Emergence the connected lives of ants brains cities and software steven johnson (PDF)

Emergence A Comparative Study of the Brains of Three Genera of Ants Intelligence of Ants The Mechanisms of Insect Cognition Hidden Diversity in Brain Worms in Zombie Ants Secret Lives of Ants Marihuana and Medicine Big Brains and the Human Superorganism The Evolutionist at Large Ant Architecture Desert Navigator Ant Encounters Ants and Some Other Insects This Is Your Brain On Parasites Plight of the Living Dead Eight Legs and a Brain Ants at Work Genes, Brains, and Human Potential Plants vs. Zombies: Official Guide to Protecting Your Brains Worries Can Eat YOU Up The Ant and the Elephant Host Manipulation by Parasites The Guests of Ants Innate Ants and Some Other Insects: An Inquiry Into the Psychic Powers of These Animals Journey to the Ants Neuropeptides in the brain of Cataglyphis nodus ants and their role as potential modulators of behavior Love and Other Thought Experiments Deadly Ants Seven and a Half Lessons About the Brain Living in a Plant The Ghost Map The Brain Library Magazine of American and Foreign Thought Exploration of Serotonin Distribution and Activity Within the Pavement Ant Brain (Tetramorium Caespitum) The Root of Thought Designing Intelligence The Ants Fumigate Your Brain Ant's Diary

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Emergence *2012-09-11*

in the tradition of being digital and the tipping point steven johnson acclaimed as a cultural critic with a poet s heart the village voice takes readers on an eye opening journey through emergence theory and its applications a new york times notable book a voice literary supplement top 25 favorite books of the year an esquire magazine best book of the year explaining why the whole is sometimes smarter than the sum of its parts johnson presents surprising examples of feedback self organization and adaptive learning how does a lively neighborhood evolve out of a disconnected group of shopkeepers bartenders and real estate developers how does a media event take on a life of its own how will new software programs create an intelligent world wide in the coming years the power of self organization coupled with the connective technology of the internet will usher in a revolution every bit as significant as the introduction of electricity provocative and engaging emergence puts you on the front lines of this exciting upheaval in science and thought

A Comparative Study of the Brains of Three Genera of Ants *1913*

most of us rest in a general hazy belief that ants are wonderfully intelligent animals without knowing exactly in what ways and degrees the intelligent action of these animals is displayed this books analyzes facts regarding the intelligence of ants their powers of special sense powers of communication memory nursing keeping pets play and leisure and presents how they organize their society taken altogether these facts certainly justify the remark of the most illustrious of naturalists the brain of an ant is one of the most marvelous atoms of matter in the world perhaps more so than the brain of a man

Intelligence of Ants 2016-06-08

ants as one of the oldest and most diverse groups of social animals on earth can provide insight into various parasite host relationships studying ants and their interactions with parasites over evolutionary time can advance our knowledge of the spread of disease throughout a society in general in this research paper i focus on worms infecting ants the principal parasitic worms affecting ants are in the phylum nematoda and the classes of cestoda and trematoda much of the previous research endeavors that have been completed on the study of worms infecting ants have been lost to time and language the time and effort dedicated by other scientists to the study of this important relationship needs to be unearthed and that is what i attempted to do in this paper therefore i conducted a detailed library study of the diversity of worm parasite in ants which involved extensive exploration of both the non digitized corpus and non english language corpus not only did i find more ant worm parasite association records than previously known but also i uncovered many significant records of parasite prevalence and distribution my work lays the foundation for more research that can now be done on this subject furthermore my work will hopefully resolve the ecological drivers of ant parasite relationships and their evolutionary implications

