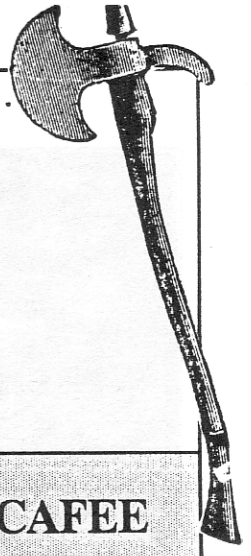

IMAGE AWARENESS HEALTHLETTER

THE IMMUNE SYSTEM

The Enemies: Viruses

VOLUME 102 NO. 2

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NOTICE

This newsletter is designed for educational purposes only. Any individual suffering from health problems which are mentioned or discussed should consult a physician for proper diagnosis and treatment.

OVERVIEW

The virus is a crystaline substance that hangs halfway between life and death. Outside a living cell it is lifeless. Inside a living cell it comes to life and vigorously reproduces itself.

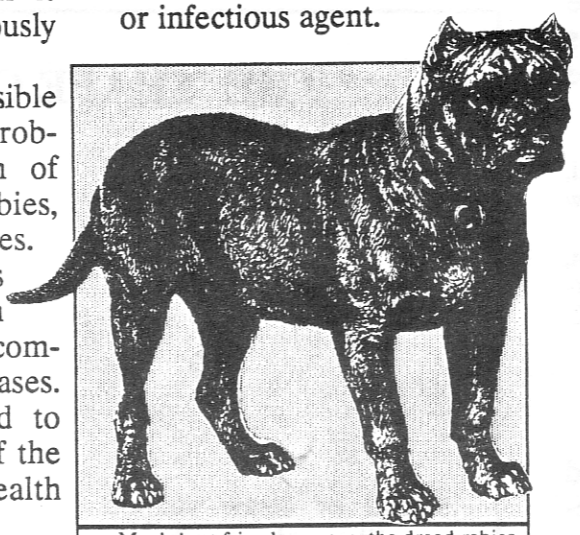
Viruses are responsible for the common cold, probably the most common of diseases as well as rabies, the most deadly of diseases.

Viruses cause warts and also measles which may be the most communicable of diseases. Viruses are even linked to AIDS and cancer, two of the most feared of health problems.

DEBT TO TOBACCO

Martinus Beijerinck was seeking the cause of a disease of the tobacco plant. Prior to his work it was thought that a poison caused the disease. He repeatedly diluted juice from tobacco plants and was still able to cause the disease.

In 1898 he published a paper concluding that tobacco was diseased by a tiny infective agent he chose to call a "virus". This is how viruses received their name. The word in Latin means poison, but he used it to refer to some kind of living poison or infectious agent.



Man's best friend can carry the dread rabies virus that attacks the brain and nerves.

REFERENCE: Locke, David, **Viruses: The Smallest Enemy**, New York: Crown, 1974, p. 19.

CURE OF VIRUS DISEASES

The first virus disease cured by man was smallpox. An English physician named Edward Jenner learned that if he exposed patients to a mild cowpox virus, it would protect from the much more deadly disease of smallpox.

Louis Pasteur set out to find the cure to rabies in the 1880's. He filtered the saliva of rabid dogs through a fine filter and tried to find an infectious organism that could destroy the brain and nerves of its victims. Although he could find no organism to blame the disease on, he did succeed in weakening the

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Louis Pasteur failed to see viruses in his microscope yet succeeded in developing a successful vaccine for the dreaded rabies virus. It made him the most famous scientist of his day. (Reproduced from Medicine and the Artist (Ars Medica) by permission of the Philadelphia Museum of Art)

virus and injecting it into animals and people exposed to the disease.

Pasteur's ability to save the lives of those exposed to the dread disease of rabies gave him instant fame. Only a handful of people have ever been exposed to rabies and survived without the help of this vaccine.

REFERENCE: Locke, David, **Viruses: The Smallest Enemy**, New York: Crown, 1974, p. 20.

Jaret, Peter and Mizel, Steven, **In Self-Defense**, San Diego: Harcourt Brace Jovanovich, 1985, p. 22.

THE "EATERS OF BACTERIA"

In 1917 it was discovered that some viruses could actually kill pathogenic or disease causing bacteria. This discovery created a great deal of hope and excitement.

