes before William (his human insists on calling him William rather than Willy, but that's another story). When Milly sees William, she immediately runs right at him, jumps up in an attempt to stand over him, and when she invariably falls off, she growls, runs around him, and in no uncertain way tells him that she's the boss. William, a gentle being, accepts it all as if a fly had landed on his thick fur, and he keeps on walking to meet his friends, both dogs and humans. Everyone loves him. Milly, on the other paw, continues jumping on William, circling him, growling, and running right at him and even bouncing off his side. Never has anyone seen anything more between these two dogs than these sorts of encounters. Milly never physically hurts William, and William never fights back or even seems annoyed. Milly clearly wants to control William, and she often successfully influences where he goes and with whom he interacts. It's safe to say she dominates him in her own gentle, but forceful, way.

Johnson (or Dr. J, as his human often calls him) is a petite mutt who truly defies any sort of classification as to which breeds he represents. He is a true control freak, like his human, who abashedly admits he is as well! Johnson has many friends at the dog park, and they always seem to be watching him—where he goes, what he's doing, and with whom he's interacting. Johnson, however, never seems

to watch other dogs at all. He freely walks around as if he's boss, clearly controlling where some of his friends go, and in this manner he dominates their movements with great finesse and subtlety. No one has ever seen Johnson do much more than strolling around: going wherever he wants, whenever he wants, and however he wants. No one has ever heard even a mild growl. The other dogs defer as if they're thinking, "Oh, it's just Johnson doing his thing."

I remember a few years ago how surprised I was when someone asked me, "Do you think dogs display dominance?" My first response was something like, "Are you kidding?"

Then I realized the person was not, and a valuable discussion followed. These conversations continue today. Many people ask me the same question, as the issue of dominance and dogs has grown into a heated, controversial topic, one that is fiercely debated and argued over among researchers, dog trainers, and the public.

For instance, a colleague shared with me what happened at a research conference on dogs a few years ago, writing: "Ah, the *D* word. One of my grad students gave a talk about dog play, in which she mentioned the *D* word because she was asking if dominance outside of play influenced what the dogs did during play. And the instant she said the *D* word, a woman stood up and began shouting at her, 'There is no such thing as dominance in dogs!' and a number of audience members clapped."[1]

In a similar vein, I was talking with a man named John at a dog park one day. He was quite friendly with me, but he got rather upset as he discussed a certain dog, Gabrielle, who ran roughshod over just about every other dog at the dog park. He said, "Gabrielle dominates all of the dogs here, and I'm sick and tired of it. Her owner doesn't do a damned thing about it, even when other people complain. I asked a trainer about it, and they said dominance does not exist in dogs. Well, if it ain't dominance, what the hell is it?"

I honestly don't see why there is any debate about whether dogs display dominance. I can't think of any animal with whom I'm familiar, whether human or nonhuman, who doesn't display some form

of dominance, including wild canids, and there is no reason whatsoever why dogs should be different from other animals. However, I've come to realize that there is a basic misunderstanding of what being "dominant" actually means among dogs and that the concept of dominance can be misused by people to justify harsh training methods and to punish unwanted behavior.

For instance, sometimes people will see "dominance" in any willful, excited, or aggressive act by a dog, such as if dogs hump, or jump on people, or pull on a leash, or growl over a toy. As dog trainer and journalist Tracy Krulik has written: "With this one word, we get a descriptor for pretty much every behavior dogs do that we would rather they didn't, and because of it, people stop investigating and ultimately have no clue why their dog does any of that stuff. What's worse is that because people use this word—which means to them that the dog is trying to show them up or is in some kind of power struggle with them—they punish the dog."[2]

In reality, some people acknowledge that dominance exists, but they argue that it's best to ignore this fact because it's misunderstood and misused by people, who then think that if dominance exists it's just fine to dominate dogs when they're training them. Meanwhile, some people genuinely believe dominance is a myth. Some claim that dogs are unique among mammals in not displaying dominance, while others claim that *no* animals display dominance. But these beliefs, for that's surely what they are, ignore detailed comparative data on the evolution of dominance in a wide variety of animals, spanning numerous and diverse vertebrates and invertebrates.

I don't see any reason to ignore facts. Rather, we should acknowledge what we know, and yet carefully distinguish how dogs relate with one another from how we relate with and treat them. Just because dogs (and other animals) form dominance relationships doesn't mean we should dominate dogs. So, let's begin by looking at the social hierarchy of dogs, and how dominance fits within it, and by defining what dominance is and what it isn't among dogs. This will allow us to explore how people misunderstand dominance in relationship with their dogs and why it has no place in dog training.

Let me stress that just because dogs and other nonhuman animals display dominance, this does not mean we should dominate dogs when we are trying to teach them to live in harmony with us and other dogs. We should always work in partnership with dogs with whom we share our homes and hearts. Taking this as one's mantra will serve well everyone involved.

Social Hierarchies of Dogs

Let's get right to the point: based on the large and growing amount of detailed comparative data from a wide range of species I mentioned above, I can assert that dominance is alive and well, so let's understand what it's all about. Dr. John Bradshaw and his colleagues correctly point out, dominance is all about relationships.[3] This is a major point I stress in this book about all sorts of social interactions.

In particular, dogs and their wild relatives display social dominance hierarchies, which includes dominance-submission relationships. In ethology, this fact is so well known and accepted it's like saying, "If I jump off my roof, I'll hit the ground." While I'm at it, let me dispel a few other myths. One is that dominant individuals always produce more offspring than subordinate animals. They don't. Another is that dogs don't form packs. They do. I've seen them, and dog packs are well documented in the detailed research by Roberto Bonanni and his colleagues on free-ranging dogs living outside of Rome, Italy, and by other researchers.[4]

Social dominance hierarchies are often called "pecking orders," a term that stems from the classic research conducted by Norwegian zoologist and comparative psychologist Thorleif Schjelderup-Ebbe on chickens. He was keenly interested in chickens and published his PhD dissertation on this work in 1921.

The renowned zoologist Edward O. Wilson, in his classic book *Sociobiology: The New Synthesis*, identified three different types of hierarchies: despotism, linear hierarchies, and nonlinear hierarchies. In despotism, one individual dominates all other members of his or her social group, and there is no rank differentiation among other

members. This can be expressed as A > B = C = D = E. Linear hierarchies are just what they sound like: each individual is submissive to the individual above and dominant of the individual below, like rungs on a ladder. This can be expressed as A > B > C > D > E, in which B > D and C > E, and so on. Finally, nonlinear hierarchies don't have a single individual who is above all others, and relationships among individuals don't follow a linear order. This can be expressed as A > B, B > C, C > D, D > E, and also E > A and D > B. There might also be "subordinate hierarchies," similar to dominance hierarchies.

Detailed research has shown that dogs form linear relationships. In "Understanding Canine Social Hierarchies," Dr. Jessica Hekman, referring to a study of a group of dogs in the Netherlands, reports that "this group was not particularly egalitarian. Division between ranks was nearly always strict, requiring a dog to greet his superior, even one just a single rank above him, with deferential behavior such as lowered body posture."[5] And, in agreement with the study I mention above by Roberto Bonanni, Dr. Hekman writes, "Indeed, the social hierarchy in this group did look ladder-like. Some species have a dizzying hierarchical structure, in which rank order may loop in an entirely nonlinear fashion. In this dog group, however, the hierarchy was strictly linear: if dog A was higher ranking than dog B, and dog B was higher ranking than dog C, then dog A would always be higher ranking than dog C. No weird circular messes—occasions, for example, when dog C was surprisingly dominant over dog A—were observed."

I've seen all types of dominance relationships in captive and free-ranging dogs, as have many other researchers. While these relationships can be stable, they can also rearrange themselves, though over time they almost always restore a linear order. Two dogs with whom I shared my mountain home clearly liked to boss around other dogs who lived up the road. They'd growl at them and try to get them to leave the area around my/our land. These confrontations never escalated into an all-out fight (though one time I thought they might), and there was no indication that any of the dogs was afraid of any of the others. Neighbors confirmed this. Yet when all five dogs were

around, it was easy to see a linear hierarchy. As in other animals, the formation of this hierarchy regulated the behavior of the individual dogs so they could play and cruise around without having to continually reassert their position in the group. Over time, the ranking order changed, but for the most part each individual simply accepted his or her place, and the group got on royally. Why waste time bickering when they could sniff to their nose's content and play until they were too exhausted to walk home?

A dog trainer once asked me how many animals it takes to form a linear hierarchy, since she had heard it takes a minimum of six individuals. This is not so, although I've heard this myth a number of times. Three animals can easily form a stable linear hierarchy. Over the course of three months at one dog park, Maude, Malcolm, and Maddie formed what others and I saw as a linear hierarchy, with only one altercation during the whole period of time: Maude, the leader, once growled and snapped at Maddie. My take on the situation was that they formed this linear relationship without fighting, and all three were quite content. They played roughly and excessively with never a hint that Maude was boss, and the relationship broke up when Maddie's human moved to another city. Maude and Malcolm continued on as if nothing had changed.

On many occasions I've seen two dogs growl at one another, accept where they fall in some sort of hierarchy, and play fairly with absolutely no indication at all that either was nervous about what was happening. I well remember a woman asking me, "How come Jessie always growls at Matilda, baring his teeth and all, and then flops into a play bow, and they play fairly to their heart's content?" I explained to her how bows and other play signals initiate and maintain play. As a voluntary activity, play requires cooperation and agreement, and it allows actions and behaviors that, in other contexts, might be perceived as threatening. Simply put, Jessie and Matilda both wanted to play, so they did, and when they played fair, nothing they did during play threatened their established relationship.

One possible reason that people misunderstand dominance among dogs, or claim that it doesn't exist, might be because dom-

inant dogs so rarely act in overtly aggressive, threatening, or domineering ways. Dominance displays are usually subtle, rather than combative and injurious. Further, as the stories of William and Milly, Johnson, and Jessie and Matilda show, dogs are comfortable within a linear hierarchy. It helps them get along.

Do Wolves Display Dominance?

Among scientists and the public, there's just as much confusion and conflict over whether wolves display dominance and over what social dominance means for wolves. Simply put, wolves do display dominance. Both wolves and dogs establish dominance-submission relationships, but they don't necessarily establish social relationships or form hierarchies for the same reasons or in the same ways. And there is no reason to think they would. Wolves are wild animals, and dogs are domestic animals whose welfare often depends on the humans they live with.

Wolf expert L. David Mech has been routinely misquoted about his views on dominance, for instance, with some believing that he claims dominance in wolves does not exist. But as he wrote to me in an email: "This misinterpretation and total misinformation has plagued me for years now. I do not in any way reject the notion of dominance."[6]

It's essential to correct the myths that are flying around, in part because some people claim that if wolves don't display dominance relationships, neither should dogs. Rather, Dr. Mech argues, as do others, that the notion of social dominance in wolves is not as ubiquitous as some claim it to be, but he doesn't reject it across the board. As Dr. Mech writes elsewhere: "Similarly, pups are subordinate to both parents and to older siblings, yet they are fed preferentially by the parents, and even by their older (dominant) siblings. On the other hand, parents both dominate older offspring and restrict their food intake when food is scarce, feeding pups instead. Thus, the most practical effect of social dominance is to allow the dominant individual the choice of to whom to allot food."[7]

Dog expert James Serpell also describes dominance among dogs and wolves as much less antagonistic than the public imagines. He writes: "When left to their own devices, free-living dogs and wolves do form and maintain social hierarchies, even though rank order within such groups seems to be maintained primarily by younger individuals deferring to their elders rather than by top-down physical enforcement by 'alpha' animals."[8]

To summarize, dogs and numerous other animals display dominance. Comparative data from detailed studies on a wide range of animals inarguably support this claim. Ideology and politics must be trumped with facts from rigorous research.

The *D* Word: What Dominance Is and What It Isn't

Some people like to dance around the *D* word because of a lack of understanding of what dominance or being dominant really mean to scientists when they discuss dogs. Synonyms include "controlling," "influencing," "managing," and "paying attention to others". In the most basic sense, researchers use the term "dominant" to refer to the relative position in a linear social hierarchy of certain dogs in relationship to others.

The term "dominance" does not necessarily define or refer to a specific behavior by dogs. A dominant dog may not engage in any injurious fighting or harm. Many animals have evolved behavior patterns and strategies to reduce the likelihood of injurious fighting, and all one has to do is go to a dog park and watch dogs to see that they can dominate one another without any physical interactions at all. A dog can control or influence the behavior of another dog in many ways, some very subtle, without any physical contact or harm. Nor do subordinate or submissive dogs necessarily suffer discomfort, isolation, deprivation, or abuse from other dogs because of their "lower" position in a social hierarchy.

Ethologists identify a "dominant" dog as one who controls or influences the behavior of another individual. How that influence

is exerted is as various as dogs themselves. A dog may influence the behavior of another individual by staring at them, moving toward them, vocalizing, displaying specific facial expressions and body postures, and so on, without any physical contact. Whether dogs are aware of the concept of dominance itself, they surely know when they are in control of a social interaction and where they fit in the social hierarchy of a group of dogs.

An important corollary is this: since there is no single behavior that defines dominance among dogs, behaviors only become dominant from the way they are used or the context in which they're used. A dog can do something in one context and it won't be an expression of dominance, but in another context, it could be. It is essential to look at the *relationship* between and among the individuals involved because dominance reflects relationships. It is contextual.

Having said that, what's the purpose of dominance among dogs? Dogs and other nonhuman animals dominate one another for a number of reasons. Individuals may dominate or control access to various resources, including food, potential and actual mates, territory, and resting and sleeping areas. They may seek the location within a group that's most protected from predators. They may want to influence the movements of others or get the attention of others. In fact, dominance interactions can be rare, though they do occur; that is why it's important to log many hours carefully observing known individuals. As researchers get to know individuals in a group, they also learn more and more about the subtle ways in which a wide variety of social messages are communicated, including those used in interactions in which one individual controls another.

Complicating the picture is the phenomenon of situational dominance. For example, a low-ranking individual may be able to keep possession of food even when challenged by another individual who actively dominates him or her in other contexts. I've seen this in wild coyotes, dogs, other mammals, and various birds. In these cases, possession is what counts. Indeed, instances of situational dominance, in which the established order is overturned in a specific way and for

a limited time, might make a human observer wonder: What's the point of being "top dog" if you can't get what you want all the time, or at least whenever you want it?

In essence, that presumption—that what dominance actually means is winning at the expense of others—is where some people make their first mistake about dogs.

When Dogs Play Tug-of-War, Are They Competing?

While I'm attempting to bust myths about dominance, let me consider a game in which many dogs partake, namely tug-of-war. Some claim tug-of-war is all about competition or dominance. However, when dogs play tug-of-war, they are not always trying to compete with or dominate one another.[9]

When dogs play tug-of-war, it's actually more complex and interesting than just being competitive. I've watched numerous tugs-of-war among dogs and wild coyotes. For example, when Molly played tug-of-war with her friend Charlotta, they'd run frantically about, each holding tightly onto the rope. Then one would let go and tease the other, and they'd run around some more, each holding the rope in her mouth. The game went on and on, with no obvious competition, end goal, or winner. Molly and Charlotta freely exchanged possession of the rope for minutes on end. They were friends, and clearly they enjoyed what they were doing.

Then again, on some occasions, dogs may actually be competing when they play tug-of-war. I once recruited some regulars at the dog park to help me collect data and analyze a hundred random tugs-of-war (out of the many I'd observed during different visits to dog parks). We came up with what can only be called preliminary data, but the evidence we found showed clearly that competition is one, but only one, explanation for what's happening when dogs play tug-of-war. For each example, I always had another person observing with me, to be sure both of us were on the same page about what was happening. Most of the people really enjoyed doing this, since it was part of an informal course on dog ethology, and they were eager to

learn more about their dogs. On only four occasions did my partner and I disagree as to what was taking place.

We were in agreement, though, that only seven times out of a hundred tugs-of-war was there a competitive element, and of these, there were six cases in which there were some growls and a clear indication that one dog wanted the rope all for her- or himself. But nothing came of these vocalizations. We only saw one instance where there was a strong likelihood that, if one of the dogs didn't give up the rope, there might have been a fight. None of the people who saw this considered anything close to what people call resource guarding. The rope was a good catalyst for play, and dogs used it to their heart's delight.

How did we go about performing this pilot study? First, a number of variables needed to be considered, including the relative size of the dogs, their social relationship and familiarity with one another, gender, context—what they were doing right before they began playing tug-of-war—age, and perhaps breed. We had information on all of these variables. We didn't observe any gender differences or breed differences, and many of the dogs were mixes.

We discovered that when dogs of different sizes played tug-of-war, they engaged in self-handicapping, which I describe in chapter 3. If the game was to continue, the larger dog had to restrain how hard she or he pulled on the rope. When a large dog pulled so hard so that the smaller dog couldn't play, the game usually ended. On one occasion, a large mutt pulled so hard he almost lifted his small friend off the ground. When the large dog saw what was happening, he dropped the rope, ran right at the smaller dog, skidded to a stop, and did a play bow. He wanted to play, and they did. Clearly, tug-of-war wasn't going to work with dogs who were radically different in size and strength unless there were compromises.

Familiarity also was important. When dogs such as Molly and Charlotta played tug-of-war, there were more exchanges and a willingness to let the other dog have the rope. When I asked people who saw these interactions, no one thought they indicated competition. More difficult to assess was how previous events—whether the dogs had been playing, just walking about, or were wired from other dog

encounters—influenced the outcome of tugs-of-war. However, once again, the impression we got was that if a rope was picked up during an ongoing play interaction, or right after one of the dogs had been playing, the play continued as the dogs yanked on the rope and exchanged it on the run.

In addition, tug-of-war between humans and dogs is also not necessarily about dominance. Not only can it be fun, but it also can be important in bonding and maintaining a positive and friendly relationship and training experience with your dog. In her book *Play With Your Dog*, dog trainer Pat Miller offers, "Tug to your hearts' content," and don't worry if your dog growls. It's all "part of the game," and if the dog's other behaviors are appropriate, "let him growl his heart out!"[10] It's perfectly okay to get down and dirty with your dog. Do some play bows, play tug-of-war, and keep your special relationship alive and growing.

To me, this tug-of-war study is a great example of how we need to observe dogs closely before assuming we know what their intentions are. Tug-of-war looks like a familiar human game, but dogs don't play by our rules, and we can get into trouble when we presume that they do.

Misunderstanding Dominance: People, Power Trips, and "Bad Dogs"

As I hope I've made clear, animal researchers and ethologists define "dominance" in dogs in a very specific, almost technical way, one that means something different than our casual understanding of the word. In everyday life, when people talk about "dominating the competition," they usually mean they seek a significant advantage over everyone else. The one who dominates "wins," and everyone else loses. Meanwhile, occupying a submissive or subordinate position is to "be a loser," to be hurt or weakened, and it can be a source of shame.

Is it any wonder, then, that people can fear being "dominated" by their dog? When they confuse these two meanings of dominance, people get into mistaken power struggles with their dog, thinking

they must act dominant in order to control their companion animal. Some dog trainers teach this explicitly, coaching their clients to impose their will on misbehaving dogs by force, if necessary.

For instance, let me share an email that Tracy Krulik wrote to me in response to an essay I wrote called "Dogs, Dominance, Breeding, and Legislation: A Mixed Bag."[11] Krulik wrote:

> As I continue to ponder the *D* word in relation to dogs, I realize that this goes beyond "training." The people who tell me their dog "is being dominant" are involved in a battle for power with the dog. They aren't thinking, "I'm going to dominate my dog to teach him." They're thinking, "My dog is so stubborn and is doing this bad behavior to show me," so I'll show him! So, in my mind, "dominance" has become a catch-all term for "my dog is doing something I don't want him to do, and he knows better!" And because people don't understand their dogs as "dogs"—meaning they don't know that dogs chew because they enjoy it or dig because it's a fun thing to do—they jump to the conclusion that the dog chewed their pillow because "he's mad at me for leaving him alone and he needs to be taught a lesson."[12]

In addition, a dog walking through a door first is not necessarily dominance. And neither are sitting on the couch, mounting, separation anxiety, or a dog getting you to rub her or his belly when you'd rather be doing something else.[13] People often conflate dominance with fighting, but there is no reason to do so. Numerous animals have evolved fairly unambiguous threat signals that say something like, "If you approach me or annoy me, I'll fight with you." Different actions are used to tell other individuals, "I accept that you're above me and that's just fine." Indeed, in some species, subordinate individuals benefit from just being part of the gang, and they accept their position willingly. Higher-ranking animals know that the integrity of the group depends on everyone getting along. Also, in a case like Johnson, he does what he wants to do and "controls" other dogs because they eye him carefully. He dominates their attention but not to

any specific goal. Primatologists have noted that some nonhuman primates also dominate others' attention, and they aptly call this the attention structure theory of dominance.

Another email I received perceptively shows how focusing on dominance can be misleading and can actually cause problems rather than lead to solutions. Any person who chooses to share their life with a dog needs to pay close attention to the context and social situations in which a dog behavior occurs, especially an unwanted one. I wish I could say that the situation described here is rare or unusual, but unfortunately, I've received a number of similar notes over the years, and this seems quite common:

> Had an interesting (and disturbing) encounter with an acquaintance on Friday. I walk into her shop and her German Shepherd is behind a barrier barking and jumping up. Friend walks back and shoos her away yelling, "Bad! Bad! Bad!" After the pup has quieted down, I ask Friend how old the dog is. "Oh, she's about eight, we think. She's the most nervous of all of the rescues I've ever had."
>
> I look at pup and see the prong collar around her neck.
>
> "She's terrible around people," Friend says. "Like when you came in and she was barking. She's just so dominant."
>
> I inquire about the prong collar, wondering how that might affect the dog if she is already "nervous."
>
> "We have no other choice," Friend says. "And even with it, I have to hold on tight and close in to me. She jumps on people, lunges at other dogs . . ."
>
> Friend then tells me that the pup was saved from a hoarding situation. "We're pretty sure that the reason she's so dominant all the time is that she must have been the most dominant at the hoarding house. That has to be how she survived and got food."[14]
>
> Here's my take on the situation:
>
> The dog wants to say hi when people come in. Her body was loose and relaxed, her tail was wagging, and she was jumping up—all prosocial behaviors. She's not jumping because she's

"dominant." She wants to greet people! And she's probably really frustrated that this barrier keeps her from doing so, hence all the barking.

We could very easily teach her to sit instead of jumping up on people, and even get her to where a person approaching is the cue for her to sit.

I haven't seen her on leash or around other dogs, but I would not be surprised if the prongs digging into her neck have created a negative association with other dogs. She's walking along, another dog walks by, she is eager to say hi and sniff, and so she pulls. The collar tightens on her neck, and OUCH! If that happens over and over, she eventually learns that "other dog" equals "OUCH!" So she sees other dogs as threats and responds accordingly.

If we add in the fact that the pup has underlying anxiety already, this leash reactivity/barrier frustration explanation becomes even more likely.

Dominant. Friend said this word five or six times in our five-minute conversation. She is located in a town where easily 90 percent of the dogs are trained by one school that employs pain and fear to teach dogs. Dominance is the root cause for every "bad" behavior, and dogs are punished because of it. I had forgotten how bad it really was there until I had this encounter.

For those readers who want to learn more about this issue, the *Journal of Veterinary Behavior* devoted a special issue in 2016 to the dominance debate, with a lead essay by Dr. Karen Overall.[15] I couldn't agree more with Dr. Overall's conclusion that "there is no justification for the most devastating advice given to people with dogs with behavioral pathology: that they 'dominate' their dogs and show the 'problem' dogs 'who is boss.'" Dr. Overall writes, "The concept of a 'dominant dog' is simply neither valid nor useful in our relationship with our companion dogs, and its application encourages behaviors that can cause morbidity and mortality for dogs and humans."[16]

Swedish dog trainer Anders Hallgren agrees with Dr. Overall and others about the lack of need to be bossy. He notes that people shouldn't worry about their dog taking charge and that there's no reason to show her or him that you're the boss. Being kind and loving work just fine. In her discussion of the hierarchy of dog needs adapted from Abraham Maslow's hierarchy of human needs, dog trainer Linda Michaels emphasizes the importance of force-free training, gentle care, and being nice to your dog as the most effective way to teach them what they need to learn to coexist peacefully with other dogs and with humans.[17]

When I'm at dog parks I hear "helicopter humans" saying—or yelling—"don't do that" or "stop that" or screaming "no!" far more frequently than I hear people simply saying something like "you're a good dog" or "thanks for being so well-behaved." People often wonder why I sometimes go up to a dog and say "you're a good dog" or, simply, "good dog" when they haven't done anything other than be who they are. Dogs, like people, like to be treated kindly and respectfully, and there's nothing wrong with some out-of-the-blue positive interactions to reinforce the friendship.

Teaching Dominance Is Bad Training

The main reason that dominance is such a controversial topic is how the concept is applied in dog training. With dog training, people aren't really arguing over science but over ideology, politics, and animal welfare. In other words, some trainers will say that, since dogs display dominance, people must learn to dominate dogs, even though this misunderstands the term. Meanwhile, others claim the opposite—that dominance does not exist in dogs (even though we know it does)—as a way to legitimize force-free training methods and to criticize aversive methods based on dominance.

To me, both sides get it wrong. Ethology makes clear that dogs display dominance, but that doesn't mean that dominance by humans has any place in dog training or teaching.

Let me repeat: training a companion dog lays the groundwork for

a lifelong relationship, and it should not be based on dominance but rather on mutual tolerance, understanding, and respect.

The misinterpretation of what dominance means for dogs results in dogs being abused by us, since people think that, if dogs dominate one another, it's perfectly okay for us to do it, too. This leads to what Jennifer Arnold calls the "because I said so" technique of training, which so often fails and doesn't result in "a fair and mutually beneficial relationship."[18]

Personally, I don't see how the "I'll show him who's boss" approach would ever improve a human-dog relationship. There's *no* reason that domination ever *has* to be part of any training program at all. Dogs also exhibit behavior patterns that indicate submission, appeasement, and uncertainty, and we must pay attention to, and respect, an individual's reluctance to do something, not force them to do it or regard them as intentionally "misbehaving" or self-consciously defying us. Tony Milligan provides an excellent discussion of these issues in an essay called "The Ethics of Animal Training."

Along these lines, Ilana Reisner writes, "The misinterpretation of 'dominance theory' as a basis for human-dog interactions thus led to its being accepted, absorbed and widely practiced among dog trainers and behaviorists justifying the need for discipline and often harsh methods in training and handling dogs."[19] When we understand and correctly interpret what dominance really is, there's no reason to use choke chains, prong collars, or shock collars.

Likewise, John Bradshaw and Nicola Rooney note that "there is a growing consensus that the concept of dog-human relationships being based on continually enforcing dominance status, for example during training, is not only ill founded, but also potentially detrimental to both owner safety and dog welfare."[20]

Dr. John Bradshaw has written powerfully on this issue, and in an email message to me, he raised the critical issues of misunderstanding, ethics, and the imperative of scientists to speak out:

> For me, the real issue is an ethical one, how concepts of "dominance" impact on the treatment of dogs by dog trainers and the

> owners they advise. . . . Many trainers use "dominance reduction" to justify the routine infliction of pain on dogs. For this reason, I believe that all responsible ethologists should take great pains to distinguish between their technical (and, of course, well-established) concept of dominance, as one method for describing social interactions, and the everyday use of the word "dominant," which denotes a tendency to be aggressive, threatening, and/or controlling. Many dog trainers use the two interchangeably, and some take great delight when academics appear to do the same. As a direct consequence, dogs suffer.[21]

If all of that isn't convincing enough, please consider the position statement put out by the American Veterinary Society of Animal Behavior (AVSAB) titled "The Use of Dominance Theory in Behavior Modification of Animals," which reads, in part: "The AVSAB emphasizes that the standard of care for veterinarians specializing in behavior is that dominance theory should not be used as a general guide for behavior modification. Instead, the AVSAB emphasizes that behavior modification and training should focus on reinforcing desirable behaviors, avoiding the reinforcement of undesirable behaviors, and striving to address the underlying emotional state and motivations, including medical and genetic factors, that are driving the undesirable behavior." This organization also is "concerned with the recent re-emergence of dominance theory and forcing dogs and other animals into submission as a means of preventing and correcting behavior problems."[22]

Is It Better for Dogs If We Pretend Dominance Doesn't Exist?

I fully understand the concerns of people who *know* that dogs and numerous other animals display dominance, and that there are dominant individuals, but who also are concerned about the use of dominance in training. Some well-intentioned people, including some trainers, argue that we should be careful about what is written about

dominance in dogs because the data might compromise dogs' well-being. They truly want to protect dogs.

For instance, psychologist James O'Heare presents a valuable detailed analysis of dominance in his book *Dominance Theory and Dogs*. He dedicates his book "to all dogs who have been mistreated as a result of the ideas of social dominance," and he concludes his book by writing, "In the end, in applied settings, I suggest dropping social dominance all together."[23]

While I strongly agree that the notion of social dominance has been, and is being, misused, and that dogs are suffering, I don't agree that the way to go forward is to pretend that social dominance among dogs doesn't exist. Instead, we need to accept social dominance for what it is and understand that it doesn't apply to training or teaching dogs.

Ethologists and other researchers will continue to study dominance in dogs, and this begs the question: What should we do with data stemming from scientific studies that show that dogs do form dominance relationships? The question of what we should do with the data can be answered in several ways. As with any legitimate, well-researched data, we should acknowledge the information. We should embrace the increase in our knowledge. This is the essence of science.

Yet there are also ethical questions. Namely, what do we do if the data are used to harm dogs? And if it is, is it acceptable to twist the truth to avoid that harmful use? These are moral and political concerns. They raise the issue of human actions and of our obligations to the well-being of dogs.

And that, I think, is the way forward, namely, to embrace both knowledge and our moral obligation to the well-being of dogs and of all nonhuman animals. If we do both, we will act in humane ways and slowly change the debate. Aversive, dominance-focused training methods are not based on science; they misuse science. Yes, dogs form dominance relationships, and individual dogs can be called dominant, but for dogs, dominance does not necessarily involve aggression. Further, the human understanding of dominance—which

can be applied in hurtful, manipulative, and punishing ways—is self-evidently harmful to dogs and other animals. We can respect science while also respecting dogs. There is *no* reason at all for us to dominate dogs in any injurious ways, especially not when our goal is to create a harmonious, healthy, loving relationship.

FIVE

Who's Walking Whom?

"Okay, Harry, I've got a meeting soon, so go pee and poop."

"Esmeralda, you have five minutes to play and do your thing before we leave."

"Come on, Ted, just pee and be done. Stop dribbling a little every ten feet."

"Sarah, stop spinning in circles and poop!"

"Oh, here we go. What's so special about this fence that you always pee on it?"

"Stop pulling, Stanford! You know I can't keep up if you run."

"You've sniffed that spot long enough. Let's go."

"Geez, can you please stop sniffing everything and just pee?"

"Why do you always have to have a pissing match before we leave?"

"We're going home and you'll just have to hold it."

Walking a dog is a daily, if not an hourly, job. It's a time for exercise, bonding, and fun—a boon for all. Or at least it should be. Swedish dog trainer Anders Hallgren emphasizes that dogs should get a

good mental workout when they're walking. I like to flesh this out as saying that a dog's senses need to be exercised just as their lungs and muscles need to be simulated. If you choose to bring a dog into your life, you accept that every day, several times a day, you will tether your companion to a leash and head outside, even when you'd rather be doing something else. I've always been amazed at how synchronous dogs and humans seem to be when they're walking either tethered or unattached, and it would be good to know if this is in fact the case. Perhaps there is more coordination than meets the eye, and dogs and their humans are learning one another's patterns of movement. This would be a very fruitful area of research.

But the real question is, who's walking whom? Or even better, who is the walk really for? It's obviously for the dog, but it's also for the person, who doesn't want their dog to pee and poop in the house, and who knows that a dog who doesn't exercise will become one high-strung pup and no fun to live with. The walk is for both of you. It helps maintain a harmonious household. Further, what happens during the walk reflects the personalities of the human and the dog, and how the walk is handled can strengthen or weaken that bond.[1]

It's important to keep this in mind because we live in a high-strung world. People often rush their dog along because they're in a hurry. Some days are more leisurely than others, but I have never in all my thousands of trips to dog parks, and in all my walks along dog paths, ever not heard a chorus of complaints like the ones that opens this chapter. People want their dog to take care of their business fast. They have other things to do. And they can't understand what takes their dog so long. What in the world are dogs doing, sniffing everything in sight?

So, this chapter asks: What are dogs doing on a walk? What do they need when they finally get outside? Elimination is just one item on *their* to-do list.

In chapter 2, I discussed a dog's most amazing organ and adaptation: their nose. Here, I will consider how dogs use their amazing noses to explore the world and negotiate their social milieu. It's a scent-filled journey, providing lots to ponder about how dogs sense

and interact in their odor-rich world. It's also important to appreciate how important walking and exercising off leash is to a dog. Dogs spend a lot of time tethered to a human, and to keep the leash from feeling like a form of bondage and a tug-of-war, it's helpful to consider the walk from a dog's perspective.