The Mechanisms of Insect Cognition 2020-03-12

all of nature is revealed through the secret lives of the amazing ants

Hidden Diversity in Brain Worms in Zombie Ants *2018*

leading physicians and scientists from around the world critically examine the pharmacological and molecular basis of the therapeutic properties of marihuana and its active ingredient thc they detail the broad array of marihuana s effects on brain function the immune system male and female reproductive functions and cardiac and pulmonary functions as well as evaluate its clinical applications in psychiatry glaucoma pain management cancer chemotherapy and aids treatment their studies indicate that marihuana persistently impairs the brain and reproductive function and that

marihuana smoke is more toxic and damaging to the lung than tobacco smoke marihuana and medicine s reports of the latest findings on the pharmacological and molecular mechanisms of marihuana and of its clinical manifestations will be essential reading for physicians psychiatrists pharmacologists health care professionals policy makers public health officials and attorneys

Secret Lives of Ants 2012-04

this book examines why humans have big brains and how brains are associated with complex society and behavior in other animals it compares brain evolution in social animals and examines the evolution of the human brain in social and historical contexts

Marihuana and Medicine *1999-04-05*

digicat publishing presents to you this special edition of the evolutionist at large by grant allen digicat publishing considers every written word to be a legacy of humankind every digicat book has been carefully reproduced for republishing in a new modern format the books are available in print as well as ebooks digicat hopes you will treat this work with the acknowledgment and passion it deserves as a classic of world literature

Big Brains and the Human Superorganism 2017-09-05

many animals from birds to insects build structures using wood soil or a range other materials suprisingly to most people a similarly diverse array of animal homes exist underground in the hiddent world beneath our feet this is particularly true for ants who excavate large and complex nests in which they shelter reproduce and generally go about their lives despite the existence of this vast underground world it has remained largely unexplored walter tschinkel however has spent his career researching underground ant nests in his home state of florida where they are particularly prevalent and this book is his story of discovery about what he has learned about these nests and they reveal about ant biology and behavior more broadly tschinkelstarts the book by describing just how he studies ants nest an arduous excavation process which involves first filling the nests with plaster molten metal or wax but this is a book driven by fascinating questions and the experiments the author has devised to try and answer them how does nest architecture vary across ant species how are new nests excavated during colony relocation are the ants organized within the nest do ants have architectural plans what is the effect of all this nest excavation on soils and how does the division of labor within the nest work ultimately tschinkel provides answers to many of these questions but also acknowledges what mysteries including why nests evolved in the first place still remain in telling this story tschinkel introduces readers to the surprising beauty and architectural complexity of underground ant nests and to how scientific research on them is done

The Evolutionist at Large *2022-09-04*

winner of the association of american publishers prose award for excellence in biological and life sciences a world renowned researcher of animal behavior reveals the extraordinary orienteering skills of desert ants offering a thrilling account of the sophisticated ways insects function in their natural environments cataglyphis desert ants are agile ultrarunners who can tolerate near lethal temperatures when they forage in the hot midday sun but it is their remarkable navigational abilities that make these ants so fascinating to study whether in the sahara or its ecological equivalents in the namib desert and australian outback the cataglyphis navigators can set out foraging across vast expanses of desert terrain in search of prey and then find the shortest way home for almost half a century rüdiger wehner and his collaborators have devised elegant experiments to unmask how they do it through a lively and lucid narrative desert navigator offers a firsthand look at the extraordinary navigational skills of these charismatic desert dwellers and the experiments that revealed how they strategize and solve complex problems wehner and his team discovered that these insect navigators use visual cues in the sky that humans are unable to see the earth s magnetic field wind direction a step counter and panoramic snapshots of landmarks among other resources the ants combine all of this information to steer an optimal course at any given time during their long journey they know exactly where to go it is no wonder these nimble and versatile creatures have become models in the study of animal navigation desert navigator brings to light the marvelous capacity and complexity found in these remarkable insects and shows us how mini brains can solve mega tasks

