

Chapter 1 : Moral Microbes | Simple Country Physicist

Microbes And Morals has 4 ratings and 1 review.

Support Aeon Donate now In the s, German physician Robert Koch was trying to curtail an epidemic of anthrax that was sweeping local farm animals. Koch injected this microbe into a mouse “ which died. He recovered it from the dead rodent and injected it into another one “ which also died. Doggedly, he repeated this grim process for over 20 generations and the same thing happened every time. Koch had unequivocally shown that *Bacillus anthracis* caused anthrax. This experiment, and those of contemporaries like Louis Pasteur, confirmed that many diseases are caused by microscopic organisms. Microbes, which had been largely neglected for a couple of centuries, were quickly cast as avatars of death. They were germs, pathogens, bringers of pestilence. Microbes became synonymous with squalor and sickness. They became foes for us to annihilate and repel. Sure, some bacteria can cause disease, but they are in the minority. Most are harmless, and many are even beneficial. We now know that the trillions of microbes that share our bodies “ the so-called microbiome “ are an essential part of our lives. Far from making us sick, they can protect us from disease; they also help digest our food, train our immune system, and perhaps even influence our behaviour. These discoveries have shifted the narrative. Many people now see microbes as allies to be protected. Magazines regularly warn that antibiotics and sanitisers might be harming our health by destroying our microscopic support system. The problem is that the latter view is just as wrong as the former. They are ill-suited for describing the messy, fractious, contextual relationships of the natural world. In reality, bacteria exist along a continuum of lifestyles. If they do us harm, we describe them as parasites or pathogens. If they exist neutrally, we call them commensals. If they benefit us, we bill them as mutualists. But these are hardly fixed categories. Some microbes can slide from one end of this parasite-mutualist spectrum to the other, depending on the strain and on the host they find themselves in. Other microbes can be pathogen and mutualist at the exact same time. The stomach bacterium *Helicobacter pylori* is well known as a cause of ulcers and stomach cancer. These terms are more like states of being, like hungry or awake or alive, or behaviours like cooperating or fighting. They are adjectives and verbs rather than nouns. They describe how two partners relate to one another at a given time and place. Nichole Broderick, assistant professor at the Department of Molecular and Cell Biology, University of Connecticut, found a great example of such shifting relationships when she was studying a soil-dwelling microbe called *Bacillus thuringiensis*, or Bt. It produces toxins that can kill insects by punching holes in their guts. Farmers have exploited this ability since the s, by spraying Bt onto crops as a living pesticide. Even organic farmers do this. They assumed that its toxins inflict so much damage on insects that its victims slowly starve to death. For instance, research has shown that it takes more than a week for a caterpillar to starve, yet Bt kills in half that time. Broderick found out what was really going on, and did so almost by accident. She suspected that caterpillars would have gut microbes that protect them from Bt, so she treated them with antibiotics and then exposed them to the pesticide. With the microbes gone, she expected, the caterpillars would die even faster. Instead, they all survived. It turns out that the gut bacteria in caterpillars, rather than protecting their hosts, are the means through which Bt kills. They are harmless if they stay in the gut, but they can pass through the holes created by Bt toxins and invade the bloodstream. This is sepsis, and it is what kills the insect so quickly. The same thing probably happens to millions of people every year. We humans are also infected by pathogens that create holes in our guts; and we also get sepsis when our usual gut microbes cross over into our bloodstream. As in the caterpillars, the same microbes can be beneficial in the gut but dangerous in the blood. They are mutualists only by virtue of where they live. It all comes down to context. Mitochondria “ the energy-providing structures found in the cells of all animals “ are domesticated bacteria that have been incorporated into their host cells for billions of years. This is one of the most effective instances of symbiosis in all of biology, and yet even mitochondria can wreak havoc if they end up in the wrong place. A cut or a bruise can split some of your cells apart and spill fragments of mitochondria into your blood “ fragments that still keep some of their ancient bacterial character. When your immune system spots them, it mistakenly assumes that an infection is under way and mounts a strong defence. If the