Relax the Leash: Dogs Need to Sniff

We've all seen dogs being dragged along by their human, who is saying something like, "Let's go, I've gotta go to work," or "Come on, there's nothing there." Well, the human might not smell anything, but I bet if they put their nose where their dog's nose is probing, they'd discover something: pungent odors that often indicate the passage of other dogs and perhaps how they were feeling. Humans often don't care about these other dogs, and they find the odors themselves disgusting, but dogs find them most lovely and extremely interesting. I've seen dogs literally using their legs to brake so they can continue taking in a most odiferous scent.

It's no news flash to say a dog's nose leads the way on many, if not most, forays. Many dogs spend an incredible amount of time at the end of a leash, and their nose sets the pace. I estimate that my dog Jethro, who was the main character in my "yellow snow" study, was off leash 99.9 percent of the time, and he sniffed and often peed around 25–30 percent of the time. This is in the range of the 33 percent the late Sophia Yin estimated for dogs on leash. This, then, is the major source of tension or conflict on most walks: people in a hurry pull their dog along whenever their dog's nose goes down to the ground, but taking in odors, and leaving their own scent, constitutes fully a third of a dog's agenda.

You might compare it to text messaging. By sniffing, dogs are getting the previous messages left by others, and peeing is, perhaps, a way of replying. Forcing dogs to walk when they are "texting" is like pulling a smartphone from a teenager's hand. I'm sure the dogs living along the mountain road where I lived were sharing messages throughout the day.

In a succinct summary of sniffing, John Bradshaw and Nicola Rooney write: "Dogs' great interest in sniffing urine-marks presumably stems from a motivation to gain information about other dogs within their home range. In addition to information about the sex and reproductive status of the producer of the urine-mark, dogs are also likely to be comparing the odor of scent-marks with the odor of dogs that they have sniffed during encounters—a form of scent-matching—thereby assessing the home ranges of those dogs."[2]

As with many other aspects of dog behavior, we still have much to learn about why dogs do what they do when they pee and what they learn as they sniff the pee of other dogs. But clearly, dogs want and need to sniff, so we should *let them sniff to their noses' content*! It's essential to let dogs use their noses, and if peeing follows, then so be it. Dog researcher and author Alexandra Horowitz warns that pulling dogs away from smell-rich environments, such as fire hydrants and tree trunks, can cause them to lose their predisposition to smell. When dogs are living in "our visual world," she says, "they start attending to our pointing and our gestures and our facial expressions more, and less to smells."[3]

On a visit to a dog park one day, a woman told me, rather seriously, that she thought that not allowing dogs to use their noses the way they want could cause serious psychological problems. I've thought about this a lot since then. We really don't know if dogs suffer psychologically when they're deprived and can't fulfill their need to sniff and pee if they choose to do so. Surely, when dogs are rushed along, they don't get to savor and properly assess and process various odors, and who knows what this does to them. This form of sensory deprivation might be devastating, since they lose detailed information about their social and nonsocial worlds.

Scent Marking: Canine Conversation

Of course, dogs often pee simply because they have to go, but peeing is also used for what ethologists call scent marking. When scent marking, dogs intentionally direct a stream or two of urine at a par-

ticular object or area, and this practice is widespread among numerous animals. It's possible that pooping is also a form of marking, but if so, then it's less directed or controlled. After all, dogs (and most animals) tend to poop less often and all at once; in contrast, leaving a shot of pee can be easy.

Marking is a form of communication, and the presence of multiple marks by multiple animals may amount to a type of conversation. By marking, individual dogs are saying things like, "This is my place and you better stay out." Or, "I'm in heat," or "I was here," or perhaps even, "I smell that you were here, and this is my way of saying I'm still around, too." I discuss some of this below, but we really don't know the extent of what dogs can communicate and understand through marking. My bet is that it's far more than we think.

Another puzzling behavior is when dogs and other animals on occasion scratch the ground after peeing or pooping. This might be done to spread the scent or to leave a visual mark on the ground, or an individual might scratch simply because he or she is wired. I've seen dogs pee or poop and scratch the ground with wild abandon, as people get covered by urine-soaked sand and grass, and on occasion splattered with fragments of poop. It would be good to know when and why dogs do this, since it might help us get out of the way.

While I was pondering all these questions about peeing, I wrote to Anneke Lisberg, who works out of the University of Wisconsin–Whitewater. She is an expert on canine peeing, and Dr. Lisberg kindly summarized some of the results of her recent studies, which I share below.[4]

WHAT DO DOGS LEARN BY SNIFFING PEE?

I've never met a dog who doesn't sniff and pee. Both genders, all ages save for newborns, every breed, and dogs of every social status will stop to check out the pee of other dogs. The reasons dogs stop and what they learn probably differs, and how long individual dogs investigate another dog's pee varies tremendously. Not all pee is equal. Or,

as we might expect, the messages or information pee conveys will be more or less important depending on the dog sniffing and who peed.

In summarizing her research, Dr. Lisberg wrote to me that "urine is used in part to advertise/detect the female reproductive state (especially of interest to intact males) but is also clearly used outside of this context. For example, intact males and females showed the same high interest in urine from unfamiliar dogs, and investigated male and female urine equally. Neutered males had little interest in the urine of intact female[s], but maintained their high interest in intact male urine."

Overall, this suggests that dogs smell urine to learn generally about unfamiliar dogs. While we don't yet know most of what they are likely able to detect, this appears to be an important part of how they get to know each other. Allowing dogs to take their time getting to know each other's marks (prior to face-to-face interactions) might therefore help dogs have smoother introductions, giving them more social cues to guide their behaviors. This applies to dog parks (can we build them with secluded entryways that let them sniff in private before joining the mob?) and introducing new dogs to homes.

Another interesting idea was put forth by Anneke Lisberg and Charles Snowdon when they reported that "gonadal hormones may affect urine investigation patterns both by increasing sexually motivated urine investigation in males and by creating signals in urine that allow assessment of potentially risky conspecifics."[5]

WHAT ARE DOGS DOING BY SCENT MARKING?

It's harder to say for certain the exact messages that dogs intend to leave when they mark. That is, pee may say a lot about the dog who left it, but is there sometimes a deliberate message that one dog means to send to other dogs? Research suggests yes. Dogs advertise their own social status, females advertise their reproductive status, and dogs may be defining their territory. Dogs don't advertise casually or randomly, either. Marking varies depending on who's doing the marking and on who marked before.

As Dr. Lisberg says: "High-status free ranging dogs and high tail-base-position companion dogs show similar patterns—high-status males and females mark, countermark, and males in particular overmark unfamiliar urine more than low-status/low-tail dogs. This basic pattern is seen in many other mammals as well."

If marking behaviors change over time, might this be an indicator of relationship changes? If we let dogs work out their relationships with marking before they meet face to face, can we decrease the occurrence of aggressive encounters? Too soon to tell, but there is potential here!

Dr. Lisberg went on to write:

> A urine mark has more to it than smell! High-status dogs also mark more frequently, so just encountering a signal more often (or first) could help enforce the validity of the status, since a low-status dog might be less successful at defending a space or covering/displacing other marks. My unpublished data suggest that this (mark frequency or order) may be an important part of the signal itself. Similarly, being the "top mark" (urine placed as an overmark) might enhance the validity of a high-status signal (again, high-status males in particular seem to use overmarks). The effect of mark location ("over" vs. "under") on response to the mark has been studied beautifully in several rodent species, and I am finishing data collection now on a habituation test that should determine whether overmarks a) hide the previous signal, b) blend with the previous signal, c) create a "bulletin board" in which each mark is considered similarly but distinctly, or d) be given preferential or more significant attention than the previous signal.

Dr. Lisberg's takeaway message also is rather important: "Urine marks are really complex signals, and dogs seem to be far savvier than most owners seem to think when it comes to deciding what to sniff (and for how long) and what to countermark (adjacent or overmark). When we walk our dogs, all we notice are the big responses, but we don't see the likely *many* signals that they are ignoring or

avoiding. For the most part, dogs are not wantonly running around and sniffing and urinating on everything (despite appearances to the contrary), but rather appear to be making decisions about what marks are important to pay attention to and whether and how to respond."

In a study of scent marking in a pack of free-ranging dogs outside of Rome, Italy, Simona Cafazzo and her colleagues report that "both males and females utilized scent marking to assert dominance and probably to relocate food or maintain possession over it. Raised-leg urination and ground scratching probably play a role in olfactory and visual communication in both males and females. Urinations released by females, especially through flexed-leg posture, may also convey information about their reproductive state."[6]

There is so much still to learn about marking among dogs. It's more complex and common than we might guess, yet as with the study of play, "simple" ethological approaches to urination patterns can produce extremely interesting and useful results. As the story below makes clear, we can sometimes start with the dogs in our own house.

ARE COUNTERMARKING PISSING MATCHES ABOUT TERRITORY?

People often ask me if dogs mark territorial borders as do their wild relatives. They wonder if canine pissing matches, or as Tracy Krulik calls them "sniffaris," mean something like, "This is my place!" While some people claim dogs don't mark territorially, it's premature to say they never do. In fact, I've seen free-ranging dogs on my mountain road behave just like wild coyotes and wolves when they mark territorial boundaries. These dogs will pee, scratch the ground, look around to see if others are around, and then pee some more. On occasion, they'll lift a leg and not urinate, and then they walk a few feet and immediately lift a leg and pee. The same thing was observed among free-ranging dogs in Italy by Simona Cafazzo and her colleagues. John Bradshaw and Nicola Rooney note: "Among free-

roaming dogs, males may urine-mark as a component of territorial behavior, while females mark most frequently around their den sites."[7]

Dr. Lisberg writes: "Location of urine marks on territory boundary as indicating 'territory boundary marking' or 'territory defense' is always an interesting measure to me—most studies can't/don't differentiate between 'first' marks placed on boundary vs. marks that might be countermarks. Territory boundaries are also places where encountering a mark from a member of a different social group is also more likely, so are they marking their territory boundary because they are making a 'fence' or 'signpost' showing where their territory boundary is, or are they just countermarking unfamiliar urine that they encounter on their territory? Of course, these are certainly not mutually exclusive in function, but it's a factor I think that is worthwhile to tease out in future studies."

I agree. There still is so much to learn about peeing and pooping by dogs, and dog parks are great places in which to do these studies.

Pissing matches don't always take place outdoors, however. My cycling teammate John Talley and his wife, Tyla, were understandably quite concerned about a continual pissing match between their two dogs, Rigby and Bodie. Bodie is Rigby's father, but Rigby joined the Talley household first. Once Rigby was nicely settled in, Bodie arrived, and soon after, Bodie started peeing in the house. Even though Rigby was already house trained, once Bodie started peeing inside, Rigby did, too. Plus, it turns out that Rigby always has to have the last pee, and he will pee right in front of Tyla, she told me. No shame there!

In addition, Bodie will ground scratch after peeing, and this has become part of their ongoing pissing contest. Tyla told me that Rigby never ground scratched before Bodie came along, and now Rigby does it regularly, even if Bodie isn't around.

Is this a territorial battle? Is Bodie just doing what dogs do in a new habitat, and is Rigby, into whose home Bodie intruded, just "defending" his place? I honestly don't know. I've seen hundreds if not thousands of pissing matches over the years, but all of them were outdoors. Dr. Lisberg notes, and I agree, that it's a testament to dogs'

social skills that so many dogs are thrown together at our whim, and they are able to work out sharing space in a home without resorting to pissing matches or duking it out.

What the Talleys observed is often called overmarking or countermarking, and we don't know all the reasons for it. I'm often asked if males overmark or countermark more than females. As I tell people, according to one study that focused on these behavior patterns, it's not as straightforward as it may seem. In their study, Dr. Lisberg and Charles Snowdon reported that "males and females were equally likely to countermark and investigate urine and countermarks made up a similarly large portion of countermarking for males and females."[8] Dr. Lisberg told me that

> males accounted for more marks and countermarks at the dog park than females—marking males were more like energizer bunnies who just kept marking. While a typical marking female might urinate once or maybe twice and be done, a typical male marker might urinate two to three times or more. So total percent of urine marks would have been strongly male biased, as seen in other studies. Within each sex, again, higher-tailed females marked more times per dog than low-tailed females, and higher-tailed males marked more times than low-tailed males. The lowest-tailed males and females didn't countermark at all, and the lowest-tailed females didn't urinate at all in the entryway.

Once again, if you don an ethologist's hat at the dog park, you can learn a lot about dog behavior and conduct "citizen science" along the way.

DO DOGS PREFER TO LIFT ONE LEG MORE THAN THE OTHER?

If you've ever walked a dog, then you know your life would be made much easier if you knew which leg your dog was most likely to raise

in order to pee. People ask me this question often, and it really depends on your dog. The bottom line is that it's impossible to say there are population differences in leg preference. Dogs are ambilateral (they are able to lift both legs), as shown in an experiment by William Gough and Betty McGuire. However, an individual dog might show a preference for lifting one leg rather than the other, and you could factor this in when deciding on which side of the street to walk your dog. Gough and McGuire concluded: "Assessing motor laterality for a natural hindlimb behavior in dogs during walks has both advantages and disadvantages, which include ease of observation during a positive experience for the dog and the challenge of obtaining sufficient scores for each dog."[9]

WHY DO DOGS SOMETIMES LIFT THEIR LEGS WITHOUT PEEING?

This is a question that comes up a good deal. It's usually males who do this. Simona Cafazzo and her colleagues suggested that raising a leg to urinate, with or without urinating, could indicate that a dog is ready to engage in a conflict if need be.[10]

To learn more about this behavior, often called dry marking, my students and I studied urination patterns in two populations of free-running dogs, one on the campus of Washington University in St. Louis, Missouri, and the other in and around Nederland, Colorado, a small mountain town about seventeen miles west of Boulder. Twenty-seven males and twenty-four females who were not in heat, all individually identified, were observed. Marking was distinguished from merely urinating in two main ways: the urine was aimed at a specific object or area (it had what ethologists call directional quality) and generally less urine was expelled during marking. We also scored the frequency of occurrence of what we called the raised leg display that occurred when a dog raised his leg but did not deposit any obvious urine.

The results can be summarized as follows:

males marked more than females and at a higher rate (for males, 71.1 percent of urinations qualified as marking; females, 18 percent);
males ground scratched significantly more than females after marking and males did it significantly more when other dogs could see them do it;
both males and females marked at the lowest rate in areas in which they spent the greatest amount of time;
seeing another male dog mark was a strong visual releaser for urine marking by males;
sniffing did not invariably precede marking by either males or females;
the raised leg display appeared to function as a visual display;
and males performed the raised leg display significantly more frequently when other males were in sight.

We concluded that the raised leg display might be a ploy by which one male gets another male to use his urine, since it was a strong visual releaser or trigger for urination by other males. We also concluded that we need to pay more attention to the visual aspects of the postures and behavior patterns involved in the deposition of scent, in this case urine. What has been accomplished by observing dogs can serve as a model for studying other species.

DOES THE SIZE OF THE DOG MATTER?

You might not think that size matters, but it's possible that it might be in relation to peeing, at least in shelter dogs. In a study called "Scent Marking in Shelter Dogs: Effects of Body Size," Betty McGuire and Katherine Bernis found that "small dogs urinated at higher rates and directed more urinations than did large dogs." They hypothesized that "small dogs favor urine marking over direct social interactions because direct interactions may be particularly risky for them."[11]

I never really thought about this possibility. As noted above, Dr. Lisberg thinks that dogs might be avoiding conflict through sniff-

ing and marking, and here is another wonderful and important topic that can be studied in nonshelter dogs at the dog park to learn just how robust these results are. I've often wondered if dogs who have to lift their heads to get a good or better whiff of pee know that a larger dog left it. Perhaps size does matter, after all.

WHY DO DOGS ROLL IN STINKY STUFF?

At the dog park, every now and again someone shouts a warning to others, like, "Oh my, Brutus just rolled on another dog's turd. Watch it! He's pretty proud and is trying to let everyone know what he just did." Dogs roll in poop and all sorts of "disgustingly awful" stuff, as one person put it. If I'm there when this happens, someone usually turns to me and almost pleads, "Why do dogs do this?"

Unfortunately, we really don't know why dogs roll on stinky stuff. Some dive in like it's their dream come true. Some people say it's because dogs want to mask their own odor by taking on a more pungent odor or one that's more prevalent where they are, whereas others say they're trying to spread their own odor around. Judging from what I've seen, dogs usually roll in things that are far smellier than they are, and like Brutus, they often want everyone to know what they just did. Lending credence to the theory that they're trying to mask their own odor, research suggests that red foxes appear to roll on scent left by pumas (mountain lions) to mask their own scent so as not to call attention to themselves and confuse predators.[12]

Some people really get into analyzing this issue. For example, Greg Coffin, who lives in Northern California, came up with a rolling rating system for his dog, Sophia, about whom there is an interesting and popular video.[13] As Coffin wrote to me: "On our walks on and around the beach, there are many delightful things my Rhodesian Ridgeback enjoys rolling in. She does it frequently enough that I have developed a simple rating system, classifying the nicest to the nastiest. Dead birds are the best you can hope for. A little musty, but nothing too gag-worthy. Fish, just really fishy. Land mammals are

next. A special kind of vulgarity. Yes, it escalates quickly. But the crème de la crème are dead sea mammals. They're full of all that rotting blubber, slathered in delicious fatty oils."[14]

What can I tell you? This probably isn't related to scent marking, but it definitely satisfies some important need in dogs to smell, in every sense of the word.

Sometimes You Just Have to Go

Dogs like to pee and poop, and people like to talk about their dog's pee and poop, as if they're freer to discuss these usually off-limits topics so long as it's about their dog. If you visit a dog park, expect to hear a lot about elimination. In his book *Off the Leash: A Year at the Dog Park*, Matthew Gilbert notes that "poop was more of a thing at the park than I had expected."[15] Gilbert himself gets into the spirit of all the poop, describing a "stray bowel movement" as a "voluminous and frozen still life."[16] Alexandra Horowitz writes about pee as graffiti, and one can say the same about poop, which is messier and more obvious to human eyes and noses.[17]

A few people have asked me if dogs really do like to poop. I don't really know. One woman told me that she was sure Ishmael, her dog, enjoyed pooping, and that's why he was always asking to be let out. Certainly, people sometimes enjoy pooping, so it is possible that dogs enjoy it, too! Some dogs also like to sniff poop and then share the scent and perhaps saliva with their human as if it's simply business as usual. Stephanie Miller, one of my friends in Boulder, lets her and her mother's dog, Smoochie, clearly know that "if you sniff poop, you kiss me later." I don't blame her for taking this point of view, having lived with a dog who thought it was great to sniff and share in rapid succession.

Unlike pee, however, there is less evidence that dogs use poop to deliberately mark. In a study of scent marking in a pack of free-ranging dogs outside of Rome, Italy, Simona Cafazzo and her colleagues report: "Our observations suggest that defecation does

not play an essential role in olfactory communication among free-ranging dogs and that standing and squat postures are associated with normal excretion."[18]

One of the most interesting and unexpected poop question I've been asked is: "Why don't animals need toilet paper?" The simple answer is an anatomical one: they don't need it because they can poop without soiling themselves.[19]

Finally, here's another fascinating tidbit. Did you know that many dogs line up with the earth's magnetic field to poop and pee? I surely didn't! However, I'm certain that many people have seen dogs work hard to orient themselves before they do their business. More to the point, an analysis of more than seventy dogs representing thirty-seven breeds showed that dogs "preferred to excrete with the body being aligned along the North-South axis under calm MF [magnetic field] conditions." When the magnetic field was thrown out of whack, the dogs were "less picky about their crapping preferences."[20] However, we really don't know why many animals show a preference for this orientation in different situations, including defecating, sleeping, and hunting.[21]

After I read this phenomenon, I tried to confirm its validity, as did a few people at a local dog park. The data we collected were ambiguous. We observed three dogs who would pace here and there before peeing or pooping, and they wound up pretty much aligned to the north-south axis. One woman asked me if I knew if this is why so many dogs move around or circle when getting ready to pee or poop, but I really don't know. When nature calls, it calls and dogs don't always have to time to assume the position. I suggested that the woman study it, but she never did.

Off leash: Walking, Running, and Playing

For a good number of reasons, people most often walk their dogs on leash. Dogs need to be protected from cars, for example, and from animals who might harm them, and they also need to be kept from

jumping on people or harassing other dogs. There really are a lot of demands imposed on dogs, day in and day out. What we ask or demand of them can be quite stressful. It might sound odd, but many dogs who are fortunate enough to share their life with a human are stressed, a point highlighted in Jessica Pierce's book *Run, Spot, Run* and in Jennifer Arnold's *Love Is All You Need*.

Most dogs love exercise, and this is the other main reason we take dogs for a walk. This is also a main reason for dog parks. They provide a protected space where we can let dogs run off leash, rather than having them pull our arms out of our sockets if we don't keep up.

The lack of suitable exercise can be a stressor. Exercise is how dogs relieve that stress and stay physically healthy. However, not all dogs love exercise, or not all the time. How much exercise is enough, what kinds, and whether being off leash makes a difference varies among dogs. You must get to know your dog and what she or he needs to be happy and healthy. As you learn more about your dog as an individual, you can tailor their exercise regime to what they indicate they need. The dogs with whom I shared my home varied in how much running here and there was necessary to keep them content. Mishka, a rather large malamute, was happy with a half-hour romp in the early morning and a shorter one in the evening. Jethro, a wired mutt, loved it when I would walk or jog the four miles down to town with him around six in the morning, and this eight-mile round-trip journey satisfied him until late in the afternoon, when, once again, we'd head out for a couple of miles.

Even when the dogs with whom I have shared my mountain home became elders, they'd love to take strolls in the mountains, on their own terms, and when they just didn't feel like it, they clearly let me know what they wanted. For example, when Jethro became a senior dog, he would walk up the road, sniff here and there, say hello to dog and human friends, and come home. Sometimes he'd just go outside, eat, and go to sleep. Whatever he wanted he got, and believe me, I know I was incredibly lucky to live in a place where dogs could freely roam.

In the end, we humans have to pay attention to what each indi-

vidual dog needs when we tether and walk them. At a minimum, we should let their noses lead the way. Like it or not, dogs are captive to our every wish, and we need to be sure we're not depriving them of vital activities, sensory stimulation, and communication. When it's dog-walk time, let your dog set the pace.

SIX

Minding Dogs

In August 2016, Mary Devine shared with me this lovely story about her dog Meeka, which is an excellent example of citizen science and some of what goes on in a dog's mind:

> My husband and I "adopted" a puppy from a shelter. We named her Meeka and brought her home when she was about three months old. Meeka was a Doberman, shep, lab, chow mix: the vet called her a "Heinz 57" dog. She weighed fifty pounds as an adult dog.
>
> Meeka was a highly intelligent and "territorial" dog. She had a tremendous receptive vocabulary (somewhere in my journals I wrote down the hundreds of words she understood). She learned and could follow multistep commands: it was second nature to me to say, "Meeka, you need to pick up your toys." She, in turn, would pick up her toys, one by one, depositing them in her toy box until the floor was cleared. Although I understand dogs don't see color (at least as we do), she could be told to "pick up your blue ball" because she had learned other differentiating traits of the "blue ball."
>
> Meeka was extremely territorial. She would walk the perimeter of our yard and, with limited instruction from us, NEVER leave the yard: not to follow an errant ball, not to chase a much-hated cat, etc. It wasn't uncom-

mon to have cars screech to a stop if a ball rolled onto our street with her in pursuit—only to have Meeka screech to a halt at the edge of the yard.

Once, when we visited my parents' house in another state, we put Meeka in the backyard and headed out for lunch. When we got home, Meeka was sitting on the front step of my parents' house. A neighbor immediately came over and described the scene: He was so nervous because he saw that Meeka had gotten out of the backyard. He watched her walk the limits of the front yard, then she sat at the front doorstep, waiting for us. Needless to say, he was amazed!

After all these tales, though, Meeka's most wondrous gift was her acceptance of our daughter. When Meeka was three years old we had our daughter. Friends of ours said things such as, "That dog is going to eat your child." This was based on the ferocity of Meeka's bark and her protectiveness and attachment to me and my husband.

My husband became a little worried, so as a freelance writer, he managed to wrangle an assignment with (I think it was) Better Homes & Gardens about how to prepare the dog for the homecoming of a baby.

The most significant points we learned (through him talking to dog experts) was: 1. We brought home our daughter's smell to Meeka before we brought home our daughter; and 2. We ignored Meeka when Sarah was asleep, but gave Meeka all sorts of attention when Sarah awakened (and throughout her being awake). Within ONE DAY, every time Sarah cried from her crib, Meeka's tail would wag and she would wait at Sarah's door (we taught Meeka to stay out of Sarah's room) until we got Sarah up. It was the beginning of a magical relationship.

Finally, one of Meeka's favorite pastimes was to tug at a "sockie" with us; she was really strong and could practically yank our arms out of the socket! When Sarah was ten months old, and was just beginning to stand independently, we could be playing the most vicious sockie tug game with Meeka, then hand the sockie to Sarah. Immediately Meeka would hold the sock in her front nibbler teeth, very gently. NEVER ONCE IN SARAH'S LIFE DID MEEKA KNOCK SARAH OVER OR PULL HER DOWN. Seriously, for the time they spent together and the seriousness of their play, it was miraculous. Back to the sock: it was amazing that Meeka didn't overdo the sock tugging, but what was more amazing is, Meeka in-

creased her "tugging" as Sarah was able to handle it. As a five-year-old child, Sarah was overjoyed to hold the sock and have Meeka drag her across the kitchen floor![1]

The phrase "minding dogs" means attributing active minds to these amazing beings and fully recognizing that they are not robotic machines. It also means that we must take care of them and give them the best lives possible, a point I stress in my book *Minding Animals*, which concerns all types of animals. There's a lot of interest in the emotional lives of dogs from a wide array of people, including young students, because an understanding of what dogs feel is central to giving them the best lives we can.

For various reasons we often "unmind" nonhuman animals—we make them out to be less intelligent and less emotional than detailed research in cognitive ethology shows them to be. However, we rarely do this with dogs.[2] Indeed, we often embellish dogs' abilities by attributing special powers of knowing and feeling to them, but there's no reason to do this because, as detailed empirical research has shown quite clearly, they are, in fact, smart and deeply emotional beings.[3] All animals are smart in their own ways, to serve their own needs, and they demonstrate this intelligence all the time, if we only mind them enough to see it.

Fred Jungclaus, writing about his dog, Smokey, captures this well: "I used to look at Smokey and think, 'If you were a little smarter, you could tell me what you were thinking,' and he'd look at me like he was saying, 'If you were a little smarter, I wouldn't have to.'"[4]

Canine Intelligence: "Smart" Dogs versus "Dumb" Dogs

In a 2013 interview in *Scientific American*, Dr. Brian Hare, coauthor, with Vanessa Woods, of *The Genius of Dogs* and founder of the Duke Canine Cognition Center, was asked, "What is the biggest misconception people have about the dog mind?"

"That there are 'smart' dogs and 'dumb' dogs," replied Dr. Hare. "There's still this throwback to a unidimensional version of intelligence, as though there is only one type of intelligence that you either have more or less of."[5]

Dr. Hare is right on the mark. There are multiple intelligences in dogs and other animals, and individual differences are to be expected. Differences are the rule rather than the exception. Research has shown that many different variables can influence a dog's performance in laboratory settings, and I often wonder how the data collected in controlled experiments transfer to dogs in real life, as dogs run around at dog parks and other venues and cope with changing social contexts and physical environs.

The word "intelligence" generally refers to the ability of an individual to acquire knowledge and to use it to adapt to different situations and do what's needed to accomplish various tasks and to survive. A friend of mine once told me about the free-running dogs she knew in a small town in Mexico who were cleverly street-smart and could survive in difficult conditions, but they didn't listen to humans all that well. Some were skilled at finding and snatching food and avoiding dogcatchers, unfriendly dogs, and people. Some were good at "playing" humans for food, whereas others weren't. Conversely, I've known some intelligent, crafty, and adaptable dogs who weren't street-smart and likely couldn't make it in such an environment. However, a few with whom I shared my home could easily steal my food and that of the other resident dog in a heartbeat, without either of us knowing what was happening.

Which dogs were "smarter" and which "dumber"? Neither, of course. Relatively speaking, these dogs were equally intelligent, but they adapted their smarts to different circumstances. Outside those contexts, they might appear quite "dumb" to us. I've lived with and met enough dogs to know that saying one is smarter than another is usually a mischaracterization of who, as individuals, they truly are.

In January 2017, Jan Hoffman wrote an essay in the *New York Times* called "To Rate How Smart Dogs Are, Humans Learn New

Tricks."[6] Two quotes there by Dr. Clive Wynne, an Arizona State University dog researcher, caught my eye: "Smart dogs are often a nuisance. . . . They get restless, bored and create trouble" and "I think 'smarts' is a red herring. . . . What we really need in our dogs is affection. My own dog is an idiot, but she's a lovable idiot." Sure, smart dogs can be a nuisance, but so too can dogs whom we believe are not all that clever. I've seen this over and over again. All sorts of dogs become a nuisance to us for all sorts of reasons, but it's not because of their levels of intelligence. The same is true regarding affection: all dogs, relatively speaking, can be equally affectionate, and this has nothing to do with smarts. These value judgments reflect us, who we are, and what we want from our dog. They arise from the particular success or frustrations that humans encounter as they interact with particular dogs, but they don't reflect a common truth about who dogs really are. When dogs are experienced as a "nuisance," it's usually because their human simply doesn't understand what their dog is doing or trying to tell them. Because there are different types of canine intelligence, I'm not sure what it means to talk about smart and not-so-smart dogs.

But people still ask me, What about dogs who truly act like idiots? Aren't there really dunce dogs? Once again, we need to be careful about characterizing dogs in this way. One of my favorite quotes about how we refer to other animals comes from the Hungarian anatomist János Szentágothai, who famously remarked, "There are no 'unintelligent' animals; only careless observations and poorly designed experiments."[7] We've known for a long time that dogs aren't brain-dead beings.[8]

In this and the next chapter, I review some of what we know from detailed cognitive ethological research (the study of animal minds) about just how smart and emotional dogs are. It's impossible to review all of it, but I'll try to answer the common questions I often get asked as I stand with people at a dog park, when I meet people walking dogs on the street, and even when I sit with folks over meals, and we stop to watch dogs doing their thing.

DO DOGS HAVE A THEORY OF MIND?

One of the hot topics in ethology and animal research today is trying to figure out if nonhuman animals have what is called a theory of mind. That is, do nonhuman animals know that other animals have their own thoughts and feelings, ones that may be different than their own and that they can anticipate and account for? A good deal of "higher" thinking and more complex emotions depend on having a theory of mind, so confirming this could open the door to confirming much else.

With dogs, evidence is increasingly showing that they probably do have a theory of mind, and one of the main ways we've discerned this is through research on dog play. When dogs (and other animals) play, there is a good deal of mind reading going on. Dogs note where others dog are looking—they confirm whether other dogs are paying attention to them—and they have to make careful and rapid assessments and predictions of what their play partner is likely to do.

Consider two dogs, Harry and Mary. Each needs to pay close attention to what the other dog has done and is doing, and each uses this to predict what the other is likely to do next. Alexandra Horowitz has studied how dogs pay attention to attention itself during play. She discovered that

> play signals were sent nearly exclusively to forward-facing conspecifics [members of the same species, in this case other dogs]; attention-getting behaviors were used most often when a playmate was facing away, and before signaling an interest to play. In addition, the mode of attention-getter matched the degree of inattentiveness of the playmate: stronger attention-getters were used when a playmate was looking away or distracted, less forceful ones when the partner was facing forward or laterally. In other words, these dogs showed attention to, and acted to manipulate, a feature of other dogs that mediates their ability to respond: which feature in human interaction is called "attention."[9]

Psychologist Cindy Harmon-Hill and ethologist Simon Gadbois at Dalhousie University in Halifax, Nova Scotia, agree that play is a good place to look for theory of mind in nonhuman animals, and they offer a neurobiological account of why it's likely that dogs have a theory of mind.[10] As animals play, they reappraise what their partner is doing—what I call fine-tuning on the run. In addition, play requires that the players cooperate, it emerges without training, and even adults engage in it. As a result, Harmon-Hill and Gadbois suggest that play is modulated by subcortical processes into a three-part motivational system: animals *like* to play and gain pleasure from doing it (1), and so they *want* to play (2), which leads them to *learn* how to play (3). The variability of play indicates that players have to assess what's happening and change their behavior according to their beliefs about what their play partner wants and plans to do. This takes a theory of mind.

Clearly, we need significantly more comparative data before we even begin to make reliable assessments of the taxonomic distribution of theory of mind—that is, determining which species have it and which don't. However, watching dogs negotiating play on the run strongly suggests they know that other dogs are also thinking and feeling.

DO DOGS FOLLOW THE GAZE OF OTHERS?