Ant Architecture *2021-06-22*

how do ant colonies get anything done when no one is in charge an ant colony operates without a central control or hierarchy and no ant directs another instead ants decide what to do based on the rate rhythm and pattern of individual encounters and interactions resulting in a dynamic network that coordinates the functions of the colony ant encounters provides a revealing and accessible look into ant behavior from this complex systems perspective focusing on the moment to moment behavior of ant colonies deborah gordon investigates the role of interaction networks in regulating colony behavior and relations among ant colonies she shows how ant behavior within and between colonies arises from local interactions of individuals and how interaction networks develop as a colony grows older and larger the more rapidly ants react to their encounters the more sensitively the entire colony responds to changing conditions gordon explores whether such reactive networks help a colony to survive and reproduce how natural selection shapes colony

networks and how these structures compare to other analogous complex systems ant encounters sheds light on the organizational behavior ecology and evolution of these diverse and ubiquitous social insects

Desert Navigator *2020-02-04*

reproduction of the original ants and some other insects by dr august forel

Ant Encounters *2010-03-22*

engrossing an expedition through the hidden and sometimes horrifying microbial domain wall street journal fascinating and full of the kind of factoids you can t wait to share scientific american parasites can live only inside another animal and as kathleen mcauliffe reveals these tiny organisms have many evolutionary motives for manipulating the behavior of their hosts with astonishing precision parasites can coax rats to approach cats spiders to transform the patterns of their webs and fish to draw the attention of birds that then swoop down to feast on them we humans are hardly immune to their influence organisms we pick up from our own pets are strongly suspected of changing our personality traits and contributing to recklessness and impulsivity even suicide germs that cause colds and the flu may alter our behavior even before symptoms become apparent parasites influence our species on the cultural level too drawing on a huge body of research mcauliffe argues that our dread of contamination is an evolved defense against parasites the horror and revulsion we are programmed to feel when we come in contact with people who appear diseased or dirty helped pave the way for civilization but may also be the basis for major divisions in societies that persist to this day this is your brain on parasites is both a journey into cutting edge science and a revelatory examination of what it means to be human if you ve ever doubted the power of microbes to shape society and offer us a grander view of life read on and find yourself duly impressed heather havrilesky bookforum

Ants and Some Other Insects *2020-07-27*

a brain bending exploration of real life zombies and mind controllers and what they reveal to us about nature and ourselves zombieism isn t just the stuff of movies and tv shows like the walking dead it s real and it s happening in the world around us from wasps and worms to dogs and moose and even humans in plight of the living dead science journalist matt simon documents his journey through the bizarre evolutionary history of mind control along the way he visits a lab where scientists infect ants with zombifying fungi joins the search for kamikaze crickets in the hills of new mexico and travels to israel to meet the wasp that stings cockroaches in the brain before leading them to their doom nothing hollywood dreams up can match the brilliant horrific zombies that natural selection has produced time and time again plight of the living dead is a surreal dive into a world that would be totally unbelievable if very smart scientists didn t happen to be proving it s real and most troublingly or maybe intriguingly of all how even we humans are affected fantastic you ll be thinking about this book long after you re done reading it kelly weinersmith new york times bestselling coauthor of soonish

This Is Your Brain On Parasites *2016-06-07*

this thesis explores the ecology behavior and sensory neurobiology of jumping spiders araneae salticidae the first section chapters 1 and 2 investigates antmimicry by the jumping spider myrmarachne formicaria the second section chapter 3 takes a neuroethological approach to sound perception in the jumping spider phidippus audax chapter 1 uses observations and collections from sites across france to study the relationship between mimics and co occurring ant species behavioral trials also explore how individual jumping spiders and ants interact results from these studies suggest that m formicaria is a general mimic of multiple ant species and that it does not positively associate with ants chapter 2 takes a quantitative approach to the study of locomotor mimicry by m formicaria it measures and compares aspects of gait and overall movement across non mimetic jumping spiders mimics and multiple ant species against widely held beliefs this work suggests that these ant mimics do not move on six legs in their overall motion however m formicaria do imitate ants chapter 3 uses behavioral trials and extracellular recordings of electrical activity from neurons in the jumping spider brain to explore responses to airborne acoustic stimuli this work demonstrates that jumping spiders perceive airborne sound at distances far greater than previously believed possible 2 m