injury is severe, and if enough mitochondria are released, the resulting body-wide inflammation can build into a lethal condition called systemic inflammatory response syndrome SIRS. SIRS can be worse than the original injury. Just as a garden flower can be considered a weed if it shows up in the wrong place, our microbes might be invaluable in one organ but dangerous in another, or essential inside our cells but lethal outside them. Why are these relationships so tenuous? Why do microbes so easily slide between pathogen and mutualist? For a start, these roles are not as contradictory as you might imagine. These are all things that pathogens must do, too. So both characters – mutualists and pathogens, heroes and villains – often use the same molecules for the same purposes. They are just tools, like computers, pens and knives: Even helpful microbes, operating in their usual, ostensibly helpful role can indirectly harm us by creating vulnerabilities that other parasites and pathogens can exploit. Their very presence creates openings. This black-and-white insect, which looks like a wasp, is death to aphids. The natural world is full of these inadvertent lures. You are giving off some of them right now. Certain bacteria turn their owners into magnets for malarial mosquitoes, whilst others put off the little bloodsuckers. Ever wonder why two people can walk through a midge-filled forest and one emerge with dozens of welts while the other just has a smile? Your personal microbes are part of the answer. Pathogens can also use our microbes to launch their invasions, as is the case with the polio virus. The virus gets a better grip on mammalian cells and becomes more stable at our warm body temperatures after touching our gut microbes. These microbes inadvertently turn poliovirus into a more effective attacker. Even when they help their hosts, they create vulnerabilities. They need to be fed, housed, and transmitted, all of which costs energy. And most important, like every other organism, they have their own interests – which often clash with those of their hosts. *Wolbachia* is inherited from mothers to daughters, so if it does away with males, it would get more hosts in the short term; in the long term, though, it risks driving those hosts extinct. If my gut microbes suppressed my immune system they would grow more readily, but I would get sick. Almost every major biological partnership is like this. Cheats are always a problem. Betrayal lurks perpetually on the horizon. Couples might work well together, but if one partner can get the same benefits without spending as much energy or effort, it will do so unless punished or policed. Even in human affairs, the partnerships for mutual benefit are not so easily kept up, in spite of me being endowed with intelligence and so being able to grasp the meaning of such a relation. But in lower organisms, there is no such comprehension to help keep the relationship going. Mutual partnerships are adaptations as blindly entered into and as unconsciously brought about as any others. We like our black-and-white narratives, with clear heroes and villains. And it saddles even the most harmonious relationships with conflict. We can see this more clearly if we leave the world of microbes and think a little bigger. These brown birds live in sub-Saharan Africa, clinging to the flanks of giraffes and antelope. But they also peck at open wounds – a less helpful habit that stymies the healing process and increases the risk of infection. These birds crave blood, and they satisfy that craving in ways that either profit their hosts, or punish them, depending on context. A well-functioning partnership could easily be seen as a case of reciprocal exploitation. A similar dynamic goes on in coral reefs, where a small fish called the cleaner wrasse runs a natural health spa. Big fish arrive, and the wrasse picks parasites from their jaws, gills, and other hard-to-reach places. The cleaners get meals, and the clients get healthcare. But the cleaners sometimes cheat by nipping bits of mucus and healthy tissue. The clients punish them by taking their business elsewhere, and the cleaners themselves will castigate any colleagues that annoy potential customers. Meanwhile, in South America, acacia trees rely on ants to defend them from weeds, pests and grazers. In return, they give their bodyguards sugary snacks to eat and hollow thorns to live in. It looks like an equitable relationship, until you realise that the tree laces its food with an enzyme that stops the ants from digesting other sources of sugar. The ants are not just beneficiaries; they are also indentured servants.

Chapter 2 : Kant's Moral Philosophy (Stanford Encyclopedia of Philosophy)

Microbes and Morals The 'Introduction' notes that unpleasant or revolting subjects are often written about for thrills or entertainment. Murder is the most common, both as fiction and as true crime stories.