Following another dog's gaze is something that some dogs do quite well. Dogs can learn a good deal about what another dog is thinking when they do this, and this simple act may help demonstrate that dogs have a theory of mind. Dogs also can follow human gazes, but results differ from study to study, which as I've said is not surprising because different dogs are studied by different researchers in various contexts using different methods.[11]

When it comes to dogs following a person's gaze, we need to pay close attention to the relationship between the dog and the human. In an interesting paper called "DogTube: An Examination of Dogmanship Online," the researchers suggest that "reciprocal attention

in the dog-human dyad" is important in gaining a dog's attention and in handling and training them. Further, they write that dogs who "are perceived as difficult to train may be in the hands of people who lack the timing and awareness that characterize good dogmanship." The researchers state that "dogmanship is reflected in the timeliness of rewards and the ability to acquire and retain a dog's attention when handling or training them."[12]

From my everyday observations at dog parks, I've seen enough of these encounters to feel safe saying that dogs are able to follow dog and human gazes. They don't always do this, surely, but they are capable of it. And, of course, dogs may be picking up information but not showing us that they have in ways we can detect.

DO DOGS HAVE A SENSE OF HUMOR?

People often ask me if dogs and other animals have a sense of humor. I go back and forth on which animals may or may not have this, but I'm pretty certain that dogs do. So, too, thinks Dr. Stanley Coren, who also notes there are likely breed differences in addition to individual differences among dogs.[13] Pondering a dog's sense of humor can uncover a lot about what they know. In his classic book *The Descent of Man and Selection in Relation to Sex*, Charles Darwin wrote: "Dogs show what may be fairly called a sense of humor, as distinct from mere play; if a bit of stick or other such object be thrown to one, he will often carry it away for a short distance; and then squatting down with it on the ground close before him, will wait until his master comes quite close to take it away. The dog will then seize it and rush away in triumph, repeating the same maneuver, and evidently enjoying the practical joke."

Having a sense of humor means that an individual knows whatever they're doing has an effect on others, and although they themselves might enjoy doing whatever they're doing, the reaction of human (and perhaps nonhuman) observers keeps them doing what they're doing. Having a sense of humor might also confirm that animals have a theory of mind.

While I'm always careful to say that I don't really know if dogs and other animals have a sense of humor and enjoy comedy, since there are few formal, ethological studies on this, the anecdotal evidence is pretty overwhelming. For example, my companion Jethro not only was a savvy food thief but also quite a jokester. He'd run around with his favorite stuffed animal, a rabbit, in his mouth, shaking it from side to side and often looking at the people who were around to see what effect this had on them. When they laughed while he was doing this, he seemed to do it more and more. When they weren't paying attention to him, he would stop running around or he would bark, look to see if they were watching him, and continue running here and there with his stuffed toy.

Or consider Benson the burper. My friend Marije terEllen tells me that Benson, a five-year-old Bernese mountain dog, likes to come up to her, face to face, look her in the eyes, and burp. He seems to get a kick out of doing it and doesn't burp at other times. Is this his way of saying "hello" or "I love you"? Or is he just having a good old time doing it to his human? Marije also insists that Benson is not mimicking her or her daughter Arianne.

I've also come across numerous examples of other species who act like stand-up comedians and jokesters, including horses, moon bears (a.k.a. Asian black bears), a scarlet macaw, and more.[14] In fact, humor may be more widespread among nonhuman animals than we think.

ARE DOGS DELIBERATELY DECEITFUL WHEN THEY STEAL FOOD?

Most people have witnessed dogs acting like thieves, especially to get food, and trickery can be art of humor. But when dogs steal food, are they being knowingly deceitful or just hungry and greedy? In fact, we can learn a good deal about the cognitive skills of dogs by watching them strategize how to steal food. I've been told many stories about dogs pilfering food over the years, and I've witnessed many crafty dogs doing just that. Jethro, a mutt whom I rescued when he was

about nine months old, was "food smart." When he and his housemate Sasha were offered food, Jethro would always run to the front door as if someone was there. When Sasha meandered over to the door to see what was going on, Jethro beelined back to her dish and vacuumed up whatever he could. That always looked like deliberate trickery to me.

That said, I should add that while some dogs are good at stealing another dog's food, it's also known that dogs will share food, especially with friends (as opposed to strangers). The simple presence of another dog actually makes them more generous than when another dog wasn't present.[15]

I think Jethro's being smart about food was related to his streetsmarts. Before I met him, Jethro had spent his life on the streets honing his food-stealing skills to great success. When I brought Jethro home, he met Sasha, and the two dogs got along famously. For one thing, even though Jethro took advantage of Sasha and her food, he only did so up to a point. He knew that Sasha was possessive of her food and that he could fool her into going to the front door, but he was careful not to rile her. He'd eye her carefully, watching for her to make the slightest move away from her bowl, and then he'd quietly and quickly slink in, grab a few morsels, and gulp them. After which he would lick her muzzle, then stroll away as if nothing had happened. Sasha seemed to have no clue. Jethro was, in fact, quite savvy at stealing my own food as well.

Along these lines, I once watched an amazing scene at a local dog park. Henrietta and Rosie were deeply engaged in play. Henrietta's human needed to go home, so he offered Henrietta a treat. Rosie, of course, followed closely. When Henrietta's human started to put the treat in front of Henrietta's nose, Rosie turned her head to the left and bowed as if another dog was approaching to play, but there was no other dog! Henrietta followed Rosie's gaze, and in that instant, Rosie snatched the treat and ran off, and without a blink, Henrietta and Rosie were at it, deep in play, oblivious to everything else. Needless to say, Henrietta's human was upset. Not for the thievery, but because he had to leave!

DO DOGS USE US TO GET FOOD?

Food also can be used as a powerful training or teaching reward, and people often ask if getting food is the only reason dogs seem to "love" us. In short, no. Dogs are more complicated than that. In her essay "Eager to Please?" dog trainer and journalist Tracy Krulik shows that giving food to a dog as a reward does not mean she or he will love you less or that the dog is using you absent any positive emotion.

I have lived in the mountains outside of Boulder, Colorado, with a number of dogs who were able to run free when I was home, and I have watched countless dogs at dog parks and on various trails where they could run free. In all these settings, I've seen food used to keep off-leash dogs under control with absolutely no indication that the dogs didn't feel extremely closely attached to—and, I feel comfortable saying, loving toward—their humans.

My dog Jethro knew that when my hand went into my right pocket there was a treat for him, and when he saw the slightest move in this direction, he came to me. I created this association deliberately. When I talk with people about how to call their dog using gestures, I refer to this practice simply as the hand-to-pocket method of teaching. And it works rather well. Some of my neighbors in the mountains were cougars, black bears, and coyotes—which meant that sometimes I couldn't use a word or a sound to cue Jethro to come to me immediately without the other animals coming to him and/or me, too! Did Jethro love me? I'm sure he did. Did he want the food treat? Of course. Was he pretending to like me just for food? Not at all. When it was okay for me to call him by saying something like "Come" or simply "J," Jethro responded without any treat.

I once had a neighbor who questioned my use of food to train the dogs I lived with. She'd say, "Jethro is using you and doesn't really love you." In contrast, Maya, my neighbor's dog, was the proverbial loose cannon, who rarely listened to her human. However, Maya came to me when I offered food and a hug. Maya knew what my right hand going into my pocket meant. We lived in risky environs, their safety came first, and food worked just fine as a motivational tool.

Like Jethro, Maya would also come when she was called, and she was wonderful and loving even when there were no treats to hand out. Dogs don't need food to be inspired to express affection, and using food as a teaching tool doesn't change that at all.

Neuroimaging studies seem to confirm this. Peter Cook and his colleagues have shown that dogs prefer praise over food, and their data "may help to explain the apparent efficacy of social interaction in dog training."[16] However, food also can be very important, and one study seemed, in fact, to show that dogs preferred food to petting. Yet there was a good deal of variability in the results the researchers of the latter study got, depending on the familiarity of the person who was doing the petting and how deprived the dogs were of social interaction.[17]

As Tracy Krulik notes, this issue with food is more of a people problem than a dog problem. It's time to get over the view that dogs are always using us for food and don't really give a hoot about us. In training, food should be used when it works, and when it does, we shouldn't then doubt a dog's love for us.[18]

STILL, CAN'T WE TEST A DOG'S IQ?

As I say, not every dog is as savvy as others, and people always wonder, since we measure intelligence in people, can't we do it with dogs? Yes, or so we hope: researchers are trying to figure out how. As I've mentioned, very few studies of dog cognition focus on individual differences; a 2016 article that reviewed recent research found only three studies to review. Thus, in order to get more of a handle on the intelligence of dogs, in February 2016 Rosalind Arden and Mark Adams published a research paper called "A General Intelligence Factor in Dogs," which was well-summarized in the article "Mensa Mutts? Dog IQ Tests Reveal Canine 'General Intelligence.'"[19]

First, the researchers created a prototype IQ test for dogs that included navigation tests, timed puzzle or barrier tests, tests of following gaze, and tests for assessing food quantities. Then they gave the test to sixty-eight border collies. Ultimately, dogs who did better on

one test also did better on other tests, and dogs who completed tests faster were also more accurate than dogs who worked more slowly.

Thus, the dogs varied in similar ways to how people vary in IQ tests. (An interesting side note is that, in people, these differences may correlate to longevity: smarter people tend to be somewhat healthier and live longer.) Yet the purpose of the study wasn't simply to compare individual dogs, but to quantify a "general intelligence" level among all dogs in an effort to help understand the evolution of intelligence itself.

Some key highlights of the study include:

- The structure of cognitive abilities in dogs is *similar* to that found in people.
- Dogs who solved problems more *quickly* were also more *accurate*.
- Dogs' cognitive abilities can be tested quickly, like those of people.
- Bigger individual differences studies on dog cognition will contribute to cognitive epidemiology.

As the researchers concluded: "Learning about individual differences in animal intelligence is a first step in understanding how cognitive abilities fit into the fitness landscape. It will provide crucial information on the relationship between intelligence and health, aging, and mortality. Data from nonhuman animals are essential if we are to develop a complete understanding of intelligence, one of the most important traits in the entire animal kingdom."

Stanley Coren summarized the results of this study noting, "This provides strong evidence for the idea of a general factor in intelligence, with smart dogs being generally proficient at everything and not-so-smart dogs doing generally more poorly on most other measures.[20]

ARE DOGS SMARTER THAN CATS?

It's always tempting to think about cross-species comparisons and ask questions such as, "Are dogs really smarter than cats?" People ask

me this sort of question quite a bit, and I always explain that these sorts of comparisons aren't really meaningful. They are fraught with error because individuals do what they need to do to be card-carrying members of their species. Dogs do what they need to do to be dogs, and cats do what they need to do to be cats.[21] Mice can do things that dogs can't do, as can ants, and all these species can do things that people can't do, so it's like comparing apples and acorns to start ranking one species as smarter than others.

It really doesn't get us anywhere to ask if dogs are smarter than cats or if cats are smarter than dogs. Intelligence can be viewed as an evolutionary adaptation whose expression differs for each species. Yes, individuals within species vary, so it's possible to ask if one dog is smarter or more adaptable than another, but this also must be done with care. Dogs, like other animals, display multiple intelligences; street-smart dogs might be better at stealing food and living independently while human-smart dogs might be better at understanding people and adapting to human homes.

Even among dogs from similar backgrounds and breeds, the variations in relative intelligence may not teach us much. For example, border collies are regarded as a very intelligent breed, but as in the study above, not all are equally intelligent. In some contexts, it might be accurate to say that one dog, Herman, is smarter than another dog, Brutus, but it's just as likely that Brutus will outsmart Herman in other contexts. I also avoid comparing or ranking dog breeds in terms of intelligence because, once again, individuals from each breed do what they need to do to fulfill the needs of that breed.

Canine Awareness: Memory and Decision Making

It's hard to get inside the head of another animal. For instance, how much do dogs and other animals learn from just hanging out and observing their surroundings? We don't really know. Many animals spend a lot of time resting, often peering around and taking in the landscape's sights, sounds, and smells. Dogs surely do this. I have often smiled as I have watched the dogs with whom I share my home

just hanging out and looking around at their dog and human friends and their environs.

When I've done fieldwork on a number of different animals, including wild coyotes, I have always noted that they spend a lot of time not doing much of anything but looking around as they rest. I am convinced that they pick up a lot of information this way and that what they learn can be used in their social encounters with others. Indeed, we know that dogs aren't passive observers. They are able to make what are called third-party evaluations of humans, and they avoid people who don't support their own human. Researcher James Anderson and his colleagues argue that dogs and other animals display a core morality that doesn't depend on language or teaching—individuals learn who's helpful or not and base their future interactions on what they've determined.[22] Clearly, dogs are not automatons who are programmed to act in specific ways with little or no thought. They remember and make decisions.

In discussions with people at dog parks and on trails, I've heard many similar stories centering on how smart and how emotional dogs are and what impressive memories they have. I recall being shocked when I once read an essay by a psychologist claiming dogs don't remember yesterday and are stuck in "an eternal present."[23] This ludicrous claim ignores tons of research showing that dogs and many other animals have great memories and use this information in social and nonsocial contexts. Not only do past events influence dogs, but dogs also plan for the future. Anyone who's rescued a dog who's been abused knows how their past influences their behavior. Many detailed studies show that mental "time travel"—imagining the past and looking ahead to the future—is not uniquely human. Dogs also are able to infer the physical properties of an object by watching a human manipulate it and then recall the information thus gained for later use. In one study, after dogs were allowed to watch two swinging doors of different weights being opened, they were able to open the doors themselves, but only after first experiencing opening both doors themselves could they infer which door was lighter and act on that information.[24]

The other dogs with whom I have happily shared my home were not as savvy as Jethro. A few rapidly learned about the black bears and cougars who visited our home and surrounding land, whereas a few didn't and rather brazenly took forays beyond my property. None ever had a problem with our wild neighbors, so clearly each figured out their own way to coexist with these predators. Each dog was an individual, with her or his own "belief system" or conception of how the world works and the best choices to make. Dogs and many other animals can adapt to a wide range of varying situations, and there is no reason at all to think that their differing responses are merely hard-wired stimulus-response reactions. I fully realize how tempting and easy it can be to reduce behavior to automatic reflexive reactions, but these sorts of explanations can't fully explain the variability with which animals respond to different situations. The late Donald Griffin, an award-winning scientist who is often called the father of cognitive ethology, argued forcefully that flexibility in behavior, as a response to varying social and nonsocial conditions, is a marker of consciousness in nonhuman animals. Many other researchers and I agree.

People often wonder how much information a dog can remember. A 2016 study by Claudia Fugazza, Ákos Pogány, and Ádám Miklósi from Eötvös Loránd University in Budapest, called "Recall of Others' Actions after Incidental Encoding Reveals Episodic-Like Memory in Dogs," showed just how much dogs remember, which is often more than we realize.[25] I asked Dr. Miklósi how his study extends what we know from other formal studies and from what people learn from watching their dog at home or at dog parks, to which he replied:

> As usual this is something that dog people may have assumed the dog is capable of doing. But most of them did not think about the possibility that dogs remember specific events happening around them. This study shows now that dogs (and probably many other animals) are able to do this. So they not only remember (spontaneously) what they have done (there are studies on chimps, rats,

> dolphins along these lines), but also what their owner did. For example, they may watch the owner cut the roses in the garden one day, and then when they see those flowers again, this memory could pop up in their mind. This could happen without showing any change in behaviour because this is just a spontaneous "thought," although in some other cases such thoughts may actually become causes of (spontaneous) behaviour.[26]

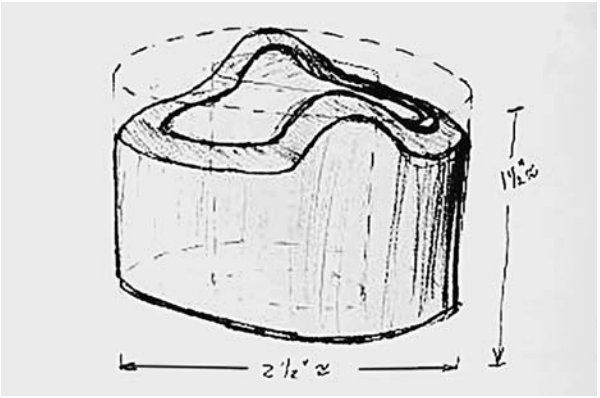
This research reminded me of the many dogs I've known who acted like know-it-alls. They seemed to sense or know what I was going to do or what I wanted them to do, although I'd never explicitly taught them to make certain associations. They gleaned my intentions and figured out the way their world worked without any formal teaching. I felt the same about some of the wild coyotes I studied for years. They just seemed to know what others were thinking, feeling, and wanting them to do. This is yet one more reason why I'm pretty certain dogs, coyotes, and many other animals have some sort of theory of mind.[27]

DO DOGS MAKE AND USE TOOLS?

People interested in "dog smarts" often wonder if dogs make and use tools. Years ago I also was told about a dog named Grendel who made a back scratcher, and I once saw a video of a dog moving and then using a chair to get onto a counter to get food.[28] Dingoes also use tools.

Grendel's human friend, Lenny Frieling, told me the following story:

> It would have been about 1973 that Grendel made her first tool. Because of her short legs and long torso, she could not reach the center of her back to scratch. One day we gave her a bone which was likely sawn from a large leg bone, perhaps lamb, because it was quite hard. It was cylindrical, with parallel flat sides. About a week (at most) after we gave her the bone, we noticed that she had chewed it so that one side was still flat, and the other side



Grendel's back scratcher. (Courtesy of Lenny Frieling)

had two raised ridges (shaped like a sine wave going around the outer rim of the bone). She would place the bone, flat side down, on the floor, and roll over onto the two raised ridges using the protrusions to scratch the center of her back. I was convinced that she had made a tool, but in my mind I thought that behavior had to be repeated to be scientifically significant. She had that first bone, as I recall it, for quite a while, maybe a year. It disappeared. We gave her another bone and within days, or a week, she had carved the second bone into a very similar shape, and used it for the same purpose. She had repeated the making of the tool.

DO DOGS UNDERSTAND WHAT WE SAY?

There's a lot of interest in whether dogs understand human communication better than other animals because of their close relationship with people. We all know many dogs are able to learn the meaning of words such as "sit," "stay," and "come," and the story of Meeka at the start of this chapter is another vivid example of how well dogs can understand what we mean quite specifically. Research shows that dogs have the ability to learn the meaning of hundreds or even as many as a thousand words.[29]

In a paper called "Do Dogs Get the Point? A Review of Dog-Human Communication Ability," researchers Juliane Kaminski and Marie

Nitzschner noted that dogs use human communication more flexibly than either chimpanzees or wolves. "One hypothesis, the so-called by-product hypothesis," they write, "suggests that dogs have been selected against fear and aggression and as a by-product this paved the way for the evolution of generally more flexible social cognitive skills, which surpassed those of their ancestor, the wolf." They also remark that "another hypothesis, the adaptation hypothesis, has claimed that dogs may have been specifically selected for certain tasks for which using human forms of communication was necessary" and conclude that the "evidence to date suggests that dogs' understanding of human forms of communication may be more specialized than was predicted by some and may be best explained as the result of a special adaptation of dogs to the specific activities humans have used them for."[30]

We also know that dogs can read our facial expressions.[31] Dogs can recognize emotional states using mental representations, and they snub people who are mean to their owners and even reject their treats.[32] Dogs can tell differences between happy and angry faces and recognize human emotions.[33] We also know that, when a person is angry, dogs don't trust that individual and won't follow their pointing.[34] So, even though dogs don't speak human languages, they've learned to read us pretty well.

Social Dynamics in Groups of Dogs

As we've seen, dogs can be both cooperative and competitive with other dogs, and dogs will trick and cheat other dogs. What's interesting is that dogs may adjust what they do based on group size. Italian researcher and dog expert Roberto Bonanni and his colleagues studied the variables that influenced whether free-ranging dogs outside of Rome, Italy, would participate in intergroup conflicts. They discovered that "dogs belonging to the smallest pack tended to be more cooperative than those belonging to larger groups." Also, young and high-ranking dogs cooperated more when their group confronted larger groups, but they remained behind other dogs during actual

conflict.[35] Dogs in larger groups also had a greater opportunity to cheat. The researchers stressed that the behavior of dogs is complex, and individuals may take advantage of who's there and doing the work for them. They can assess group size, displaying what the researchers call numerical cognition.

Dr. Bonanni and his colleagues also provided another example of numerical cognition. They observed that free-ranging dogs living in a suburban environment are able to assess the number of opponents during intergroup conflicts. They concluded:

> The overall probability of at least one pack member approaching opponents aggressively increased with a decreasing ratio of the number of rivals to that of companions. Moreover, the probability that more than half of the pack members withdrew from a conflict increased when this ratio increased. The skill of dogs in correctly assessing relative group size appeared to improve with increasing the asymmetry in size when at least one pack comprised more than four individuals, and appeared affected to a lesser extent by group size asymmetries when dogs had to compare only small numbers. These results provide the first indications that a representation of quantity based on noisy mental magnitudes may be involved in the assessment of opponents in intergroup conflicts and leave open the possibility that an additional, more precise mechanism may operate with small numbers.[36]

In other words, maybe dogs can't do math, but when it matters, they can discriminate quantity, or as academics like to put it, they have numerosity, or some sort of numerical sense.

Self-Awareness in Dogs

The short and correct answer to the question of whether dogs are self-aware is that *we just really don't know*. I conducted what has come to be called "the yellow snow study" when I walked my dog companion Jethro along the Boulder Creek trail, just outside city limits. To

study the role of urine in eliciting urinating and marking, I moved urine-saturated snow ("yellow snow") from place to place during five winters, and I compared the responses of Jethro to his own and others' urine. When people saw me do this, they tended to avoid me and shake their head, clearly questioning my sanity. But the experiment was easy to conduct. You can easily don an ethologist's hat and repeat this experiment and risk being called weird.[37]

I learned that Jethro spent less time sniffing his own urine than that of other males or females and that, while his interest in his own urine waned with time, it remained relatively constant for other individuals' urine. Jethro infrequently urinated over or sniffed and then immediately urinated over his own urine, and he marked over the urine of other males more frequently than he marked over the urine of females. I concluded from this that Jethro clearly had some sense of "self." He displayed a sense of "mine-ness," if not necessarily of "I-ness." Biologist Roberto Cazzola Gatti confirmed my findings using what he called the "Sniff Test of Self-Recognition" on four dogs.[38] In her book *Being a Dog: Following the Dog into a World of Smell*, Dr. Horowitz wrote about the results of a more systematic study of self-recognition with dogs in her cognition laboratory. She observes that the dogs "peed only on other dogs' containers, not their own. They saw themselves."[39]

While neither Dr. Horowitz nor I are sure that these studies confirm the presence of self-awareness, they do indicate an awareness of identity.[40]

Do Dogs Recognize Themselves in a Mirror?

Many people have watched their dogs watching themselves in a mirror, and this provides another great opportunity for citizen science, which can help us identify and understand self-awareness in dogs. In January 2017, Arianna Schlumbohm, who partook in a class discussion with me and my colleague Jessica Pierce, wrote me this story about her dog, Honey:

> One day a few years ago, Honey had been lying with me on my bed. I was wearing these truly awful purple fuzzy socks, and she got some fuzz on her forehead at some point. It was adorable. After a little bit of this, she caught a glance of herself in my mirror and almost immediately reacted. She batted at the fuzz with her front paws until it caught, then sat on my stomach until I pulled the fuzz off her paw. Then she went back to the foot of the bed for a few more hours. Honey was really upset, but calmed down as soon as she saw the purple was off. I always just thought of it as a cute, dopey dog story, but I really hope that it will help out your research!![41]

Arianna's story is the best I've heard about a dog paying attention to something on their forehead after seeing it in a mirror. Honey hadn't been observed paying any attention to herself in the mirror previously. This observation reminds me of the more formal "red dot" studies that have been done on nonhuman primates, dolphins, orcas, elephants, and birds, in which a red dot is placed, without the animal knowing it, on their forehead or on an area of their body that they cannot see without using the mirror. Then a mirror is placed in front of the animal, and any self-directed movements responding to the red dot are interpreted as indicating some form of self-recognition. This procedure is called the mirror test, and it depends on the animals using visual rather than olfactory or auditory cues to make assessments of who's in the mirror.

All in all, the results of studies of self-recognition are a mixed bag. While some individuals, and often only one, will touch the dot, not all individuals in a study show these self-directed movements. However, just because some animals don't, this does not mean that they don't have some sense of self. For example, decades ago, Michael Fox and I tried to do the mirror test on dogs and wolves, and none showed any interest in the spot on their forehead. Yet my yellow snow test with Jethro shows that a dog's sense of self may be primarily related to olfactory rather than visual cues. There still is a lot of

work to be done, but there is no reason at all to think that dogs do not have some sense of self.[42]

Dogs surely can figure out how mirrors work. I once received an interesting email from Zeno Zimmerman about a dog using a mirror to recognize different people:

> I have a German Pinscher who is incredibly smart and aware of way too much. In fact, she is so intelligent she has been difficult to train this past decade. However, from sheer love and training she has developed exceptional skills.
>
> Both my roommate and I were shocked to realize she clearly is able to recognize herself in our wall-length mirror at the top of the stairs. But what is most revealing to us is she is able to recognize different people in the mirror with herself.
>
> For instance, we will often find her looking into the mirror at the top of the stairs and waiting for our reflections perceived behind her in the mirror to tell her it is ok to run down the stairs, someone is coming behind her to open the door. If she does start down the steps after seeing our reflections moving behind her in the mirror, and we stop, she will often notice it in the mirror and stop herself or turn around and give us signals to continue walking down the steps behind her.
>
> I was shocked to read most people believe dogs do not have this ability. Of course every dog owner thinks their "Fee-fee" is the smartest, best thing on the planet . . . and prefer to believe their dog is incredible beyond belief. . . .
>
> If there are two people behind her in the mirror, she will turn and respond to the person who makes the gesture in the mirror while she can only see the person by watching the mirror. . . . From what I am reading on the net, this awareness is rare?[43]

Along these lines, in a study by Megumi Fukuzawa and Ayano Hashi called "Can We Estimate Dogs' Recognition of Objects in Mirrors from Their Behavior and Response Time?" the researchers show

that dogs can learn to use mirrors to locate food without humans helping them.

In May 2016, I received an email from Rebecca Savage about her dog Sammy that exemplifies much of what this chapter discusses—that we should never presume what dogs know or how smart our own dog may, or may not, be:

> Growing up, I had a very sweet all-black cocker spaniel, Sammy. While he was very sweet, he wasn't the smartest dog I've met, but there was one day where Sammy became markedly self-aware.
>
> Sammy never watched TV, as some dogs do. But, one day, my parents and I were watching a Discovery Channel show on dogs and Sammy came over to the TV, sat down, and intently watched the show. He paid attention for a time and then got up and went to the back of the TV to look for the dogs, finding nothing, he came back to the screen, watched, looked behind the TV again, and repeated this process a number of times.
>
> There also happened to be a full-length mirror that was set on the floor and stored in the same corner the TV was backed into. After a time going back and forth between the screen and the back of the TV, Sammy went over to the mirror and regarded himself, came closer, moved back, poked his nose to the mirror and was trying to figure out who the dog in the mirror was. He went over to the TV and then back to the mirror and did this a number of times. He was undeniably becoming self-aware and recognizing himself as a dog. We were awestruck.[44]

It's difficult for me to imagine that dogs don't have some sense of self, but right now we don't know much at all about this cognitive capacity. Indeed, when we look at all the data that are available for other animals, it's still not clear who has it and who doesn't. This is a wonderful area of research for those who want to know more. And it's surely an area that's ripe for citizen science.

SEVEN

Emotions and Heart

A few years ago, Rebecca Johnson shared with me this story of her dog Cash, which is another great example of citizen science:

> I know animals are capable of joy, but do you think they feel pride? Are they aware when they have accomplished something difficult or something they didn't know they were capable of?
>
> I ask because of a moment with Cash. We went on an eleven-mile hike into Tolovana hot springs. After a lovely two days there, it was time to hike out. The first two miles out are a very steep switchback. One of my friends had a snow mobile and offered to run me to the top of the hill. I knew Cash would not let me hold him on the snow machine, so this would only work if Cash would follow us up the trail. We started slowly. I sat backward and called to Cash.
>
> Understandably, he was at first nervous due to the noise, but he saw me leaving and trotted after us. Then he became excited to be running, so we went a bit faster. Cash also picked up his pace. We continued to increase our speed till Cash was running at top speed, faster than he'd ever run before. When we arrived at the top I got off the snow machine, and Cash came bounding up to me. He was so excited. He ran around me in huge circles, very fast, and then would stop near me and bounce in a play

bow before taking off again at top speed. It seemed like he was saying, "Did you see me? Did you see how fast I was? WOW!!" This single event was a big boost to his confidence.[1]

One does not have to be a rocket scientist to know that dogs are conscious, smart, and emotional individuals. They show their deep and varied emotions clearly and openly. No one watching dogs even casually could doubt that they are deeply emotional beings, right? It's obvious from Rebecca's story that, whether Cash felt pride or not, he was clearly experiencing strong emotions that resembled joy. And what is pride if not a particular kind of joy?

Well, a dwindling few people and researchers do still try to argue today that we don't really know if dogs feel joy or grief, but thankfully, these doubters are rapidly and rightly evaporating like ice on a hot stove. At a class I was teaching, a student once asked, "Why don't people blink when a dog displays grief over losing a human friend, but some people wonder if they truly feel grief when a dog friend leaves or dies?" This is a great question, and many animal welfare and other organizations have pamphlets about how to deal with a dog who's grieving the loss of a human or nonhuman friend.

If we could confirm that Cash's joy was a direct response to doing something he'd never done before, then we might be able to label it pride—or a canine version of pride. The study of animal emotions is not science fiction, and there is a large and rapidly growing database on the cognitive and emotional lives of dogs. Recognizing rich and deep emotions in other animals is good biology. They publicize their emotional lives, and it's clear from all sides—evolutionary theory, detailed scientific data, and common sense—that dogs are not mindless machines but, rather, smart, thinking, and feeling beings who experience a wide range of emotions similar to our own. This is not to say they feel exactly what we feel. Just as my joy and grief are not the same as another person's, so a dog's emotions aren't the same as human ones. But acknowledging difference also does not mean that humans have emotions and dogs don't. Rather, one basic truth about

evolution is that all species retain certain similarities and develop certain differences, and we should be careful not to fall into the trap of regarding humans as the sole template for comparisons and for understanding other species.

Dealing with Doubt and the Limits of Knowing

Ample research shows that dogs and numerous other nonhuman animals are conscious and experience deep and meaningful feelings. I agree wholeheartedly with Patricia McConnell when she writes in *For the Love of a Dog*: "It's time to stop apologizing for the belief that animals, like our dogs, have emotions. *Of course*, our dogs can experience emotions like fear, anger, happiness, and jealousy. And yes, as far as we can tell, their experience of those emotions is comparable in many ways to ours. People who argue otherwise might as well argue that the earth is flat."[2]

At the same time, that doesn't mean that we understand everything that exists in the minds and hearts of another animal, including humans. There are limits to what we can know. We will always encounter uncertainty about what nonhuman animals actually think and feel, and comparisons to our own thoughts and feelings will only take us so far. In this chapter, I try to distinguish what we know with virtual certainty from what is less likely and what we can still only guess, but to a degree, discussions of animal minds and emotions will always include some room for doubt, differences, and the limits of knowing others.

I emphasize this because people and researchers still sometimes regard the presence of doubt as a reason to deny animal emotions altogether, even when this flies in the face of their own experience. This has always been exemplified to me by a scientist I once knew named Bill, about whom I've written before. In casual conversations, Bill loved to tell stories about his companion dog Reno, who was so smart he could beat Bill at chess (!) and who openly resented the attention that Bill gave to his daughter and who got angry when Bill left him alone. Yet when Bill went to work and put on his white

laboratory coat, he was reluctant to admit to Reno's emotions and smarts. Bill, like many scientists, lived a split life concerning animal cognition and animal emotions. He regarded and treated his dog at home differently than he treated the dogs in his laboratory, but aren't they essentially the same dog? Along these lines, when people tell me they love animals but then abuse them or allow abuse to happen, I tell them that I'm glad that they don't love me.

Why do some people maintain these contradictory views? Because acknowledging animal minds and emotions would require them to change or give up other ideas that they are more attached to. As I like to say, I think that *Homo sapiens* could easily be reclassified as *Homo denialus* because we are so good at denying what is right in front of our senses when it suits our purposes.

HOW DOES EVOLUTION HELP US UNDERSTAND ANIMAL EMOTIONS?