Plight of the Living Dead *2018-10-02*

a stanford professor redefines how nature organizes itself based on nearly two decades of research in the arizona desert in a revolutionary book that maintains that the ant queen is not in charge there are no leaders 14 line drawings

Eight Legs and a Brain 2015

for countless generations people have been told that their potential as humans is limited and fundamentally unequal the social order they have been assured is arranged by powers beyond their control more recently the appeal has been to biology specifically the genes brain sciences the concept of intelligence and powerful new technologies reinforced through the authority of science and a growing belief in bio determinism the ordering of the many for the benefit of a few has

become more entrenched yet scientists are now waking up to the influence of ideology on research and its interpretation in genes brains and human potential ken richardson illustrates how the ideology of human intelligence has infiltrated genetics brain sciences and psychology flourishing in the vagueness of basic concepts a shallow nature versus nurture debate and the overhyped claims of reductionists he shows how ideology more than pure science has come to dominate our institutions especially education encouraging fatalism about the development of human intelligence among individuals and societies genes brains and human potential goes much further building on work being done in molecular biology epigenetics dynamical systems evolution theory and complexity theory it maps a fresh understanding of intelligence and the development of human potential concluding with an upbeat message for human possibilities this synthesis of diverse perspectives will engender new conversations among students researchers and other interested readers

Ants at Work *1999*

plants vs zombies the official guide to protecting your brains is a must for kids who love the video game plants vs zombies there are more than twenty five types of zombies in the fantastical world of plants vs zombies and each has a special talent from pole vaulting to digging to teaming up with a zombie dolphin fortunately a gamer armed with the official guide to protecting your brains has all the tricks knowledge and strategy needed to plant a garden perhaps with a few fume shrooms cherry bombs and potato mines that will defeat each member of the fun loving brain eating mob the zombies won t have a chance

Genes, Brains, and Human Potential *2017-03-21*

about the book worries can eat you up be careful of these ants yes worries can surely eat you up the only way out is to be careful of these ants worries are like ants all the time eating our head and brain and making us an empty minded fellow w e need to be bold and be strong it is said that worry is purely our own matter though it has got something to do with our external circumstances but there are certainly some positive factors within us that keep us happy and there is something negative within us also which keep us unhappy happy living through positive and good thoughts is nothing more than that of living a normal life free from undue pressures problems and tensions if we want to live a good and happy life then we need to get rid of the negativity within us which makes us unhappy negative approach always complicates the problems and increases unhappiness most of us do the fatal mistake of looking outwards for happiness rather than looking inwards be positive be strong be bold and be courageous you are sure to find the feeling of happiness within you even if we are having a bad day think of some good things that may come our way either later that day tomorrow next week or next moment when everything seems to be beyond our control it s almost too easy for us to slip into the grasp of negativity and unhappiness to avoid sadness we must strive to abolish this sort of thinking through the power of thinking positively and generate the feeling of happiness within us the art of sweet living is not a complicated kind of art difficult to learn rather a simple art of happy living feeling well eating well and thinking well what we need to do is just to tune up our mind to enjoy every moment of life and let the sweet happiness follow us this is something that needs to be looked into thoroughly we need to focus on the positive aspects of lives rather than on the negative setbacks and enjoy every moment of life happily and merrily enjoy your life with cheerful talks be happy and cheerful we must remember that happy living is the reward of sweet and positive thinking we ought to remember only the positive thinking can bring happiness in our lives if we cannot think positively you cannot live happily be our own teacher or adviser we ought to look everything with a positive angle let us find something good even in most critical moments of our life and let us make positive thinking the basis of our happy living it s a matter of thought that fools worry about the circumstances on which they have no control the wise live on positive good and happy thoughts a sound and positive happiness is all around it s not far away from us if we do not want to live happy it s up to us it s our own choice we must not blame others nor should we blame our fate or external circumstances another thing is that feeling confident affects the way we perceive our situations and how we decide to manage them

