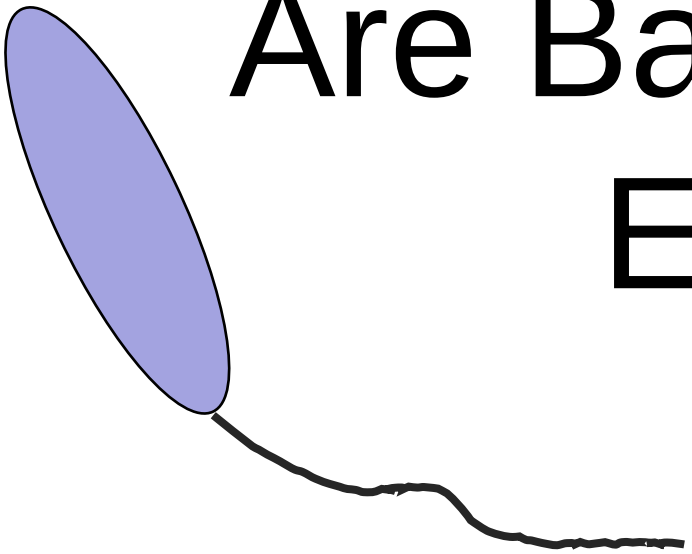
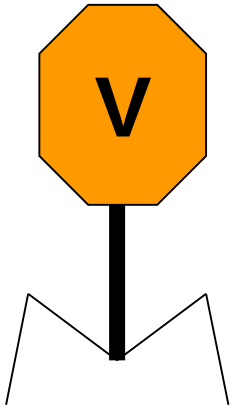
Are Bacteria & Virus Evolving?



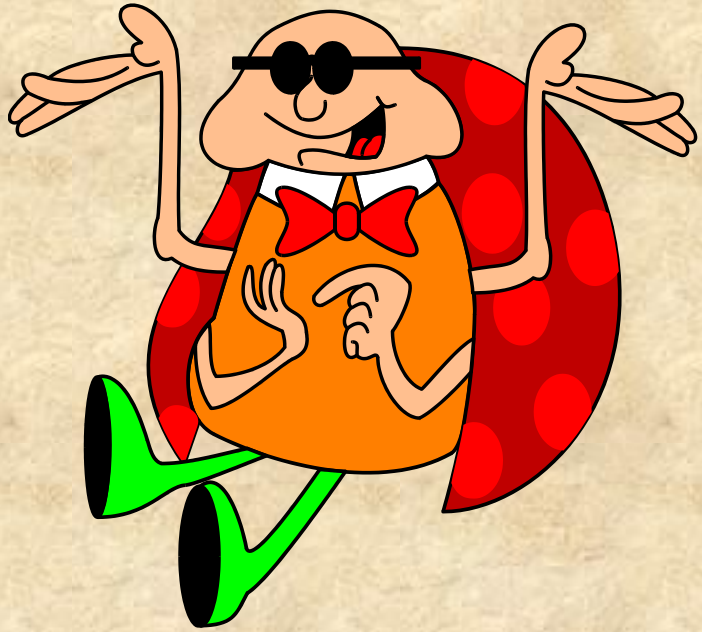


We keep hearing that the Coronavirus is mutating and evolving. This article is from Biology year 2 from a longer lesson 14 - “Viruses The Good, the Bad the Ugly.”. From this we see that bacteria and viruses do not, by mutations “evolve” into bigger, better and tougher organisms. The First Law of Thermodynamics says all molecular systems in the universe are going from a complex state to a simpler state:

1. Molecules cannot combine accidently to form more complex substances or life.
2. Molecules in organisms cannot become more complex than their DNA Blueprint dictates.

I believe, based on the following information, that the bacteria and viruses are **variating** (my word) to adjust to many different environments either by exchanging DNA Blueprint molecules with other bacteria and viruses or rearranging molecules in their own body. Nevertheless they are still the same organism.

Viruse Defined



Some, like those at the bottom… are smaller than a human cell…

Chart comparing yeast cell…

to viruses…

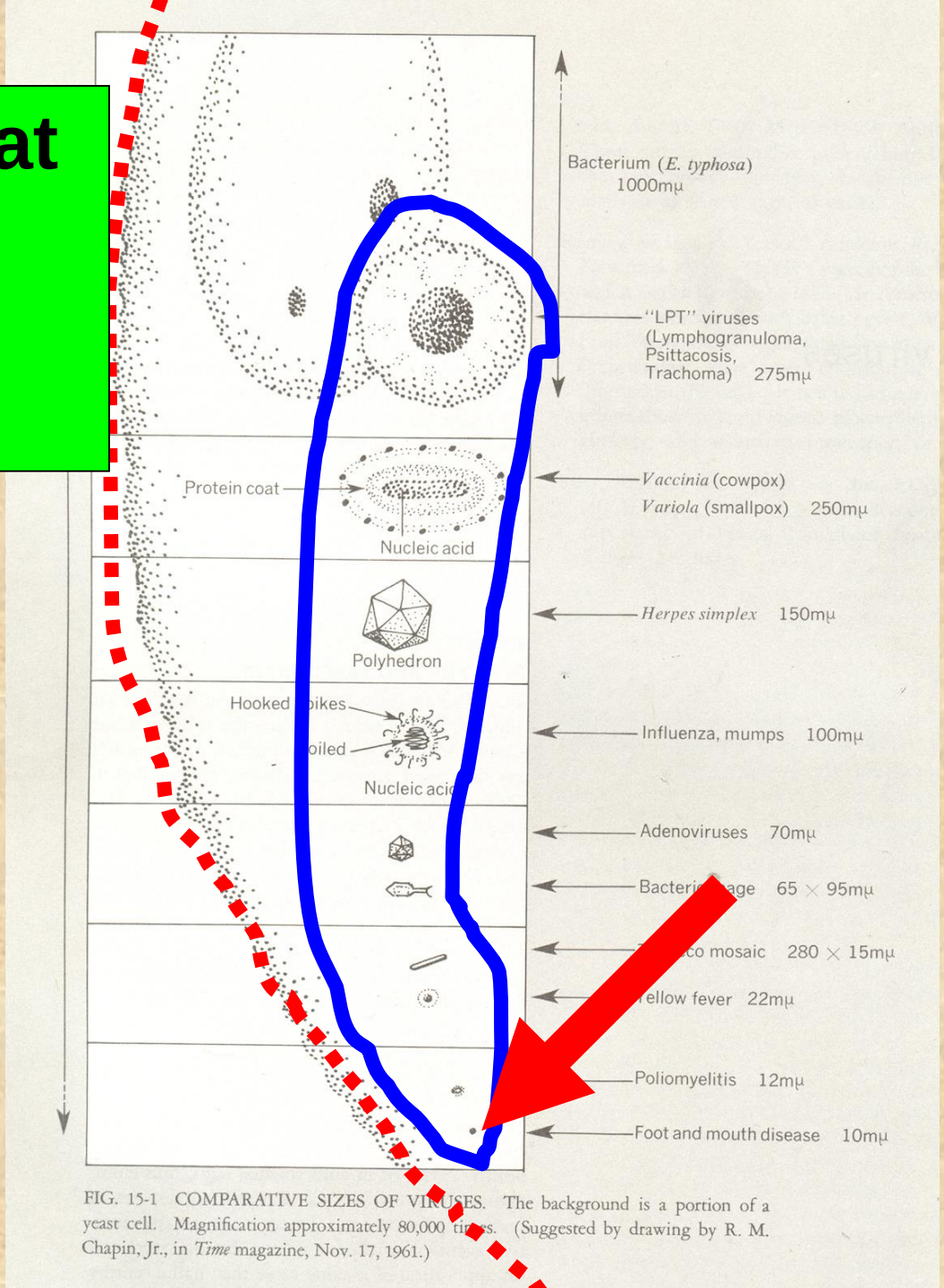
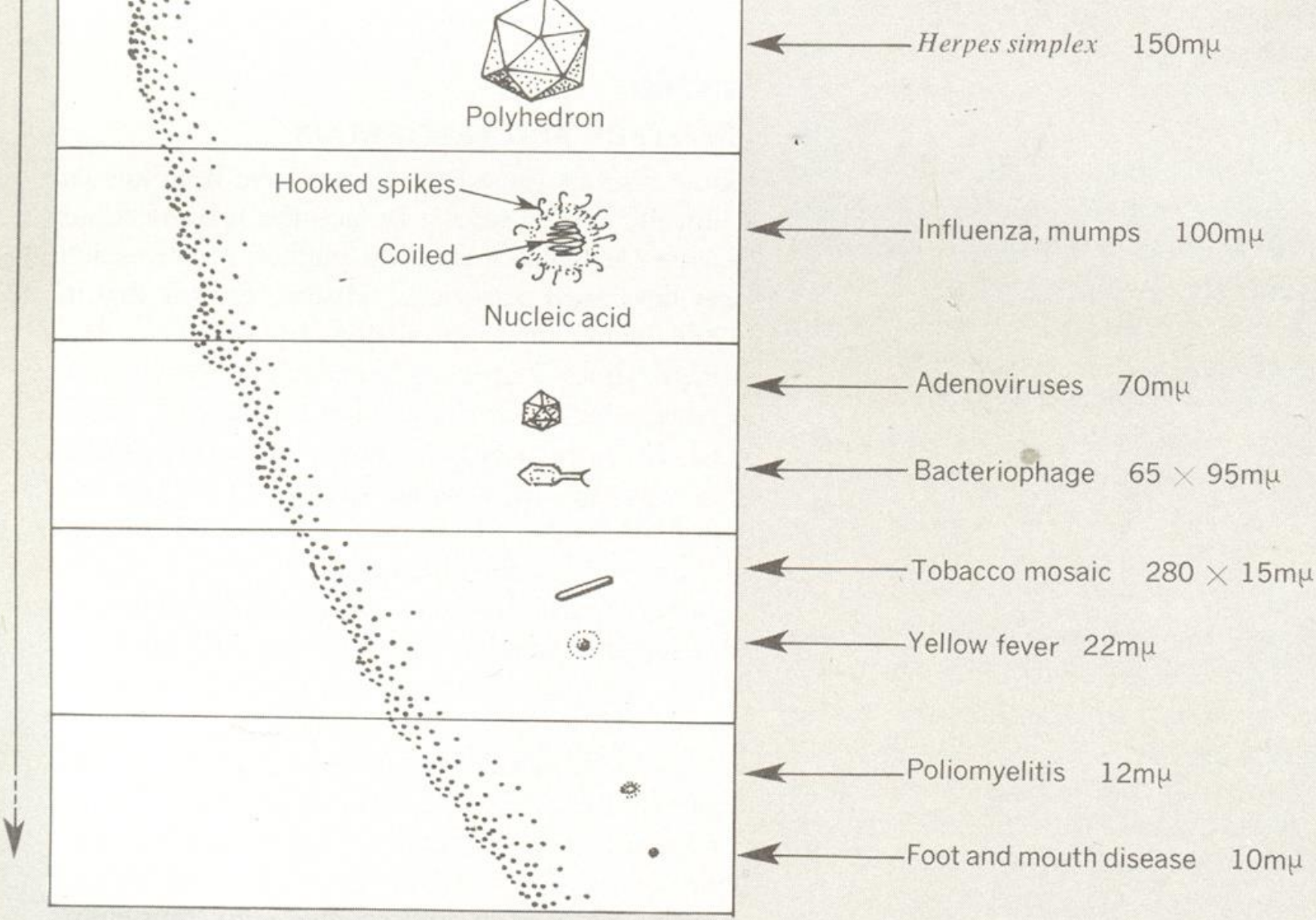


FIG. 15-1 COMPARATIVE SIZES OF VIRUSES. The background is a portion of a yeast cell. Magnification approximately 80,000 times. (Suggested by drawing by R. M. Chapin, Jr., in *Time* magazine, Nov. 17, 1961.)