The real question at hand is *why* emotions and consciousness have evolved, not *if* other animals are emotional, conscious beings. Our doubt and uncertainty relate to what purpose these attributes serve and what shape they take in other species, not if other species have them. This is made abundantly clear in the 2012 Cambridge Declaration on Consciousness, in which a consortium of scientists declared that "all mammals and birds" and most other creatures display consciousness and emotions. Meanwhile, *Animal Sentience: An International Journal on Animal Feeling* is dedicated to studies of animal hearts and minds; one recent essay focused on primitive organisms and the likelihood that they, too, have conscious experiences.[3]

Charles Darwin's idea about evolutionary continuity provides a good way to understand the evolution of emotions. Darwin argued that differences among species are differences in *degree* rather than *kind*. What this means is that differences among species are shades of gray, rather than black and white. In other words, if humans experience joy and grief, for example, so too do other animals. This does not mean that human joy and grief are the same as dog joy and grief,

nor will these be the same as cat, mouse, or chimpanzee joy and grief, nor does it mean that the inner lives of individuals of the same species are necessarily the same. What it does mean is that if humans evolved to possess some capacity, this must have previously existed in some form in other animals. Particularly when it comes to useful adaptations, evolution isn't stingy; helpful traits get passed along and appear in many different species.

Consider, for instance, the discussion of self-awareness in chapter 6. Humans are highly visual mammals, and we have no problem recognizing ourselves in a mirror. Dogs may or may not be able to do this, but they live by smell, and so their preferred method of identifying others and themselves probably uses their noses. How might dogs experience self-awareness through smell? We probably will never really know, which is why humans often aren't the most useful template against which to compare other animals.[4]

ISN'T ATTRIBUTING EMOTIONS TO ANIMALS BEING ANTHROPOMORPHIC?

For a long time, whenever a scientist attributed emotions and intentions to animals, they were accused of being anthropomorphic. Still today, a few people come up to me and say, "Oh, you're being anthropomorphic." This charge is an easy way to dismiss all claims about the emotional lives of nonhuman animals. However, there really is no worry at all. Simply put, it's okay to be anthropomorphic. It's natural to do so, and critics are wrong to say we must never do it.

Nonhuman animals and human animals share many traits, including emotions. Thus, when we recognize and name emotions in other animals, we're not inserting something human into them. We are merely using human language to communicate what we observe and understand. Neurobiological studies support this point of view. It's certainly possible to project false understandings onto animals, but we cannot avoid using anthropomorphic or human language to describe other animals. What alternatives do critics suggest that

might really help us come to a further understanding of animal cognition and animal emotions? As with my scientist colleague Bill, what I find is that there is often a double standard at work. Some critics will say, for example, that an elephant in a tiny cage in a zoo is happy, but when I, or others, say that she is unhappy, this is dismissed as anthropomorphism. It's self-serving double-talk to claim that animals can be happy but not unhappy.[5]

Along these lines, I have written about what I call *biocentric* anthropomorphism, and Gordon Burghardt has written about what he calls *critical* anthropomorphism.[6] What both of these ideas emphasize is that, when we use human language to describe what other animals are feeling, we need to do it carefully and take into account who the animals are. There is no substitute for using emotional language, unless we restrict ourselves to describing muscle contractions and neurons firing, descriptions that say nothing about what is actually happening or being felt. As Alexandra Horowitz and I have argued, it's possible to be "anthropomorphic" and still easily stay within the bounds of science.

ARE ANIMAL EMOTIONS "QUASI-EMOTIONS"?

The idea that dog joy or jealousy are "primordial forms" of emotion doesn't sit well with me. I know of no careful discussion of what a "primordial" emotion would look like, and the word usually is used to refer to something ancient, existing from the beginning of time. The implication is that the emotions of nonhuman animals are not as developed as those of humans. Similarly, some people use the prefixes "quasi-" or "proto-" to indicate some early or lesser form of an emotion, without providing a detailed account of what they mean, other than to imply that the animals aren't feeling something as deeply or richly as we do.

Some people also like to put quotation marks or scare quotes around such words as "love," "grief," "sadness," and "guilt" when they talk about the emotional lives of animals, or skeptics will use qualifi-

ers like "sort of," as if these emotions are not real—as if only we have true emotions and other animals don't. There's simply no reason to use scare quotes or make these qualifications when talking or writing about animal emotions. There's no reason to assume that the emotions of animals aren't experienced as profoundly or as deeply as we experience our own emotions.

A personal example shows why it's so difficult to make comparisons, even among humans. My sisters and I grieved rather differently after my mother passed away, but the grief we each felt was profound. *Different from* does not mean *less than*. The use of words like "primordial" and the use of scare quotes cheapens what other animals are feeling—as if they're only acting "as if" they truly feel something. This is speciesist, since it elevates humans above other animals and presumes that, because animals experience emotions differently, those emotions must be less than ours.

All in all, based on detailed scientific research, there's no doubt that many animals experience rich and deep emotions. We must never forget that our emotions are the gifts of our ancestors, our nonhuman animal kin. We have feelings and so, too, do other animals.

In this book I frequently acknowledge what we don't know, but these reminders are intended to keep the door open on the cognitive, emotional, and moral capacities of other animals. We are constantly discovering "surprises," such as fish using gestural or referential communication to indicate the location of food to other fish, prairie dogs having communication systems that rival those of great apes, rats displaying regret, and mice, rats, and chickens displaying empathy. In fact, when we call these and other discoveries surprises, we are admitting that we didn't think fish or other animals could do these things in the first place. We reveal our negative assumptions, which were made before the necessary research had been conducted.

I suspect that many more surprises await us, as studies focus on identifying such emotions as jealousy, guilt, shame, envy, embarrassment, and so on in dogs and other nonhuman animals. The many good stories and anecdotes from both citizen scientists and renowned researchers indicate we still have much to learn.

The Basics: Dogs Feel Joy, Anger, Grief, Fear, and Pain

Most people accept that domestic dogs and other nonhuman animals experience a handful of basic emotions. These include joy, pleasure, happiness, love, anger, fear, grief, sadness, pain, suffering, anxiety, and depression. These emotions don't require self-awareness or a theory of mind in order to be felt.

As we've seen, many dogs love to play—it's a voluntary activity, they seek it out, and they play to exhaustion. It's highly likely that dogs and other mammals share the same neural circuits that underlie play in rats, who also laugh and like to be tickled. Recent research has also shown that mice can sense and feel the pain of other mice via olfactory cues.[7] We don't know yet if dogs can do this, but I hear many stories that strongly suggest that they can. My discussion of how play can break down in larger groups of dogs, perhaps because rapid mimicry and emotional contagion break down, might have something to say about empathy in dogs.

This discussion about empathy reminds me of a wonderful story by renowned author Elizabeth Marshall Thomas titled "A Friend in Need," which appeared in a book I edited called *The Smile of a Dolphin: Remarkable Accounts of Animal Emotions*, about a dog named Ruby who helped another dog, Wicket, cross a partly frozen stream. Wicket was afraid to cross on her own, and Ruby, who had already crossed the stream, went back to Wicket, greeted her, and after around ten unsuccessful attempts, convinced Wicket to follow her across the ice. Psychologist Stanley Coren remarks that it's hard to imagine that animals as social and intelligent as dogs would not show empathy.[8] I agree. Nevertheless, there is really still so much to learn.

Finally, on the subject of basic emotions, dogs also suffer from a wide variety of psychological disorders, including posttraumatic stress disorder, anxiety, and obsessive-compulsive disorder. There's a large literature on this aspect of dog emotions. Nicholas Dodman's book *Pets on the Couch: Neurotic Dogs, Compulsive Cats, Anxious Birds, and the New Science of Animal Psychiatry* is an excellent review of this field of study. In a world in which humans are getting busier and bus-

ier by the second, it seems we must pay careful attention to how dogs (and other animals) respond to the stress that their human companions are experiencing.

More Complex Emotions: Jealousy, Guilt, Shame, Embarrassment, Pride, and Compassion

Beyond the "basic emotions" described above, we simply don't know yet whether dogs are cognitively sophisticated enough to experience all of the so-called higher or more complex emotions, like jealousy, guilt, shame, embarrassment, pride, and empathy. Based on existing data, it's likely that dogs do experience some of these emotions. However, while I have discussed empathy (just above) and the presence of some type of moral awareness—of fairness, justice, and right/wrong (in chapter 3)—and will discuss guilt shortly, it nevertheless may be that dogs don't experience some of these complex emotions or that they don't experience certain other feelings that humans do, such as spirituality. At the same time, no evidence yet confirms that dogs don't or can't experience these more complex emotions. Any claims that dogs don't experience one of these is premature at best and may turn out to be flat-out wrong.[9]

So-called higher emotions are usually distinguished by requiring self-awareness and/or a theory of mind in order to be experienced. As it's not possible to look closely at all of these emotions, in the spirit of myth busting, let's consider jealousy and guilt, since arguing that dogs have the capacity to experience these two emotions seems problematic for some people. In some cases, for instance, people deny dogs feel guilt because, as with considerations of dominance, they fear it'll be used against dogs.

As I've said, I'm all for keeping to the data, but I don't accept using lack of data on a specific topic as an excuse for bad treatment. People with an agenda will often claim that dogs don't experience jealousy or guilt or make some other strong statement about the absence of certain emotions in dogs and other animals. If I respond that we really don't know, I mean we can't make categorical claims

one way or the other. I don't know anyone who would say that dogs don't experience a wide range of emotions. How wide remains to be seen. This is why I always find it alarming when people are so certain dogs do *not* feel particular emotions, absent any data to support this contention.

DO DOGS FEEL JEALOUSY?

A story my friend Christy Orris told me about her dog, Anna, and her neighbor's dog, Daisy, is one of many I've heard on the topic of jealousy:

> Anna and Daisy have been best friends since they were crazy puppies running wild all over our neighborhood. Anna is our good-natured golden retriever—aren't they all?—and Daisy lives next door. Daisy is a cheerful medium-sized dog with a huge personality. I love her! She makes me smile whenever I see her. This should not cause a problem, but it has. Anna has become aggressively jealous with Daisy when I am around. Instead of the playful greeting they usually give each other, Anna exhibits domineering behavior and makes Daisy roll over on her back while she stands above her. I now try to ignore Daisy when I see her so Anna does not get jealous and behave meanly to her best friend. I have asked Daisy's owners if they see Anna's aggressive behavior when I am not around. They say they have never seen it.[10]

It often seems that not a day goes by at a dog park without someone telling me how jealous their dog is when they give attention to another dog or to another human. I often hear something like, "Josie always pushes herself between Jack and me"; "Whenever I give Mervin attention, Pluto pushes him aside and leans into me"; and "If I rub Smoochie's belly, Diablo sidles in for a rub." Pretty much anyone who's lived with a dog has seen what we'd call jealousy.

I know that these anecdotes aren't hard scientific data, but we need to pay careful attention when different people tell the same

story over and over again. These stories can and should motivate systematic research. As Stanley Coren writes: "It is strange that behavioral scientists often ignore such common observations. It is well accepted that dogs have a broad range of emotions. Dogs are certainly social animals, and jealousy and envy are triggered by social interactions. Dogs also have the same hormone, oxytocin, which has been shown to be involved in both expressions of love and jealousy in experiments involving humans."[11]

In her book *The Secret Language of Dogs*, Victoria Stilwell observes that "the canine expression of jealousy mirrors that of a human. This seems to explain canine behavior that is pushy."[12] And dog expert Patricia McConnell, as quoted earlier in this chapter, also claims dogs do, indeed, feel jealousy.

As it turns out, an important and carefully done formal scientific study directly supports this claim. We now have data showing that dogs know when they've been dissed and they don't like it one bit.[13] The 2014 study "Jealousy in Dogs," by Christine Harris and Caroline Prouvost of the University of California, San Diego, shows that dogs do experience jealousy in the way humans define it, namely, resentment of another individual's success, advantage, or something another individual does or possesses. As it says in the abstract for this study:

> It is commonly assumed that jealousy is unique to humans, partially because of the complex cognitions often involved in this emotion. However, from a functional perspective, one might expect that an emotion that evolved to protect social bonds from interlopers might exist in other social species, particularly one as cognitively sophisticated as the dog. The current experiment adapted a paradigm from human infant studies to examine jealousy in domestic dogs. We found that dogs exhibited significantly more jealous behaviors (e.g., snapping, getting between the owner and object, pushing/touching the object/owner) when their owners displayed affectionate behaviors towards what appeared to be another dog as compared to nonsocial objects.[14]

Harris and Prouvost studied jealousy in thirty-six dogs using a test similar to one used to study jealousy in human infants. The dogs were videotaped while their owners ignored them and did something else: either interacting with a stuffed dog that could bark and wag its tail, interacting with a novel object (a jack-o'-lantern pail), or reading a children's book aloud. The dogs' owners were unaware of the goal of the study.

As the abstract describes, dogs displayed plenty of jealous-seeming behaviors when owners showed affection to the stuffed dog, but far fewer when they showed attention to inanimate objects. And, as the authors conclude, we might expect that jealousy occurs in social species other than humans—so it shouldn't surprise us to be able to find it and recognize it in dogs. I'm sure I'm not alone in having seen similar behavior patterns among wild coyotes and wolves, and I feel certain that other researchers have seen similar behavior patterns in other wild animals. Furthermore, I like that this team adopted an experimental design that is used on prelinguistic humans, since we must also infer what human babies are feeling. By observing behaviors, we can draw inferences about what nonhuman animals and prelinguistic youngsters are feeling, and when we see similar patterns of behavior, we can infer a common underlying emotion.

Of course, much more comparative research is needed to confirm this beyond doubt, but there is no reason to think we won't be able to do so.

DO DOGS FEEL GUILT?

When it comes to dogs, if dominance is the *D* word, then guilt is the *G* word: it inspires lots of denials and controversy. On the one hand, some people make misleading claims that dogs cannot feel guilt, but, on the other hand, as far as I can determine, and I've asked other researchers, there are no studies that show that "dogs don't feel or display guilt" (as a veterinary scientist once claimed). Nothing has disproven this possibility, so the worst we can say is that we don't know.

Then again, when I insist that we really *don't* know if dogs feel guilt, other people get frustrated with me.[15] They think it sounds like a cop out, and they accuse me of being "too scientific." They say things like, "You know dogs feel guilt, but you're too uptight as a scientist to say they do. Come on, get out of the stifling ivory tower. I appreciate your scientific caution, but there is no way dogs, like other mammals, including us, don't feel guilt."

Many people clearly believe dogs are capable of feeling a sense of guilt. Research by Dr. Paul Morris and his colleagues shows that more than 75 percent of dog owners believe their dogs feel guilty, and 81 percent think that their dogs experience jealousy.[16] And maybe dogs do feel guilt, but there is evidence that people may also sometimes misread their dogs and assume guilt when it doesn't exist.

In 2009, Dr. Alexandra Horowitz published a study called "Disambiguating the 'Guilty Look': Salient Prompts to a Familiar Dog Behaviour" that looked at whether humans are being anthropomorphic when they believe they are detecting guilt in dogs. This study has since been misrepresented and misunderstood as a study of whether dogs actually feel guilt.[17] Rather, Dr. Horowitz was studying us and how dogs react to our cues, and she discovered that *we are not very good at detecting guilt*. In the study, dogs tended to act guilty if their human accused them of misbehaving for having eaten a forbidden treat, even if the dog hadn't actually eaten the treat or misbehaved. Meanwhile, dogs who ate the treat and weren't scolded didn't act guilty at all. A dog's "guilty look" seemed to correspond to how we treated them, not to their self-perception of doing something wrong. In response to an essay of mine about the misrepresentations of this study, Dr. Horowitz wrote to me, saying:

> Thanks so much for correcting the ubiquitous error about my study, some years back, which found that dogs showed a more "guilty look" when a person scolded or was about to scold them, not when the dog actually disobeyed the person's request not to eat a treat. Clearly, what the results indicated was that the "guilty look" did not most often arise when a dog was actually "guilty."

> My study was decidedly NOT about whether dogs "feel guilt" or not. (Indeed, I'd love to know . . . but this behavior didn't turn out to indicate yay or nay.)[18]

That said, the fact that dogs have a recognizable guilty look might be partial evidence that they are in fact capable of feeling genuine guilt, but since their canine moral compass is different than ours, they may not feel guilty about the things we do or about the things we think they should (like stealing a treat).

Indeed, this is why some people wish that, like dominance, we could simply deny that dogs feel guilt, since they fear it is sometimes used against them. In 2016, John Bradshaw wrote to me:

> Regarding Alexandra [Horowitz]'s "guilt" study, I guess I'm mainly coming from a welfare perspective. She showed that many owners routinely punish their dogs based on a misinterpretation of their dog's body language. More generally, I'm concerned that overestimation of dogs' cognitive capacities—i.e., always giving them the benefit of the doubt—plays straight into the hands of those who preach that dogs are conniving little so-and-so's who are constantly trying to "dominate" their owners and can only be dissuaded from doing so by inflicting pain. So while attributing rich cognitive and emotional lives to elephants (for example) may make people more inclined to donate to conservation charities, doing the same to dogs may provide the very same people with an excuse to hurt them.[19]

It's essential not to let the science or a lack thereof become a justification for abuse or neglect. There's absolutely no reason to embellish the abilities of dogs or other animals by ascribing to them more capacity for feeling more than they actually have. Meanwhile, researchers and others are responsible for presenting data accurately and for being clear when they're representing beliefs rather than facts. Of course, as research continues, it's highly likely that yesterday's facts will have to be fine-tuned because dogs and other animals

are such highly variable individuals. But isn't this why science is so exciting? Isn't this why we love to learn about dogs? Just when we think we know it all, it's clear we don't.

The Grammar of Tail Wagging

How do dogs communicate or express their rich and deep emotional lives? One obvious way is with their tails. Dog tails are amazing appendages. They come in all shapes, girths, and lengths. Like the nose, tails are fascinating pieces of work—wonderful, beautiful adaptations—and they can be a source of both whimsy (dogs love to chase their tails) and destruction: I've had many occasions when my dog's tail knocked over some good wine or single-malt scotch. Tails can also disperse a lovely anal gland scent. In 1947, Swiss ethologist Rudolph Schenkel published an extremely important study called "Expression Studies on Wolves," in which he discussed how wolves express their emotions, including how they use their tails.[20] This study provides an interesting perspective on the latest dog research because, not surprisingly, there are many similarities between the way wolves and dogs use their tails.

A tail can be an excellent barometer of what a dog is feeling, and they are often used in combination with a whole host of other signals—gait, ear position, body posture, facial expressions, vocalizations, and odors, for example. Taken together, these form composite signals that carry a lot of information about what a dog is thinking and feeling.

I never thought much about what would happen if a dog lost his or her tail due to an accident. My friend Marisa Ware told me her dog Echo had this happen to her. As a result, Echo changed the way she communicated with dogs and people by using her body and ears to compensate for the loss of her tail: "Mainly I notice that Echo relies more on her ears to express her feelings—particularly if she is excited to see someone, instead of wagging her tail, she puts her ears very far back and will almost wiggle them. She also has developed this move where she gives a little hop and wiggles her butt very

quickly if she is excited to see someone. It's not a typical butt wiggle that I've seen border collies or other dogs with docked tails do—it's quite different, and she never did it before losing her tail."[21]

Stanley Coren tells a similar story about a dog who lost her tail after a collision with a motorcycle. He notes that other dogs seemed unable to understand what she was trying to communicate after her tail had to be amputated.[22]

The stories of Echo and the other dog made me think that we really don't know if dogs with no tails use different ways to communicate than dogs with tails. I also wonder about the effects of tail docking and how it might deprive a dog of her or his ability to effectively communicate with other dogs and with humans. Docking takes away a significant mode of communication. We already know from research, for instance, that a longer tail is more effective at sending a message than a shorter tail.[23]

So what messages are dogs sending with their tails? Can we learn to "read" this emotional grammar? A classic 2011 research paper called "Behavioural Responses of Dogs to Asymmetrical Tail Wagging of a Robotic Dog" discovered what has become something of a truism: when a dog's tail wags to the right, it's a sign of positive emotions, while a left-wagging tail is expressing negative emotion.[24]

This discovery begs another question concerning a dog's telltale tail that needs more detailed study: What do dogs understand when they see another dog wag his or her tail? Do they know that a dog wagging their tail to the right is feeling good and a dog wagging their tail to the left is feeling a negative emotion? Some of the same researchers in the tail-wagging study have recently discovered that dogs do, in fact, draw such conclusions. A *New York Times* story about this research, called "A Dog's Tail Wag Says a Lot, to Other Dogs," reported that, "when watching a tail wag to the left, the dogs showed signs of anxiety, like a higher heart rate. When the tail went in the opposite direction, they remained calm."[25]

Are dogs really talking to one another with their tails? According to the same account in the *New York Times*, "It is unlikely that dogs are wagging their tails to communicate with one another. 'This is

something that could be explained in quite a mechanistic way,'" said researcher Giorgio Vallortigara, a neuroscientist at the University of Trento in Italy. "'It's simply a byproduct of the asymmetry of the brain,' and dogs learn to recognize the pattern over time."

Perhaps that's true. Perhaps a tail doesn't wag to convey an intentional message, but it simply expresses whatever is being felt. As I say, tails are fascinating appendages, and there still is much to learn about how dogs use them in different contexts, how dogs read the movements of other dogs' tails, and how they use the information they glean. Dr. Stanley Coren provides a useful guide about what we know about tail wagging.

A slight wag, with each swing of only small breadth, is usually seen during greetings as a tentative "Hello there," or a hopeful "I'm here."

A broad wag is friendly: "I am not challenging or threatening you." This can also mean: "I'm pleased." This is the closest to the popular concept of the happiness wag, especially if the tail seems to drag the hips with it.

A slow wag with the tail at *half-mast* is less social than most other tail signals. Generally speaking, slow wags with the tail in neither a particularly dominant (high) nor a submissive (low) position are signs of insecurity.

Tiny, high-speed movements that give the impression of the tail vibrating are signs the dog is about to do something, usually run or fight. If the tail is held high while vibrating, it is most likely an active threat.[26]

Barking and Growling: Something to Talk About

Dogs obviously express their emotions, motivations, and intentions through a variety of vocalizations. What kinds of sounds do dogs produce and how many? We've all heard barking, howling, growling, yelping, whimpering, whining, and creative combinations thereof. Because researchers categorize sounds and other behavior patterns

differently, it's impossible to say whether dogs produce ten, twelve, or even more different sounds. The facial structure of a dog might also influence what vocalizations sound like, and dogs often mix different sounds together. These distinctions obviously make a difference in what a dog is trying to communicate, and this makes studying vocalizations more difficult because of the complexity of sounds and the variety of combinations.[27]

I'm always surprised that we don't know more about the different common sounds dogs make and why they make them. Some dogs are barkers, whereas others don't bark much at all. And we really don't know if dogs *always* bark for a reason or if sometimes they do it just for the hell of it because it feels good.[28]

That said, dogs seem to understand what other dogs are saying, and humans are quite adept at understanding the emotional content of dog barks. This might be important for effective communication between dogs and humans.[29] Dog researcher Julie Hecht says: "The takeaway message is that barking is a nuanced and flexible behavior, and relationships can grow by paying attention to what your dog's vocalizations mean."[30]

According to Stanley Coren, pitch, duration, and frequency (how often the vocalization occurs) are important to consider when we're trying to figure out what a dog is saying.[31] Low-pitched growls may say the dog is angry; they may signal a threat, declaring that if you come closer, I could get rather nasty. High-pitched sounds such as whimpering may be saying it's safe to approach. Dr. Coren also notes that the longer a sound, the more likely the dog has made a conscious decision to vocalize. A shorter vocalization such as a growl, for example, may indicate fear. Sounds that are uttered frequently in succession may indicate excitement and a sense of urgency, whereas sounds that are spaced out may mean that the dog is less excited.

All in all, it's essential to respect what a dog is saying, or trying to say, and punishing a dog for growling is ill-advised. It's essential to know what is stressing the dog and come up with solutions to remove the stressors.[32] Growling can also occur when dogs are playing and having a good old time. As with so many dog behaviors, one sound

probably doesn't mean the same thing all the time; always consider the context.

The bottom line is that lots more research needs to be done to come to a fuller understanding of the sounds dogs make and why they utter them, and it's exciting to think that, with more detailed studies, we'll come to better understand what dogs are trying to tell us.

Measuring Emotions: The Human-Dog Bond

We all know that dogs and humans form close and enduring bonds. These relationships are extremely special to many of us, and they often seem important to dogs, but how can we really know? In fact, we can learn about the nature of these bonds not only by observing dogs but also by studying how their brains work. This is useful information. According to one study, "Indicators of mutual physiological changes during positive interaction between dog lovers and dogs may contribute to a better understanding of the human-animal bond in veterinary practice."[33]

For instance, in a study called "Dogs Show Left Facial Lateralization upon Reunion with Their Owners," Miho Nagasawa and his colleagues found that a dog's left eyebrow moved more when the owner was present, but there was no difference in how eyebrows moved when the dogs saw attractive toys.[34] The researchers suggest that this reflects the dog's attachment to their human.

We also can learn a lot about dog brains by using neuroimaging.[35] For example, researchers Gregory Berns and his colleagues at Emory University in Atlanta, Georgia, studied twelve awake and unrestrained dogs who were trained to cooperate with these studies and voluntarily enter a functional magnetic resonance imaging (fMRI) machine. Berns discovered that the dogs responded more strongly to scents of familiar humans, even to those who were not their primary caregivers, compared to the scents of other dogs, even familiar dogs. Conversely, dogs responded more strongly to the sounds of other dogs than to the sounds made by humans.[36] However, human sounds

are important to dogs, and we also know that when people use baby talk with dogs, and they do this very often, puppies are much more responsive than older dogs.[37]

In addition, Berns and his colleagues discovered that, when dogs respond to people they know, they use the caudate nucleus, the part of the brain that humans likewise use when they anticipate things they enjoy, such as food, love, and money.[38]

These results, when taken together, highlight the incredible importance of humans in the social lives of dogs, a fact we've known for a long, long time. Indeed, Duke University dog researchers Evan MacLean and Brian Hare claim that dogs hijacked the human bonding pathway as they became "embedded in human societies."[39] However, no matter how tight the bonds between humans and dogs can be, Yale University's Laurie Santos discovered that dogs ignore bad advice that human children will follow.[40] In a study conducted by Santos and fellow researchers, for instance, dogs who were shown that in order to open a puzzle box to get a treat it was necessary to move a lever and then lift the box top off were able to ignore the lever once they discovered it was actually irrelevant—unlike young children, who, in a related study, continued to use the lever even after it was obvious it served no function.

Researchers are increasingly using fMRI, also called awake imaging, to study animal emotions, and these studies reveal a lot about what dogs think and feel. In addition to the pioneering research by Gregory Berns and his colleagues in this area, a group of researchers at Eötvös Loránd University in Budapest have also published fascinating studies using this kind of imaging.

One study published by Attila Andics and his colleagues titled "Neural Mechanisms for Lexical Processing in Dogs" looked at how dogs process speech.[41] I've often wondered if dogs understand the conflicting or contradictory messages they frequently hear. When humans rub their heads or bellies, they say things like, "I love my dog but she's too fat," and "You're so beautiful, but you're so dumb."

To perform this study, thirteen dogs of four breeds were trained to lie still in an fMRI brain scanner. Then they listened to a series of

words that were previously recorded by their trainers, so they were listening to a familiar voice. The words were a mix of praise and neutral phrases, and they were spoken with a mix of positive and negative intonations, which sometimes didn't match the meaning of the words themselves.[42] What the researchers found was that canines used their left hemisphere to process words and the right hemisphere to process intonation, just like humans do, and then they combined them to understand what was said. The reward centers of the dogs' brains only lit up when both the spoken tone and the meaning of the words reflected praise.

In other words, dogs notice both what we say and how we say it. As we know, dogs learn many human words, but even when dogs don't understand language, our meaning comes through in our voices. While it remains an open question about what dogs understand of our conflicting messages, my guess is that they understand us better than we think. And they often pick up on our personal quirks.

For instance, it's a cliché that the personalities of dogs and humans often come to mirror one another, and yet there may be some truth to this. When I've been able to spend a good deal of time around a particular dog and their human, I'm often struck by how similar they are. I've casually noticed that anxious and pessimistic people seem to have anxious and pessimistic dogs, while calm people seem to have calm dogs. People are often surprised when they notice this themselves, saying something like, "Gosh, my dog is just like me!" While it's not that surprising to me, given how sensitive dogs are to us, there hasn't been much research exploring this phenomenon. However, in a 2017 study, a team of researchers discovered that, by measuring levels of the stress hormone cortisol, "dogs are not only able to recognize human emotion but also adopt certain personality traits of their owners. . . . Pet owners who are pessimistic and prone to anxiety have dogs who also exhibit these qualities."[43] For instance, the study found that dogs of anxiety-prone owners don't cope well with threats and stressful situations. Perhaps obviously, they also

found that humans have more of an influence on their dog's personality than dogs do on their human's.

There's much more I could talk about on the topic of dogs and emotions, which clearly shows that current research—including noninvasive neuroimaging studies where dogs can choose to partake—supports a lot of what many of us already believe about the cognitive, emotional, and moral lives of dogs. Certainly, we know enough right now, today, to know that dogs are smart and sentient beings and should be treated with respect and dignity. They should not be dominated nor shamed into serving us with no regard for who they truly are. Dog trainers need to stay abreast of the latest research, and many do. They, too, are a dog's guardian, just like the human or humans with whom a dog lives. Of course, there's still a lot to learn, and sometimes the best place to learn it is at the dog park.

EIGHT

Dog Park Confidential

Early one gorgeous morning at the dog park, a woman sipping coffee and fiddling with her mobile phone came up to me and said, "Oh lord, my best friend has no idea how she has revealed who she truly is by adopting Miranda. I, I . . . just can't take her anymore, and I wish the best for Miranda. How could she have kept her secrets so hidden? How could I have been her friend for so long?"

As the woman explained, she felt she could no longer be friends with her friend because of how she was treating a dog she'd just adopted. I said something like, "Oh, that's very interesting," hoping to wiggle out of that one-sided conversation—it was TMI! (too much information)—but my strategy didn't work. After about five minutes, I was at my wit's end with the amount of personal detail she was spewing forth, when someone who had been watching came up to me and asked a question about dog play. Thank goodness! I used this polite excuse to smoothly slide away.

I've experienced every imaginable variation on this scene during my many years visiting dog parks. People freely talk about other people, especially the regulars, who take ownership of particular parking spaces and chairs, and some of whom get upset when other visitors have the gall to occupy their chosen places.

Sometimes within a few seconds of people having met me, they talk to me as if I'm their best friend, and they occasionally open up to me about deeply personal

laments, as if I'm their confidant or even their counselor. I just listen and never say anything. Personally, I come for the dogs, but I've learned that, especially at dog parks, a dog's human companion always comes along. Maybe that's for the best. As I've said, dogs play an integral role in human interactions. Dogs are social catalysts who make connections and stimulate conversations among people who were, moments before, strangers. I think of dogs as a social lubricant who seem to be able to absorb negative energy when it arises between humans. They foster cooperation and trust in people. Dog parks are never just about the dogs. Many people freely offer advice to others, solicited or not, and make assumptions about who people are based on who their dog is and how they treat them.

There's no predicting what people will say. Within seconds of meeting someone she didn't know, one of my friends was told that she had severe psychological problems and that she and her dog needed to use flower essences to fix the situation. Another person told me his life story and how he met his wife when he helped her bag some poop, a gesture for which she remains ever grateful. People often debate good training versus bad training and discuss end-of-life decisions for older, sickly dogs. People support one another and learn a lot about how to make these incredibly difficult choices. The stories go on and on, and I've learned a lot from carefully listening, such as how much kindness and compassion people feel. I often feel that if people spent more time at dog parks, the world would be a better and more peaceful place.

Dog parks can play a surprisingly important role in our lives, in addition to all the benefits they provide for dogs. Much as in the story I tell in the preface, about the two boys I met watching squirrels in Central Park, people can easily rewild at dog parks and reconnect with nature and other animals, including a myriad of dogs and the small mammals, birds, and others who live there.[1] University of Pennsylvania professor and dog expert James Serpell sees dogs as mediators in three principle areas, namely, as social lubricants (catalysts of social relationships between people), social ambassadors (a moral link with other animals and nature in general), and the animal within (a sort of unconscious connection with other animals and nature).[2]

For some people, their visit to a dog park, I'm told, comprises a large percentage of their interactions with other humans. Some people spend upward of one to two hours at dog parks each and every day—drinking coffee, texting, chatting on the phone, hanging out with friends, meeting new people and dogs, and having a good old time with everyone, dog and human. In many instances, when I see the care and attention people lavish on their companions, I wish I were one of their dogs—though surely not always. Dog parks are not perfect places, and people are not perfect, either. At times, I wish people spent more time watching their dogs and were more focused on their canine friend's needs. Some people visit a dog park more for themselves than for their dog, and it shows. Neglectful people and frustrated, unmanaged dogs tend to be at the center of dog park conflicts and troubles when they arise.

Nevertheless, I love going to dog parks, even when I don't have a dog with me. Dog parks are a fascinating, recent, and growing cultural phenomenon. I go rather often to what I call my field sites, for that's what they are, to study play behavior and other aspects of dog behavior, such as urination and marking patterns, greeting patterns, and social interactions, including how and why dogs enter, become part of, and leave short-term and long-term groups and social relationships.