Plants vs. Zombies: Official Guide to Protecting Your Brains *2016-04-12*

of all the animals the elephant rescues only the tiny ant returns the favor

Worries Can Eat YOU Up *2015-12-16*

parasites that manipulate the behaviour of their hosts represent striking examples of adaptation by natural selection this text provides an authoritative review of host manipulation by parasites that assesses developments in the field and lays out a framework for future research

The Ant and the Elephant 2006

pulitzer prize winner bert hölldobler and behavioral ecologist christina kwapich reveal a universe of behavioral mechanisms whereby invaders known as myrmecophiles break into ant colonies by decoding ants sophisticated communication systems these invaders disguise themselves as friendly suppress ant aggression and feast on colony resources

Host Manipulation by Parasites *2012-06-07*

what makes you the way you are and what makes each of us different from everyone else in innate leading neuroscientist and popular science blogger kevin mitchell traces human diversity and individual differences to their deepest level in the wiring of our brains deftly guiding us through important new research including his own groundbreaking work he explains how variations in the way our brains develop before birth strongly influence our psychology and behavior throughout our lives shaping our personality intelligence sexuality and even the way we perceive the world we all share a genetic program for making a human brain and the program for making a brain like yours is specifically encoded in your dna but as mitchell explains the way that program plays out is affected by random processes of development that manifest uniquely in each person even identical twins the key insight of innate is that the combination of these developmental and genetic variations creates innate differences in how our brains are wired differences that impact all aspects of our psychology and this insight promises to transform the way we see the interplay of nature and nurture innate also explores the genetic and neural underpinnings of disorders such as autism schizophrenia and epilepsy and how our understanding of these conditions is being revolutionized in addition the book examines the social and ethical implications of these ideas and of new technologies that may soon offer the means to predict or manipulate human traits compelling and original innate will change the way you think about why and how we are who we are provided by the publisher

The Guests of Ants 2022-07-19

according to the author auguste forel the book ants and some other insects presents an inquiry into the psychic powers of these living creatures and contains an appendix on the peculiarities of their olfactory sense

Innate *2020-03-31*

richly illustrated and delightfully written journey to the ants combines autobiography and scientific lore to convey the excitement and pleasure the study of ants can offer bert hölldobler and e o wilson interweave their personal adventures with the social lives of ants building from the first minute observations of childhood a remarkable account of these abundant insects evolutionary achievement

Ants and Some Other Insects: An Inquiry Into the Psychic Powers of These Animals *2022-05-29*

longlisted for the booker prize 2020 longlisted for the desmond eliot prize 2020 longlisted for the polari prize 2021 featuring on bbc 2 s between the covers sophie ward is a dazzling talent who writes like a modern day f scott fitzgerald elizabeth day author of how to fail an act of such breath taking imagination daring and detail that the journey we are on is believable and the debate in the mind non stop there are elements of doris lessing in the writing a huge emerging talent here fiona shaw a towering literary achievement ruth hogan author of the keeper of lost things rachel and eliza are planning their future together one night in bed rachel wakes up terrified and tells eliza that an ant has crawled into her eye and is stuck there rachel is certain eliza a scientist is sceptical suddenly their entire relationship is called into question what follows is a uniquely imaginitive sequence of interlinked stories ranging across time place and perspective to form a sparkling philosophical tale of love lost and found across the universe

Journey to the Ants *1998-07-21*

most ants don t look dangerous but certain species can be lethal discover fascinating facts about killer ants where they can be found how they organize their colonies and the methods of controlling their damage this illustrated volume is written in accessible language that can be appreciated by readers of all ages