Transgenics refers to those specific genetic engineering processes that remove genetic material from one species of plant or animal and add it to a different species. Due to the high similarity in genetic sequences for proteins among species, transgenic organisms are able to effectively assimilate and express these trans-genes. The mule is a common example of a transgenic organism created when a horse and a donkey mate and produce offspring. Image courtesy Wade B. Worthen, Furman University, Biology Department. Transgenics involves removing genetic material from one species and adding it to another. The process of creating a transgene begins by isolating the gene of interest from a donor organism or selecting for purchase any of the thousands of known genes from massive online genomic databases. Once the gene is obtained, it is usually altered so it can function more effectively or be expressed more readily in the host organism. A transgenic organism is further defined as one that contains a transgene introduced by technological methods rather than through selective breeding. Hybrids are transgenic organisms created when reproductive cells from two species combine to form a single embryo e. Current Developments Figure 2: Golden rice right compared to white rice. By incorporating a human protein into bananas, potatoes, and tomatoes, researchers have been able to successfully create edible vaccines for hepatitis B, cholera, and rotavirus, the latter of which can cause fatal bouts of diarrhea. One of the proposed goals is to create trees that could illuminate streets and pathways, thereby saving energy and reducing our dependence upon limited energy resources; however, the public release of such plants has sparked a heated debate centered around potential environmental impacts of introducing highly genetically engineered plants into natural ecosystems. The fiber artificially created from this silk protein has several potentially valuable uses, such as making lightweight, strong, yet supple bulletproof vests. Other industrial and medical applications include stronger automotive and aerospace components, stronger and more biodegradable sutures, and bioshields, which can protect military personnel and first responders from chemical threats such as sarin gas. Pigs may serve as a valuable source of organs and cells for transplantation into humans. Genetic engineering and transgenic combinations represent a significant aspect of current biotechnology research. Xenotransplantation, or the transplantation of living tissues or organs from one species to another, is often seen as a potential way to alleviate the shortage of human hearts and kidneys. Pigs have a similar physiology and organ size, making porcine pig organs ideal candidates for transplantation into human recipients. Genetic manipulation of stem cells now includes the growth of tissues on a scaffolding, or a 3-D printer, which then can be used as a temporary skin substitute for healing wounds or burns. Tissue engineering is becoming a viable alternative in procedures that involve replacement of cartilage, heart valves, cerebrospinal shunts, and other organs. Transgenics and genetic engineering also present a variety of ethical considerations that span social, as well as extrinsic and intrinsic, concerns. Ethical Issues Transgenic biotechnology presents an exciting range of possibilities, from feeding the hungry to preventing and treating diseases; however, these promises are not without potential peril. Some of the issues that need to be considered are the following: Social Concerns If the blending of animal and human DNA results, intentionally or not, in chimeric entities possessing degrees of intelligence or sentience never before seen in nonhuman animals, should these entities be given rights and special protections? What, if any, social and legal controls or reviews should be placed on such research? What unintended personal, social, and cultural consequences could result? Who will have access to these technologies and how will scarce resources—such as medical advances and novel treatments—be allocated? Extrinsic Concerns What, if any, health risks are associated with transgenics and genetically modified foods? Should research be limited and, if so, how should the limits be decided? How should the limits be enforced nationally and internationally? Intrinsic Concerns Are there fundamental issues with creating new species? What, if any, consequences are there of blurring species boundaries? What, if any, research in genetic engineering should be considered morally impermissible and banned e. The issue of crossing species boundaries represents a current topic of debate for bioethicists.

Many plants and animals form hybrids in nature. Should these hybrids be considered separate species? As a result, the U. Food and Drug Administration FDA has banned xenotransplantation trials using nonhuman primates until the procedures have been adequately demonstrated to be safe and until ethical issues have been sufficiently publicly discussed. However, with the advent of stem cell tissue engineering and 3-D printing, xenotransplantation may quickly become outmoded, opening the doors to more complex social, ethical, and legal issues and discourses. Genetically modified crops or GMOs may pose long-term risks to the environment, such as damage to cultivated foods and non-target organisms, or large-scale ecological shifts. Prior to large-scale acceptance of genetic engineering and transgenics, other potential ethical and environmental consequences must be addressed. In addition to the issue of species boundaries, there are other issues that need to be considered and discussed prior to large-scale acceptance and usage of transgenics and other genetic engineering research, including: Various bioethicists, environmentalists, and animal rights activists have argued that it is wrong to create animals that would suffer as a result of genetic alteration for example, a pig with no legs and that such experimentation should be banned. What constitutes a person? A genetic definition is not very helpful, given the variability of gene sequences between individuals. A species definition can be controversial, as mentioned earlier. The question of whether the definition should be more expansive or restrictive will need to be considered as courts, legislatures, and institutions address laws regarding genetic discrimination. The International Olympic Committee is one of multiple organizations that have expressed public concern about genetic engineering. In a similar vein, the medical director of the International Olympic Committee IOC has expressed concern that athletes have started employing genetic engineering to get an edge over their competition. Proponents of genetic manipulation argue that currently parents can and do give their children advantages by sending them to better schools or giving them growth hormones, and that banning genetic manipulation is a denial of individual liberties. These arguments also reflect the opposing philosophies regarding how scarce resources should be allocated. Conclusion Genetic engineering and transgenics continue to present intriguing and difficult challenges for 21st century scientists and ethicists, and education and meaningful, respectful discourse are just the beginning of what is required to tackle such complex ethical issues. Until we as a society or, perhaps, as a global entity can agree on what beings are "human or otherwise" are worthy of moral and legal status and respect, we can expect intense cross-disciplinary debate and discussion as new life forms are created through science and medicine. Educators have permission to reprint articles for classroom use; other users, please contact editor actionbioscience. Linda MacDonald Glenn, J. She completed a fellowship at the Institute of Ethics with the American Medical Association, where her research encompassed the legal, ethical, and social impact of emerging technologies and evolving notions of personhood. She has advised governmental leaders and agencies and published numerous articles in professional journals and books.