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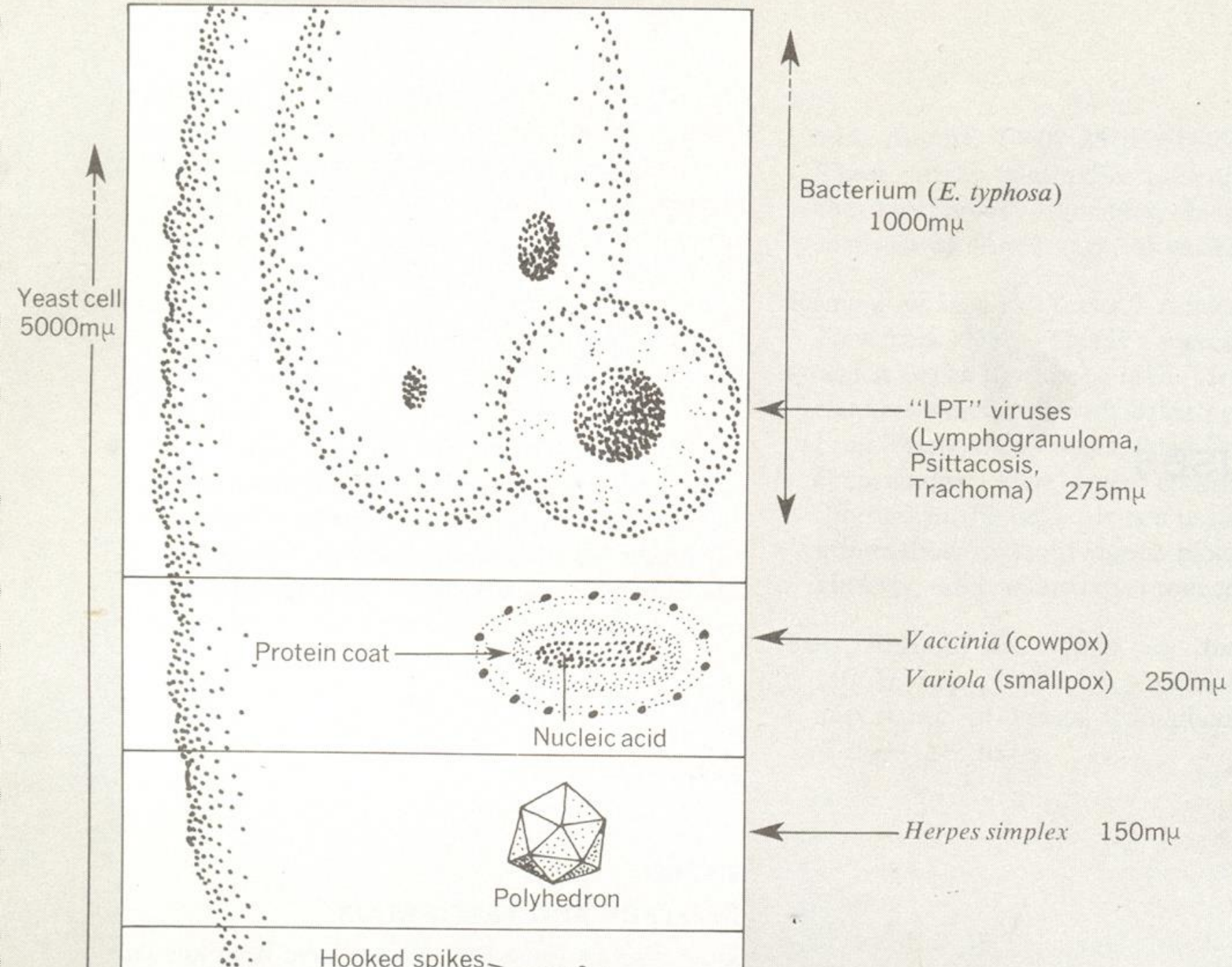
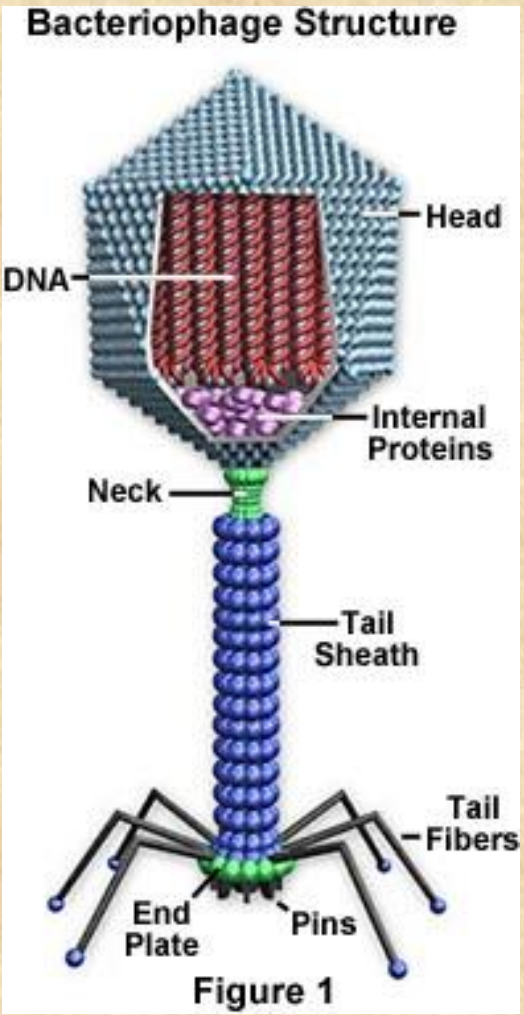
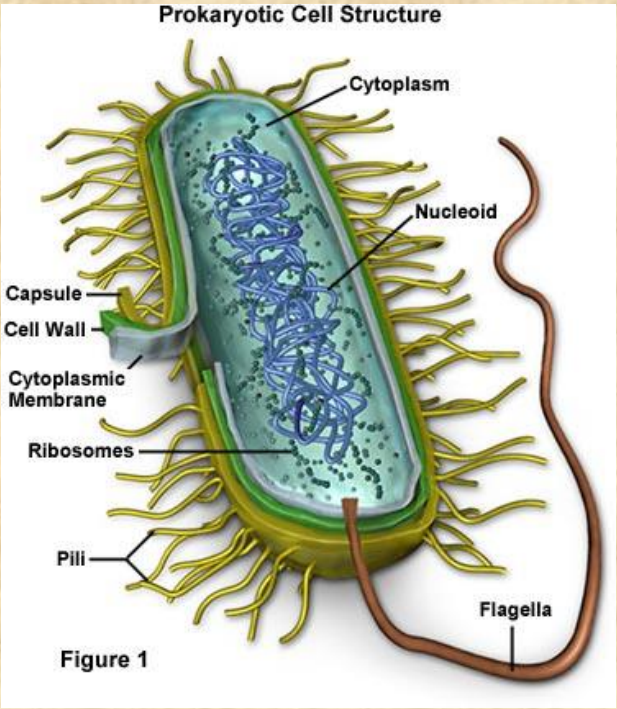

Yeast cell
5000mμ
Bacterium (*E. typhosa*)
1000mμ
"LPT" viruses
(Lymphogranuloma,
Psittacosis,
Trachoma) 275mμ
Protein coat
Nucleic acid
Vaccinia (cowpox)
Variola (smallpox) 250mμ
Polyhedron
Herpes simplex 150mμ
Hooked spikes