Perhaps these viruses could be domesticated and used to eradicate many of the dangerous bacterial diseases? Unfortunately, it was learned that these viruses were destroyed by stomach acid if taken orally and by antibodies if injected.

While they are actually viruses, these microorganisms were given the name bacteriophages or "eaters of bacteria" because of the excitement they created.

Bacteriophages are of nutritional significance because of the attempts to administer them orally. This demonstrated that stomach acid protects to a considerable extent from at least some of the viruses.

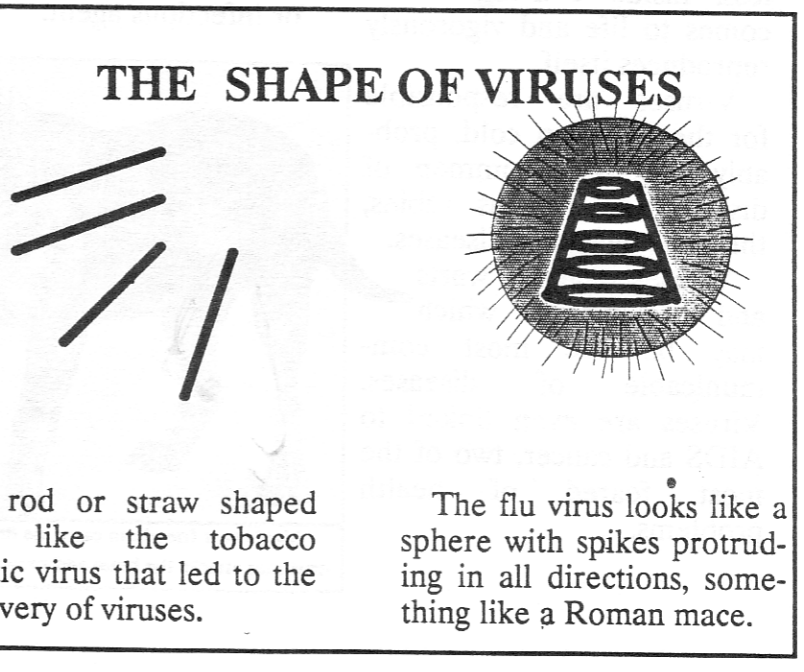
The reader is refered to the first issue in this series on the immune system which contains a discussion of the gastric barrier and how it protects against bacterial attack. Viruses, like bacteria, are composed of protein. Thus one would expect that they also would be damaged by exposure to a strong stomach acid.

REFERENCE: Locke, David, **Viruses The Smallest Enemy**, New York: Crown, 1974, p. 25-27.

THE SHAPE OF VIRUSES

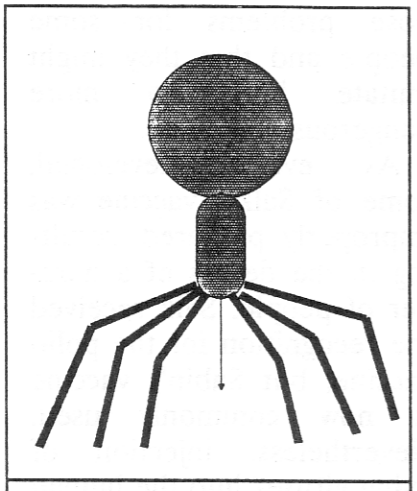
In appearance viruses tend to look spherical like a geodesic dome or cylindrical like a cigarette. Some, like certain of the bacteriophages, combine both forms.

Many viruses which appear spherical have the shape of a icosahedron. This is a geometric shape with 20



A rod or straw shaped virus like the tobacco mosaic virus that led to the discovery of viruses.

The flu virus looks like a sphere with spikes protruding in all directions, something like a Roman mace.



Some bacteriophages look like lunar landers. The head contains genetic material for reproduction, the legs aid in attachment to the bacteria, and the stinger is used to inject genetic material into the bacteria.

triangular facets. Spikes on the surface of the virus can aid in recognition and attachment of the virus to its prey.

On the inside one finds a core of genetic information coiled like a snake. On the outside is a covering of protein to protect the genetic information. Some viruses have a much more complex structure than others.

ACTIVITY OF VIRUSES

It is actually easier for a virus to attack an animal cell than it is to attack a plant cell or bacteria. Animal cells tend to have thinner cell walls. Nutrition undoubtedly plays a role in susceptibility to virus infection.