Chapter 3 : calendrierdelascience.com:Customer reviews: Microbes and Morals

Microbes and Morals: The strange story of venereal disease by Theodor Rosebury. Viking Adult. Hardcover. POOR. Noticeably used book. Heavy wear to cover. Pages contain marginal notes, underlining, and or highlighting.

Kant pursues this project through the first two chapters of the Groundwork. The point of this first project is to come up with a precise statement of the principle or principles on which all of our ordinary moral judgments are based. The judgments in question are supposed to be those that any normal, sane, adult human being would accept on due rational reflection. Nowadays, however, many would regard Kant as being overly optimistic about the depth and extent of moral agreement. But perhaps he is best thought of as drawing on a moral viewpoint that is very widely shared and which contains some general judgments that are very deeply held. In any case, he does not appear to take himself to be primarily addressing a genuine moral skeptic such as those who often populate the works of moral philosophers, that is, someone who doubts that she has any reason to act morally and whose moral behavior hinges on a rational proof that philosophers might try to give. He rests this second project on the position that we "or at least creatures with rational wills" possess autonomy. The argument of this second project does often appear to try to reach out to a metaphysical fact about our wills. This has led some readers to the conclusion that he is, after all, trying to justify moral requirements by appealing to a fact "our autonomy" that even a moral skeptic would have to recognize. Yet in the Critique of Pure Reason, Kant also tried to show that every event has a cause. Kant recognized that there seems to be a deep tension between these two claims: Kant thought that the only way to resolve this apparent conflict is to distinguish between phenomena, which is what we know through experience, and noumena, which we can consistently think but not know through experience. Our knowledge and understanding of the empirical world, Kant argued, can only arise within the limits of our perceptual and cognitive powers. On one interpretation Hudson, one and the same act can be described in wholly physical terms as an appearance and also in irreducibly mental terms as a thing in itself. On this compatibilist picture, all acts are causally determined, but a free act is one that can be described as determined by irreducibly mental causes, and in particular by the causality of reason. A second interpretation holds that the intelligible and sensible worlds are used as metaphors for two ways of conceiving of one and the same world Korsgaard; Allison; Hill a, b. When we are engaging in scientific or empirical investigations, we often take up a perspective in which we think of things as subject to natural causation, but when we deliberate, act, reason and judge, we often take up a different perspective, in which we think of ourselves and others as agents who are not determined by natural causes. We also need some account, based on this principle, of the nature and extent of the specific moral duties that apply to us. To this end, Kant employs his findings from the Groundwork in The Metaphysics of Morals, and offers a categorization of our basic moral duties to ourselves and others. In addition, Kant thought that moral philosophy should characterize and explain the demands that morality makes on human psychology and forms of human social interaction. These topics, among others, are addressed in central chapters of the second Critique, the Religion and again in the Metaphysics of Morals, and are perhaps given a sustained treatment in Anthropology from a Pragmatic Point of View. Further, a satisfying answer to the question of what one ought to do would have to take into account any political and religious requirements there are. Each of these requirements turn out to be, indirectly at least, also moral obligations for Kant, and are discussed in the Metaphysics of Morals and in Religion. Finally, moral philosophy should say something about the ultimate end of human endeavor, the Highest Good, and its relationship to the moral life. In the Critique of Practical Reason, Kant argued that this Highest Good for humanity is complete moral virtue together with complete happiness, the former being the condition of our deserving the latter. Unfortunately, Kant noted, virtue does not insure wellbeing and may even conflict with it. Further, he thought that there is no real possibility of moral perfection in this life and indeed few of us fully deserve the happiness we are lucky enough to enjoy. Throughout his moral works, Kant returns time and again to the question of the method moral philosophy should employ when pursuing these aims. A basic theme of these discussions is that the fundamental philosophical issues of morality must be addressed a priori, that is, without drawing on