I also study human-dog interactions, which often reveals a lot about humans. For example, people often express to me how happy they are to let their dogs run free and be with other dogs at the dog park. People assume that dog parks visits are all good for their companion. But dog parks aren't always as free and relaxing for dogs as people think, and sometimes without realizing it, people themselves can undermine their dog's freedom: constantly calling them back, telling them not to sniff this or that, and interrupting interactions and play when it seems too rough. You call this free?

So in addition to exploring dog park ethology, I also want to ask readers to examine whether their dog park experiences are fulfilling their good intentions.

Dog Parks: The Good, the Bad, and the Ugly

Dog parks are the fastest-growing part of city parks.[3] There were 569 off-leash dog parks in the hundred largest U.S. cities in 2010, a 34 percent jump in five years, while overall parks increased only 3 percent.[4] Some dog parks also are making accommodations for special-needs individuals, and some cities are offering places for dogs and humans to interact that are in between homes and dog parks.[5]

You might say that dog parks have never been more popular, and they are becoming better and better places to be. A quick ask of people at dogs parks around Boulder showed that more than 95 percent of people loved them for the obvious reasons: they are safe places for dogs to run off leash and play with friends, and people can chat as their dogs have fun. Most people find dog parks a relaxing experience.[6] In addition, I love when I see local trainers at dog parks, since they get to see dogs outside of the context of training. As I mentioned earlier, dog parks can be great classrooms for learning about basic principles of animal behavior and evolutionary biology. These Cliff Notes–like discussions benefit people as well as their dogs.

Still, I want to consider some of the negative aspects of dog parks. First, while most of the dogs I've known love to go to dog parks, some dogs do not enjoy them, and it is essential to respect a dog's decision if he or she would rather not join in the fun. The dog park environment is not fun for them. A young man once told me, "I know my dog doesn't like dog parks. She gets all sorts of nervous and resists leaving the car, but she just has to get used to it because I like going." This is a classic example of undermining otherwise good intentions: Why go to a dog park if it doesn't benefit the dog?

I have to admit, I was extremely surprised to discover that a good number of people don't like dog parks at all. Sometimes this is a safety concern, since conflicts among dogs can occasionally—though very rarely—escalate into fighting, which can lead to injury for dogs and people.[7] Personally, I don't find dog parks to be unsafe environments, but we don't have any empirical studies that focus

on this question. More often, though, it's more a matter of dog park etiquette and of the social environment that turns some people off to dog parks.[8] Many people simply don't like the way other people and their dogs behave at dog parks.[9] I don't want to belabor dog park courtesy here, since there's a good deal of information about this online.[10] However, I do want to note that often these issues are a people problem for which the dog can get blamed. When people complain about a dog, it's really their human companion who's at fault, leaving the dog to get the short end of the leash, so to speak.

The same sort of issue arises when dogs are walked along public trails and their people throw tennis balls and Frisbees for them to chase off trail.[11] When dogs and humans are sharing space, it's essential to remember that not all people like dogs. Years ago, I was walking a large, some might say zaftig, malamute on a loose leash. I saw a man approaching us, and when he saw us, he began crossing the street, obviously afraid of the dog. I stopped and said, "There's no problem. He doesn't bite," Unfettered, the man asked me, "Well, how does he eat?" I told him that was a good question, and we went on to have a nice conversation during which he told me that he had been nipped by a dog when he was young, and now he was afraid of them. My mother also was bitten when she was young, which is why I grew up with a goldfish with whom I had numerous conversations, rather than a dog. It's essential to respect the fact that not all people love or even like dogs.

However, in dog parks, the more common issue is frustration with how people are managing their particular dog. In an email to me, Elise Gatti noted that a good deal of conflict comes down to different forms of "dog parenting"—some humans are very controlling and protective helicopter guardians and others are more relaxed about their dog's behavior.[12] I will address this more below.

In addition, each dog park has a unique identity that reflects the culture and attitudes of the locals or regulars. Even within a small city like Boulder, there are differences among dog parks. Without mentioning names, one I go to often is open to newcomers, both dogs and humans, but another one I frequent is, as one of my friends

puts it, "a bit more uppity." When my friend went to the latter park for the first time, people became concerned at seeing a newcomer and asked her if she lived in Boulder! The same thing happened to another friend who went to this same park because he wanted a change of scenery for him and his dog.

Finally, I've had cause, though only rarely, to marvel at just how inconsiderate a few people can be. This is not related to dog park etiquette but rather to basic human courtesy. On a few occasions, I've been asked by someone why their own dog has bad manners when they themselves are rather inconsiderate. I'm always tempted to quip, "Have you looked in the mirror?"—as we saw last chapter, it's not an accident when people and their canine companions reflect one another—but rather than get involved, I redirect their attention to some interesting dog-dog interaction happening elsewhere.

Dog Park Ethology: Studies of Dog Parks

Not only are dogs an ethologist's dream, but so too are dog parks. As I say, I find dog parks to be a gold mine of information about all sorts of behavior. In addition, dog parks are fertile places for citizen science, such as the work that one of my students, Alexandra Weber, conducted on whether familiar and unfamiliar dogs play differently. I always encourage people to become ethologists in a dog park, and one good focus for study is what Jessica Pierce and I call "the ethology of freedom" in our book *The Animals' Agenda*. At the dog park, simply select a focal dog and see how much time they spend on their own (or with other dogs) without being interrupted by their own or another human. When I do this, I'm often pretty surprised by just how tethered some "free" dogs actually are at dog parks. (For more on becoming an ethologist, turn to the appendix.)

However, there are an increasing number of formal scientific studies set in dog parks. From a research perspective, dog parks are sometimes criticized as "too uncontrolled." With so much going on, and so many variables, some researchers question whether you can accurately study, for example, whether dogs follow human gaz-

ing or pointing and how well, or if dogs have a theory of mind. But let's face it, some laboratory studies are also rather uncontrolled, mainly because dogs are such a mixed bag of participants (as might be the researchers themselves). Watching animals in their "natural habitats"—and within certain limits, dog parks might qualify as such—has shed much light on various aspects of behavior that are difficult to study with animals in captivity or in other more controlled environs. Although many lab studies of dogs are likely more controlled than those conducted on free-running dogs, controlled studies can also limit what dogs do. Many people have seen behavior patterns that warrant reinvestigation in more ecologically relevant situations.

As a graduate student at Memorial University in St. John's, Newfoundland, Melissa Howse did an important study called "Exploring the Social Behaviour of Domestic Dogs (*Canis familiaris*) in a Public Off-leash Dog Park." Previously, she notes, there had only been six similar studies, plus one conducted later at the same place, called Quidi Vidi Dog Park, by Lydia Ottenheimer Carrier and her colleagues, "Exploring the Dog Park: Relationships between Social Behaviours, Personality and Cortisol in Companion Dogs."[13]

Using focal animal sampling and video recordings of 220 dogs, of whom sixty-nine were included in her focal sample, Howse discovered that in the first four hundred seconds following entry into the dog park, "on average, focal dogs spent 50% of their time alone, nearly 40% with other dogs and 11% in other activities; time with dogs decreased and time alone increased over the first six minutes. Some behaviours were very frequent (i.e., more than 90% of focal dogs initiated and received snout-muzzle contact to the anogenital and head areas), while others were rare (i.e., 9% and 12% of focal dogs initiated and received lunge approaches, respectively). Dog density and focal dog age, sex, neuter status, and size were found to influence some behavioural variables."[14]

All in all, Howse learned that sex and age influenced social behavior, and the dog's size was also important. She found that older dogs generally spent more time alone, and older females spent the least

amount of time interacting exclusively with other dogs compared to all other sex/age combinations. There was also a good deal of mutual chasing; males eliminated (peed and pooped) more than females; and older dogs eliminated more than younger dogs. Smaller dogs were also more likely than larger dogs to receive running/leaping approaches from other dogs.

Consistent with other studies in dogs parks, Howse never observed serious aggression, observing that, "indeed, aggression in dog parks may be unlikely[,] due to the personality characteristics of dogs brought by owners to the dog park, owner intervention, and/or other factors. Thus, canine aggression may be better studied in other contexts where it is more likely to occur (i.e., multi-dog households, feral groups)."[15]

Another aspect of Howse's study is that her data differ from those of another project conducted at the same dog park after she completed her observations. For example, Howse observed that play bows were initiated by 23 percent of the focal dogs within the first four hundred seconds of entry into the dog park. In the other study conducted at the same dog park, 51 percent of focal dogs used play bows over twenty minutes, a time period three times longer. It wouldn't be surprising that the rate at which dogs use play bows changes over the course of a visit to a dog park. This would be a wonderful topic for future studies. I wonder if dogs use play bows more when they first arrive at a dog park, when they try to play with an unfamiliar dog or with a dog they don't know well, or when they first begin playing to establish a "play mood." Then, when play is in the air, they may use bows less frequently. I discovered that play bows are more stereotyped when they are first used to initiate play than when they are used after dogs, coyotes, and wolves are already playing.[16]

Once again, when we begin talking about *the* behavior of *the* dog at *the* dog park, we soon see that we can't make general statements with any reliability. Howse explained that some of the differences between her study and the other one done at the same dog park could be due to differences in observation durations, dog groupings, and definitions of dog-dog activities.

The stress a dog is experiencing may also be a factor in his or her behavior at dog parks, and this also is important to consider when comparing results among different studies. For example, in a study done at the same dog park as Howse's study, Lydia Carrier and her colleagues discovered that "cortisol was correlated with dog park visit frequency, such that dogs which visited the park least often had higher cortisol levels." Cortisol is a measure of stress levels, and these data indicate that when we study the behavior of dogs at dog parks, we need to pay attention to how frequently they visit and possibly who's already there. Of course, an individual dog's familiarity with his or her surroundings as well as with the dogs who are there can also influence their behavior, including how they play and if they try to run the show or hang out on the periphery.

Clearly, we need much more research into what dogs do at dog parks, with particular focus on *individual* differences. Howse concluded: "Given the number of questions generated by the present work, and that dog park studies remain scarce, it is obvious that observations of dogs in dog parks should be greatly increased. Dog parks hold much potential for answering questions about intraspecific sociality of companion dogs, which will help us to better understand dogs as complete and unique social beings, and possibly aid in our ability to protect or improve their welfare." I couldn't agree more.

Dog Park Managers: Of Leashes, Fences, and Freedom

Anyone who's visited a dog park knows that there's clearly a lot happening all at once, and both humans and dogs are involved. Everyone influences everyone else. Taryn Graham and Troy Glover, in a paper titled "On the Fence: Dog Parks in the (Un)Leashing of Community and Social Capital," write that "findings from this study suggest owners navigate parks through their pet. How dogs behave toward other dogs and toward people influence their owners' social networks and access to resources. Positive interactions provide opportunities for relationships and communities of interest to form, where sources

of support, information sharing, collective action, and conformity can be mobilized. Negative perceptions of dogs, however, often extend towards owners, thereby leading to tension, judgment, and sometimes even exclusion from social networks or public space altogether."[17]

In other words, no one is really "in charge" at the dog park. All the relationships are negotiated on the fly, and each alignment or conflict can affect every other type of relationship, whether dog-dog, dog-human, or human-human.

In his essay titled "Situated Activities in a Dog Park: Identity and Conflict in Human-Animal Space," Sonoma State University's Patrick Jackson captures this in his discussion of how humor helps people manage potential conflict around dog behavior:

> For example, one woman yelled, "Stop that, you dirty old man" in response to an older dog mounting her companion dog. In other circumstances there is no criticism of negative commentary. Among three men:
>
> > While we were talking, the black dog mounted the golden and then the bull terrier after the golden shrugged it off. People were laughing. The terrier caretaker said, "Some people get upset by this." The golden's caretaker said that he didn't. The bull terrier caretaker added, "I don't mind watching it. It's the most exciting thing in my day. I'm not getting much at home." Everyone laughed.[18]

Dogs mounting other dogs is a common source of friction among people at dog parks, and it often raises the conundrum for dog caretakers of freedom versus control. As I say, dogs are not as free as some people claim they are at dog parks. People regularly call their dogs back or yell something like "Stop that!" over every perceived misdeed. Or people run over to their dog and leash them up to avoid annoying someone else.

Freedom clearly raises its complex head at dog parks, as well as

in cars, on leashes, on walks and hikes, and at home. People often ask me when you should manage and monitor your dog closely, and risk frustrating the dog, and when should you relax and allow your dog to do whatever they like, and risk being accused of having an out-of-control dog. Honestly, I try to avoid these debates as much as possible, since everything depends on the people and the dogs involved.

However, questions about how free dogs should be, or how free they truly are, are clearly not as simple and straightforward as they seem, and many people get pretty worked up about it. People are not just managing their dogs, but their dogs' relationships to other dogs, since those dog relationships affect all the human relationships. And everyone has a different idea about what is and is not acceptable. An essay by Wes Siler in *Outside* magazine called "Why Dogs Belong Off-Leash in the Outdoors" got a lot of people thinking about these sorts of questions, and many people, including myself, weighed in on all sides of the issues.[19] Siler writes, "If the owners are responsible, the presence of off-leash dogs can actually make the outdoors a better place."

Obviously, dog parks are fenced, which allows dogs to be off leash and yet contained. This isn't the place to get into a long discussion about whether dogs should be allowed off leash in open areas.[20] Yet some studies show clearly that when dogs are allowed off leash, even in areas where this is permitted, problems arise more due to people than dogs.[21] In one study, for example, we learn that "many more people reported seeing other people disturb wildlife (92.2 percent), . . . significantly more often than dogs (49.7 percent)."

The bottom line is that enforcement of local regulations is critical for keeping dogs and humans in line. If someone chooses to let their dogs run off leash where it's assumed to be safe to do so, they need to be responsible for their dog's behavior. This is not always the case. I conducted a study of dog–prairie dog interactions with my student Robert Ickes called "Behavioral Interactions and Conflict among Domestic Dogs, Black-Tailed Prairie Dogs, and People in Boulder, Colorado."[22] To quote from our study: "People tried to stop dogs from harassing prairie dogs only 25 percent of the time. A survey showed

that 58 percent of people polled at the Dry Creek dog park where we conducted our study (all dog owners) did not believe that prairie dogs should be protected even if dogs are a problem. Increased human responsibility would likely go a long way towards reducing existing conflict among people wanting to protect prairie dogs and those who do not." We also suggested that "proactive strategies grounded by empirical data can be developed and implemented so that the interests of all parties can be accommodated."

In our study, people weren't good about controlling their dogs. However, in Patrick Jackson's essay "Situated Activities in a Dog Park," he noted: "Caretakers become 'control managers' who must negotiate problems related to a variety of dog behaviors, especially mounting, aggression, and waste management. In this process, caretakers use various strategies to manage their own and others' possible perceptions and understandings of appropriate behavior for dogs in public places." Dr. Jackson kindly followed up on some of his thoughts in an email to me, in which he wrote:

> I was impressed with the high level of the disconnect that may or does exist between the humans and the nonhumans in dog parks I've been to. Perhaps we may be able to more easily get a handle on what the humans are feeling about how and why they do what they do in relation to their dogs in the park, and what I notice (and I'm thinking you would agree to some extent) is that people often have no idea what their dogs are "really" up to. But the fact that that exists—that humans in the dog park create interpretations and act on them (regardless of their "objective" accuracy or relevancy to the dogs in the way the humans intend)—can have huge implications for the dogs and their inter- and intra-species interactions in that context. Since a lot of the questions and work that you and others are doing is appropriately centered on nonhuman species, which is under/unstudied, I suppose my long-winded thought is it may be directly relevant to comprehending the implications of the species divide for interaction in the dog park.[23]

I agree with Dr. Jackson that we really don't know all that much about the dynamics of control and freedom at dog parks. At the conclusion of his thoughtful essay, he writes: "This study suggests that dog parks not only provide insight into canine behavior, but also into human-animal and human-human interaction. Thus, while dog parks may appear as urban playgrounds for dogs, the interactions that take place there have implications that extend far beyond the fence that defines their boundary."

It's clear we need a lot more research about dog parks. One early reader of this book asked, "Do people with expensive purebred dogs visit dog parks more or less frequently than people with mutts? Do dogs play more or less when meeting in the confines of the dog park than when off-leash in a larger space? What is the optimum size for a dog park—that is, the density?" These are great questions, and I know of no available data to answer them.

The list of questions that can be studied at dog parks seems almost endless. It seems as if each time I go to a dog park I come away with new questions. What happens when one dog leaves a group and another joins? Are there differences when the dogs know one another than when they don't? What's the best size for a play group? How often do dogs sniff versus sniff and pee, and how often do people interfere in what their dog is doing?

All of these questions represent research projects just waiting to be done. Perhaps you, on your next visit to the dog park, could try to tackle one of them. I love visiting dog parks, and I find it incredibly exciting how much we can learn about dogs and humans by studying what happens when we visit them.

NINE

A Dog Companion's Guide

"I love Mervin, but I'm not sure I can give him what he wants and needs, although I'm his total slave from the time we get up until the time we go to sleep. Do you think pet keeping will end?"

"When I get up in the morning, I love spooning with Serena, my lovely beagle. I get out of bed slowly, make some coffee and some eggs, and as I sip my coffee, Serena gulps down her eggs, sometimes boiled and sometimes scrambled. If she's been good, I sometimes add some bacon."

"Molly's been rather ill—she's getting old and lame. I love her and have tried to give her all she needs, and now I'm not sure if I'm just keeping her alive to keep myself alive. What should I do?"

"What do you think about pet hospice? I like it but is it really worth it?"

"Jamie died yesterday. I feel like I made the decision to let her go at the right time. Maybe she would have had a few more weeks, but she told me 'it's time.'"

"I decided to give Patricia up and let her have the opportunity for a better life. I just can't do what I need to do and what she needs to do, and it breaks my heart."

"How many dogs should a person be allowed to adopt and return? I know someone who's done it eight times. Thank goodness, when she tried again, she was told 'no.'"

"I was essentially clinically depressed, and when Shelby came into my life, I felt better, stopped taking far too many prescription drugs, went out more and made friends, and lost fifteen pounds."

Hardly a day or dog park visit goes by during which I don't hear stories or questions such as those above. I offer what information I can, but rarely, if ever, do I offer advice. I also try never to be judgmental because I know most people care deeply about the dog, or dogs, with whom they live. Oftentimes, these various questions lead to deep and serious conversations about the ethics of pet keeping.

That's the focus of this final chapter, in which I discuss how individuals and society can provide the best possible life for dogs. I hope, by this point, you realize that dogs are amazing and fascinating beings. So too are humans. I also hope it's clear that while we know quite a bit about dog behavior and dog-human relationships, there still is much to learn. Most of all, we need to pay attention to and respect individual differences. Not every dog, and not every person, is the same, and what works in one relationship may not in another. In a way, the messes dogs make—literal and metaphorical—can't be avoided. We have to accept that even when dogs are disruptive, we can learn from these experiences and still continue loving and caring for our dog companions, both in our homes and in our society, in our parks and ranging free.

The Ethics of Pet Keeping: Negotiating Human-Dog Relationships and Caring for Our Companions

When you offer a dog or other animal a place in your life, it's a "cradle-to-grave" commitment. The cradle, of course, is when you make the decision to share your home, and I hope your heart, with a dog. The grave, in contrast, is usually the end of the animal's life, since unless you're over seventy or so when you adopt a dog, you most likely will outlive your canine companion.

The other commitment you make is to give your dog or other ani-

mal the best life possible that you can. I was talking recently with my cycling buddy and close friend Randy Gaffney about his dog, Gracie, who has blessed his life for ten years. I asked how she was, and his response echoes what I often hear. He said: "Gracie is living the life. My primary purpose in life is to make her happy." I only wish these words applied to all dogs in the world.

People also always ask me, what does a good life for a dog mean? Questions about the ethics of pet keeping are coming more and more into public discussions, and I've noticed this when I go to dog parks or when I give talks about dog behavior. People wonder how to give their dog the best life possible, and they wonder if the best they can provide is good enough. Naturally, making someone else happy all the time is impossible. No one is happy all the time. Life can be a series of compromises, and as I say, every individual is different. Some trade-offs are harder than others, and everyone copes differently. Given how variable dogs are, and how variable humans are, we get into trouble when try to provide, or try to live by, overriding prescriptive conclusions that we insist apply to everyone.

This is why I think it's so essential that we all become naturalists in a dog park. Every human companion of a dog should dedicate themselves to becoming a student of their dog's behavior, so that they learn what their dog considers a good, satisfying life. Like good ethologists, we should talk to others, including scientists and trainers, and learn from one another as much as possible. We need to read what researchers are publishing, including in related fields of animal studies, and listen to knowledgeable friends at the dog park. Then we need to confirm what others say with what we see with our own eyes and in our own dog. (For more on how to observe like an ethologist, please turn to the appendix.)

One thing that's true, and that no individual can fix, is that human life is often stressful for dogs. Thus, it's important to manage your own human-dog relationship so that it eases this stress and so that your relationship works successfully for both of you. While people often think of training as a one-time thing, living with a dog is an ongoing negotiation of desires and needs that evolve over time.

For instance, along that spectrum of negotiations, we have to think about and prepare for end-of-life decisions. Illness can strike at any time, and what makes a good life for an old dog is as various as at any other time of life. Indeed, people often wonder about trade-offs between quality and quantity—is a shorter life that's good better than a longer life filled with pain and suffering? I'm also sometimes asked if dogs ever want to die to end the pain.[1] While such an inclination by a dog is likely unusual, I do think that this could sometimes be the case, and the only way you can ever know is if you have spent a lot of time carefully listening to your dog and coming to understand her or him as a unique individual.

Do Dogs Get Stressed Out by Human Life?

The downside of choosing to live with another animal is that many can be highly stressed because they can't do what they want and need to do in order to experience high-quality lives. This point is clearly made by Dr. Jessica Pierce in her book *Run, Spot, Run: The Ethics of Keeping Pets* and by service-dog trainer Jennifer Arnold in her book *Love Is All You Need.* Arnold notes that dogs live in an environment that "makes it impossible for them to alleviate their own stress and anxiety." Dogs, like humans and other animals, may go gray when they're anxious, prematurely growing gray hair on their muzzles.[2] Researchers have also found that females tend to show more gray than males, as do dogs who are fearful of loud noises and unfamiliar animals and people. Premature gray muzzles in young dogs might call attention to a dog who is anxious or fearful.[3]

Arnold writes: "In modern society, there is no way for our dogs to keep themselves safe, and thus we are unable to afford them the freedom to meet their own needs. Instead, they must depend on our benevolence for survival." Think about it: we teach dogs that they can't pee or poop wherever they want. To eliminate, they must get our attention and ask for permission to go outside the house. When we go outside, we often restrain dogs with a leash or fence them within yards or parks. Dogs eat what and when we feed them, and

they are scolded if they eat what or when we say they shouldn't. Dogs play with the toys we give them, and they get in trouble for turning our shoes and furniture into toys. Most of the time, our schedule and relationships determine who dogs play with and who their friends will be. All things considered, it's a very asymmetric, one-sided relationship, one that many would not tolerate with another human.

Many dogs, perhaps most of them, make their peace with these compromises. Yet millions of dogs also live with stress-related disorders or are on drugs to relieve that stress and anxiety. Arnold notes that we abuse our power over dogs when we impose our will on them without considering their thoughts and feelings—because they are, in fact, thinking and feeling social beings. What Arnold calls the "because I said so (BISS) technique" of training fails and doesn't result in "a fair and mutually beneficial relationship."[4] By studying dogs carefully, we can avoid this situation. There really is no reason at all to become involved in a power struggle with a dog.

Tony Milligan, in the book *Pets and People: The Ethics of Our Relationships with Companion Animals*, notes that dogs have to do a lot. We place a good number of demands and expectations on them. He writes: "An additional wrinkle in this picture is that companion animals such as dogs of course need to learn about far more than just getting along with humans. In the case of a dog, for example, the community in which she will have an opportunity to flourish will include various different humans and nonhumans. Given this, 'She needs to be housebroken, to learn not to bite or to jump up on people, to be wary of cars, and not to chase the family cat (unless it's a play chase!).' . . . And such socialization is learned partly from the humans but also, in part, from the nonhumans."[5]

I've often been asked if free-ranging dogs are actually less stressed than dogs living with humans because of the demands placed on dogs in a human-centered relationship. Of course, it's impossible to answer this question with any certainty because individual dogs and individual humans and the nature of their relationships need to be considered. However, in Bangalore, India, in one study of street dogs—called "streeties" by the locals—Sindhoor

Pangal observes: "I found the dogs that I studied to not seem stressed at all. They showed no signs of elevated stress levels in their body language. When approached, all of them were relaxed, cautiously curious (like most street dogs) and very friendly once they realized I was no threat. When awake, they seemed to spend most of their time perched on an elevated surface if they could find one, and just watching the world go by."[6]

Norwegian dog trainer Turid Rugaas also has written a good deal on stress in dogs, and she is an expert in using what she calls "calming signals" to soothe dogs and to reduce stress. In her work, she emphasizes the importance of watching dogs carefully at home and in other venues, including when they interact with other dogs. Just how effective "calming signals" are remains to be determined.[7] My take is that calming signals do indeed work, but like many other behavior patterns, not always. People need to pay close attention to what the dogs are doing, their familiarity with one another, and watch them carefully. I'm sure that future studies will shed more light on how dogs use calming signals to tell one another what's acceptable and what's not, how effective they are, and why they work and don't work in different contexts.[8]

IS IT OKAY TO HUG YOUR DOG?

If there's one tried-and-true method for relieving stress, while also expressing our affection for our dogs, it's through physical contact. We pet our dogs all the time, and they appeal to us constantly for back scratches and belly rubs. Sometimes dogs sleep with us, and they freely jump into our laps and lounge in our arms. For some dogs, touch is important and actively sought, whereas for others it's less important and can be downright aversive.

Hugging is a form of positive touching; however, some researchers and others have questioned whether hugging your dog is okay. Not long ago, I read a rather alarmist essay that basically said, "Don't ever hug your dog." So in the spirit of myth busting, let me say that, yes, it's really okay to carefully hug your dog, so long as you do

so on *their* terms. Not all dogs like to be hugged, and neither do all humans. And that goes for every other type of physical interaction. Some dogs adore roughhousing and wrestling, and other dogs definitely do not.

Concerning hugging, a topic in which numerous humans are interested, I was talking with some people about dog behavior at a party last year. This happens a lot. We had discussed various aspects of behavior, when Virginia Arnette, who had seen the article telling people not to hug a dog, asked me, "So, is it okay to hug a dog?" I could tell that she really wanted to know. After I told her it was okay to do so on their terms, she told me about her dog, Marketa, a Shiba-Inu, who was quite ill and loved to be hugged. Her friend continued to hug Marketa, and she found it hard to believe that hugging dogs could be wrong. Good for them! Please hug your dog if your dog likes to be hugged, and you might consider tickling them as well, as many dogs (and rats) like to be tickled.

In fact, dogs can be very—some might say too—open about want they want and need and how they feel. Their emotional lives are rather public. You don't need an advanced degree to understand your dog and give them what they need. We don't, and likely will never, know all there is to know about dogs, but I don't find that problem to be staggering. Filling in the blanks and connecting the dots to understand dogs better is surely important, but we know enough now to provide dogs with fulfilling and happy lives.

WHAT'S A GOOD LIFE FOR AN OLD DOG?

I often get involved in discussions about quality of life, end-of-life decisions, and hospice for old "senior" dogs.[9] I agree with Mary Gardner who observes that there is a difference between a "senior" dog and a "geriatric" dog, the former being a dog who simply has reached a certain age and the latter being a dog who has health problems.[10] Many people go out of their way to care for an elder dog. In my hometown of Boulder, Jeff Kramer, a mail carrier, built a ramp for an aging dog, Tashi, along his route.[11]

I remember a few years ago when I met an old dog who was clearly totally blind. Jack lumbered along with his nose to the ground and occasionally bumped into things. I smiled because he seemed to be having a good old time, tail wagging wildly whenever he came upon an appealing scent. I assumed Jack and his human had been together a long time, but when I talked with the woman who was with him, I learned she had adopted him when he was thirteen years old and already completely blind. Jack had been given only a month or two to live because of bone cancer, and here he was, two years later and fifteen years old, still alive and one happy dog being. His human said he had an "awesome disposition" and always seemed content; he was always "polite with other dogs and humans." I still think about Jack often, along with the woman who selflessly took him in and increased his quality of life when she thought he only had a month or two to live.[12]

What follows is a personal story that contrasts questions of quality versus quantity of life. Inuk was a dog who lived with me, and I first published this story on my *Psychology Today* site in 2016. I have to admit I have been stunned by all of the positive feedback I have received about it since then.

> Inuk was a very fit dog, getting regular long runs, as he was a mountain dog, and very healthy for thirteen-plus years. But he declined fairly rapidly due to a gastrointestinal problem, so the veterinarian to whom he went and really liked prescribed a large orange pill, as I remember it, that had to be shoved down his throat. There was no guarantee that the pill would work, but it was worth a try. To say the least, Inuk hated the pills, and after having three a day for four days, he ran away when he knew the pills were coming no matter how softly I spoke to him. He'd cringe in the corner of his large outdoor run or scoot up the dirt road as best he could. No one seeing him would draw any conclusion other than he didn't want to take the pills. If Inuk were a human, and in many ways he was, there wouldn't have been a shred of doubt that the pills were not at all welcomed. Inuk also did not

appear to get any better and clearly was telling me no more pills, please.

What to do? We considered different alternatives and then decided (without asking the veterinarian, but letting her know after the fact what we had decided to do) that because the pills weren't working and were causing him a good deal of unneeded and obvious emotional distress, Inuk should spend the last weeks of his life enjoying every single moment as much as possible. He loved ice cream, so that's what he got. Every day he got a frozen pint of ice cream, and he worked on it for hours on end, tail wagging, ears up, and clearly enjoying every second of this special treat. And, most remarkably, after a few days, he had more energy, took longer walks up the road, played with some with his dog friends who lived up the road, and loved to snuggle once again.

So, am I happy with how Inuk spent the last few months of life? I am, indeed, even if he might have had a few more days on earth if he'd gotten the awful pills. Would I do something similar again? Yes, I would, without a doubt. Inuk had a great life, and there was no reason he should have spent his last days agonizing over the big orange pills. That's what we decided was a good life for an old dog.

Jane Sobel Klonsky, author of *Unconditional: Older Dogs, Deeper Love*, shared a story with me that mirrored my experiences with Inuk:

I've heard over and over from people who have dogs nearing the end of their lives, and the resounding sentiment is definitely to let them spend the end of their lives enjoying every single moment. They would wholeheartedly agree with how Inuk spent the last few months of his life, relishing in his doggy life pleasures and loves. The cover girl of my book, Olivia, is almost thirteen and was diagnosed with cancer over a year ago. Annie, her human mom, opted not to do chemo, but she did try for a few months to stuff all kinds of herbal supplements down Ol-

Thirteen-year-old Ozzie enjoying a bath. (Courtesy of Jane Sobel Klonsky)

ivia's throat. Olivia HATED them. She wouldn't eat. She was depressed. Annie decided that she hated seeing Olivia like this, so she stopped all the herbs and went back to Olivia's normal diet and lifestyle. Within a week, Olivia was a happy dog again, taking long walks, frog hunting at the pond, smiling and snuggling. Annie understands that Olivia probably won't live the number of extra days she might live if she ate her supplements, but wow, is she a happy dog living life to its fullest every day, and when she does go on, she'll do it with a smile on her face.[13]

Another story about old dogs came to me via Cici Franklin:

I adopted both Buddy and Daisy from Golden Retriever Rescue of the Rockies—Daisy was four months and Buddy was ten years. He was quite sick when we got him, very overweight, oily coarse coat, on wrong meds, etc., and I thought he was coming home with us for hospice care—to have a little bit of time in a fabulous place before he left us. Well, with lots of love, constant harassment from Daisy, good food, and the right meds, he was easily

> hiking six to eight miles with me in no time. We had over four years of being blessed by his presence in our lives. We miss him so much but were so lucky we found each other! He was one of the most special dogs I've ever known![14]

Basically, old dogs rock. And there is so much we can learn from them.

Positive Teaching Methods: Managing the Human-Dog Relationship

As I've said many times before, I like to say that we don't train dogs, we "teach" them. The word "teach" gets us closer to the truth of what we do during dog training: we establish the do's and don'ts of our human-dog relationship, and we create a system of signals, so both we and our dogs can communicate what's wanted and needed on the run. Dogs learn our system, but that doesn't mean they will always choose to follow the rules or do what we ask. When we become fluent in dog, it's good for them and good for us.

It's really no different than raising children. Parents teach their kids what's proper behavior for their household, and until the kids leave home, those rules and expectations are a constantly evolving negotiation.