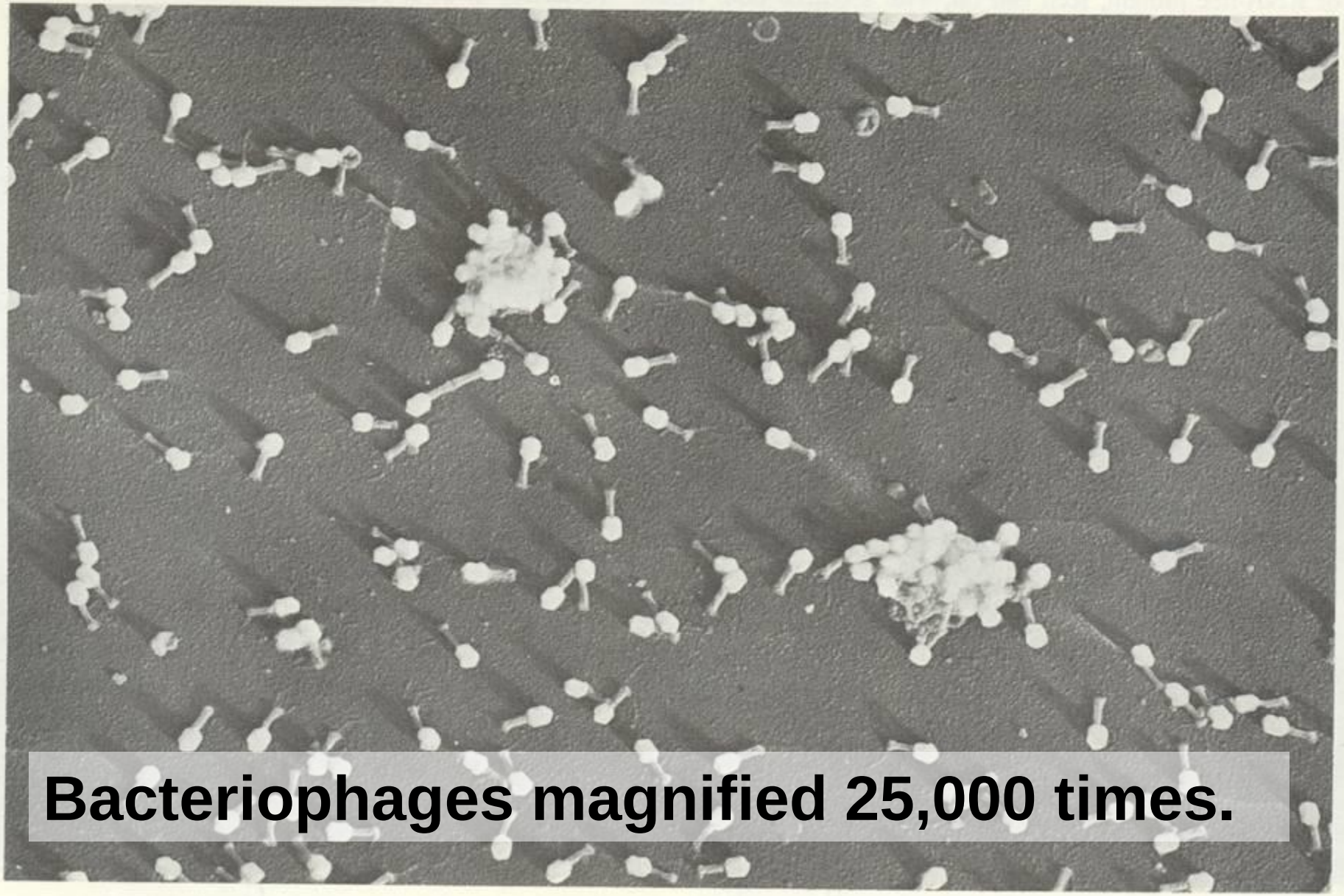




1. Bacteriophages which attack bacteria…

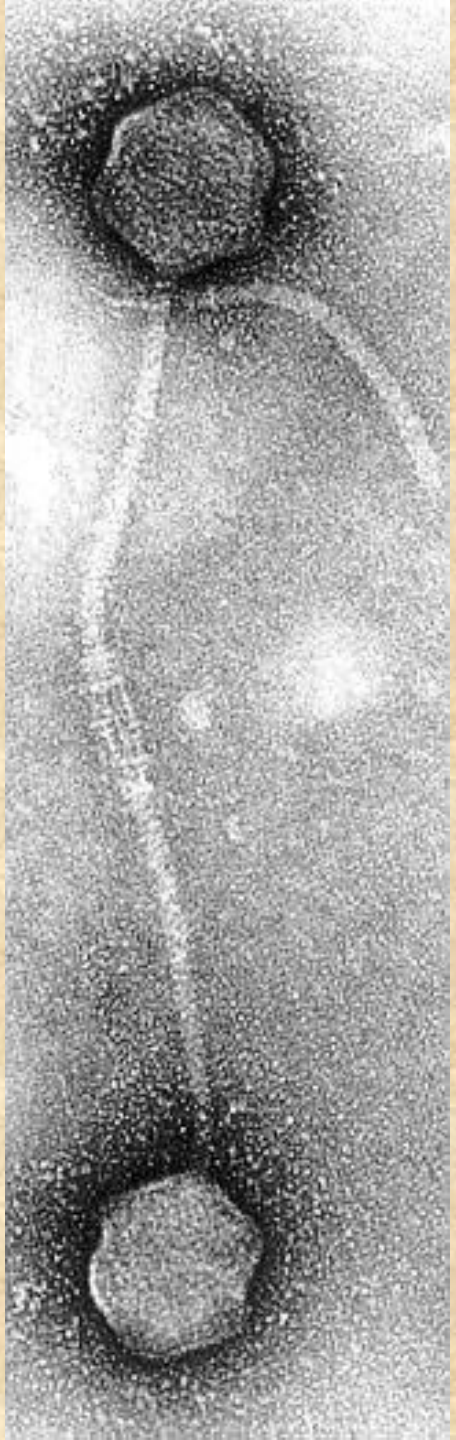
Two types of viruses…

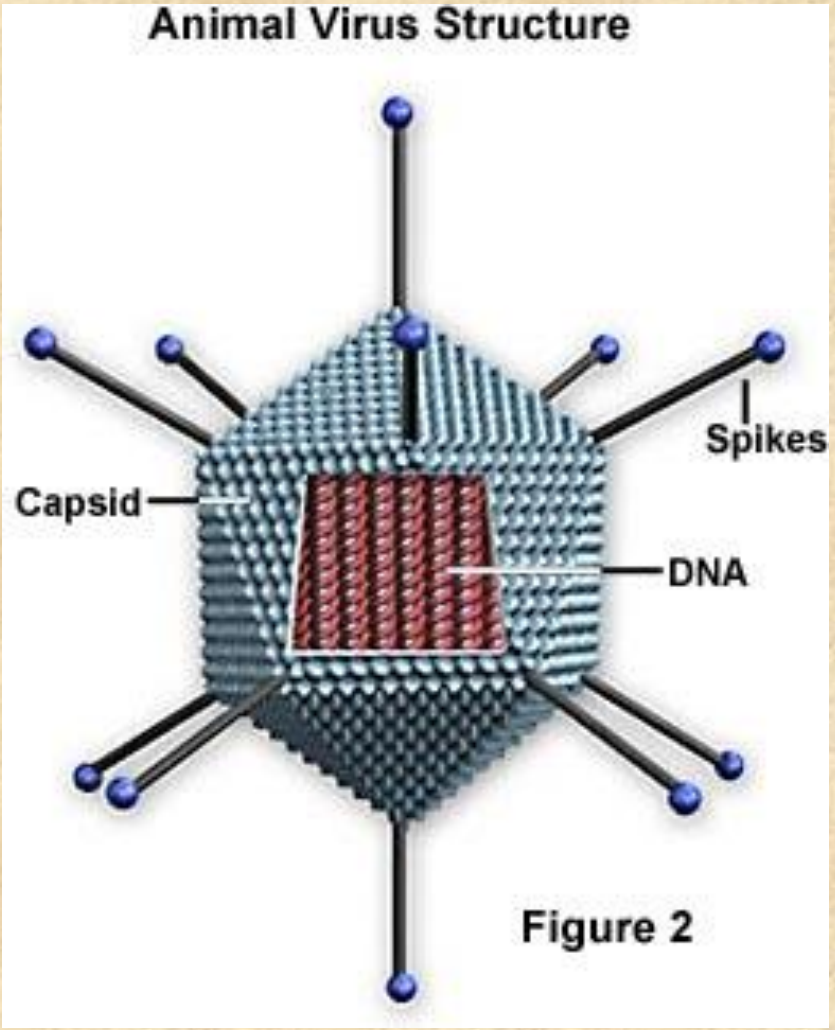
FIG. 15-12 T2 COLI PHAGE (×25,000). The purified T2 virus shown here was fixed with formalin vapor and shadowed with chromium. (From R. M. Herriott and J. L. Barlow in *J. Gen. Physiol.*, 36:17–28, 1952.)



Bacteriophages magnified 25,000 times.

Bacteriophage (bacterial viruses) - magnification about 500 000x





2. Viruses that attack animal and plant cells…

Example:

Ebola Virus.

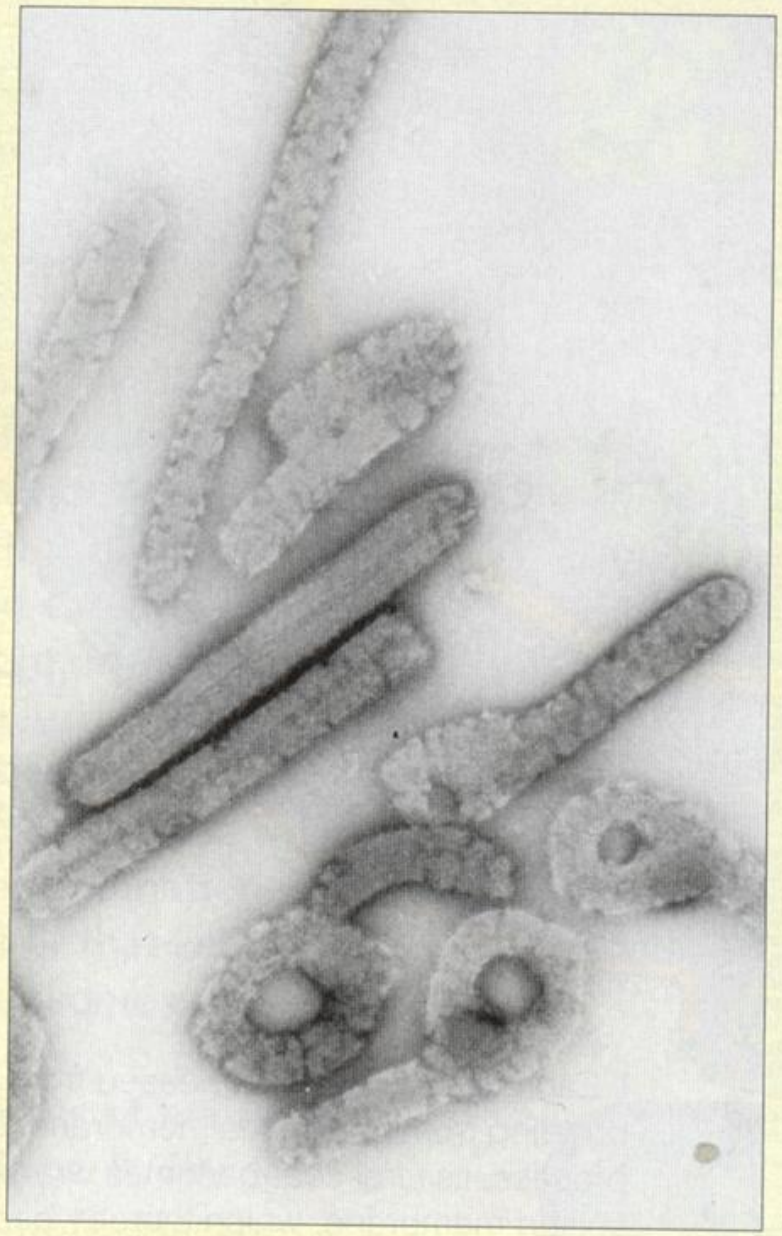
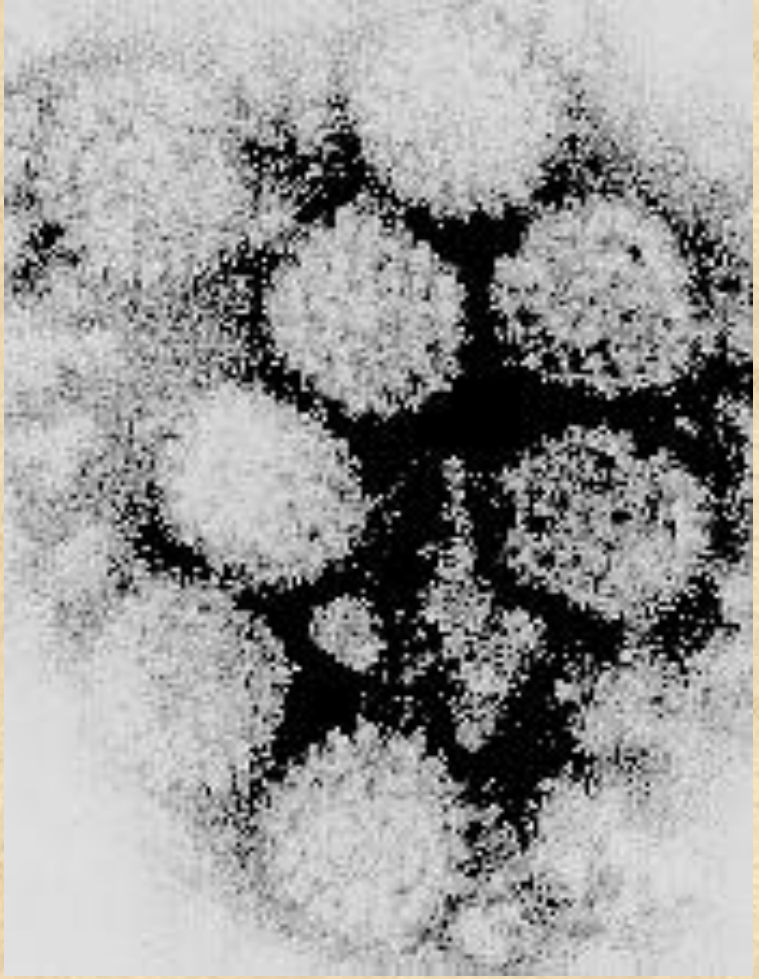
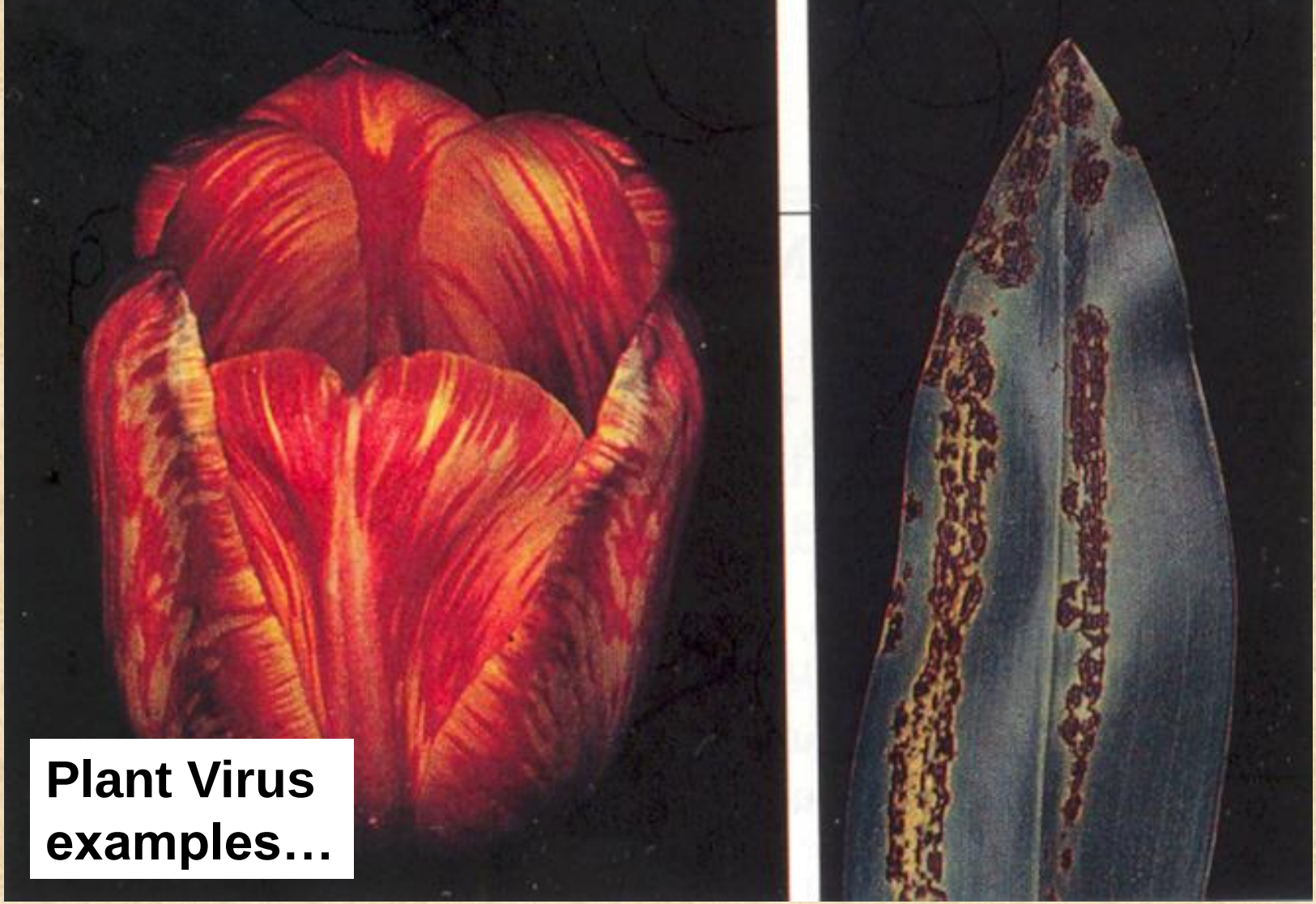