observations of human beings and their behavior. The *Metaphysics of Morals*, for instance, is meant to be based on a priori rational principles, but many of the specific duties that Kant describes, along with some of the arguments he gives in support of them, rely on general facts about human beings and our circumstances that are known from experience. In one sense, it might seem obvious why Kant insists on an a priori method. Such a project would address such questions as, What is a duty? What kinds of duties are there? What is the good? What kinds of goods are there? These appear to be metaphysical questions. Any principle used to provide such categorizations appears to be a principle of metaphysics, in a sense, but Kant did not see them as external moral truths that exist independently of rational agents. Moral requirements, instead, are rational principles that tell us what we have overriding reason to do. Metaphysical principles of this sort are always sought out and established by a priori methods. However, the considerations he offers for an a priori method do not all obviously draw on this sort of rationale. The following are three considerations favoring a priori methods that he emphasizes repeatedly. The first is that, as Kant and others have conceived of it, ethics initially requires an analysis of our moral concepts. Given that the analysis of concepts is an a priori matter, to the degree that ethics consists of such an analysis, ethics is a priori as well. Of course, even were we to agree with Kant that ethics should begin with analysis, and that analysis is or should be an entirely a priori undertaking, this would not explain why all of the fundamental questions of moral philosophy must be pursued a priori. Indeed, one of the most important projects of moral philosophy, for Kant, is to show that we, as rational agents, are bound by moral requirements and that fully rational agents would necessarily comply with them. Kant admits that his analytical arguments for the CI are inadequate on their own because the most they can show is that the CI is the supreme principle of morality if there is such a principle. Kant must therefore address the possibility that morality itself is an illusion by showing that the CI really is an unconditional requirement of reason that applies to us. This is the second reason Kant held that fundamental issues in ethics must be addressed with an a priori method: The ultimate subject matter of ethics is the nature and content of the principles that necessarily determine a rational will. Fundamental issues in moral philosophy must also be settled a priori because of the nature of moral requirements themselves, or so Kant thought. This is a third reason he gives for an a priori method, and it appears to have been of great importance to Kant: Moral requirements present themselves as being unconditionally necessary. But an a posteriori method seems ill-suited to discovering and establishing what we must do whether we feel like doing it or not; surely such a method could only tell us what we actually do. Kant argued that empirical observations could only deliver conclusions about, for instance, the relative advantages of moral behavior in various circumstances or how pleasing it might be in our own eyes or the eyes of others. Such findings clearly would not support the unconditional necessity of moral requirements. To appeal to a posteriori considerations would thus result in a tainted conception of moral requirements. It would view them as demands for which compliance is not unconditionally necessary, but rather necessary only if additional considerations show it to be advantageous, optimistic or in some other way felicitous. Thus, Kant argued that if moral philosophy is to guard against undermining the unconditional necessity of obligation in its analysis and defense of moral thought, it must be carried out entirely a priori. Nevertheless, this idea of a good will is an important commonsense touchstone to which Kant returns throughout his works. The idea of a good will is supposed to be the idea of one who is committed only to make decisions that she holds to be morally worthy and who takes moral considerations in themselves to be conclusive reasons for guiding her behavior. This sort of disposition or character is something we all highly value, Kant thought. He believes we value it without limitation or qualification. By this, we believe, he means primarily two things. First, unlike anything else, there is no conceivable circumstance in which we regard our own moral goodness as worth forfeiting simply in order to obtain some desirable object. By contrast, the value of all other desirable qualities, such as courage or cleverness, can be diminished, forgone, or sacrificed under certain circumstances: Courage may be laid aside if it requires injustice, and it is better not to be witty if it requires cruelty. There is no implicit restriction or qualification to the effect that a commitment to give moral considerations decisive weight is worth honoring, but only under such and such circumstances. Second, possessing and maintaining a steadfast commitment to moral principles is the very condition under which anything else is worth having or pursuing. The value of a