In addition, how we teach is part of what we teach. This is certainly true with children, and it's equally true with dogs. We love our children, so we teach with love, and we hope that if our teaching methods are caring and respectful, we will teach care and respect. In this way, we create an environment in which everyone feels cared for, even when they can't do everything they want.

Training, alternatively, emphasizes obedience, and when the dog or a child disobeys, they are usually punished. There is little to no negotiation, and conflict and tension are almost guaranteed, since no conscious being—and that's who dogs are—obeys every rule 100 percent of the time.

So when it comes to methods of dog training, I fully encourage

and support using positive reinforcement and reward-based methods rather than punishment, aversion, and domination.[15]

Kimberly Beck, founder of the organization the Canine Effect, stresses that we must pay careful attention to the relationships that are formed among dogs and between dogs and humans.[16] In her work as a dog trainer, Kimberly is concerned with dog-human interactions, and she views training as troubleshooting, in which there is constant tweaking of the relationship between dog and human. It's also essential to recognize that we choose the dogs with whom we want to share our life, and often they didn't have any voice—or bark—in choosing us, although of course there can be a deep connection and clear reciprocity at work.

I like the way Kimberly put it when she told me that training is frequently about trying to close the gap between human expectations, which vary from person to person, and what each dog as an individual wants and needs. The gap rarely closes fully, which leads to acceptable levels of tolerance from both the human and the dog. Kimberly also emphasizes that there is constant flow in leadership, which is essential for a healthy relationship. This means that sometimes the human leads and sometimes it's the dog's turn. Also, each side of the relationship has "nonnegotiables." For example, dogs shouldn't be allowed to jump on people without the human's permission, and we are obliged to protect dogs from running into traffic and from the risk of being attacked by wild predators.

Of course, nonnegotiables vary in different dog-human relationships; some humans are looser or more permissive than others in allowing dogs to do certain things. While there are some rules of thumb, there also is a good deal of flexibility, which can try our science, minds, and patience. Mutual tolerance and trust are key. So, too, is patience. It might sound paradoxical, but it's really true that when dogs know we have their best interests in mind, and when we carefully exercise control in positive, not dominating, ways, dogs can enjoy more freedom over what they can and cannot do. Another way to put this is that the goal isn't to train the dog out of the dog, but to show the dog how to cope in a human world.[17]

Bridging the Empathy Gap: Dogs Inspire Compassion

Often, when I'm discussing some aspect of animal abuse that involves chickens, pigs, cows, or laboratory animals such as mice and rats, I get people's attention by asking whether they would do the same thing to their dog. Across the board, people are incredulous when I ask this question. Of course they wouldn't do something harmful to their dog. They love their dog without qualification—which is why the question works. Dogs aren't more sentient or emotional than food animals or animals used in other contexts, such as in research and entertainment, so why would we do things to these animals that we wouldn't dream of doing to our own dog?

In this way, dogs help us bridge the empathy gap we sometimes have with other animals, just as Jane Goodall's dog, Rusty, helped her bridge the empathy gap when she was a youngster.

In August 2016, *New York Times* columnist Nicholas Kristof published an essay called "Do You Care More about a Dog Than a Refugee?"[18] I was surprised and even more pleased by his essay, which begins as follows:

> Last Thursday, our beloved family dog, Katie, died at the age of twelve. She was a gentle giant who respectfully deferred even to any mite-size puppy with a prior claim to a bone. Katie might have won the Nobel Peace Prize if not for her weakness for squirrels.
>
> I mourned Katie's passing on social media and received a torrent of touching condolences, easing my ache at the loss of a member of the family. Yet on the same day that Katie died, I published a column calling for greater international efforts to end Syria's suffering and civil war, which has claimed perhaps 470,000 lives so far. That column led to a different torrent of comments, many laced with a harsh indifference: Why should *we* help *them?*
>
> These mingled on my Twitter feed: heartfelt sympathy for an American dog who expired of old age, and what felt to me like

> callousness toward millions of Syrian children facing starvation or bombing. If only, I thought, we valued kids in Aleppo as much as we did our terriers!

Clearly, Kristof used the passing of his dog to bridge the empathy gap that people sometimes have with those from another country, race, or religion. To drive this home, Kristof ends his essay with a bit of speculation:

> I wonder what would happen if Aleppo were full of golden retrievers, if we could see barrel bombs maiming helpless, innocent puppies. Would we still harden our hearts and "otherize" the victims? Would we still say "it's an Arab problem; let the Arabs solve it"?
>
> Yes, solutions in Syria are hard and uncertain. But I think even Katie in her gentle wisdom would have agreed that not only do all human lives have value, but also that a human's life is worth every bit as much as a golden retriever's.

Historically, dogs have motivated others to try to put an end to invasive research. In Peter Singer's classic book *Animal Liberation*, he writes:

> In July 1973 Congressman Les Aspin of Wisconsin learned through an advertisement in an obscure newspaper that the United States Air Force was planning to purchase two hundred beagle puppies, with vocal cords tied to prevent normal barking, for tests of poisonous gases. Shortly afterward it became known that the army was also proposing to use beagles—four hundred this time—in similar tests.
>
> Aspin began a vigorous protest, supported by antivivisection societies. Advertisements were placed in major newspapers across the country. Letters from an outraged public began pouring in. An aide from the House of Representatives Armed Services Committee said that the committee received more mail

> on the beagles than it had received on any other subject since Truman sacked General MacArthur, while an internal Department of Defense memo released by Aspin said that *the volume of mail the department had received was the greatest ever for any single event, surpassing even the mail on the bombings of North Vietnam and Cambodia*. After defending the experiments initially, the Defense Department then announced that it was postponing them, and looking into the possibility of replacing the beagles with other experimental animals. [my emphasis][19]

Kristof's piece prompted me to write an essay of my own, titled "Valuing Dogs More Than War Victims: Bridging the Empathy Gap."[20] This, in turn, inspired Dr. Patty Gowaty, a world-renowned evolutionary biologist, to write to me about her dog Rocky and the effect that living with Rocky has had on her and her husband, Steve:

> Rocky's empathy was the leading, determining emotion in our house during this entire year of living with him. Rocky changed us: Steve and I are both calmer and happier. We suffer when we are away from him. We are constantly impressed with Rocky's thoughtfulness, his kindness, his politeness, and his play with us, his gazing into our eyes! Our dogs do a loving number on us, which is hard for those stuck in Aleppo to do: any empathy we might feel for them is not reciprocated with the immediacy of our interactions with our dogs. Empathy is not theoretical.[21]

Are Dogs Therapeutic?

Many people say that living with a dog is comforting. While dogs do not love unconditionally, as I've mentioned, we connect with dogs in a directly emotional way that many people find healing. This is one reason dogs are so helpful in bridging the empathy gap. Dogs give us so much and improve our lives simply by being themselves.

That said, is it really true that dogs are therapeutic? In fact, the research and scientific literature on whether dogs and other animals

really make a positive difference in humans' lives is not as robust as some make it out to be. They're measurably beneficial for some people and not for others. Further, the popular media likes to run with this idea a bit too indiscriminately, claiming that animals are a wonderful panacea for *everyone* who's down and out.[22]

My take on this is if a dog makes a positive difference in your life, then that's wonderful, and you should treasure that relationship. However, don't expect or hope that living with a dog will fix you. Dogs are not medicine but, rather, living beings who need love and care themselves. The dogs with whom I've shared my home, along with many other dogs, have been constant reminders that I am alive and lucky to have had them in my life. In turn, I've always done the best I could to give them a great life.

Caring for a companion animal is sometimes exactly what helps people feel better about the world and themselves. Further, dogs can and are trained to be empathetic and compassionate and to assist us emotionally, not to mention all the practical help dogs are trained to give us.

While some researchers still debate whether dogs really help people get through difficult times, if a dog helps you emotionally and you are able to give the dog what he or she needs to have a good life, that's really what counts. For more than fifteen years, I've been teaching a course on animal behavior and conservation at the Boulder County Jail as part of Jane Goodall's global Roots & Shoots Program. I've heard many stories about how, for some people, dogs were their only friends when they were young, or when they were down and out, because dogs trusted them and didn't judge them. The dogs accepted them for who they were.

In 2017, I exchanged letters with Chante Alberts, a woman incarcerated at the Denver Women's Correctional Facility, which runs a dog-training program called the Prison Trained K-9 Companion Program. In one letter, Chante described her work in this program, which takes in shelter and puppy mill rescues, as well as family-owned dogs brought there for training, and what the dogs have meant to her:

> When I first came to prison, I was two months pregnant with my daughter. Once I had her, I almost immediately joined the dog team. I found so much healing from being around the dogs. I was able to "mother" them . . . in a way I was unable toward my daughter. . . .
>
> Not only does this program save dog's lives but also ours as inmates. After I had my daughter, my postpartum really became overwhelming for me. The interactions and focus I had with my dogs literally kept me grounded and sane. Being on the team, we are held at a higher standard than the rest of the prison population.

Chante and others working with the dogs have to keep their prison records incident free and be role models for other prisoners. She also wrote: "Once a week, as a handler, I was able to actually meet with the public families who were interested in adopting my dog or had brought their dog to us to train. Once a week I wasn't looked at as a criminal or an inmate, but as a woman who was introducing them to their new family member or showing them how much more behaved and obedient their family member became. That right there is the best feeling in the entire world."

I was speechless when I received Chante's letter. Clearly, being in the company of dogs, training them, and being responsible for giving them the best life possible greatly helped her along and gave her life meaning. She has also told me that her mother has a dream of starting a program based on the idea of "pets and parolees," but geared toward anyone going through a hardship or in a "pit" in life. Her intention is for people to "find healing with the relationship with the dog."

When I think about Chante, I'm reminded of a wonderful documentary called *Dogs on the Inside*, in which I was featured, that also clearly shows how interacting with dogs can soften even the most hardened inmates and give their lives a lot of meaning.[23] According to the makers of this this landmark film, "*Dogs on the Inside* follows the relationships between abused stray dogs and prison inmates

working towards a second chance at a better life. In an attempt to rebuild their confidence and prepare for a new life outside, these prisoners must first learn to handle and care for a group of neglected strays. This heart-warming story reconfirms the timeless connection between man and dog, showing the resiliency of a dog's trust and the generosity of the human spirit in the unlikeliest of places."

Dogs in Our Manic, Busy World: Protecting Dogs from Abuse

With all this in mind, I'd like to ask a pointed question: If we love dogs so much, why don't we take care of them better as a society? Dogs, like all other animals, are considered to be objects or property in our legal system and also in many others throughout the world.[24] This legal status as property does not remotely align with our feelings toward the canine companions who share our homes, which prompts another empathy gap question: Would we treat *our* dog the way society too often treats *other* dogs?

It's worth remembering that, along with us, all dogs suffer from the pollution, ecological problems, and environmental damage of our modern world. Some people have even suggested that, in a meaningful and grand way, dogs might be the proverbial canaries in the coal mine, and their health might provide useful warnings about the devastating effects of environmental contaminants. A study published in August 2016 noted a decrease in the fertility of male dogs, and researchers "were able to demonstrate that chemicals found in the sperm and testes of adult dogs—and in some commercially available pet foods—had a detrimental effect on sperm function at the concentrations detected."[25] While more research is needed, it's sobering to think that dogs and other nonhuman animals can give us advanced warnings about what is wrong in our environment, one that we are all supposed to share.

However, the point I really want to raise here is the sort of preventable abuse, and at times intentional cruelty, that dogs can still suffer in our world. It's estimated that about one million compan-

ion animals are abused each year in the United States alone, and I'm pleased to say that slowly but surely more and more people are being punished for this cruelty.[26] While there always will be ups and downs concerning the legal status of, and legal protections for, other animals, I hope the stories below show that *justice truly is a dog's best friend*.

It has become a felony, for instance, to abuse companion animals in Ohio, an Ohio hunter was fired from his job for killing two dogs, and an animal cruelty unit was established in Orange County, Florida, in July 2016.[27] In a number of states, people are rallying to have state laws changed so that charges of animal abuse are treated as felonies, rather than misdemeanors. This was movingly captured in the outstanding 2015 documentary called *A Dog Named Gucci*, which details the story of a severely abused dog named Gucci, a chow-husky mix, and his rescuer, Doug James, who worked relentlessly to get legislation passed in Alabama to make domestic animal abuse a felony.[28] In 2017, the same type of legislation was also sought in Wyoming, New Mexico, Virginia, and Mississippi.[29] In Mississippi, Senator Angela Burks Hill stressed the strong relationship between abuse to nonhumans and abuse to humans, which is often referred to as "the link."[30] Also in 2017, Alaska became the first U.S. state to take "into consideration the well-being of an animal," allowing "judges to assign joint custody of pets"; a bill called the Pet and Women Safety Act (PAWS) was reintroduced into the U.S. Congress by Massachusetts's Katherine Clark that would protect pets in homes where there is domestic violence; and a federal court in New York City upheld a ban on puppy mill sales.[31]

Promising progress to protect dogs from abuse is also occurring internationally. In November 2016, greyhound racing was banned in Argentina, and in December 2016, the mayor of London was called on to review the Dangerous Dog Act (1991) because it was ineffective in reducing dog bites and didn't protect dog welfare.[32] As of April 2017, dogfighting will be penalized as a felony in Mexico.[33] Also in Britain, the environment secretary, arguing for better welfare, announced that the sale of dogs under eight weeks old will be made illegal to stop

backstreet breeders who run puppy farms. The penalty for breaking the rules could be an unlimited fine or up to six months behind bars.[34] In Wales, the Royal Society for the Prevention of Cruelty to Animals (RSPCA) had more successful animal welfare convictions in 2016 than ever before.[35] In February 2017, a new law banned euthanizing animals in Taiwan; the intent is to cut down the number of abandoned and stray dogs who uncontrollably reproduce and to make the public aware of this enormous problem. In May 2016, Taiwanese veterinarian Chien Chih-cheng, most likely suffering from deep and enduring empathy burnout and compassion fatigue, committed suicide from the stress of having to kill numerous stray dogs.[36] Of course, many people everywhere are sick and tired of organized dog fighting, and since 2006, the RSPCA in the United Kingdom reports receiving nearly five thousand calls about organized dog fighting in England and Wales.[37]

To avoid feeling demoralized, it's important to balance reports of bad news with examples of good news. And I prefer to focus on the good. Take Ohio: in 2016, Ohio lawmakers cracked down on bestiality and cockfighting, and in a separate decision, an Ohio Appeals Court ruled that "dogs are not dining chairs or television sets" and that damages for an injured pet need to be more than "simple 'market value.'"[38] And yet Ohio continued to allow pet stores to sell dogs from puppy mills because of pressure from the Ohio-based Petland franchise, which is the largest puppy-selling pet store chain in the United States.[39] Also in the bad news column, in December 2016, a federal court in Detroit, Michigan, gave police the go-ahead to shoot a dog if they move or bark when an officer enters a home, and a Canadian judge ruled that dogs are to be considered as property and have "no familial rights."[40] However, in January 2017, the premiere of the movie *A Dog's Purpose* was canceled after a video showed a stunt dog in distress.[41]As with Gucci, public opinion and concerns really can make a positive difference for the lives of dogs. And, more good news came in June 2017, when Pennsylvania's governor, Tom Wolf, signed an upgraded anticruelty bill for his state.[42] Around the same time, the city council of Vancouver, Canada, banned the sale of dogs, cats,

and rabbits in pet stores; abused dogs in Connecticut got their own lawyers; and Vermont passed a new law banning the sexual abuse of animals.[43] Businesses have also gotten involved in helping dogs. For instance, in 2017 BrewDog, a craft brewery in Ohio and Scotland, started giving employees a week off when they took a new dog into their homes.[44]

The fight continues. In February 2017, animal welfare and animal abuse data were removed for unknown reasons from the website of the U.S. Department of Agriculture, a reprehensible form of censorship.[45]

ARE DOG TRAINERS REGULATED?

In the United States, anyone can call themselves a dog trainer, and there simply are no dog-training regulations of which I or the people I have spoken to are aware.

Most incidents of abuse arise from dominance-based or aversive dog training. This approach uses and encourages the harsh physical handling of dogs, which is justified by the belief that dogs need to be physically "dominated" before they will respect or listen to a person. As I've said, this idea is flat-out wrong and terribly misguided. This type of "training" traumatizes dogs and leads to injury and even death. For instance, in January 2017, I received an email that broke my heart:

> I am writing you to seek your support; I am on a team working with lawmakers in Florida to introduce legislation for dog training techniques, which Animal Legal Defense Fund worked with me to draft. ALDF surveyed the country and found that this legislation is unprecedented, so we all think it is time.
>
> My puppy, Sarge, was attending daycare, where they use dominance-based techniques. He was dead within two hours of a cruel tactic used on him.
>
> Sarge was a three-and-a-half-month-old Shih Tzu/Pekingese mix. He weighed eight pounds.

> Because Sarge wasn't "heeling," the trainer grabbed Sarge and held his mouth closed with his right hand while holding his neck with his left—Sarge thrashed and collapsed. The trainer said, "That's normal. Because he's a puppy, he exerted all his energy," and "I won that battle, but you may not next time because he is strong." I said, "But his eyes are glazed over, and his tongue is hanging out." The trainer made Sarge get up. Sarge tried, but collapsed again.
>
> I first took him to the training facility's veterinarian close by. I was then referred to the emergency clinic. I believe Sarge died in my arms as I was entering the door of the emergency vet; I could feel his heartbeat fading. He suffered terribly and had a hard time breathing his last two hours.

Sarge died in May 2015, and in March 2017, two months after I received the above email and got involved, there was some movement to regulate dog trainers in the county in which Sarge had lived.[46] In December 2016, abuse at a dog training facility in Oceanside, New York, led to a call for legislation that would create a state-issued license for dog trainers "to curb the unregulated practice of individuals claiming to be dog-training experts."[47]

These are only a few examples. In an excellent and well-researched 2016 essay, Elizabeth Foubert points out that "in the United States anyone can work as a dog trainer, regardless of the person's qualifications," and the Academy for Dog Trainers rightfully has called for transparency.[48] In a Facebook post, they wrote: "What should owners look for in a dog trainer? If you ask us, the most important thing is **transparency**. If a dog trainer is not willing to fully disclose, in clear language, exactly what will happen to your dog (in the physical world) during the training process, keep shopping. Look for verbs, not adjectives. Demand to know what specific methods will be employed in what specific situations. Don't settle for smoke and mirrors."[49]

I agree completely with this advice. Dog training can be abusive, and we must do all we can to make sure it is not. There still is a lot

of work to be done, and it is essential for people to get involved at a grassroots level. Dogs need all the voices and justice they can get.

ARE ELECTIVE, COSMETIC SURGERIES ABUSIVE?

Dogs and other animals also need protection from elective "cosmetic" surgeries. These include tail docking, ear cropping, devocalization, cat declawing, and piercing and tattooing. Some dogs also are being treated with Botox for eye lifts, testicular implants to regain masculinity, and plastic surgery for nose jobs and tummy tucks.[50] I see absolutely no reason for any cosmetic or breed-specific surgeries, or those that are done to make it easier to live with a dog. I think that dogs who are born with tails look much better with them rather than having their tails cut off because some humans like them tailless. Let's work hard to let dogs keep their tails. One reason given for the use of elective cosmetic procedures is that they make dogs more attractive, sometimes so that their humans won't dump them and sometimes to make them more adoptable. Says one veterinarian, "Hangy boobs and lumps and bumps make people uncomfortable." I can see where fixing these "imperfections" might serve a dog well on certain occasions, but cosmetic surgeries to please people or to prevent human guardians from giving up their companion don't say much at all about these people. Dogs don't give a hoot or a bark about how their eyes look or if they have a big nose, even if they can look in a mirror and recognize themselves.

Spaying and neutering are also elective surgeries. These are typically done to prevent unwanted breeding (and unwanted puppies) and to reduce aggression or problem behaviors. However, only the first outcome is assured, and the topic of spaying and neutering is complex. Opinions and evidence are mixed about whether these surgeries actually result in the positive behavioral changes some claim.[51] I regularly hear from people like the woman I quote in chapter 1, whose dog, Helen, continues to hump wildly despite being "fixed." Ultimately, spaying and neutering are not panaceas for behavioral issues.

It's important to keep in mind that we can do whatever we want to dogs and other animals, whether they like it or not. While dogs may still love us regardless of what we decide to do to make them more attractive or easy to live with, it's essential to honor that this imbalance in power is not a license to do whatever we choose.[52] There's lots of money in the pet cosmetic surgery industry, and we shouldn't let money rule because of human vanity.

A variety of state laws govern elective surgical procedures on pets, and the American Veterinary Medical Association offers a useful summary, which was last updated in December 2014.[53] These laws typically restrict such surgeries unless there is a medical reason to perform them. Of course, there is always more to do to protect dogs. On the positive side of the ledger, in November 2016, Canadian veterinarians in British Columbia banned tail docking and ear cropping.[54]

Concerning the debarking of dogs—that is, performing a procedure in which dogs' vocal cords are cut to quiet them—the National Animal Interest Alliance (NAIA), which also favors the use of animals for research, dismisses debarking as "bark softening" and thinks it's just fine to do.[55] Yet we don't really know how this changes the behavior of individual dogs. Of course, many others and I take issue with their position. Dog trainer and writer Anna Jane Grossman nicely covers the pitfalls of this surgical procedure. She suggests that dog noise really is a human problem, and these surgeries have side effects that include the buildup of scar tissue (which makes breathing or swallowing difficult), chronic coughing (which can cause infection), and swelling of the throat (which can cause heatstroke).[56] She writes: "The governments of the U.K. and 18 other countries have signed the European Convention for the Protection of Pet Animals into law. This convention also prohibits ear cropping, tail docking, and declawing (in cats). In 2010, Massachusetts outlawed the procedure, following a bill filed by a teenager. New Yorkers are hoping a similar bill will be passed next year."[57]

All in all, laws on dog abuse are slowly changing for the better. There are also many organizations that work to protect dogs, too many to mention here, including the wonderful Sound of Silence

Campaign to protect dogs from being used in testing.[58] We still have a long way to go, but any progress is good. We just need to keep working for more protection for dogs and other animals in a world in which human interests typically outweigh those of nonhuman animals.

The Big Picture: What You Can Do

We need a new social contract for our relationships with all nonhuman animals.[59] There always will be mysteries about other animals, and recognizing that we don't know all there is to know should keep us on our toes. But let me stress again that we know enough right now—and we have for a long period of time—to do more for dogs and other animals in an increasingly human-dominated world. I know this seems like a big ask, but I do feel that if we always try to do more, everyone will benefit, dogs and humans.

One thing this means is making sure our big picture view always includes nonhuman animals, so that we extend our respect and compassion throughout the animal kingdom. I'm always amazed by how dogs help us bridge the empathy gap to do this. As I was writing this chapter, I discovered an essay by Andy Newman in the *New York Times* called "World (or at least Brooklyn) Stops for Lost Dog."[60] Bailey, a two-and-a-half-year-old goldendoodle, went missing in Brooklyn. Her human, Orna Le Pape, was understandably distraught, and numerous strangers got involved looking for Bailey. Why would people interrupt their busy lives to do this? One of Le Pape's friends weighed in: "At a time like this, when there's so much turmoil going on around the election, here's this story that everyone can latch on to and be on the same side. Everyone wants a lost dog found."

As William Shakespeare wrote, "All's well that ends well," and of course, Bailey's story has a happy ending. Bailey was eventually found, eight pounds lighter, starving, and dehydrated. Yet Bailey perfectly exemplifies how dogs can help us bridge the empathy gap and come together. Bailey catalyzed cooperation during a time when cooperation was severely strained by our political divisions. His

story reminds me of the story I told in chapter 1 about how Pepper's dognapping from a Pennsylvania farm in 1965 lead to the passage of the federal Animal Welfare Act in 1966. With a little help from our canine friends, we can easily wrap other animals into the folds of respect and compassion, so they, too, know we're doing all we can for them.

Of course, there always is more to do.[61] Our work on behalf of dogs (and other animals) never stops. Abuse must be countered head on. Dogs need all the voices they can get. They are totally dependent on our goodwill and rely on us to work selflessly and tirelessly on their behalf. If we don't, it's a dirty double-cross. It's indisputable that we cause severe psychological and physical harm to our companions when we let them down, when we neglect them or dominate them selfishly, taking no responsibility for the deep hurt we've created. The hearts of our companion animals, like our own hearts, are fragile, so we must be mindfully gentle with them. We can never be too nice or too generous with our love for our dear and trusting companions, who are so deeply pure of heart.

When we betray our companion's trust and take advantage of their innocence, our actions are ethically indefensible. These actions make us less than human and are simply wrong. Much unadulterated joy will come our way as we clear the path for profound and rich two-way interdependent relationships based on immutable trust with our companions and all other beings.

Simply put, we must care for dogs' fears and stress as they try to live in a human-dominated and over-busy world. Dogs need to feel safe, and attachment is all about trust. They truly comprise a class of vulnerable and highly sentient beings. Of course, many people are lucky to have animals like dogs in their lives, and many dogs are lucky to have us. But we need to keep in mind that around 75 percent of dogs in the world are on their own, just trying to make it through a day. Trying to make it through another day is an issue as well, I'm afraid, for many dogs who live in ostensibly far better circumstances.

Concerning the plight of dogs who are on their own, I was thrilled to learn that, in January 2017, a mall in Istanbul, Turkey,

opened its doors to stray dogs during a winter storm.[62] In the same month, an Indonesian charity helped to find new homes for unwanted dogs.[63] Pippin, a dog who was stranded at the bottom of a concrete drain in Jakarta, found a new home in Atlanta, Georgia. Small acts of kindness are important. They help specific animals, of course, and they might also inspire similar acts elsewhere.

Because I work with Jane Goodall's global Roots & Shoots Program, I interact with youngsters quite a lot.[64] If we show them how important it is to treat dogs and others well, and to respect them for who they are, there really is hope for the future. I love how humane educator Zoe Weil puts it: "The world becomes what we teach."[65]

The State and Future of Dogs

> We need another and a wiser and perhaps a more mystical concept of animals. Remote from universal nature, and living by complicated artifice, man in civilization surveys the creature through the glass of his knowledge and sees thereby a feather magnified and the whole image in distortion. We patronize them for their incompleteness, for their tragic fate of having taken form so far below ourselves. And therein we err, and greatly err. For the animal shall not be measured by man. In a world older and more complete than ours they move finished and complete, gifted with extensions of the senses we have lost or never attained, living by voices we shall never hear. They are not brethren, they are not underlings; they are other nations, caught with ourselves in the net of life and time, fellow prisoners of the splendour and travail of the earth.
>
> **Henry Beston, *The Outermost House***

This quote from Beston is one of my all-time favorites. I go to it constantly because it says so much about who other animals are and about our relationships with them. First, we do indeed view others through our own senses, and as we have clearly seen, dogs don't sense the world how we do. So our views are, indeed, distorted. We also patronize them for not being like us, for what we perceive as their incompleteness, as if we are complete. This misrepresentation

allows some people to place dogs and other animals below us on some mythical evolutionary scale. They're referred to as "lower" beings, a move that results in rampant mistreatment and egregious abuse. As Beston asserts, "And therein we err," for we should not be the template against which we measure other animals. I also like how he views other animals as "other nations," since this asks us to view them as the *beings* they are, not as *what* we want them to be. And surely, dogs and other animals are caught up in the "travail of the earth," captive to whatever we want them to do and whoever we want them to be. As we've seen, this makes for a good deal of stress in their lives as they try to adapt to a human-dominated world.

One aspect of the world in which dogs are captive is our busyness. I often wonder what the future is going to be like as people get even busier and more stressed. How will dogs fit into our lives in a more demanding world? How will we prioritize dogs, those companions with whom we choose to share our lives? Many people who work closely with dogs are concerned with just how stressed dogs truly are in all sorts of situations. Dog trainer Kimberly Beck suggests that we need to work toward tolerance in our relationships with dogs. She also wonders whether we love them simply because they love us. This question opens the door to discussions in all sorts of settings, ranging from cocktail parties to ivory towers.

I hope I've been successful in showing you how fascinating dogs are and why we need to let dogs be dogs. Of course, we need to be sure they learn what is and is not acceptable in the world of humans they inhabit, but we should not train the dog out of them. We can learn a lot about respect, dignity, commitment, and love from sharing our lives with dogs. Dogs can also show us that a violent world is not a natural world.

The state of dogs is slowly getting better. Dogs want to live in peace and safety just like we do. So feel free to don your ethologist's hat, take a pen and pad, have a video camera ready if possible, make it a social outing or family affair, and show the dog with whom you share your home and heart that you really care about them. These

feelings of empathy and compassion can easily spread to other dogs, other animals, and other humans.

It's often claimed that humans have a natural affinity for nature, including other animals. This is called the biophilia hypothesis.[66] Let's all tap into what's in our genes, bridge the empathy gap, and do what's right. What a great example this would be for youngsters and for future generations. The more we learn about dogs and other animals, the more informed our actions and activism on their behalf should be. But as I've pointed out repeatedly, we already know enough to do more for them right now.

When we give dogs and other animals the very best lives possible, it can easily spill over into more freedom and justice for all animals, including ourselves. Wouldn't that be grand? Who could argue that more trust, empathy, compassion, freedom, and justice wouldn't be the best thing we could do for all animals and for future generations who will inherit our wondrous planet? I surely don't know anyone who would do so.

I often wonder if dogs, by bridging the empathy gap among humans, could help to heal our wounded world by bringing together people of all ages and all cultures who share an attachment and affection for these wonderful beings.

We are most fortunate to have dogs in our lives, and we must work for the day when all dogs are most fortunate to have us in their lives. In the long run, we'll all be better for it.

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APPENDIX

So, You Want to Become an Ethologist?

Merl arrives at the dog park, waits impatiently for his human to open the gate. He strides through the gate and immediately goes over to a rock, lifts his right leg high as if he's the "top dog," pees a steady stream, scratches the ground vigorously, walks over to the fence surrounding the park, lifts his leg again, dribbles some pee, and then looks around either to see who else is there or to see if anyone saw him do this. This is Merl's routine, and I've seen him do it many times. However, after he pees a bit the second time, if Merl sees his friend Antonio, he takes off, runs straight at him, does a few quick play bows, and the two wrestle, bite one another with abandon, chase one another all over the place, often running over other dogs and nearly taking down some people. They play as long as their humans allow them to. However, if Antonio isn't there, and Merl sees other dogs looking at him, he pees and scratches the ground again to be sure they know what he's done. And if another dog comes over and sniffs Merl's pee and pees over it, pissing matches ensue. I once watched Merl and another dog engage in five rapid exchanges of the yellow stuff.

This description of Merl playing and peeing is an excellent example of what field notes look like, as is the story of Jethro and Zeke that opens chapter 3. Indeed, people at dog parks spend a lot of time watching and commenting on these two behaviors. At dog parks,

when I teach people how to become ethologists, I usually focus on playing, peeing, ground scratching, and dogs observing one another. These behaviors are excellent teaching tools because individuals can be identified, they can be seen throughout the encounter, and the actions are clear and easy to score. When training students, I use a standard clip of these sorts of interactions, and over time students learn to become better observers. Everyone is pleased when we agree on what dogs are doing and on what behaviors mean. Instances of occasional differences in opinions are instructive as well. People can see things differently, and these differences are important to parse.

At the dog park, people are often grateful for these mini-lessons in ethology. I remember one man, Jack, whom I coached in observing his three dogs, Henry, Max, and Violet. He was pleased that I had taken the time to train him to become a citizen ethologist, which allowed him to "become" one of his three dogs whenever he chose to do so. He told me he really felt closer to his dogs, and he had begun training other humans at the dog park. I consider this outcome advantageous to everyone affected, since the dogs and the humans always benefit from these quick courses on dog behavior.

Dogs are an ethologist's dream. When we carefully observe dogs, what we learn is a never-ending story. There always is something more to the puzzle of why dogs do what they do. Further, to understand dogs, there are *no* substitutes for careful observation and description. For ethologists, watching dogs in every type of setting and situation is critical for generating experiments, models, and theories. For you, as the human companion of a dog, closely observing your own dog is the best way to improve your dog's quality of life and to relieve the stress so many dogs endure day in and day out.

This appendix is for those who want to learn how to observe like an ethologist. A good place to begin is with the realization that to learn what it is like to be a dog, we have to, in some sense, become a dog. We have to try to adopt a dog's perspective, even if this takes an imaginative leap. When we watch dogs and other animals, it's essential that we see exactly what they're doing and try to understand it from their point of view; in this way, we, the see-ers, become the

seen.[1] There's a narrative to a dog's body movements, and within the larger narrative, there are micro-movements or smaller narratives. To understand what a dog thinks and feels, we must pay close attention to the subtleties in their behavior, all of which matter.

I love meeting and inspiring citizen scientists in dog parks. I love hearing what other people think about the dogs we observe together. I learn a lot from the questions people ask and the observations they make. And I feel strongly that science in general, and the ethology of dogs in particular, will only be improved and grow through the efforts of citizen scientists.