Figure 22.18 Transmission electron micrograph of particles of *Ebola* virus.

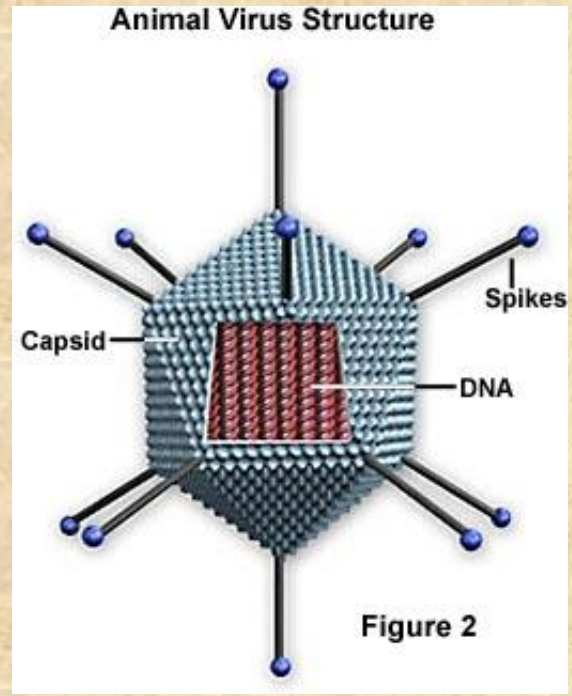


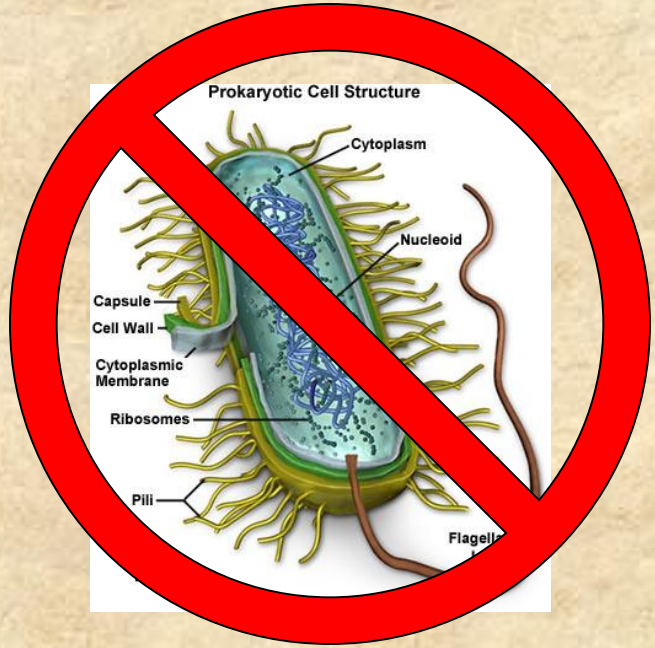
Insect virus particles (a spherical virus, like influenza) magnification about 700 000x



Plant Virus examples…

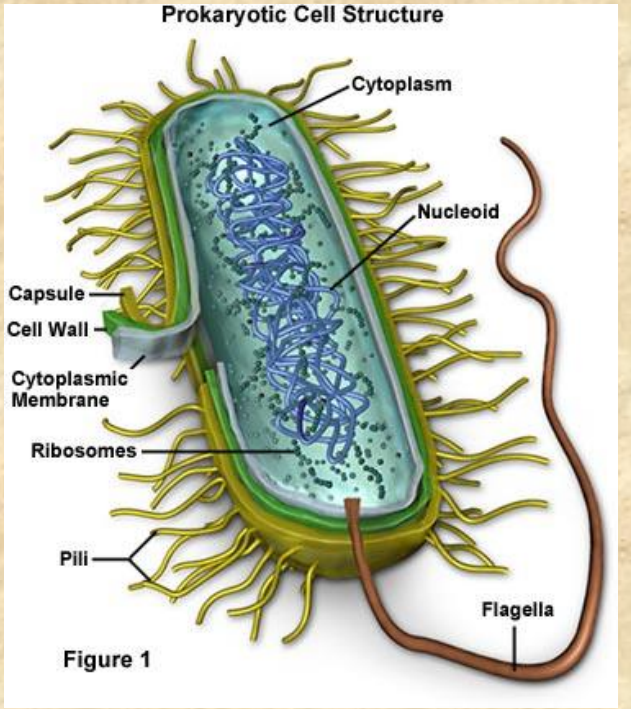
(**c**) Streaking of a tulip blossom. A harmless virus infected pigment-forming cells in the colorless parts. (**d**) An orchid leaf infected by a rhabdovirus.





Introduction

Let's see what a virus is NOT. A virus is not a bacterium… nor an independently-living organism. A virus cannot survive in the absence of a living cell within which to synthesize copies of itself (replicate).



Antibiotics do not harm a virus; it is for this reason that treatment for the "flu" for example, is mainly to help ease the symptoms of the illness rather than to kill the organism which causes the "flu" (*Influenza virus)*

Short Definition:

vi•rus - dead infectious agents that contain RNA or DNA, and can grow and multiply only in living cells.

Long Definition:

vi•rus \"vï-r€s\ *n* [L, venom, poisonous emanation] 1 : any of a large group of submicroscopic infectious agents that have an outside coat of protein around a core of RNA or DNA, that can grow and multiply only in living cells, and that cause important diseases in human beings, lower animals, and plants; *also* : a disease caused by a virus.

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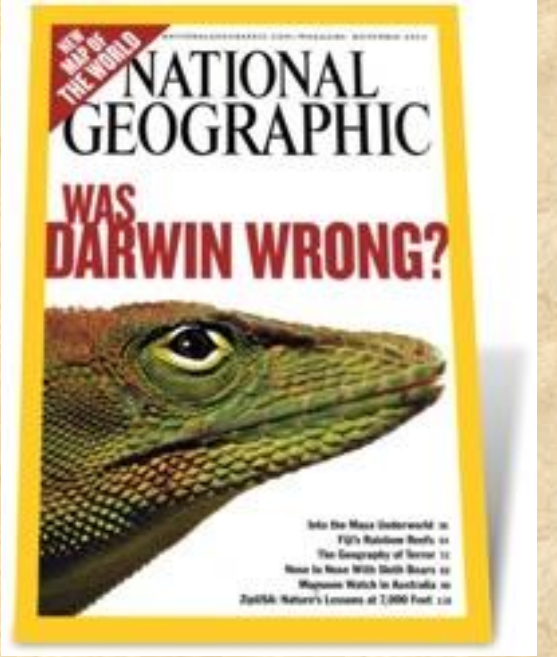
Are Bacteria Evolving?



Commentary on National Geographic Article

I am indebted for all the following material from Apologetics Press. They do a wonderful job of defending Creation Science with good factual data. There are many other good articles on their site (see next page). It is too bad that their rebuttal will never be presented in National Geographic or any secular publication. This is the way science SHOULD work. One person presents his theory or observation then others present the contrary evidence and we come to a better understanding all the way around. Evolutionist have cut off this scientific exchange because many who criticize their interpretations are Creationists. Evolutionists, by knee jerk reaction, will not have anything to do with Creationists.

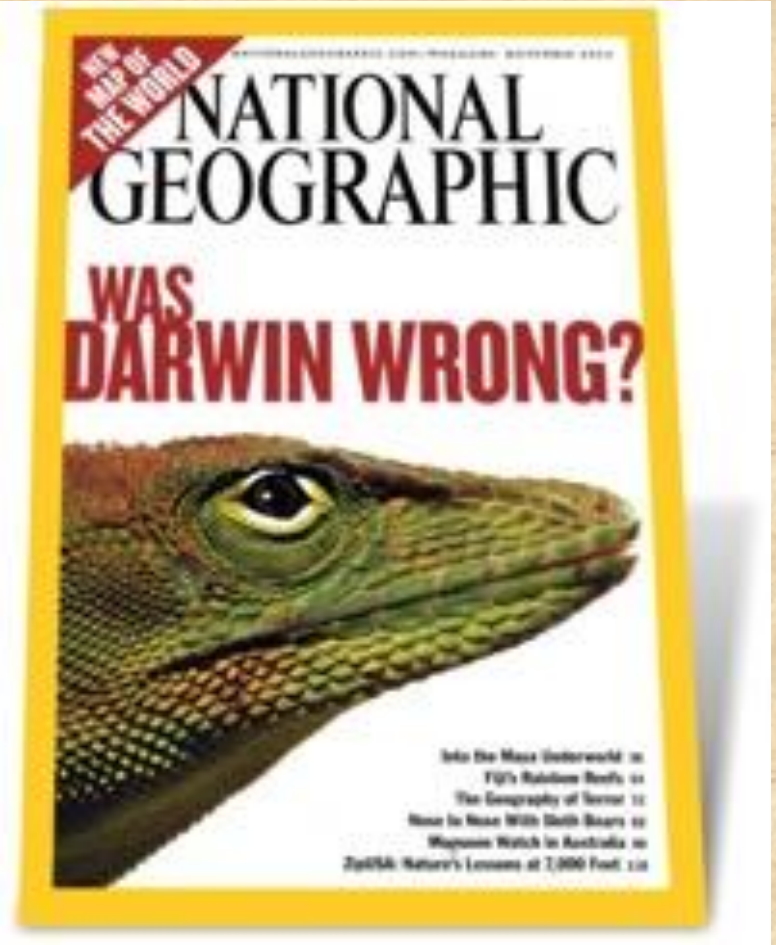
My comments will be in brackets [ ]

All material is from the following site
http://www.apologeticspress.org/articles/2644

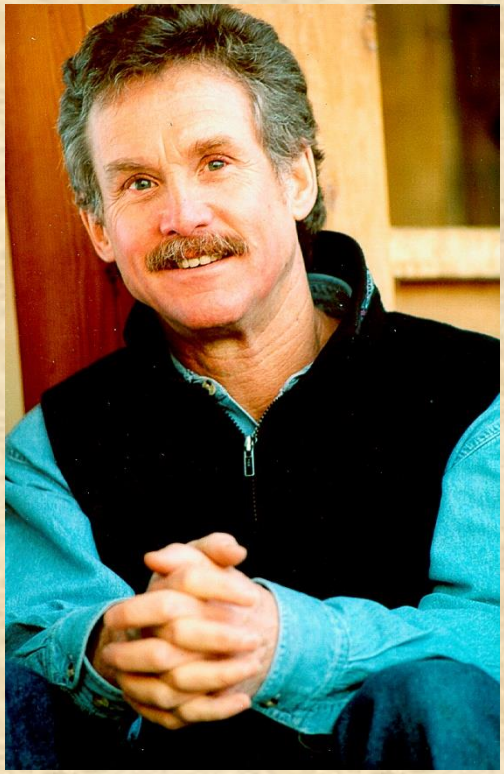
National Geographic Shoots Itself in the Foot—*Again!*
by Bert Thompson, Ph.D. and Brad Harrub, Ph.D.