good will thus cannot be that it secures certain valuable ends, whether of our own or of others, since their value is entirely conditional on our possessing and maintaining a good will. Indeed, since a good will is good under any condition, its goodness must not depend on any particular conditions obtaining. Human beings inevitably feel this Law as a constraint on their natural desires, which is why such Laws, as applied to human beings, are imperatives and duties. A human will in which the Moral Law is decisive is motivated by the thought of duty. A holy or divine will, if it exists, though good, would not be good because it is motivated by thoughts of duty because such a will does not have natural inclinations and so necessarily fulfills moral requirements without feeling constrained to do so. Kant confirms this by comparing motivation by duty with other sorts of motives, in particular, with motives of self-interest, self-preservation, sympathy and happiness. He argues that a dutiful action from any of these motives, however praiseworthy it may be, does not express a good will. Only then would the action have moral worth. Many object that we do not think better of actions done for the sake of duty than actions performed out of emotional concern or sympathy for others, especially those things we do for friends and family. What is crucial in actions that express a good will is that in conforming to duty a perfectly virtuous person always would, and so ideally we should, recognize and be moved by the thought that our conformity is morally obligatory. The motivational structure of the agent should be arranged so that she always treats considerations of duty as sufficient reasons for conforming to those requirements. In other words, we should have a firm commitment not to perform an action if it is morally forbidden and to perform an action if it is morally required. Having a good will, in this sense, is compatible with having feelings and emotions of various kinds, and even with aiming to cultivate some of them in order to counteract desires and inclinations that tempt us to immorality. Suppose for the sake of argument we agree with Kant. We now need to know what distinguishes the principle that lays down our duties from these other motivating principles, and so makes motivation by it the source of unqualified value. Duty and Respect for Moral Law According to Kant, what is singular about motivation by duty is that it consists of bare respect for the moral law. What naturally comes to mind is this: Duties are rules or laws of some sort combined with some sort of felt constraint or incentive on our choices, whether from external coercion by others or from our own powers of reason. For instance, the bylaws of a club lay down duties for its officers and enforce them with sanctions. City and state laws establish the duties of citizens and enforce them with coercive legal power. Thinking we are duty bound is simply respecting, as such, certain laws pertaining to us. Respect for such laws could hardly be thought valuable. For another, our motive in conforming our actions to civic and other laws is rarely unconditional respect. We also have an eye toward doing our part in maintaining civil or social order, toward punishments or loss of standing and reputation in violating such laws, and other outcomes of lawful behavior. Indeed, we respect these laws to the degree, but only to the degree, that they do not violate values, laws or principles we hold more dear. Yet Kant thinks that, in acting from duty, we are not at all motivated by a prospective outcome or some other extrinsic feature of our conduct except insofar as these are requirements of duty itself. We are motivated by the mere conformity of our will to law as such. Human persons inevitably have respect for the moral law even though we are not always moved by it and even though we do not always comply with the moral standards that we nonetheless recognize as authoritative. The force of moral requirements as reasons is that we cannot ignore them no matter how circumstances might conspire against any other consideration. Basic moral requirements retain their reason-giving force under any circumstance, they have universal validity. So, whatever else may be said of basic moral requirements, their content is universal.

Chapter 4 : ActionBioscience - promoting bioscience literacy

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Chapter 5 : Microbes, mating, and morality: individual differences in three functional domains of disgust.

directed against the threat of ingesting certain substances, including bodily wastes of humans and other animals. The recognition that disgust applies to objects and acts beyond.

Chapter 6 : - Microbes and Morals: The strange story of venereal disease by Theodor Rosebury

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Chapter 7 : Microbes and climate change –“ Microbes and biofuels

What is the function of disgust? Whereas traditional models have suggested that disgust serves to protect the self or neutralize reminders of our animal nature, an evolutionary perspective suggests that disgust functions to solve 3 qualitatively different adaptive problems related to pathogen.

Chapter 8 : Microbes And Morals: The Strange Story Of Venereal Disease by Theodor Rosebury

Microbiologist Rosebury who condemned at some length our overcleanliness in Life on Man () now attacks the dirty narrow-mindedness we attach to the 'natural' venereal diseases; this is partially responsible for their alarming recrudescence. Back in the middle '30's the Public Health Surgeon.

Chapter 9 : Ethics in Research - How Morals and Ethics Affect Research

Morals, microbes, and methods. Previous Article Rethinking personalised medicine. Next Article No murder in paradise. There is an apocryphal quote from former US.