Ethology: What It's All About

Simply put, ethologists observe animals and ask questions about the evolution and ecology of different behavior patterns. In the most basic terms, ethology is all about the details of who does what to whom, how many times, and when and where. Many psychologists are also interested in the behavior of dogs, but they typically don't take such a broad evolutionary and ecological view of behavior.

Ethologists also usually focus on free-ranging rather than captive animals. And some dogs are of course free-ranging, and we can learn a lot by watching them and seeing where they go, with whom, and for what purpose when no humans interfere with their choices. We can study feral dogs just as we study other wild animals. However, we can also study companion dogs in every setting and context. In a general sense, this field of study is called the behavioral ecology of dogs because we can observe and study them in different ecological niches, if you will, including trails where they can run free, dog parks, and in our homes, on leash and off leash, and during their various interactions: with other dogs, with combinations of dogs and people, with strangers, and with their human family. One major advantage of studying companion dogs is that it's possible to identify individuals, see them interact with other identifiable dogs, and watch them over time. When studying other animals in the field, it's not always possible to identify individuals reliably or to watch them over time.

It's essential to realize that behavior is not only something an individual *does*, but it is something an individual *has*, actions that can be measured. Behavior patterns that endure over time (or across generations) are considered evolutionary adaptations. For example, the play bow is adaptive because it works to initiate and to maintain a "play mood." This gesture has been exhibited for many generations, and each new generation continues to use it. The play bow isn't performed by a few individual dogs now and then; it seems that all dogs (with the exception of New Guinea singing dogs—a type of wild dog notable for its unique vocalizations) use bows as a successful method of communicating specific intentions.[2] Remember: the play bow changes the meaning of the behaviors that follow it. In other contexts, actions that would be regarded as aggressive or mating behavior become, after the play bow, only play.

By thinking of and studying animal behavior in this way, as a structure that an individual has, ethologist Konrad Lorenz showed how evolution can influence a wide variety of behavior patterns, including the signals used to communicate threat and dominance, as well as play, among other behaviors. The author of *Man Meets Dog*, Dr. Lorenz is often called the father of ethology, and he became famous for having ducklings and young geese imprint on him and follow him around as he crawled on the grass.

The wide-ranging importance of ethological investigations was highlighted in 1973 when Konrad Lorenz—along with Niko Tinbergen, who is often called the curious naturalist, and Karl von Frisch, for his work on bee language—jointly won the Nobel Prize in Physiology or Medicine.[3] Many scientists who deemed their own work "real research" were quite irritated that this hallowed prize went to three fellows who got paid to watch animals. What, creating ingenious field experiments to study animal behavior—and having fun doing it—isn't real research? Nothing could be further from the truth. Each scientist keenly observed animals, devised novel and often incredibly simple experiments, and offered useful and enduring theories concerning the evolution of behavior. One of my favorite books about the study of ethology and the natural history of animals is poet Hoffman

Hays's easy-to-read *Birds, Beasts, and Men*.[4] I regularly recommend it to people who want to know more about these three scientists, the history of animal behavior, and what ethologists do.

NIKO TINBERGEN'S FOUR QUESTIONS

Many ethologists, myself included, follow Niko Tinbergen's integrative ideas about the questions with which ethological studies should be concerned, namely:

evolution (Why did a behavior evolve? What is it good for?);
adaptation (How does a particular behavior allow an individual to adapt to the immediate situation? How does it contribute to individual reproductive fitness?);
causation (an overt cause is like a red light that causes you to put your foot on the brake of your car; an internal cause is like a hormonal or neural reaction that causes you to startle);
and *ontogeny* (the development and the emergence of individual differences and the role of learning).[5]

Dr. Tinbergen's ideas about how to study animal behavior became well accepted. Subsequently, University of Tennessee psychologist Gordon Burghardt added the question of personal experience to Tinbergen's scheme.[6] Burghardt had worked with Donald Griffin, a world-renowned biologist who shocked many of his colleagues when, in the mid-1970s, he suggested that we needed to pay more attention to the evolution of consciousness in animals.[7] Personal experience was an important addition to Tinbergen's four questions because it stressed that animals are conscious and sentient beings who have feelings and emotional/personal lives, which are adaptations that also evolve.

In my studies, I take a strongly comparative, evolutionary, and ecological approach, which means I look for similarities and differences among different species; I try to understand why particular behavior patterns have evolved and why they are maintained in

(selected for), or disappear from, a species' repertoire; and I observe how behavior changes in different ecological and other venues. Of course, it's rare that one or only a few studies can do all this, and that's why it's so important for researchers to share results and talk with one another. Surely, research on dogs has benefited from these sorts of cooperative endeavors, though some researchers are more willing than others to engage in them.

CORRELATION ≠ CAUSATION!

As we begin, it's essential to make one more comment about analyzing behavior, namely, correlation does not imply causation. Just because different events happen at the same time, or at almost the same time, that does not necessarily mean that they are *causally* related. If, on occasion, I pour myself a glass of good red wine while a police car speeds by my home, these events are correlated in time, but there's no plausible causal explanation. Likewise, if your dog gets up (and wakes you up) whenever your neighbor pours a cup of coffee in the early morning, it would be difficult to argue for a causal relationship between the two events. However, in other, less obviously unrelated scenarios, people make this mistake all the time. For instance, when training dogs, we can inadvertently reward the wrong behavior and create an accidental association that implies causation, but that doesn't solve the problem at hand. This is why I emphasize close observations over time.

Becoming a Dog, or the Practice of Ethology

As an ethologist—a biologist who studies animal behavior with an emphasis on evolution, ecology, and comparisons of closely and more distantly related species—I always want to learn more about everything dogs do and why they do it. I am also interested in comparing individuals of one species to one another and doing cross-species comparisons to try to get a handle on why there are similarities and differences.

The bottom line is that, by becoming an ethologist yourself, you can "become a dog," or at least get a good approximation of what it's like to be a dog. Those readers well versed in philosophy will see I'm teetering on writing about phenomenology, a field that stresses the importance of direct experiences. So, in some ways I'm advocating for a field some might call phenomenological ethology.

In any case, what follows is a step-by-step primer in basic ethological research.

PATTERNS OF SOCIAL INTERACTION

Throughout this book, I discuss dog → dog (cell number 1 in the matrix below), dog → human (cell number 2), human → dog (cell number 3), and human → human (cell number 4) interactions.

It's important to note that often, when watching dogs or other animals, the different sorts of interactions become blurred awfully fast. Sometimes it's simply impossible to figure out who initiated and who ended an encounter, and when there are more than two dogs, or a dog and a human, it can become a nightmare very fast. Nonetheless, we still can learn a lot from parsing out the different types of interactions using this simple matrix.

	Receiver	
Initiator	Dog	Human
Dog	1	2
Human	3	4

On your journey to becoming an ethologist, you can make your own matrix or a set of matrices and fill in the numbers for all sorts of interactions. It's a simple and fun exercise through which you'll learn a lot about your dog's personality. For example, is she or he a leader or a follower, a player or more of a loner? What types of interactions do they initiate, and what sorts of encounters don't they especially like and try to avoid? You also can discover if they prefer

some dogs rather than others, if they're having a good or bad day, and how their behavior changes over time with familiar and unfamiliar dogs and humans in different social and physical contexts. The list of things you can learn is long, depending on your interests. That's what makes watching dogs so exciting!

HOW TO MEASURE BEHAVIOR

As you become an ethologist, you'll also learn that the sorts of data you collect depend on the methods you use to watch individuals or groups of animals. Ethologists try to use objective criteria and measurements when observing and analyzing behavior. Some of these measurements include:

FREQUENCY: This is simply the number of times a behavior is performed.

RATE (frequency/time): This is a refinement of frequency, in that *rate* factors in time or duration. How frequently does a dog perform a particular behavior during a specific period of time?

INTENSITY: It's difficult to measure intensity (or concentration) when observing individuals, so some researchers often use what's called the distraction index. Namely, how difficult is it to stop an animal from doing something? So, for example, when a dog is walking around with their nose pinned to the ground, sometimes it's almost impossible to get their attention. Intensity is a subjective measurement, but it can be made somewhat more objective by measuring the strength of a scent needed, the loudness of a noise required, and the length of time it takes to get the individual's attention.

SAMPLING TECHNIQUES

Another aspect of doing ethological research is to decide how to watch dogs. Researchers call these sampling techniques. Here are a few outlined by Dr. Jeanne Altmann, who did seminal studies on the behavior of nonhuman primates.[8]

AD LIB SAMPLING: This means you record everything you can. It's easier to do this when filming animals, but it's also possible to do when recording ongoing behavior into a tape recorder of a smart phone. Of course, when an individual is out of sight, you have little to no idea of what they did or what was done to them.

FOCAL ANIMAL SAMPLING: This sampling method means you observe and score everything that one member of the group does and everything that is done to that focal animal for a period of time. Then you rotate in order (or randomly) among all the members of the group. Sampling must be randomized so that all individuals are observed at different times of day (or differing periods throughout the observation time window). It is necessary to be able to identify individuals for this method to work.

1–0 SAMPLING: With this method, you choose one individual and set a time interval during which you simply score if they do something or something is done to them. This is a very crude method that doesn't generate many detailed data, but often it's all that can be done, especially when it's difficult to follow or to identify individuals.

CHOOSING A METHOD: In the best of all possible worlds, it would be great if you could record everything that an individual does as well as everything that other group members do, but this is often difficult, so you just have to go with what works and make the best of it. It's essential to know the limitations of the sampling methods you use. If you can't see a dog all of the time, or if you can't identify individuals reliably, then there are limits to what you can learn. But this is okay. Rather, do what you can do and recognize whatever limitations you face.

Of course, short-term results may vary significantly from results gained over long periods of observation. A good question that often comes my way is: "How do you know when to stop?" If no new patterns or observations are made after a period of time, it's likely you saw most of what is important. Of course, many animals breed only once a year, so if you missed this, you will have missed a very important set of events! After around three years of studying dogs, I

didn't note any new behavior patterns that could be added to the catalog of actions I recorded. But in my eight-year study of wild coyotes, we were still learning new facts about these incredibly cunning and adaptable canids right up until the end.

CONSTRUCTING AN ETHOGRAM

As I say, the easiest way to become a dog or other animal is first to spend time watching them. It's incredibly instructive simply to observe them running freely, or nearly so, such as at dog parks and on trails where they're allowed to run and explore on their own. However, observing dogs as they walk tethered by a leash to a human also yields data. Of course, it's almost equally important to watch the people who are with the dogs. The outcome of these observations would be a list of behavior patterns called an ethogram. This list is just that, a descriptive menu of what the dogs and humans do with no interpretation or explanation for why they do it. Actions can be described by their physical characteristics—what they look like—such as postures, gestures, facial expressions, and gait, or by the consequence they have, such as an individual's orientation to objects or to individuals in the environment, the results of which lead to the accomplishment of a task or to some result.

When I taught courses in animal behavior, every student had to do some sort of field project. Many chose to observe dogs with whom they lived or unfamiliar dogs in and around Boulder, Colorado, and the first thing they did was simply to observe dogs and humans for fifteen to twenty hours. They could take notes or just watch all sorts of interactions to familiarize themselves with the various behavior patterns and interactions that occurred. Other students chose to watch squirrels or birds on campus, for example, and they also spent the same amount of time watching the animals to get a feel for who they are and what they do. After this time, they developed an ethogram and compared notes to be sure they had a good sampling of difference actions and encounters.

The information collected from direct observations could then be supplemented by filming the animals, but the first set of observations were through their own eyes, ears, and noses. Today, you can record the data using a tape recorder, phone, or computer, and new methods and devices are constantly being developed. Students routinely told me they were amazed by how much they learned by watching dogs with whom they were familiar, individuals whom they thought they really knew. I told them that I was always amazed as well when I simply stepped back and watched dogs with whom I lived or dogs in other venues. Having been trained in ethology, I know that all ethologists spend a lot of time "just watching" the animals in whom they are interested with no agenda other than to learn about the things they do and to get a feel for how they negotiate various social and nonsocial situations. As you know by now, I treasure the ethological approach to learning about animal behavior.

Developing an ethogram, or a menu of what animals do, is the most important part of a behavioral study. To me, it really is fun and a great experience in learning about how animals act. There are numerous dog ethograms available, and two I use are offered by ethologists Roger Abrantes (*Dog Language*) and Michael W. Fox (*Behaviour of Wolves, Dogs, and Related Canids*). Barbara Handelman's *Canine Behavior: A Photo Illustrated Handbook* is also an excellent resource, as are the numerous illustrations at "Learning to Speak Dog Part 4: Reading a Dog's Body."[9] Some behavior patterns that people score include a dog's approach to other dogs (speed and orientation); biting directed toward different parts of the body; biting intensity (inhibited and soft, or hard and accompanied by either shaking of the head or not); rolling over; standing over; chin resting, play soliciting; self-play; peeing and the posture used; pooping; growling; barking; whining; approaching and withdrawing; pawing directed toward different parts of the body; ear position; tail position; gait; and so on. Over the years, I have found that I can account for the behavior of most dogs by scoring around fifty different behavior patterns.

SPLITTERS AND LUMPERS

Depending on their focus, researchers tend to approach or organize their data in two ways: by splitting or lumping. Splitters do micro-analyses of actions, and lumpers are interested in broad categories of behavior, such as play, aggression, and mating, for example. Whether you split or lump actions depends on the questions in which you're interested. I always split because then you can lump later on if that's the best strategy. But if you lump first, it's impossible to split later on. It turns out that there is a lot of agreement among people who construct dog ethograms, so there are some basic behavior patterns that transcend dogs.

To put this all together, the simple steps in constructing an ethogram are as follows: watch animals in person or on videos; list each different behavior; compare your list with others; watch more and write down more behaviors; come up with a code for each behavior so you can "score" observations easily; and split behaviors rather than lumping two or more together. For instance, rather than write "bite," distinguish where the bite occurred: face bite, ear bite, neck bite, body bite, and so on. Or denote intensity: an intense hip slam versus a mild hip slam. You can group all bites together later, but you will lose the subtle differences if you do not record them first. Finally, you generate flow charts and matrices of interactions from the raw data.

What Good Does Ethology Do? Experts Weigh In

Let me end by considering a question that I'm often asked: "So, what the hell does all this ethological research do for me and my dog?" Some people follow up this question with something like, "You all need to get out of the ivory tower and into the field." Of course, this is something I believe myself. Too many researchers and dog trainers only observe dogs in the lab and when there's a problem, but they also need to go to places where dogs are walked and allowed to run freely. They need to observe dogs in the real world.

People want to know whether anything practical comes from all this research on dog behavior. For instance, many people who want to adopt dogs are interested in the value of assessment tests that are used to understand an individual's personality. While there are some debates about their reliability, I feel they work well enough so that they should be continued.[10] One example of practical application comes by way of Alexandra Protopopova, an assistant professor in companion animal science in the Department of Animal and Food Sciences at Texas Tech University. According to *Science Daily*, she is working "to determine what behavioral traits in dogs are most attractive to potential adopters and then working with shelters to train dogs to exhibit those traits when an adopter shows interest."[11] "We are very excited about this procedure," said Protopopova, "because this is really the first time we have experimentally and systematically demonstrated an increase in adoption rates through behavioral training." This really is good news for the millions of dogs who need homes and who spend far too long in cages at shelters or are put to sleep.

I certainly hope that this book has helped in many ways to answer the question of whether all this research into the ethology of dogs actually benefits dogs themselves. Research on dogs increases our understanding of our family pets and companions, and it helps us improve their lives so we can provide the best life for them that we can. So I thought I'd end the book by letting an international group of experts in the field of dog studies share their insights about how research benefits dogs. I asked each this question, and this is what they replied:

DR. ÁDÁM MIKLÓSI: The author of the excellent book *Dog Behaviour, Evolution, and Cognition* and numerous research essays with many colleagues at Eötvös Loránd University in Budapest, Dr. Miklósi oversees the Family Dog Project.

> This is a very general question. In my experience people know very little about dogs, both about their general behavior and their problem-solving ability. In some situations they may overesti-

mate the dogs' performance (e.g., talking about their smelling skills); at other times they underestimate it (e.g., dogs can learn by observing humans and other dogs—not just clicker training). So our research aims to provide objective knowledge about behaviors and skills of dogs.

People often make parallels between humans and dogs. Stanley Coren says that dogs are like two- to three-year-old children. We would like to be more precise and find out exactly in which case (behavior function/skill) can we say that the performance of dogs is comparable to that of a two-year-old, and when is this comparison problematic. Moreover, even if we find similarities, the underlying mental mechanisms can be still different.

I also support the notion of friendship, which means that people need to invest time and effort in their relationship with dogs, and they should allow the dog to be a dog, and should not try to turn it to a "little baby."

I hope when people read our one hundred-plus papers, then they get a good overall picture about the dog, which has made a very interesting evolutionary journey from the "wild" to become our best friend.[12]

DR. JOHN BRADSHAW: Internationally known for his research on dogs and cats, Dr. Bradshaw is the author of *Dog Sense: How the New Science of Dog Behavior Can Make You a Better Friend to Your Pet*.[13] In an email, he addressed research on feral dogs, stating: "In my view, the main contribution that studies of feral dogs have made is to confirm that dogs are not wolves." Then he pointed me to an essay he wrote with Nicola Rooney, in which they note:

The relevance of wolf social biology to furthering our comprehension of the behavior of domestic dogs has recently been cast into doubt, partly because wolves and dogs are now known to be significantly different in their cognitive abilities, and partly because studies of free-roaming dogs have revealed a preferred so-

> cial structure that is pack-based but otherwise quite unlike that of the wolf. The apparent certainties of the wolf-pack model, which was still universally adopted as recently as two decades ago, have not yet been replaced by any new consensus. To explain dog behavior functionally ("what is it for?") requires an understanding of the adaptive pressures that have shaped dogs since their divergence from the wolf. It is likely that these are essentially anthropogenic, and that each dog's lifetime reproductive success is influenced more by interactions with people than by interactions with other dogs. If so, it follows that any social structure adopted by free-roaming dogs may not be fully adapted to feral life.[14]

DR. LUIGI BOITANI: Well known for his research on wolves and feral dogs, Dr. Luigi Boitani replied that

> this is not a simple question! I think that studying feral dogs we have the opportunity to learn at least two orders of information:
>
> 1) How much has been lost through domestication of the dog's capacity to cope with natural environments. In other words, how much domestication has changed traits of wolf natural history (hierarchy, territoriality, social cohesion within a pack . . .). This may not be of interest to a dog owner, I agree, but it is of great interest to biologists.
> 2) How thin is the separation between wild and domesticated environments. In an epoch (the Anthropocene) in which human domination is extending rapidly all over the world, the maintenance of clear boundaries between what is (or should be) wild and what is a human environment becomes a crucial question that has huge ethical, biological, evolutionary, economic, and many other aspects. Feral dogs and hybrids (wolf-dog) are the perfect paradigms to explore the friction between the two realms and help us think of what owning a dog means.[15]

DR. ROBERTO BONANNI: I asked Dr. Bonanni—who is well known for the detailed research he and his colleagues do on free-ranging dog packs on the outskirts of Rome in an area called Muratella—how what we learn from feral dogs can be applied to companion dogs.

As you know, that's a very difficult question! I suspect that stray/feral dogs may be genetically different from companion dogs (and not just ontogenetically different), so for this and many other reasons every comparison should be taken with great caution. Anyway, I will try to tell you what I have learnt from my experience in the field.

In brief, dogs are emotional animals and they need to live in stable social groups, e.g., if they lose the support of their companions, for any reasons, they seek immediately to associate with someone else (dog or human); however, they are also able to maintain looser affiliative relationships with individuals (dogs and humans) who are not belonging to their stable social unit. So, for dogs going to parks, interactions with familiar individuals would be preferable, although interactions with less-familiar dogs are also possible and can be affiliative.

Dogs living with human families suffer from many limitations and constraints that are usually not experienced at all by stray/feral dogs. Although there are dominance hierarchies in dog packs, and these affect several aspects of social life, dog leaders are usually much less despotic than human leaders. For example, subordinates are sometimes allowed to lead collective movements; pack members are never forced to follow the leaders. They are completely free to go wherever they want at any time; they are free to smell everything they want without being taken on the leash; subordinates are allowed to breed at least to some extent; they are often allowed to spray their urine to mark. Importantly, our research has shown that subordinates like staying and resting close by the leaders, and this is the reason why they usually follow them! Coordination, as well as cooperation, are promoted by having developed a positive and affiliative rela-

tionship. Another point is that dominance rank in these packs is mainly affected by age, a variable that seems to be even more important than body size (unpublished information), so social status seems to be more often acquired by getting old than by aggressive challenges.

In summary, dogs are cooperative carnivores, they like doing things together especially in a coordinated fashion, aggression among pack companions is rare (especially in small groups), and severe aggression is extremely rare. Aggression tends to increase when dogs are competing for food and females, although you will often see pack members feeding close to each other without showing any tension. In practice, this may mean (for example) that since there are usually short social distances between leaders and subordinates in dog packs, allowing your dog to sleep with you in your bed or on the grass may be even a good idea, indeed! Also, doing things together (e.g., walking, running, playing, exploring a natural environment, resting together, marking) should contribute to improve the quality of dog-human relationships. Feeding before your dog, as well as forcing your dog to walk always behind you, is despotic behavior and should be avoided.[16]

DR. BRIAN HARE: Director of Duke University's Canine Cognition Center, Dr. Hare is also coauthor with Vanessa Woods of *The Genius of Dogs: How Dogs Are Smarter Than You Think*.[17] In answer to the question of how citizen science can help, Dr. Hare shared the abstract of a paper that he and his colleagues authored on this topic:

Family dogs and dog owners offer a potentially powerful way to conduct citizen science to answer questions about animal behavior that are difficult to answer with more conventional approaches. Here we evaluate the quality of the first data on dog cognition collected by citizen scientists using the Dognition.com website. We conducted analyses to understand if data generated by over five hundred citizen scientists replicates internally and

in comparison to previously published findings. Half of participants participated for free while the other half paid for access. The website provided each participant a temperament questionnaire and instructions on how to conduct a series of ten cognitive tests. Participation required internet access, a dog, and some common household items. Participants could record their responses on any PC, tablet, or smartphone from anywhere in the world, and data were retained on servers.

Results from citizen scientists and their dogs replicated a number of previously described phenomena from conventional lab-based research. There was little evidence that citizen scientists manipulated their results. To illustrate the potential uses of relatively large samples of citizen science data, we then used factor analysis to examine individual differences across the cognitive tasks. The data were best explained by multiple factors in support of the hypothesis that nonhumans, including dogs, can evolve multiple cognitive domains that vary independently. This analysis suggests that in the future, citizen scientists will generate useful datasets that test hypotheses and answer questions as a complement to conventional laboratory techniques used to study dog psychology.[18]

I'm really glad these experts took the time to answer these questions. Agree or not, they offer a lot of food for thought. Ultimately, our common goal is to use what we know to make the lives of dogs, with whom we share our homes and hearts, the best they can possibly be. By following some of the material provided in this crash course on dog behavior, you can play a vital role in helping the dog or dogs with whom you live enjoy life to its fullest.

NOTES

Preface

1. There are on-going debates about how to refer to domestic dogs; some people prefer the traditional *Canis familiaris*, whereas others prefer *Canis lupus familiaris*.
2. My own experience is that some dogs like music and many are rather indifferent. A study published in March 2017 indicated that music could be used to reduce stress in some dogs when they listened to soft rock and reggae (Bowman, Dowell, and Evans, "The Effect of Different Genres of Music").
3. Hirskyj-Douglas, "Here's What Dogs See When They Watch Television."
4. Ma, "Take a Walk on the Rewild Side."
5. Bekoff, "Hugging a Dog Is Just Fine"; "Sleep Habits of the Animal Kingdom."
6. Bekoff, "Training Dogs"; also see Tracy Krulik, "Eager to Please"; and Bekoff, "If Dogs Were Humans They Would Be Jerks."

Chapter One

1. Nonhuman animals often make humans laugh, but we know little about why. In "Tails of Laughter," Robin Maria Vilari suggests that "dogs may serve as friends with whom to laugh or their behaviors may provide a greater source of laughter."
2. Kimberly Nuffer, email message to author, November 13, 2016.
3. Ken Rodriguez, email message to author, November 13, 2016.
4. For additional information on the Canine Effect's style of dog training, see https://www.facebook.com/thecanineeffect/.

5. Researchers at the University of Lincoln in Great Britain are conducting many ongoing studies of dog personality that are providing important information about the range of personalities dogs display. These projects include detailed genetic, neurobiological, and behavior analyses (http://www.uoldogtemperament.co.uk/dogpersonality/).
6. For more information and reviews of research papers and books on the origin of dogs, please see a series of essays by Mark Derr in *PsychologyToday* (*Dog's Best Friend* [blog]) and his book *How the Dog Became the Dog*; David Grimm's *Citizen Canine*; Ádám Miklósi's *Dog Behaviour, Evolution, and Cognition*; Pat Shipman's *The Invaders*; Jacob Mikanowski's "Wild Thing"; Morey and Jeger's "From Wolf to Dog"; and Janice Koler-Matznick's *Dawn of the Dog*.
7. Nonhumans and humans rely on instincts or innate patterns of behavior in certain situations, especially when something has to be done "correctly" the first time. These actions include staying close to an adult for food and protection or avoiding predators. Contrary to much popular use of words such as "instinct" or "innate" that suggests that instincts are not modifiable, research shows that instincts can be modified through learning, and are not set in stone. For more on this topic please see Jack Hailman's classic essay titled "How an Instinct Is Learned"; and books, including Konrad Lorenz's *The Foundations of Ethology*; and Niko Tinbergen's *The Study of Instinct.*
8. In response to an essay I wrote about Cesar Millan being bitten by a dog named Holly because he continually intruded into her space despite Holly giving him many warnings to leave her alone, someone suggested that Holly bit her humans and perhaps Millan "for no reason at all" ("Do Dogs Really Bite Someone for 'No Reason at All'?). Of course, Holly has plenty of good reason to bite people who don't take heed of her warnings that "enough's enough: please leave me alone."
9. Please see Jonathan Balcombe's *What a Fish Knows*. We also know that bumblebees can use tools, count to four, and play soccer (Handwerk, "Bees Can Learn to Play 'Soccer'").
10. Numerous essays published in *Animal Sentience: An Interdisciplinary Journal on Animal Feeling* (http://animalstudiesrepository.org/animsent/) provide excellent examples of the amount of interest and research there is on this topic; please also see material on the Cambridge Declaration on Consciousness (http://fcmconference.org/img/CambridgeDeclarationOnConsciousness.pdf).
11. For most personal stories in this book, I've used pseudonyms to protect the guilty and the innocent. Many quotes are just as they were spoken; others I paraphrase because I don't want to identify the humans, who, I hope, will read this book.
12. Pearce, "Down with Data."

13. Bray, MacLean, and Hare, "Increasing Arousal Enhances Inhibitory Control in Calm but Not Excitable Dogs."
14. Howse, "Exploring the Social Behaviour of Domestic Dogs."
15. Arden, Bensky, and Adams, "A Review of Cognitive Abilities in Dogs."
16. Bekoff, "Pit Bulls"; please also see Dickey, *Pit Bull*.
17. James Crosby, email message to author, July 15, 2017; Crosby, "The Specific Use of Evidence in the Investigation of Dog Bite Related Human Fatalities." For more details about dog bites from different points of view, see Mills and Westgarth, *Dog Bites: A Multidisciplinary Perspective*.
18. Margini, "What Is It Like to Be an Elephant?"
19. Hoff, *The Tao of Pooh*, 29.
20. A touching story of how hundreds of strangers escorted a dying dog for his last walk nicely exemplifies how dogs can be social catalysts (Corbley, "Hundreds of Strangers Escort Dying Dog").
21. Abbott, "Jane Goodall, Rusty and Me."
22. Peterson, *Jane Goodall*, 277.
23. Abbott, "Dogs (and Cats) without Borders."
24. Warden and Warner, "The Sensory Capacities and Intelligence of Dogs," 2.
25. For an excellent summary of this topic, see Stewart et al., "Citizen Science as a New Tool in Dog Cognition Research." Also see Cavalier and Kennedy, *The Rightful Place of Science*; and Cooper, *Citizen Science*.
26. This story by Rohan Dennis is from a personal conversation with the author, while quotes are from an email message to author, November 11, 2016.
27. Sonntag and Overall, "Key Determinants of Cat and Dog Welfare," 213.
28. Bekoff, "We Are Animals and Therein Lies Hope for a Better Future."
29. Bekoff, "Is an Unnamed Cow Less Sentient Than a Named Cow?"
30. Jamin Chen, email message to Jessica Pierce, May 8, 2016.
31. DeKok, "The Origin of World Animal Day."
32. Pascaline, "Minnesota Town Elects Dog Mayor Named Duke for the Third Time."
33. Chan, "The Mysterious History behind Humanity's Love of Dogs."
34. Good News for Pets, "Pet Industry Spending at All-Time High."
35. Addady, "This Is How Much Americans Spend on Their Dogs."
36. Brulliard, "Americans Are Spending More on Health Care—for Their pets."; see also Riley, "Puppy Love."
37. "People Living in Cities Will Risk Own Safety to Save Animals"; see also Irvine's *Filling the Ark*.
38. Bradley and King, "The Dog Economy Is Global."
39. For more discussion on this topic, please see Archer, "Why Do People Love Their Pets?"; and also Carr's *Dogs in the Leisure Experience* and references therein.

40. Pilgrim, "Children Are Closer to Their Pets Than Their Siblings."
41. "Pet Dogs Help Kids Feel Less Stressed."
42. Tasaki, "Trending: Dog-Friendly Housing Associations."
43. I can't find any "academic" reference for this number, but it comes up in many conversations. Even if it were 5–10 percent, it would be far too high.
44. McPherson, "'I Want to Kill These Dogs.'"
45. "The Vet Who 'Euthanised' Herself in Taiwan."
46. In January 2017, fifty-one greyhound trainers in Australia were accused of doping dogs with ketamine, amphetamines, pesticides, and cobalt (Knaus, "Greyhound Doping).
47. Designer dogs are not purebred dogs as some often refer to them. It's important to note that Wally Conron, the man who first produced labradoodles, regrets his creation. In an essay by Stanley Coren called "A Designer Dog-Maker Regrets His Creation," Conron notes, "I opened a Pandora's box, that's what I did. I released a Frankenstein. So many people are just breeding for the money. So many of these dogs have physical problems, and a lot of them are just crazy."
48. "Appetite for Designer Dogs 'Unquenchable.'"
49. Kaplan, "Dog Domestication Saddled Man's Best Friend with Defective Genes"; also see Brandow's *A Matter of Breeding*. There are, in addition, issues centering on dogs sold in pet shops that go beyond what I cover here.

    Along these lines, on a few occasions I've been asked how selecting for different traits works. A few of the people who have asked this question had degrees in biology, so I offered them a brief "lecture" on evolutionary biology. I explained to them that, when breeders select, for example, for traits such as a smushed nose or crunched-up face, I tell them that Elliott Sober, a philosopher at the University of Wisconsin in Madison, draws a distinction between the notion of "selection *for*" and "selection *of*" different traits in his book called *The Nature of Selection*.

    Basically, when a trait is selected *for* we are intentionally trying to produce it, and the other traits that accompany it are examples of by-products. What I also find very interesting is how many people, even those without any background in biology or any degree at all, are open to these sorts of discussions when they can see concrete examples of what we're talking about. Dog parks are great "classrooms" for field classes in animal behavior and biology. And this is a plus for the dogs as well.
50. Scully, "The Westminster Dog Show Fails the Animals It Profits From."
51. Bird, "Undercover Video Shows Texas A&M Intentionally Breeds Deformed Dogs."
52. Bekoff, "Why People Buy Dogs Who They Know Will Suffer."
53. I'm also asked frequently if dogs love us more than cats do. The simple answer

is that we really don't know. For more on this, please see Bekoff, "Do Our Dogs Really Love Us More Than Our Cats Do?"

54. Elise Gatti, email message to author, January 25, 2016.

Chapter Two

1. "A nose with a body attached" is Frans de Waal's summary of Horowitz in "How Do Dogs Recognize Us?"
2. A wealth of valuable information about dogs' noses can be found in two books that focus on noses. The first, by dog researcher Alexandra Horowitz, is called *Being a Dog* and the second is by Norwegian biologist Frank Rosell and is called *Secrets of the Snout.*
3. Horowitz, *Being a Dog*, 29–31. I'm often asked about research that shows that dogs know when their human is coming home. Rupert Sheldrake has done a good deal of research on this question (see, e.g., under "Scientific Papers on Animal Powers" at http://www.sheldrake.org/research) and my friend Lawrence Bosch tells me that Rocket, one of the standard poodles with whom he shares his home, knows when family are coming up the road to visit him regardless of season or if windows are closed or open. I've heard a good number of these stories from people who don't know of Dr. Sheldrake's research. We surely need more research in this area.
4. For more on conservation dogs, see my interview with Pete Coppolillo, executive director of Working Dogs for Conservation (https://wd4c.org): Bekoff, "For the Love of a Ball."
5. For more information on these topics, please see Milena Penkowa's book *Dogs and Human Health* and references therein; see also Marucot, "Dogs Can Smell Fear but Can't Detect If You Have Lung Cancer."
6. "Paintings from the Perspective of a Dog's Nose."
7. Research published in May 2017 calls into question whether humans' sense of smell is really all that much poorer than that of dogs (Ball, "Don't Be Sniffy If You Smell Like a Dog"). Gallings, "Sight, Hearing, Smell."
8. Horowitz, "From Fire Hydrants to Rescue Work."
9. Horowitz, *Being a Dog*, 48.
10. Hodes, "More Fat, Less Protein Improves Detection Dogs' Sniffers."
11. Farricelli, "Does Human Perfume Affect Dogs?"
12. Rosell, *Secrets of the Snout*, 27.
13. Ibid., 28.
14. Ibid., 32.
15. Bradshaw and Rooney, "Dog Social Behavior and Communication," 140.