Full PDF (Adobe Acrobat) Version
Size 1660 KB

INTRODUCTION: THE FIRST SELF-INFLICTED SHOT IN THE FOOT—NOVEMBER 1999



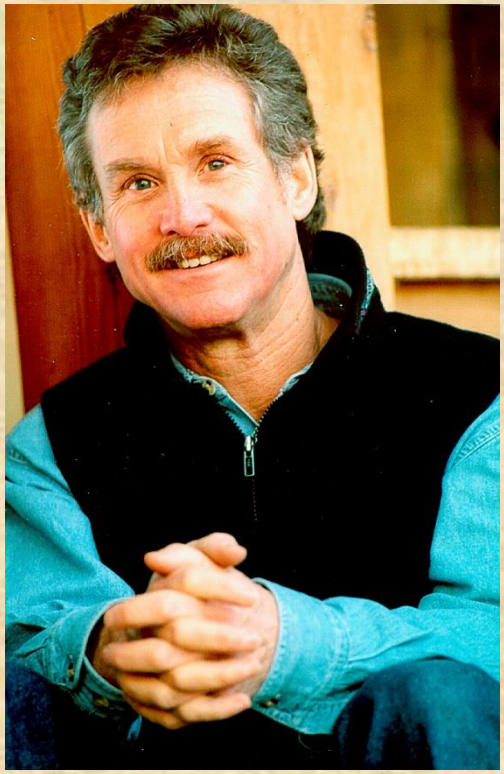
David Quammen



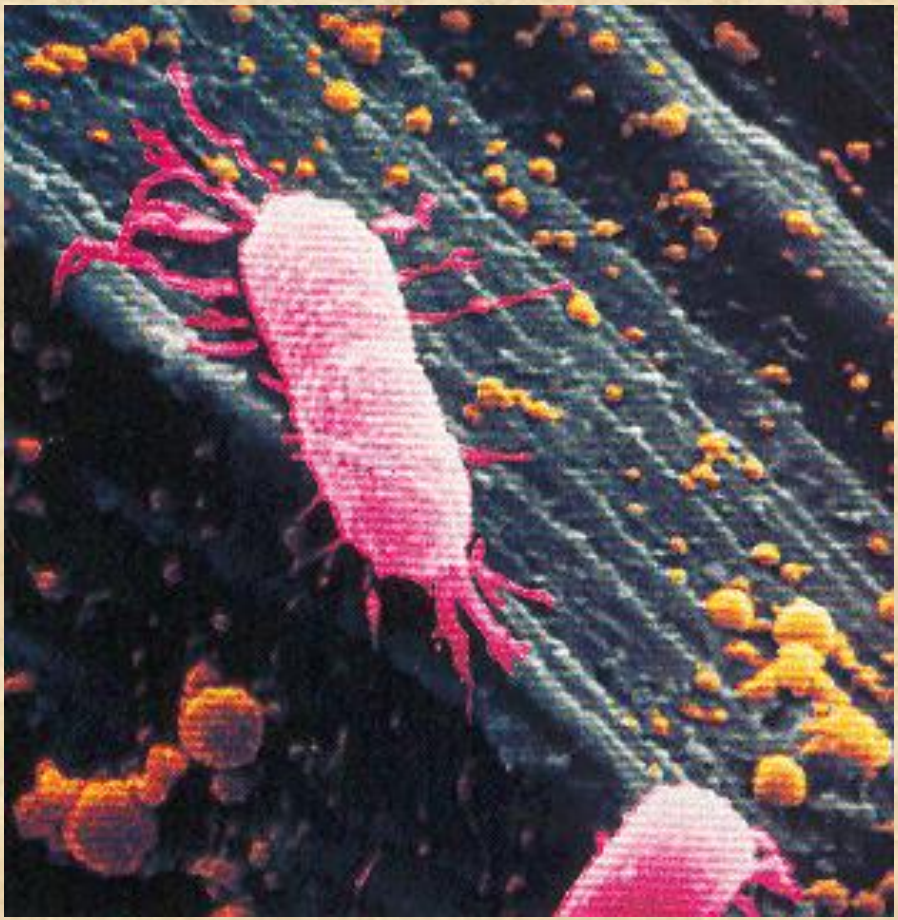
Who is the author? David Quammen

Beginning on page 2 of the November 2004 issue, *National Geographic* published David Quammen's article defending organic evolution. Quammen, strangely enough, is not a biologist (or a scientist of any sort). His specialty is—**literature**. In an interview with him that was published in the October 27, 2003 issue of the *Seattle Post-Intelligencer Reporter*, he admitted to the interviewer, John Marshall: "I did my graduate work on William Faulkner. My training was all in literature, not biology. But when I couldn't make it as a fiction writer, I turned to this. And I liked it more—I get to talk to biologists, walk through rain forests and see the world" (Marshall, 2003).

Photo from http://search.yahoo.com/search?ei=utf-8&fr=slv1-adbe&p=David+Quammen+Photo

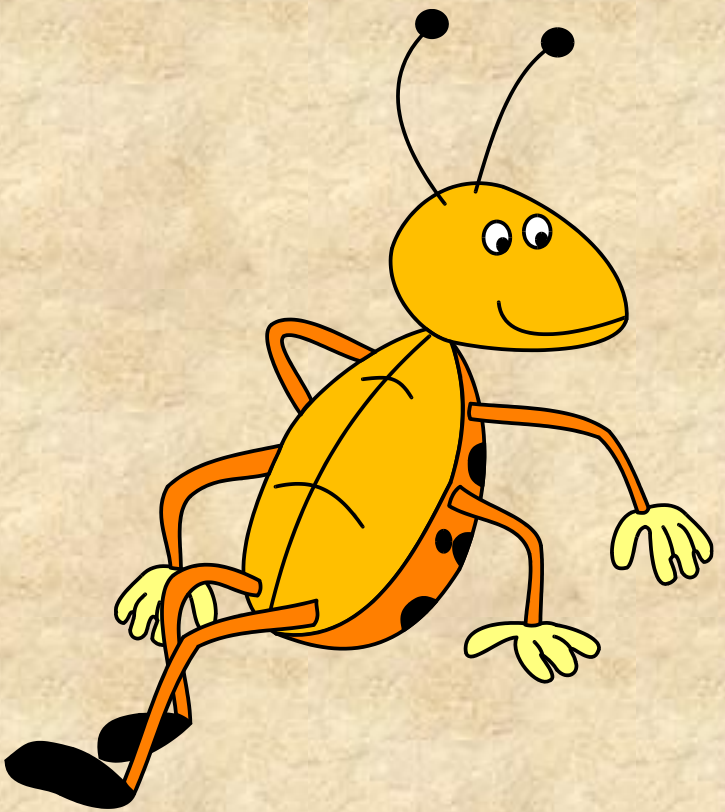


“Talking to biologists, walking through rainforests, and seeing the world” apparently qualifies a person, from Bill Allen’s perspective as the editor of *National Geographic*, to write from a scientific viewpoint on the intricate biological, biogeographical, and paleontological aspects of evolution. From our perspective, however, the choice of this particular author might explain why much of Quammen’s article—dealing as it does with such a wide variety of scientific concepts related to organic evolution—**is so far off the mark**. And make no mistake about it—it **is** far off the mark!



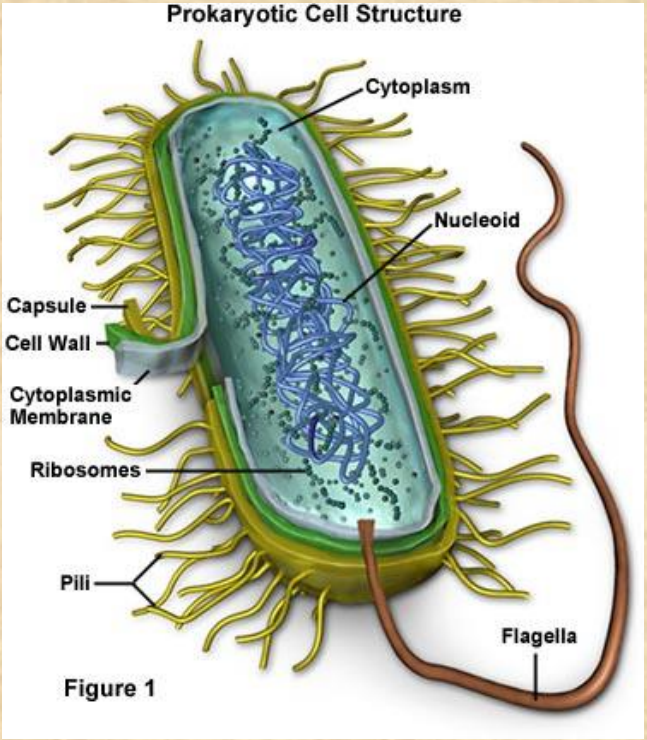
Rebuttal:

But surely the most obvious of all the sleight-of-hand tricks used by Quammen was his use of antibiotic-resistant bacteria as a “proof” that evolution has occurred. He wrote: “No aspect of biomedical research seems more urgent today than the study of microbial diseases. And the dynamics of those microbes within human bodies, within human populations, can only be understood in terms of evolution” (p. 21). And what did Quammen use to establish such a grand claim? Listen carefully.



Quammen says:

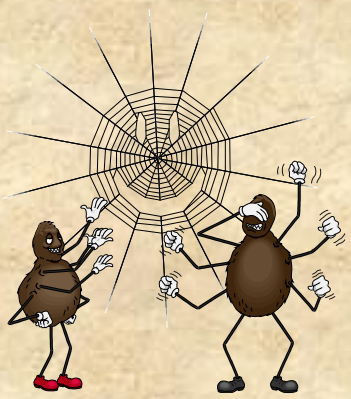
"The capacity for quick change among disease-causing microbes is what makes them so dangerous to large numbers of people and so difficult and expensive to treat. They leap from wildlife or domestic animals into humans, adapting to new circumstances as they go. Their inherent variability allows them to find new ways of evading and defeating human immune systems. By natural selection they acquire resistance to drugs that should kill them. **They evolve**. **There's no better or more immediate evidence supporting the Darwinian theory than this process of forced transformation among our inimical germs"** (p. 21, emp. added).



Rebuttal:

Evolutionists frequently use this idea of the “rapid evolution” of microorganisms as “observed proof” for evolution. Their claim is that drug-resistant strains of many types of such organisms have evolved from strains that, at one time, were susceptible to these same drug treatments. Scientists would have us believe that microorganisms are “selectively adapting” to our drug treatments through a mechanism that involves genetic mutations. But do they do it “on purpose”?

By magically endowing such microorganisms with a “sinister mind,” Palumbi has suggested that “bacterial evolution outwits one antibiotic after another” (as quoted in Hayden, 2002, 133[4]:48).