Neuropeptides in the brain of Cataglyphis nodus ants and their role as potential modulators of behavior 2021

highly accessible content rich and eminently readable fascinating and informative popular science at its best the observer subtly radical it presents a revelatory model of consciousness that will be completely new to most readers the guardian best reads for summer have you ever wondered why you have a brain let renowned neuroscientist lisa feldman barrett bestselling author of how emotions are made demystify that big grey blob between your ears in seven short chapters plus a brief history of how brains evolved this slim entertaining and accessible book reveals mind expanding lessons from the front lines of neuroscience research you ll learn where brains came from how they re structured and why it matters and how yours works in tandem with other brains to create everything you experience along the way you ll also learn to dismiss popular myths such as the idea of a lizard brain and the alleged battle between thoughts and emotions or even between nature and nurture to determine your behaviour sure to intrigue casual readers and scientific veterans alike seven and a half lessons about the brain is full of surprises humour and important implications for human nature a gift of a book about our most complex and crucial organ

Love and Other Thought Experiments *2020-02-06*

acacia ants evolved obligate protective mutualisms with acacia trees which they defend against herbivores food parasites and encroaching vegetation in this mutualism the fitness of one partner entirely depends on the other other ant species are parasitic on acacia trees they nest on the tree harvest food rewards do not defend their own tree and occasionally try to steal food from other trees usually inhabited by mutualistic ants to understand the behavioral and anatomical effects of the interaction between ants and host trees i integrated brain anatomy morphology and field experiments to study parasitic and mutualistic species of pseudomyrmex ants associated with acacia trees in chapter 1 i describe a previously unknown behavior of stealing food from other ant defended acacia trees in the parasitic acacia ant p nigropilosus and i evaluate four strategies that may allow parasitic ants to overcome the usually effective defenses of the robbed mutualistic ants protecting a host tree in chapter 2 i study how colony size correlates with the degree of division of labor and brain anatomy of workers focusing on a species of acacia ant lacking morphological castes among workers p spinicola in chapter 3 i study acacia ant behavior of killing vegetation encroaching on a host tree i document the interspecific differences among acacia ants in the size of the area around the host tree that workers clear from encroaching vegetation i further test for interspecific variation in pruning behavior and whether mandibular force correlate with worker pruning decisions in chapter 4 i test whether ant species that routinely leave the host tree to forage or to prune encroaching vegetation are better at orienting themselves when returning to their host tree compared to ant species that rarely leave their host tree this dissertation documents how the obligate protective mutualism of an ant with a tree has consequences for division of labor navigational skills behavioral specializations head shape and brain anatomy of ant workers

Deadly Ants *2012*

in ghost map steven johnson tells the story of the terrifying cholera epidemic that engulfed london in 1854 and the two unlikely heroes anaesthetist doctor john snow and affable clergyman reverend henry whitehead who defeated the disease through a combination of local knowledge scientific research and map making in telling their extraordinary story johnson also explores a whole world of ideas and connections from urban terror to microbes ecosystems to the great stink cultural phenomena to street life re creating a london full of dirt dust heaps slaughterhouses and scavengers ghost map is about how huge populations live together how cities can kill and how they can save us

Seven and a Half Lessons About the Brain *2021-03-04*

this is the story of how your life shapes your brain and how your brain shapes your life join renowned neuroscientist david eagleman on a whistle stop tour of the inner cosmos it s a journey that will take you into the world of extreme sports criminal justice genocide brain surgery robotics and the search for immortality on the way amidst the infinitely dense tangle of brain cells and their trillions of connections something emerges that you might not have expected to see you

Living in a Plant *2015*

until recently neuroscientists thought glial cells did little more than hold your brain together but in the past few years they ve discovered that glial cells are extraordinarily important in fact they may hold the key to understanding intelligence treating psychiatric disorders and brain injuries and perhaps even curing fatal conditions like alzheimer s parkinson s and lou gehrig s disease in the root of thought leading neuroscientist dr andrew koob reveals what we ve learned about these remarkable cells from their unexpected role in information storage to their function as adult stem cells that can keep your brain growing and adapting longer than scientists ever imagined possible ranging from fruit flies to einstein koob reveals the surprising correlation between intelligence and the brain s percentage of glial cells and why these cells unique wavelike communications may be especially conducive to the fluid information processing human beings depend upon you ll learn how crucial glial cells grow and develop why almost all brain tumors are comprised of glial cells and the potential implications for treatment even the apparent role of glial cells in your every thought and dream