16. Ray, "How Does One Dog Recognize Another as a Dog?"; and Autier-Dérian et al., "Visual Discrimination of Species in Dogs (*Canis familiaris*)."
17. How good is a dog's sense of hearing? 2009. Service Dog Central; http://servicedogcentral.org/content/node/435
18. Huber, "How Dogs Perceive and Understand Us."

Chapter Three

1. Darwin, *The Descent of Man*, 99.
2. Ibid., 105.
3. Boult, "Rats Laugh When Tickled."
4. Caldwell, "Mindfulness & Bodyfulness."
5. Sarah Bexell, email message to author, November 21, 2016.
6. Carl Safina, email message to author, October 16, 2016.
7. "Biology of Fun."
8. Gruber and Bekoff, "A Cross-Species Comparative Approach to Positive Emotion Disturbance."
9. Research has shown that dogs growl honestly—they mean what they say especially in serious contest situations—and that humans are very good at understanding what dogs are saying to one another when they growl, women being better than men in correctly classifying these vocalizations. Researchers also discovered that there is more variation in play growls, and perhaps this is one reason why play only rarely escalates into serious aggressive interactions. For more discussion on this topic, see Bekoff, "Dogs Growl Honestly and Women Understand Better Than Men."
10. *Wikipedia*, s.v. "stabilizing selection," last modified May 7, 2017, https://en.wikipedia.org/wiki/Stabilizing_selection.
11. These forms of selection are different types of natural selection.
12. Burghardt, *The Genesis of Play*.
13. Schaefer, *Religious Affects*, 188.
14. For more on some classic research on the social and physical development of dogs, please see Scott and Fuller's classic book *Genetics and the Social Behavior of the Dog*; and Fox's *Integrative Development of Brain and Behavior in the Dog*.
15. Spinka, Newberry, and Bekoff, "Mammalian Play."
16. Jennifer Miller, email message to author, November 20, 2016.
17. Rugaas, *On Talking Terms with Dogs*.
18. McConnell, "A New Look at Play Bows."
19. Bekoff, "Social Communication in Canids."
20. Byosiere, Espinosa, and Smuts, "Investigating the Function of Play Bows in Adult Pet Dogs (*Canis lupus familiaris*)."

21. Bekoff, "Play Signals as Punctuation."
22. Bauer and Smuts, "Cooperation and Competition during Dyadic Play in Domestic Dogs, *Canis familiaris*."
23. Norman et al., "Down but Not Out."
24. Smuts, Bauer, and Ward, "Rollovers during Play."
25. Hecht, "Why Do Dogs Roll Over during Play?"
26. Ward, Trisko, and Smuts, "Third-Party Interventions in Dyadic Play between Littermates."
27. Cordoni, Nicotra, and Palagi, "Unveiling the 'Secret' of Play in Dogs (*Canis lupus familiaris*)."
28. Bradshaw and Rooney, "Dog Social Behavior and Communication," 152.
29. Sergio Pellis, email message to author, October 19, 2016.
30. McConnell, "A New Look at Play Bows."
31. Shyan, Fortune, and King, "'Bark Parks.'"
32. Lindsey Mehrkam, email message to author, June 24, 2015.
33. Palagi, Nicotra, and Cordoni, "Rapid Mimicry and Emotional Contagion in Domestic Dogs."
34. Ibid.
35. Bálint et al., "'Beware, I Am Big and Non-Dangerous!'" 128.

Chapter Four

1. Email message to author, March 10, 2016; the author wishes to remain anonymous
2. Krulik, "Dogs and Dominance."
3. Bradshaw, Blackwell, and Casey, "Dominance in Domestic Dogs."
4. Gompper, ed., *Free-Ranging Dogs and Wildlife Conservation*.
5. Hekman, "Understanding Canine Social Hierarchies."
6. L. David Mech, email message to author, February 16, 2012.
7. Mech, "Alpha Status, Dominance, and Division of Labor in Wolf Packs," 1200.
8. Serpell, "Epilogue," 407.
9. Bekoff, "What's Happening When Dogs Play Tug-of-War?"
10. Miller, *Play with Your Dog*.
11. Tracy Krulik is a dog trainer and behavior consultant (http://dogzandtheirpeoplez.com). Bekoff, "Dogs, Dominance, Breeding, and Legislation."
12. Tracy Krulik, email message to author, December 22, 2016.
13. Regarding separation anxiety, see Krulik, "Dominance and Dogs."
14. Anonymous email message to author, January 15, 2017.
15. Overall, "Special issue: The 'Dominance' Debate."
16. Ibid., 5.

17. Michaels, *Do No Harm*; for further discussion, see my interview with Michaels, "A Hierarchy of Dog Needs."
18. Arnold, *Love Is All You Need*, 6.
19. Reisner, "The Learning Dog," 214.
20. Bradshaw and Rooney, "Dog Social Behavior and Communication," 153.
21. John Bradshaw, email message to author, July 11, 2016.
22. American Veterinary Society of Animal Behavior, "Position Statement on the Use of Dominance Theory in Behavior Modification of Animals."
23. O'Heare, *Dominance Theory and Dogs*, 67.

Chapter Five

1. Pierce, "Not Just Walking the Dog."
2. Bradshaw and Rooney, "Dog Social Behavior and Communication," 150.
3. Horowitz, "From Fire Hydrants to Rescue Work."
4. Unless otherwise noted, the quotes by Anneke Lisberg in this chapter are from a personal email message to the author, November 1, 2016.
5. Lisberg and Snowdon, "The Effects of Sex, Gonadectomy and Status on Investigation Patterns," 1147.
6. Caazzo, Natoli, and Valsecchi, "Scent-Marking Behaviour in a Pack of Free-Ranging Domestic Dogs," 955.
7. Bradshaw and Rooney, "Dog Social Behavior and Communication," 150.
8. Lisberg and Snowdon, "Effects of Sex, Social Status and Gonadectomy on Countermarking," 757.
9. Gough and McGuire, "Urinary Posture and Motor Laterality in Dogs," 61.
10. Caazzo, Natoli, and Valsecchi, "Scent-Marking Behaviour in a Pack of Free-Ranging Domestic Dogs."
11. McGuire and Bernis, "Scent Marking in Shelter Dogs," 53.
12. Gray, "Foxes May Confuse Predators by Rubbing Themselves in Puma Scent," 15.
13. "Sophia Grows."
14. Greg Coffin, email message to author, November 14, 2016.
15. Gilbert, *Off the Leash*, 66. For a general discussion on how humans use humor to talk about all sorts of poop, please see Robert, "The Evolution of Humor."
16. Gilbert, *Off the Leash*, 67.
17. Horowitz, *Being a Dog*, 17.
18. Cafazzo, Natoli, and Valsecchi, "Scent-Marking Behaviour in a Pack of Free-Ranging Domestic Dogs," 955.
19. Bekoff, "Perils of Pooping."
20. Gayomali, "Dogs Might Poop in Line with the Earth's Magnetic Field"; see also Hart et al., "Dogs Are Sensitive to Small Variations of the Earth's Magnetic

Field"; and Bekoff, "Dogs Line up with the Earth's Magnetic Field to Poop and Pee."

21. Henry Nichols notes that many different animals show a roughly north-south alignment in different activities, but no one really knows why ("Animal Magnetism.").

Chapter Six

1. Mary Devine, email message to author, August 25, 2016.
2. It's been suggested that some people "unmind" animals who are used for food or research in order to distance themselves from what they are doing to these sentient beings; Please see Bekoff and Pierce, *The Animals' Agenda*, for more discussion on this point.
3. In *Understanding Dogs*, sociologist Clinton Sanders discusses how people "mind dogs" by paying attention to their thought processes, emotional experiences, and unique personalities, and how important this is in developing and maintaining relationships with them.
4. "Dog Quotations," http://www.crazyfordogs.com/quotes/quotes.shtml.
5. Cook, "Inside the Dog Mind," interview with Brian Hare.
6. Hoffman, "To Learn How Smart Dogs Are, Humans Learn New Tricks."
7. Szentágothai, "The 'Brain-Mind' Relation," 323.
8. Bekoff, "Dog Smarts."
9. Horowitz, "Attention to Attention in Domestic Dog (*Canis familiaris*) Dyadic Play," 107.
10. Harmon-Hill and Gadbois, "From the Bottom Up."
11. Gorman, "Why Is That Dog Looking at Me?"
12. Payne, Bennett, and McGreevy, "DogTube."
13. Coren, "Do Dogs Have a Sense of Humor?"; I do not agree with Dr. Coren that dogs have "juvenile minds."
14. Bekoff, *The Emotional Lives of Animals*, 57–60.
15. "Dogs Share Food with Other Dogs Even in Complex Situations."
16. Cook et al., "Awake Canine fMRI Predicts Dogs' Preference for Praise Versus Food," 1853.
17. Feuerbacher and Wynne, "Most Domestic Dogs (*Canis lupus familiaris*) Prefer Food to Petting"; also see Bekoff, "Training Dogs."
18. Bekoff, "Training Dogs."
19. Arden and Adams, "A General Intelligence Factor in Dogs"; London School of Economics, "Mensa Mutts?"
20. Coren, "Understanding the Nature of Dog Intelligence."
21. One study of cats demonstrated they show the same sort of episodic memory

as dogs concerning where they had found food to eat, so for those who like to claim dogs are smarter than cats this study shows that the generalization is false; Briggs, "Cats May Be as Intelligent as Dogs."

22. Anderson et al., "Third-Party Social Evaluations of Humans by Monkeys and Apes."
23. Hyman, "Dogs Don't Remember."
24. Kuroshima et al., "Experience Matters."
25. Fugazza, Pogány, and Miklósi, "Recall of Others' Actions after Incidental Encoding Reveals Episodic-like Memory in Dogs."
26. Ádám Miklósi, email message to author, November 24, 2016.
27. Bekoff, "Theory of Mind and Play."
28. "Clever Dog Steals Treats From Kitchen Counter."
29. Pilley, *Chaser*.
30. Kaminski and Nitzschner, "Do Dogs Get The Point?" 294.
31. Howard, "Here's More Proof That Dogs Can Totally Read Our Facial Expressions."
32. Bekoff, "Dogs Recognize Emotional States Using Mental Representations"; Griffiths, "Dogs Snub People Who Are Mean to Their Owners."
33. Gill and Webb, "Dogs 'Can Tell Difference between Happy and Angry Faces'"; Müller et al., "Dogs Can Discriminate Emotional Expressions of Human Faces"; "A Man's Best Friend."
34. Hrala, "Your Dog Doesn't Trust You When You're Angry."
35. Bonanni, Valsecchi, and Natoli, "Pattern of Individual Participation and Cheating an Conflicts between Groups of Free-Ranging Dogs," 957.
36. Bonanni, Natoli, Cafazzo, and Valsecchi, "Free-Ranging Dogs Assess the Quantity of Opponents in Intergroup Conflicts," 103.
37. Bekoff, "Hidden Tales of Yellow Snow."
38. Gatti, "Self-consciousness."
39. Horowitz, *Being a Dog*, 28.
40. Dahl, "What Does a Dog See in a Mirror?"
41. Arianna Schlumbohm, email message to author, January 13, 2017.
42. A list of some of the animals who have passed the mirror test along with videos can be seen at Pachniewska, "List of Animals That Have Passed the Mirror Test."
43. Zeno Zimmerman, email message to author, January 6, 2015.
44. Rebecca Savage, email message to author, May 26, 2016.

Chapter Seven

1. Rebecca Johnson, email message to author, December 15, 2011.
2. McConnell, *For the Love of a Dog*, 283.

3. Reber, "Caterpillars, Consciousness, and the Origins of Consciousness."
4. For more discussion on comparative studies of animal emotions, please see my book *The Emotional Lives of Animals* and numerous essays that I've written for the *Animal Emotions* blog in *Psychology Today*.
5. Bekoff, "Anthropomorphic Double-Talk."
6. Bekoff, "Anthropomorphic Double-Talk"; Burghardt, "Mediating Claims through Critical Anthropomorphism."
7. Mondal, "Study: Mice Can Sense, Feel Each Other's Pains with a Whiff."
8. Coren, "Do Dogs Have Empathy for Other Dogs?"
9. For a moving and well-informed discussion of canine spirituality and soul, see Root, *The Grace of Dogs*.
10. Christy Orris, email message to author, November 12, 2016.
11. Coren, "Do Dogs Feel Jealousy and Envy?" It is also known that oxytocin promotes social bonding in dogs (Romero et al., "Oxytocin Promotes Social Bonding in Dogs").
12. Stillwell, *The Secret Language of Dogs*, 39.
13. Bekoff, "Dogs Know When They've Been Dissed."
14. Harris and Prouvost, "Jealousy in Dogs."
15. Bekoff, "We Don't Know If Dogs Feel Guilt So Stop Saying They Don't."
16. Morris, Doe, and Godsell, "Secondary Emotions in Non-primate Species?"
17. Bekoff, "Do Dogs Really Feel Guilt or Shame?"
18. Alexandra Horowitz, February 4, 2013, "Spot on, on 'guilt,'" comment on Bekoff, "The Genius of Dogs and the Hidden Lives of Wolves."
19. John Bradshaw, email message to author, January 4, 2016.
20. Schenkel, "Expression Studies on Wolves."
21. Marisa Ware, email message to author, November 4, 2016.
22. Coren, "Long Tails versus Short Tails and Canine Communication."
23. See, e.g., Leaver and Reimchen, "Behavioural Responses of *Canis familiaris* to Different Tail Lengths of a Remotely-Controlled Life-Size Dog Replica."
24. Artelle, Dumoulin, and Reimchen, "Behavioural Responses of Dogs to Asymmetrical Tail Wagging."
25. Quengua, "A Dog's Tail Wag Says a Lot, to Other Dogs."
26. Coren, "What a Wagging Dog Tail Really Means."
27. Feddersen-Petersen, "Vocalization of European Wolves (*Canis lupus lupus* L.) and Various Dog Breeds (*Canis lupus* f. fam.)."
28. Derr, "What Do Those Barks Mean?"
29. Pongracz et al., "Human Listeners Are Able to Classify Dog (*Canis familiaris*) Barks Recorded in Different Situations"; also see Lewis, "The Meaning of Dog Barks."
30. Hecht, "Dog Speak."
31. Coren, "What Are Dogs Trying to Say When They Bark?"

32. Miller, "5 Steps to Deal with Dog Growling."
33. Odendaal and Meintjes, "Neurophysiological Correlates of Affiliative Behaviour between Humans and Dogs."
34. Nagasawa et al., "Dogs Show Left Facial Lateralization upon Reunion with Their Owners."
35. For an excellent summary of this research, see Berns, *What It's Like to Be a Dog*.
36. Berns, Brooks, and Spivak, "Scent of the Familiar."
37. Davis, "Puppies' Response to Speech Could Shed Light on Baby-Talk"; Ben-Aderet et al., "Dog-Directed Speech."
38. Olson, "Dogs have FEELINGS too!"
39. MacLean and Hare, "Dogs Hijack the Human Bonding Pathway," 280.
40. Hathaway, "Dogs Ignore Bad Advice That Humans Follow."
41. Andics et al., "Neural Mechanisms for Lexical Processing in Dogs."
42. Bekoff, "Dogs and Humans Process Sounds Similarly."
43. Carlos, "True Best Friends:"; Bekoff, "'Gosh, My Dog Is Just Like Me.'"

Chapter Eight

1. Dogs also get us out into nature. Renowned photographer Chuck Forsman's dog, Magpie, played an essential role in getting him out into nature as he followed Magpie's curious nose, ears, and eyes in natural and human-made environs, as documented in his 2013 book *Walking Magpie*. See also, on the importance of dogs in our leisure time, Neil Carr's *Dogs in the Leisure Experience* and references therein.
2. Serpell, "Creatures of the Unconscious": see also Wood et al., "More Than a Furry Companion"; and Johnson et al., *Health Benefits of Dog Walking for People and Pets*.
3. "Dog Parks Lead Growth in U.S. City Parks." The website for the Trust for Public Lands (www.tpl.org), where the latter report appears, contains numerous details about many different aspects of urban parks.
4. Information on the history of dog parks can be found in Allen, "Dog Parks"; and El Nasser, "Fastest-Growing Urban Parks Are for the Dogs."
5. Bartram, "All Dogs Allowed"; and Gaunet et al., "Description of Dogs and Owners in Outdoor Built-Up Areas."
6. For a detailed study of an evaluation of off-leash dog parks in which "users were generally satisfied," see Lee, Shepley, and Huang, "Evaluation of Off-Leash Dog Parks in Texas and Florida."
7. Case, "Dog Park People."
8. Estep and Hetts, "Pilgrim Bark Park Provincetown."
9. Heimbuch, "15 Things Humans Do Wrong at Dog Parks."

10. Smith, "Behavior: Dog Park Tips"; see also Gomez,"Dog Parks"; and Ioja et al., "Dog Walkers' vs. Other Park Visitors' Perceptions."
11. Bekoff and Meaney, "Interactions among Dogs, People, and the Environment in Boulder, Colorado."Many people are also concerned about the effect of dogs on wildlife and Sarah Reed and her colleagues discovered that, in Northern California, "the policy on domestic dogs did not appear to affect species richness and abundance of mammalian carnivores" (Reed and Merenlender, "Effects of Management of Domestic Dogs and Recreation," 504).
12. Elise Gatti, email message to author, January 23, 2017.
13. Carrier et al., "Exploring the Dog Park."
14. Howse, "Exploring the Social Behaviour of Domestic Dogs," 2.
15. Ibid., 100.
16. Bekoff, "Social Communication in Canids."
17. Graham and Glover, "On the Fence," 217.
18. Jackson, "Situated Activities in a Dog Park."
19. Siler, "Why Dogs Belong Off-Leash in the Outdoors." A number of people wrote to me mistakenly thinking I wrote Siler's essay; I did not—although I was quoted in it. Bekoff, "Why Dogs Belong Off-Leash."
20. An interesting case of leashed versus nonleashed dogs centers on the Laurel Canyon Dog Park in California, where humans let their dogs off leash illegally to cut down on illegal human activities. The park reverted to a place where dogs and humans could again go (Wolch and Rowe, "Companions in the Park").
21. Bekoff and Meaney, "Interactions among Dogs, People, and the Environment in Boulder, Colorado."
22. Bekoff and Ickes, "Behavioral Interactions and Conflict among Domestic Dogs, Black-Tailed Prairie Dogs, and People in Boulder."
23. Patrick Jackson, email message to author, May 29, 2015.

Chapter Nine

1. Bekoff, "Do Dogs Ever Simply Want to Die to End the Pain?" For further discussion of how to assess whether or not a dog is in pain, see Jessica Pierce's essay "Is Your Dog in Pain?"
2. Geggel, "Anxiety May Give Dogs Gray Hair."
3. King et al., "Anxiety and Impulsivity."
4. Arnold, *Love Is All You Need*, 6.
5. Milligan, "The Ethics of Animal Training," 212.
6. Pangal, "Lives of Streeties."
7. London, "Should We Call These Canine Behaviors Calming Signals?" In her analysis of the study by Dr. Mariti and her colleagues ("Analysis of the Intraspecific

Visual Communication"), Dr. London, a certified professional dog trainer, notes that the researchers did not report on the rate of de-escalation of an encounter in the absence of a calming signal. However, they did report that in 33 percent of their observations (thirty-six cases) in which dogs did not show any calming signal after receiving an aggressive behavior, they usually increased the distance between themselves and another dog by fleeing or walking away. Dr. Mariti, the senior author of the paper on which Dr. London commented, wrote to me that the reason they did not report the rate was because twenty-four of the thirty-six cases involved a single dog (email message to author, July 5, 2017).

8. In my essay "Dogs: Do 'Calming Signals' Always Work?" I agree overall with Dr. Mariti and her colleagues ("Analysis of the Intraspecific Visual Communication") that their results "suggest that these CSs [calming signals] indeed may have a role in social facilitation and preventing further aggressive behaviors."
9. See Pierce, "Palliative Care for Pets," for numerous references. See also Pierce, *The Last Walk*, and "Deciding When a Pet Has Suffered Enough"; and Klonsky, *Unconditional*. For a discussion of how we mourn various animals, including our companions, see DeMello's *Mourning Animals*. Adam Clark also has a website for dealing with pet loss education and support (www.lovelosstransition.com). For lovely stories about how old dogs can have wonderful lives and about the caring people who selflessly help them along, please see Coffey, *My Old Dog*.
10. Gardner, "Senior vs. Geriatric."
11. Byars, "Boulder Mailman Builds Ramp for Aging Dog along Route."
12. For more information on how to give a blind or sight-impaired dog the best life possible, see Horsky, *My Dog Is Blind*.
13. Jane Sobel Klonsky, email message to author, November 22, 2016. For an interview with Klonsky, please see Bekoff, "Older Dogs."
14. Cici Franklin, email message to author, January 11, 2017.
15. A recent review of different training methods stresses the importance of using positive reinforcement and avoiding positive punishment and negative reinforcement (Ziv, "The Effects of Using Aversive Training Methods in Dogs."); see also Todd, "New Literature Review Recommends Reward-Based Training"; and Michael "Hierarchy of Dog Needs" and *Do No Harm*, which can be purchased at https://gumroad.com/1 /trainingmanual.
16. Information on the Canine Effect can be found at https://www.facebook.com /thecanineeffect/; for wider-ranging discussions on the importance of understanding the different sorts of relationships that are formed between humans and dogs and their complexity, see the books by Donna Haraway in the bibliography.
17. For more advice and suggestions about dog training, see the website www

.ispeakdog.org created by Tracy Krulik, as well as my *Psychology Today* interview with Tracy (Bekoff, "iSpeakDog").

18. Kristof, "Do You Care about a Dog More Than a Refugee?"
19. Singer, *Animal Liberation*, 27.
20. Bekoff, "Valuing Dogs More Than War Victims."
21. Dr. Patty Gowaty, email message to author, August 21, 2016.
22. See, for instance, this summary of some current research: Herzog, "Study Finds Dog-Walkers Have More Bad Mental Health Days!"
23. *Dogs on the Inside*, directed by Brean Cunningham and Douglas Seirup (New York: Bond/360, 2014), DVD; for more on the making of the film, see http://www.dogsontheinside.com/.
24. For a review of animal protection laws in the United States in 2016, see Animal Legal Defense Fund, *2016 U.S. Animal Protection Laws Rankings*.
25. "Study Demonstrates Rapid Decline in Male Dog Fertility."
26. Travis, "Supreme Court: All Dogs Have Value."
27. Goldman, "Success! It's Now a Felony to Abuse Companion Animals in Ohio"; "Ohio Hunter Faces Felony Charges for Killing Man's Dogs"; and Cherney, "Orange-Osceola State Attorney Creates Animal Cruelty Unit."
28. *A Dog Named Gucci*, directed by Gorman Bechard (What Were We Thinking Films, 2015), DVD; see the films official website for more about the film: http://www.adognamedgucci.com; Bekoff, "A Dog Named Gucci."
29. Velarde and Schmitt, "New Mexico Lawmaker Wants to Make Animal Cruelty a Felony"; Orr, "2 Bills Seek Tougher Penalties for Animal Abusers in Wyoming."
30. Fowler, "MS Legislator Pushes Animal Cruelty Bill"; "How Are Animal Abuse and Family Violence Linked?"
31. Brulliard, "In a First, Alaska Divorce Courts Will Now Treat Pets More Like Children"; Paiella; "This Bill to Protect Domestic-Violence Victim's Pets Could Save Women's Lives"; Pacelle, "Federal Court Upholds New York City Ban on Puppy Mill Sales."
32. "Argentina Lawmakers Pass Law Banning Greyhound Racing"; London Assembly, "Time to Review the Dangerous Dog Act."
33. Bird, "Mexico Gets Serious."
34. "Sale of Puppies under Eight Weeks Old to Be Made Illegal."
35. "RSPCA Animal Welfare Prosecutions in Wales Up."
36. Bekoff, "Empathy Burnout and Compassion Fatigue among Animal Rescuers"; "The Vet Who 'Euthanised' Herself in Taiwan."
37. "Dog Fights Prompt 5,000 Calls to RSPCA in Past Decade."
38. Bird, "Dogs Are Worth More Than Mere 'Fair Market Value.'"
39. Pacelle, "Ohio Lawmakers Crack Down on Cockfighting."

40. "Federal Court Rules Police Can Shoot a Dog If It Moves, Barks When Officer Enters Home"; Kassam, "Judge Rules Pet Dogs Cannot Be Treated as Children in Canada Custody Dispute."
41. Kilday, "Universal Cancels Premiere of 'A Dog's Purpose.'"
42. "Animal Cruelty Law Has Governor's Signature, Dog's Paw Print."
43. Lewis, "Breaking News! Vancouver Bans Sale of Dogs, Cats, and Rabbits in Pet Stores"; Wamsley, "In a First, Connecticut's Animals Get Advocates in the Courtroom"; "Vermont Has New Law Banning Sexual Abuse of Animals."
44. Leone, "Brewery Offers 'Pawternity' Leave for Employees with New Dogs."
45. Bekoff, "Censored: Animal Welfare and Animal Abuse Data Taken Offline."
46. Contorno, "'Sarge's Law' Could Bring New Rules for Dog Trainers in Hillsborough."
47. Costello, "Dog Abuse Video Spurs Legislation to License Trainers."
48. Foubert, "Occupational Licensure for Pet Dog Trainers"; information about the Academy for Dog Trainers can be found at https://www.facebook.com/AcademyforDogTrainers/?fref=nf.
49. "Dog Training and Consumer Protection," video, https://www.facebook.com/AcademyforDogTrainers/videos/987644334623619/; also see, for additional information about the Academy for Dog Trainers, https://academyfordogtrainers.com.
50. Carlos, "Even Dogs Have Gotten into the Plastic Surgery Craze."
51. In an essay called "Are There Behavior Changes When Dogs Are Spayed or Neutered," Stanley Coren notes that there can many unexpected and unwanted behavior changes. He summarizes the results of two studies of a large number of dogs that show that, in contrast to what people expect, neutered dogs, both males and females, often show more aggression and increased fearfulness. In contrast, urine marking decreased as a result of neutering. Coren also writes: "Considering the fact that one of the reasons recommended for spaying and neutering dogs is to correct a range of canine behavior problems, Duffy and Serpell's conclusions expose this to be a myth when they say 'For most behaviors, spaying/neutering was associated with worse behavior, contrary to conventional wisdom.'"
52. Bekoff, "Bowsers on Botox."
53. "State Laws Governing Elective Surgical Procedures."
54. Ryan, "Veterinarians in British Colombia Ban Animal Tail Docking and Ear Cropping."
55. McGowan, "Debarking (Bark Softening)."
56. Grossman, "All Dog, No Bark."
57. Ibid.; Council of Europe, *European Convention for the Protection of Pet Animals*; Sweet, "Teen Files Bill to Make Vocal Surgery Illegal."

58. "Actress & Celebrity GUL PANAG Launches the SOUND OF SILENCE CAMPAIGN!"
59. For more discussion on this topic, see Ganardi, *The Next Social Contract*.
60. Newman, "World (or at least Brooklyn) Stops for Lost Dog."
61. As I noted above, the Animal Welfare Act remains a mixed bag. While dogs and nonhuman primates are considered to be animals, it unbelievable that laboratory rats, mice, and other animals continue not to be considered animals (Bekoff, "The Animal Welfare Act Claims Rats and Mice Are Not Animals"). This is simply absurd and I wonder why aren't researchers who *know* rats and mice are indeed animals speaking out about this idiocy. The science that clearly shows these rodents are sentient beings continues to be totally ignored. Thus, in the 2002 iteration of the Animal Welfare Act we read: "Enacted January 23, 2002, Title X, Subtitle D of the Farm Security and Rural Investment Act, changed the definition of 'animal' in the Animal Welfare Act, specifically excluding birds, rats of the genus Rattus, and mice of the genus Mus, bred for use in research" (Farm Security and Rural Investment Act of 2002, Pub. L. No. 107-171, https://www.nal.usda.gov/awic/public-law-107-171-farm-security-and-rural-investment-act-2002).
62. "Mall Opens Its Doors for Stray Dogs during Winter Storm."
63. Harvey, "Indonesian Charity Finds New Homes Overseas for Unwanted Dogs."
64. More information on the Roots & Shoots Program can be found at the website https://www.rootsandshoots.org.
65. "TEDxDirigo—Zoe Weil: The World Becomes What You Teach."
66. *Encyclopaedia Britannica Online*, s.v. "Biophilia hypothesis," by Kara Rogers, accessed June 30, 2017, https://www.britannica.com/science/biophilia-hypothesis.

Appendix

1. See Bekoff, *Rewilding Our Hearts*, and references therein.
2. Information on the New Guinea singing dogs comes from Janice Koler-Matznick, personal communication.
3. "The Nobel Prize in Physiology or Medicine 1973," https://www.nobelprize.org/nobel_prizes/medicine/laureates/1973/.
4. Sandy McIntosh, "Remembering H. R. Hays."
5. Dale Jamieson and I write more on the topic of integrative ideas concerning ethological questions in our essay "On Aims and Methods of Cognitive Ethology."
6. Bekoff, "Ethology Hasn't Been Blown."
7. Dr. Griffin discovered echolocation in bats as an undergraduate at Harvard University and wrote numerous papers and books on this topic, as well as on bird

migration. He was elected to the National Academy of Sciences based on his groundbreaking research. Dr. Griffin's book *The Question of Animal Awareness*, published in 1976, shocked colleagues because he was considered to be much more of an empirical scientist. I was at some of the meetings where he spoke about his new ideas, and many of his colleagues were incredulous because, at that time, talking about the inner subjective lives and personal experiences of nonhuman animals and consciousness was rarely done, at least in public. Over the years, his ideas were increasingly accepted and some people call Griffin the father of cognitive ethology.

8. Altmann, "Observational Study of Behavior." For more details on different methods of study, see Lehner's *Handbook of Ethological Methods*.
9. "Learning to Speak Dog Part 4."
10. Wynne, "Should Shelters Bother Assessing Their Dogs?"
11. "Most Desirable Traits in Dogs for Potential Adopters."
12. Ádám Miklósi, email message to author, February 11, 2016. For more on the Family Dog Project, see https://familydogproject.elte.hu; you can receive research updates at the website as well. This group also is developing a project called SENSDOG that helps dog owners to collect and analyze behavioral data on their dogs and offers updates oncurrent research (http://sensdog.com/blog/index.php/sample-page/).
13. John Bradshaw, email message to author, February 15, 2016.
14. Bradshaw and Rooney, "Dog Social Behavior and Communication," 152.
15. Luigi Boitani, email message to author, February 7, 2016.
16. Roberto Bonanni, email message to author, February 12, 2016.
17. More information on the Duke Canine Cognition Center can be found at https://evolutionaryanthropology.duke.edu/research/dogs.
18. Stewart et al., "Citizen Science as a New Tool in Dog Cognition Research."

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This list of books covers much of the material I've discussed here from various perspectives. (I don't necessarily agree with everything that's in them. However, it's essential to see what's out there and then decide what fits and what doesn't fit with one's views. As I've stressed here, only positive nondominating methods of training/teaching should be acceptable.) There are numerous books on dog behavior and dog training available, and Dogwise Publishing (www.dogwise.com) and Hubble and Hattie (www.hubbleandhattie.com) regularly publish books for those interested in many aspects of dog behavior, dog training, and dog-human relationships. So, too, does the magazine *The Bark*. James Serpell's edited volume *The Domestic Dog: Its Evolution, Behavior and Interactions with People* is a gold mine for the latest information on numerous diverse topics related to dogs, and *Animal Sentience: An Interdisciplinary Journal on Animal Feeling* (http://animalstudiesrepository.org/animsent/) is an excellent example of the ever-growing amount of comparative research and cross-disciplinary interest on this topic. The website iSpeakDog (http://www.ispeakdog.org) is an interactive tool to allow people and dogs to communicate better and provides a wonderful source for all things dog.

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Index

Note: Page numbers in *italics* refer to illustrative matter. All first name headings refer to individual dogs.