Rebuttal:

Yet, studies indicate an alternative explanation for this acquired immunity—one that argues **against** organic evolution. Researchers Monica Sala and Simon Wain-Hobson (of the world-famous Pasteur Institute in France) published a paper titled "Are RNA Viruses Adapting or Merely Changing?" (2000). In this particular study, they examined 85 sets of proteins from viruses that are known to infect bacteria, plants, and mammals.

According to the evolutionary hypothesis, once drug therapy alleviates the majority of susceptible microorganisms, only those that remain have mutated during replication and thus are resistant. Evolutionists believe that this represents a type of natural selection taking place, in which mutations "purposefully" confer drug resistance.

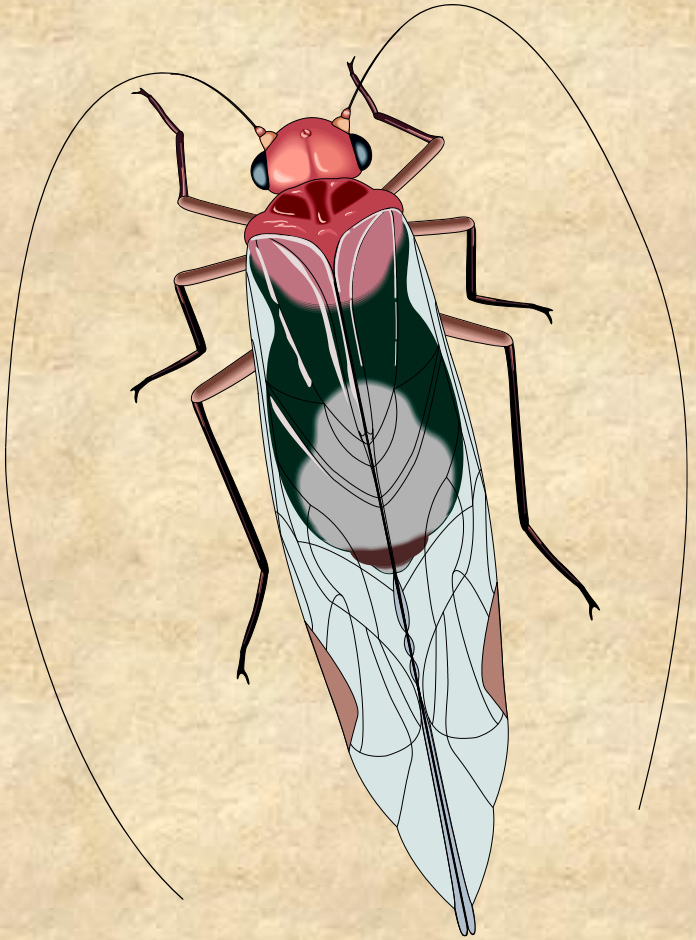
Speaking about bacterial replication, Miller stated: "The result is unavoidable, given the millions of genetic duplications that occur in a bacterial population in just a few days. Sooner or later, the 'right' mutation shows up, and it causes the individual bacteria that possess it to prosper at our expense" (p. 50).

Genetic Drift

However, Dr. Sala's data indicate that the changes we are seeing are due to simple genetic drift (i.e., **random** genetic variations) rather than a "selectively adapted response" to drugs. These studies demonstrated that this genetic drift occurred at a constant rate, even when microorganisms were subjected to drug treatments (in other words, organisms changed whether or not they had been exposed to drugs).

Plus, the appearance of "drug resistance" is not as new as researchers think. Modeling studies examining HIV-resistant mutants have demonstrated that drug resistant strains were present **before** drug therapy began (Ribeiro and Bonhoeffer, 2000), which indicates that the changes in these viruses are occurring randomly, rather than in response to a particular drug. Prominent evolutionary geneticist Francisco Ayala noted:

Insect resistance to a pesticide was first reported in 1947 for the housefly (*Musca domestica*) with respect to DDT. Since then resistance to one or more pesticides has been reported in at least 225 species of insects and other arthropods. The genetic variants required for resistance to the most diverse kinds of pesticides were apparently present in every one of the populations exposed to these man-made compounds (1978, 293[3]:65)

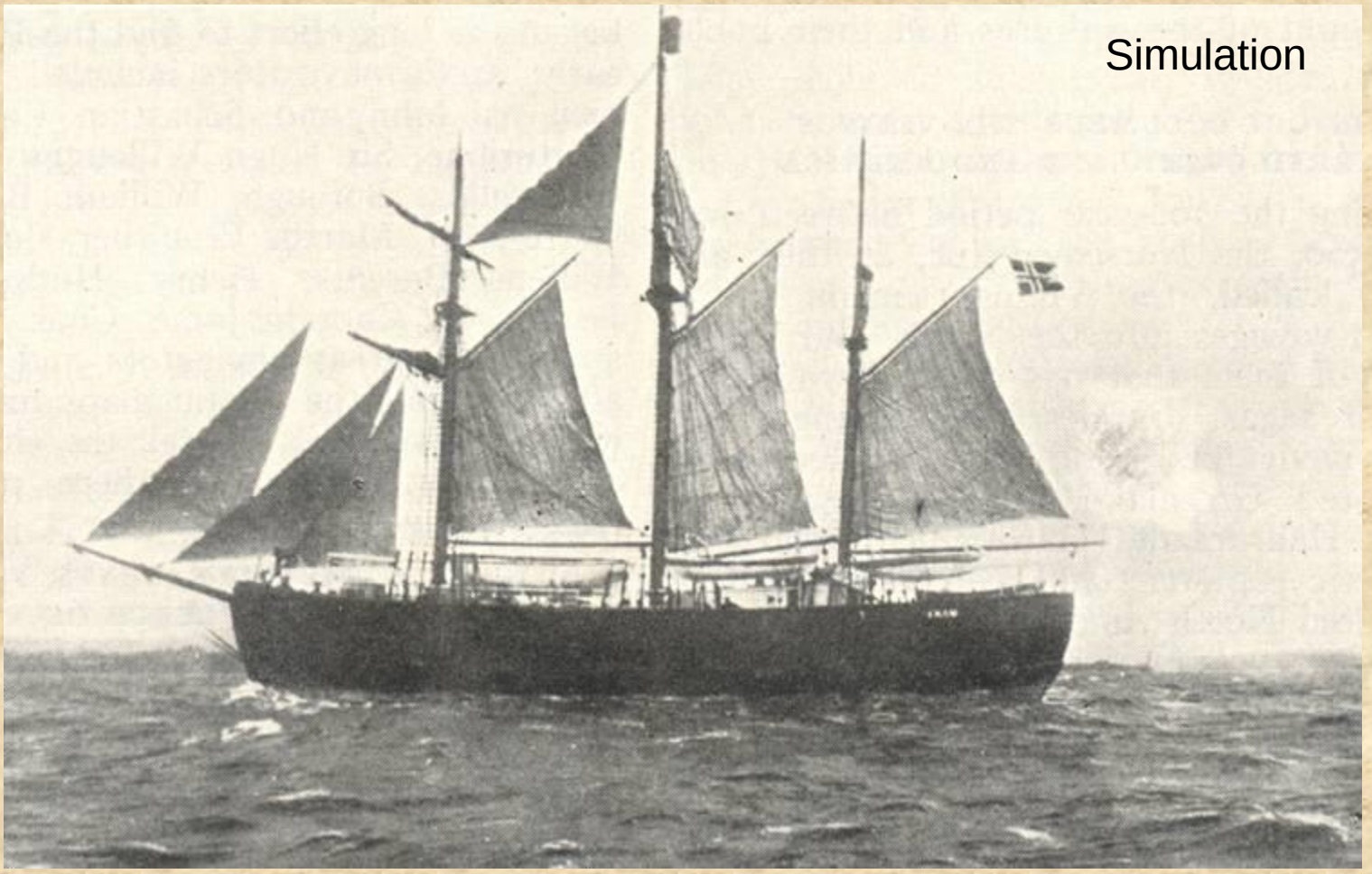


That some germs were already resistant to man-made antibiotics before these were invented is common knowledge to microbiologists. Soil samples from villages where modern antibiotics had never been used show that some of the germs are already resistant to drugs like methicillin which have never existed in nature (1997/1998, 20[1]:11).

Simulation

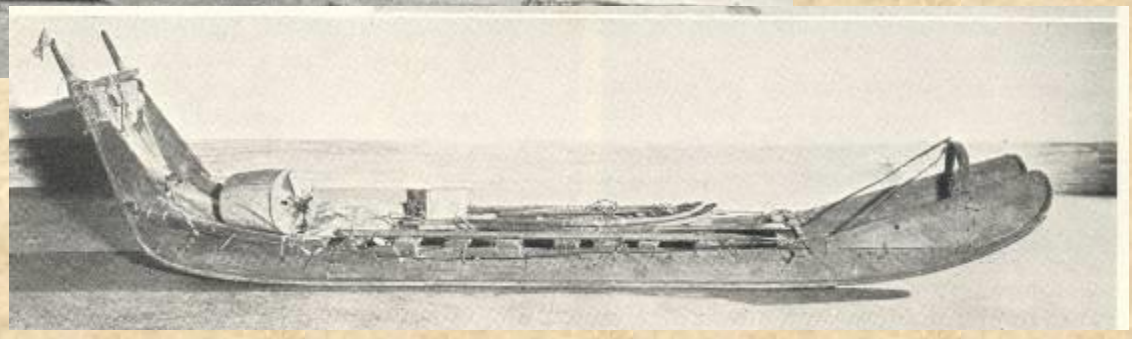
Bacteria before vaccinations immune:

Additionally, in 1988, researchers did autopsies on three of the Northwest Passage explorers who froze to death in the Arctic in 1845. Bacteria from their colons were cultured (with great care, to avoid any possible contamination), and many already were resistant to the most powerful modern-day antibiotics (see Wieland, 1994; McGuire, 1998, parenthetical item in orig.).



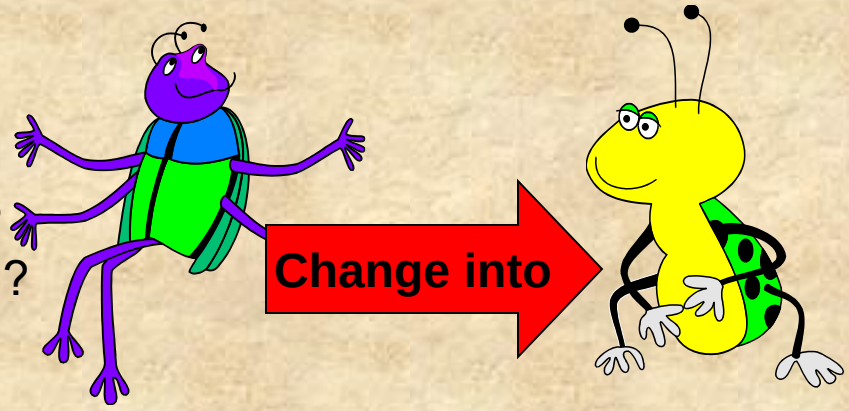
Dr. Wieland's reference to the "Northwest Passage explorers" has to do with the famous "Franklin Expedition" of 1845. Regarding that expedition, one writer noted: Scientists at the University of Alberta have revived bacteria from members of the historic Franklin expedition who mysteriously perished in the Arctic nearly 150 years ago.

Simulation



Not only are the six strains of bacteria almost certainly the oldest ever revived, says medical microbiologist Dr. Kinga Kowalewska-Grochowska, three of them also happen to be resistant to antibiotics. In this case, the antibiotics clindamycin and cefoxitin, both of which were developed more than a century after the men died, were among those used (Struzik, 1990, p. A-1).