The Ghost Map *2008-01-31*

anthology from the year 2011 in the subject sociology knowledge and information language english abstract this is a book about embodiment the idea that intelligence requires a body and how having a body shapes the way we think the idea that the body is required for intelligence has been around since nearly three decades ago but an awful lot has changed since then research labs and leading technology companies around the world have produced a host of sometimes science fiction like creations unbelievably realistic humanoids robot musicians wearable technology robots controlled by biological brains robots that can walk without a brain real life cyborgs robots in homes for the elderly robots that literally put themselves together and artificial cells grown automatically this new breed of technology is the direct result of the embodied approach to intelligence along the way many of the initially vague ideas have been elaborated and the arguments sharpened and are beginning to form into a coherent structure this popular science book aimed at a broad audience provides a clear and up to date overview of the progress being

made at the heart of the book are a set of abstract design principles that can be applied in designing intelligent systems of any kind in short a theory of intelligence but science and technology are no longer isolated fields they closely interact with the corporate political and social aspects of our society so this book not only provides a novel perspective on artificial intelligence but also aims to change how we view ourselves and the world around us credits front cover design by hakam el essawy featuring the humanoid robot eds photo patrick knab robot construction the robot studio trs ecce robot project eu s 7th framework programme ict challenge2 cognitive systems and robotics motors maxon motor switzerland know how partner starmind com

The Brain *2015-11-05*

from the arctic to south africa one finds them everywhere ants making up nearly 15 of the entire terrestrial animal biomass ants are impressive not only in quantitative terms they also fascinate by their highly organized and complex social system their caste system the division of labor the origin of altruistic behavior and the complex forms of chemical communication makes them the most interesting group of social organisms and the main subject for sociobiologists not least is their ecological importance ants are the premier soil turners channelers of energy and dominatrices of the insect fauna toc the importance of ants classification and origins the colony life cycle altruism and the origin of the worker caste colony odor and kin recognition queen numbers and domination communication caste and division of labor social homeostasis and flexibility foraging and territorial strategies the organization of species communities symbioses among ant species symbioses with other animals interaction with plants the specialized predators the army ants the fungus growers the harvesters the weaver ants collecting and culturing ants glossary bibliography index

Library Magazine of American and Foreign Thought *1885*

year in my life have you ever wondered what it is like to be an ant well read this special book and find out in her own words ant describes her busy life underground and the exciting adventures that she and her sisters have when they venture out of their nest the diary format introduces youngsters to the true wonders of the natural world in an entertaining way you can watch the ant meet her huge queen mother help to feed the grubs fight off a beetle attack and beware of the egg stealing spiders i have a few minutes to spare so i can begin my diary at last here are a few facts about me my ant sisters and my friends ants are tiny ants brains are even tinier we don t have much room for learning but we are born knowing all we need to know which is how to work all ants work very hard we love it work is all we do and all we want to do there s no time for playing by the time l ve worked eaten and rested it s time to work again yippee i found all this out from old ant our oldest and wisest sister who knows everything she let me nibble some pages out of a book she found which explains it all l ve stuck some of the pages in my diary and there are also illustrations by tim hayward robin carter and adam stower they ve been working hard too right rest period over i m on duty again back to work hooray

Exploration of Serotonin Distribution and Activity Within the Pavement Ant Brain (Tetramorium Caespitum) *2018*

The Root of Thought *2009-06-03*

Designing Intelligence *2011-01-27*

The Ants *1990*

Fumigate Your Brain *2016-04-11*

Ant's Diary