Three Point Rebuttal:

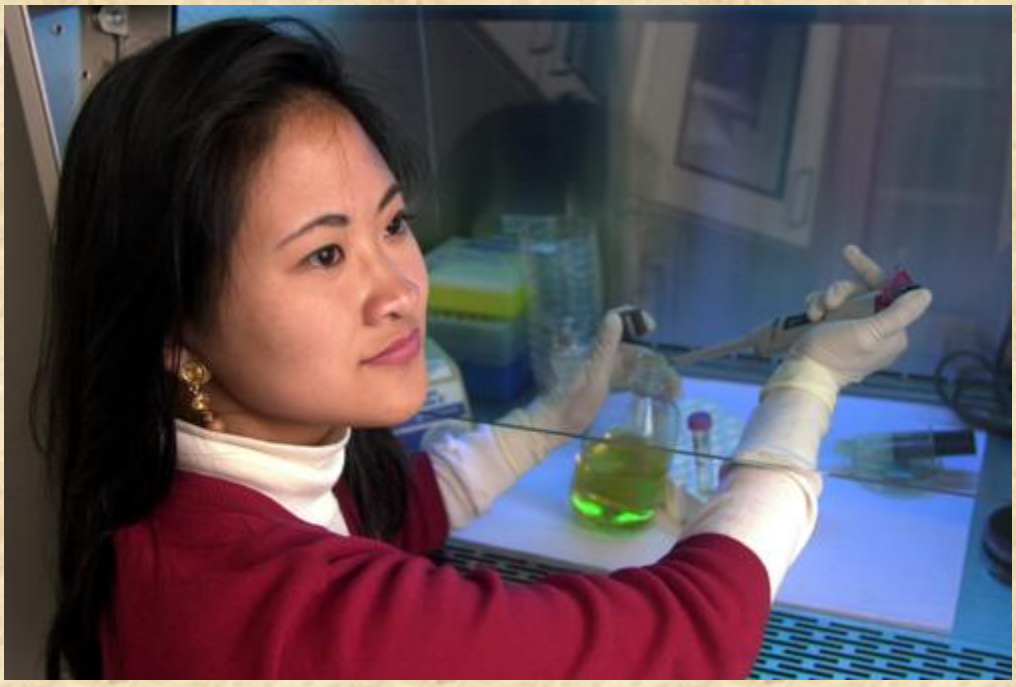


Do microorganisms change over time?
Yes. Are they “purposefully evolving”…?
No.

1. First, the genetic mutations responsible for antibiotic resistance in bacteria do not arise as a result of the “need” of the organisms to develop such resistance. As evolutionist Douglas Futumya noted:

“...the adaptive “needs” of the species do not increase the likelihood that an adaptive mutation will occur; mutations are not directed toward the adaptive needs of the moment.... Mutations have causes, but the species’ need to adapt isn’t one of them”(1983, pp. 137,138).

What does this mean? Simply put, bacteria did not “mutate” as a result of being exposed to antibiotics; the mutations responsible for the resistance were present in the bacterial populations even prior to the discovery or use of the antibiotics. Joshua Lederberg’s experiments on streptomycin-resistant bacteria in 1952 showed that bacteria that never had been exposed to the antibiotic already possessed the mutations that conferred the resistance (see Lederberg and Lederberg, 1952).



2. Second, while certain pre-existing mutations may confer to bacteria antibiotic resistance, such mutations also may decrease the organism's viability in other ways. For example, "the surviving strains are usually less virulent, and have a reduced metabolism and so grow more slowly. This is hardly a recommendation for 'improving the species by competition' (i.e., survival of the fittest)"

Bacterial antibiotic resistance does not prove Vertical macroevolution (one species changes into another)

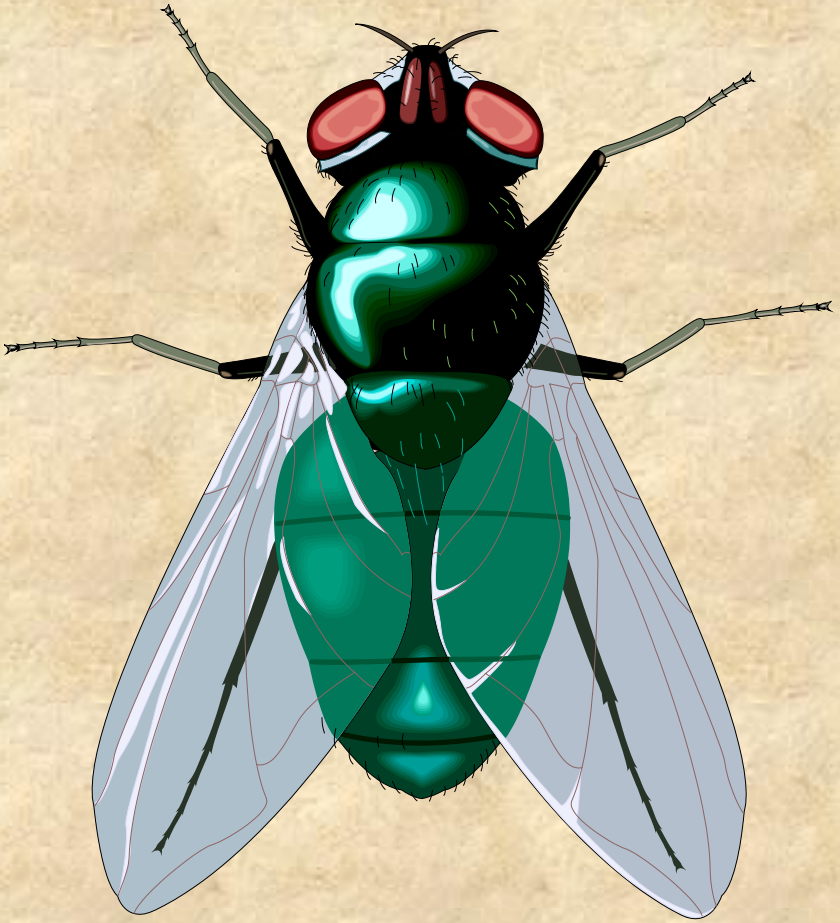
But shows horizontal microevolution (i.e., adaptation and variety within a species).

3. Third, regardless of how bacteria acquired their antibiotic resistance (i.e., by mutation, conjugation, or by transposition), the fact remains that they still are exactly the same bacteria **after** receiving that trait as they were **before** receiving it. This "proof" of evolution (like so many others that Quammen used in his article, such as variation in horses, variation in finches, variation in dogs, etc.) turns out to be not vertical **macro**evolution but horizontal **micro**evolution (i.e., adaptation)…

--- Thousands of laboratory experiments with bacteria, plants, and animals witness to the fact that the changes that a species can tolerate have definite limits. There appears to be a tight cohesion of interacting systems that will accept only limited change without inviting disaster.

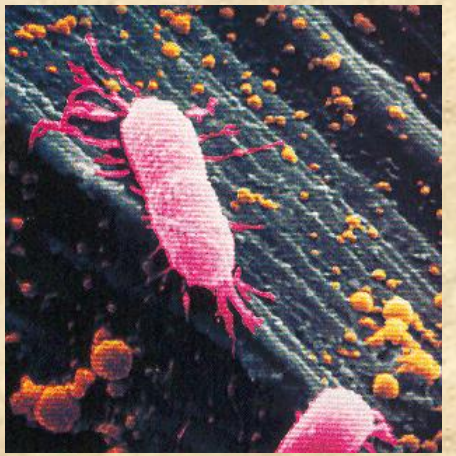
After decades or centuries of experimentation, fruit flies retain their basic body plan as fruit flies, and wool-producing sheep remain basically sheep. Aberrant types tend to be inferior, usually do not survive in nature, and, given a chance, tend to breed back to their original types.

Scientists sometimes call this phenomenon genetic inertia (genetic homeostasis) 1998, pp. 85-86, parenthetical item in orig..



Conclusion

Bacteria and Viruses are not mutating but are "variating."



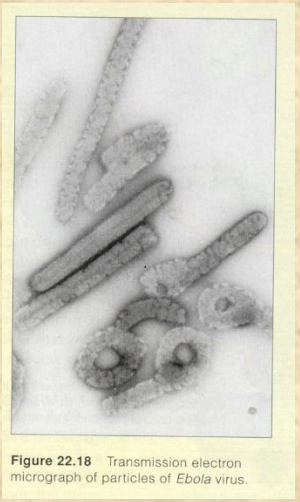
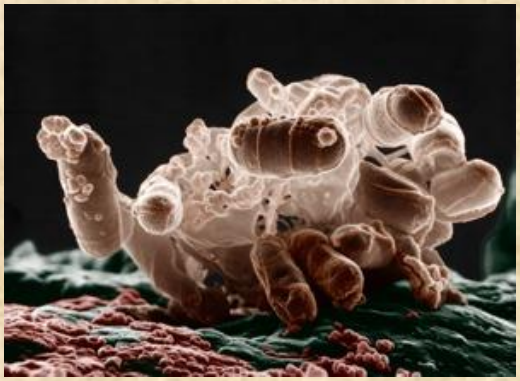


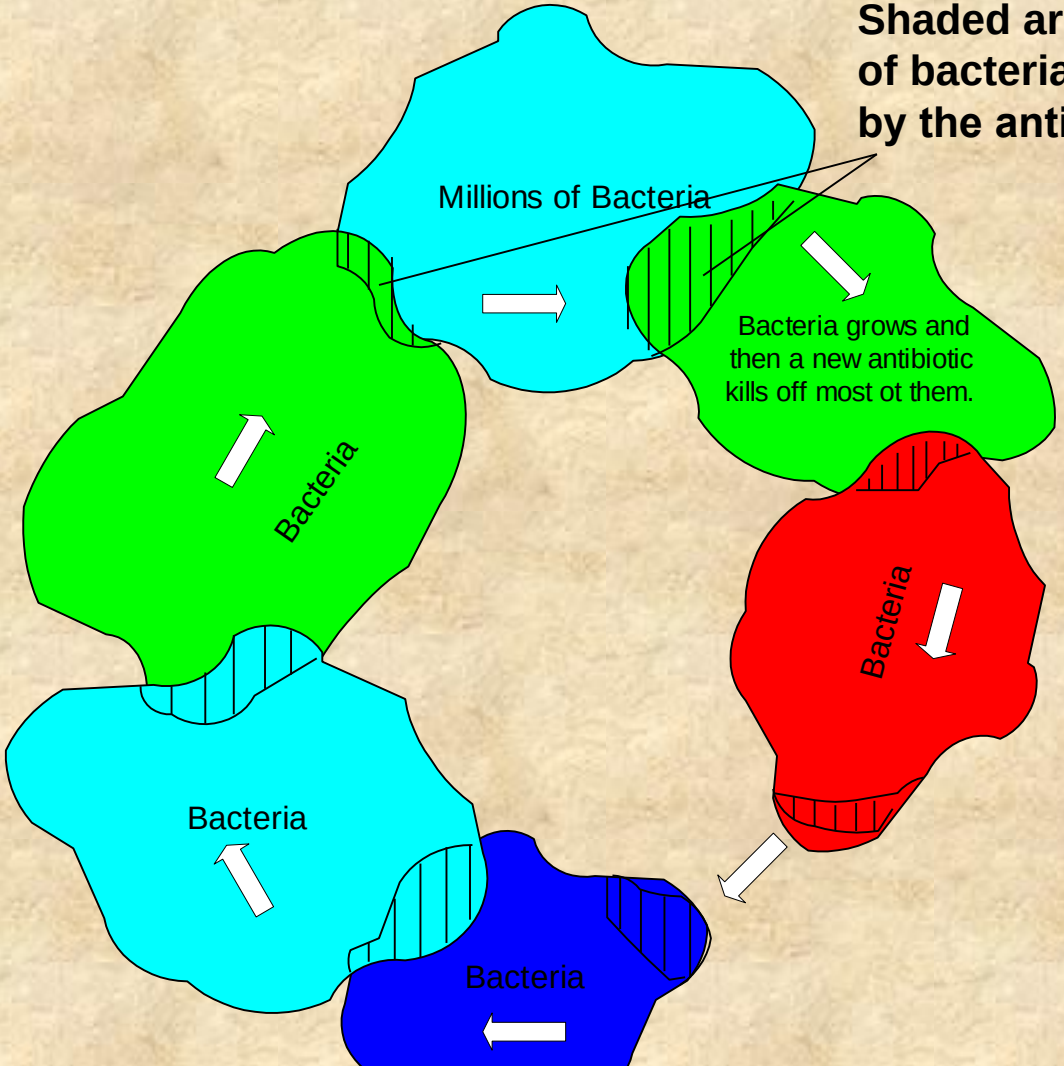
Figure 22.18 Transmission electron micrograph of particles of *Ebola* virus.

Bacteria and Antibiotic Resistence

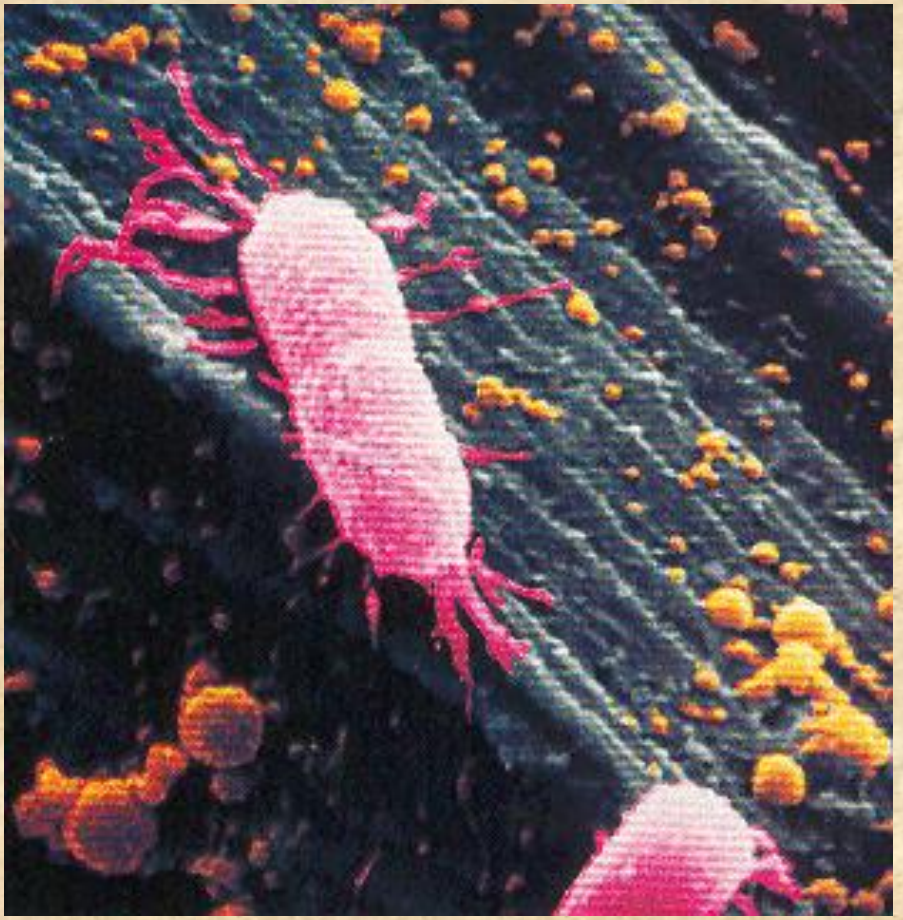


Review of Lesson 10

Bacterial Antibiotic Resistance. Mutation or Variety?



Though the antibiotic kills off the weak varieties of bacteria, <u>the strong ones survive to reproduce and re-infect if the organism is too weak to manufacture it's own antibiotics</u>. It has been found that bacteria can splice with other bacteria to exchange DNA material that will help them to resist antibiotics. They have their own antibiotic manufacturing ability, too.



God created bacteria for good, but because of Adams free will choice and resultant sin, they are out of control and thus affect us adversely. Because of mutations in humans, our immune system is breaking down and is not as effective to resist infections.

Bacterial Mutation and antibiotic resistance.

Streptomycin is an antibiotic. The Israeli biophysicist Dr. Lee Spetner found a bacteria which was resistant to streptomycin.

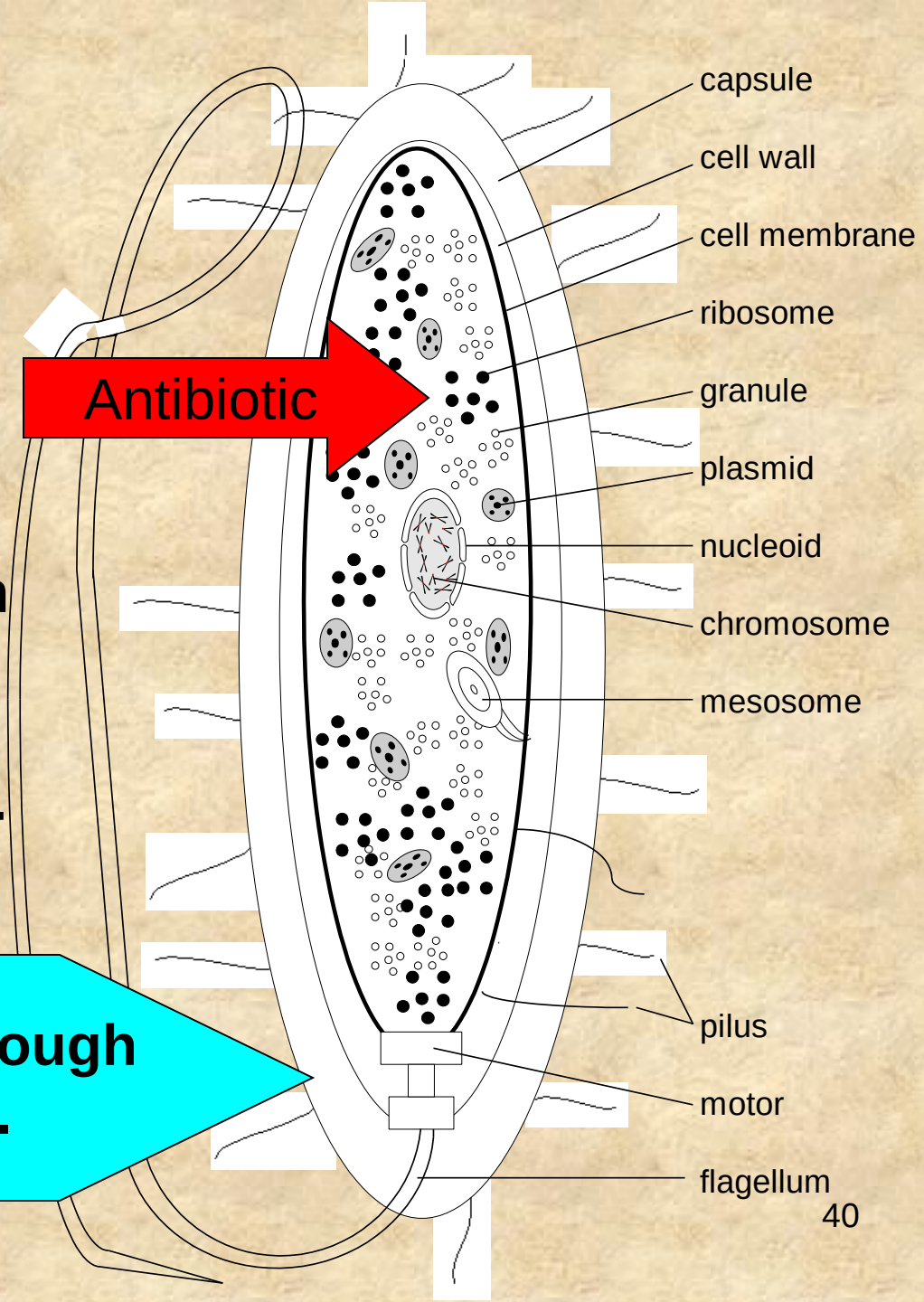
The bacteria's Ribosome had been damaged by a mutation.

The streptomycin normally attacks the Ribosome. Because the part of the ribosome that the streptomycin kills was missing, the medicine was ineffectual.

This is a mutation that caused lost information, and he says "this is not what evolutionists need to mutate an ape into a human form."

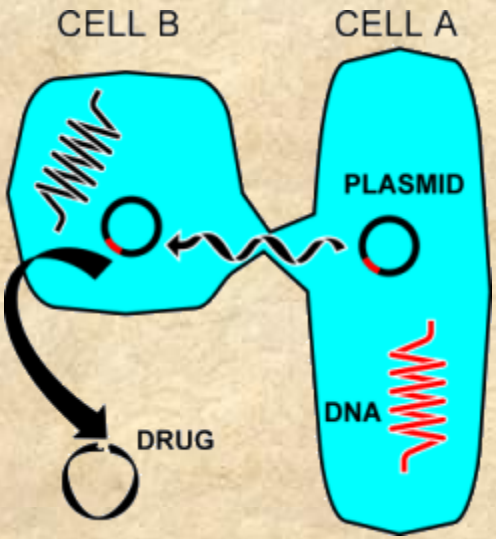
Bacterial Mutation and antibiotic resistance.

From Dr. Lee Spetner: Bacterial resistance to streptomycin stems from a mutation that affects the ribosome… and structurally damages it…



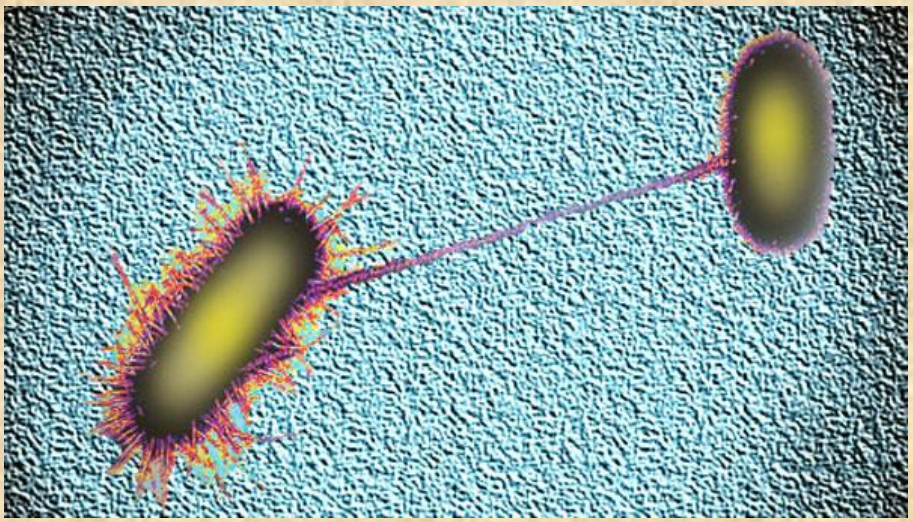
Antibiotic resistance through loss of information.

Colorized electron micrograph of a cluster of *E. coli* bacteria. Courtesy usda.gov, photo by Eric Erbe, colorization by Christopher Pooley.



GERM WARFARE: During fluid exchange, one bacterial cell (A) can transfer any tiny DNA circle (plasmid) to another cell (B). This act can occur even between cells of different species. The transfer gives bacterium B a resistance to a drug that formerly was not present in its own DNA. In this example, the plasmid contains a gene (shown in red) to manufacture an enzyme that destroys the drug's ability to interfere with bacterial cell division (as in the case of penicillin).

http://www.apologeticspress.org/articles/439



Bacterial Recombination:
Binary fission is an effective way for bacteria to reproduce, however it does produce problems. Since the cells produced through this type of reproduction are identical, they are all susceptible to the same types of antibiotics. In order to incorporate some genetic variation, bacteria use a process called recombination. Bacterial recombination can be accomplished through conjugation, transformation, or transduction.

Conjugation
Some bacteria are capable of transferring pieces of their genes to other bacteria that they come in contact with. During conjugation, one bacterium connects itself to another through a protein tube structure called a pilus. Genes are transferred from one bacterium to the other through this tube.