Years ago the author spoke with a scientist who had conducted research on E. coli bacteria and viruses. When the bacteria was deprived of any important

Epstein-Barr Virus

The Epstein-Barr virus belongs to the herpes family of viruses. These viruses have the ability to hide in the body for long periods of time. This particular virus takes over white blood cells and makes them immortal. Once infected the virus is always in the body. Studies indicate that ninety percent of the population over 30 in the United States carry the virus.

Recently the virus has been blamed for a "chronic flu-like condition". The constellation of symptoms includes "fatigue, headache, depression, sore throat, fever, aches and pains". In cases of the disease diagnosis is based on persistence of these symptoms for more than a year. At the same time the virus is active, as indicated by high levels of antibody to the virus.

In one study at the University of Arizona in Tucson 44 of 49 recurrently ill individuals were found to suffer from this problem. In another study at the National Institutes of Health 23 of 31 such patients were found to have the virus.

Modern medicine can offer no cure for Epstein-Barr syndrome. Perhaps sound nutrition can offer fortification of the immune system and help the body deal with this virus.

John Meyers, M.D. has noted that one nutrient which seems to be of great benefit during adolescence when mononucleosis strikes is iodine. He writes, "It is my experience that it is the need for iodine in puberty that is the prime cause for the development of infectious mononucleosis....Response of the disease to iodine is remarkable." Meyers also notes the benefit of vitamin C for the problem.

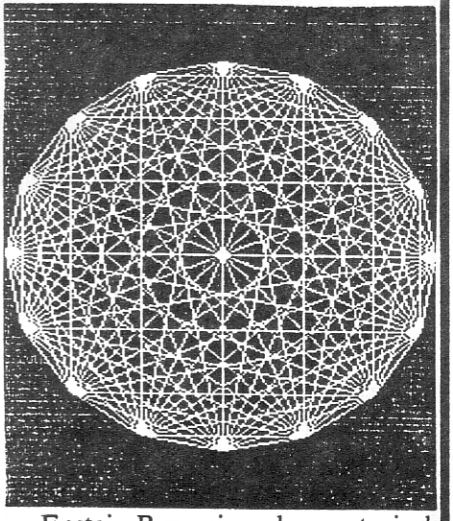
Supplementation with only two nutrients is probably an oversimplification of the nutritional approach to dealing with the problem. We know that many nutrients (including the amino acid lysine) are important for adequate immune function as a subsequent issue of this newsletter will discuss.

Iodine is a key component of thyroid function and a healthily functioning thyroid gland is essential for good health and resistance to disease

References:

"The Protean Ways of Epstein-Barr Virus", **Science News**, January 12, 1985, p. 21.

Meyers, John, "Iodine and Trace Elements in the Promotion and Maintenance of Metabolic Excellence" **in Metabolic Aspects of Health** by Karl Schutte and John Meyers, Discovery Press, 1979, p. 289.



Epstein-Barr virus has a typical spherical or "icosahedral" shape. This is a computer generated facsimile.

nutrient, viruses could penetrate the cell wall and either destroy the bacteria or so alter it that its posterity would succumb to future virus attacks. As long as the nutritional chain of life was left intact the bacteria had the ability to resist attack.

Viruses search for what is called a "viral recognition site" on the surface of a cell. Once they find this they shed their protective protein shell and pass their genetic material into their desired host.

The genetic material then takes over the cell and produces from 100 to 1000 viruses. When mature these can bud out of the cell membrane, or they can simply burst the cell that bore them.

REFERENCE: Jaret and Mizel, **Ibid.**, p. 25.

IMMUNIZATION

Immunization is an attempt to aid the body in defending itself against viruses or bacteria. The practice poses some hazards which can be illustrated by the polio immunization controversy that took place between Dr. Jonas Salk and Dr. Albert Sabin. Salk argued that the best immunization would consist of using dead viruses.

Sabin argued that one could have mistakes made in production of the immunization that would lead to innoculation with living and deadly viruses. He believed that weakened polio organisms were a safer form of immunization.

His opponents argued that these weaker organisms might be strong enough to pose problems for some people and that they might mutate back to more dangerous organisms.

As events developed, some of Salk's vaccine was improperly prepared, resulting in the deaths of a number of people. Salk received the recognition for the polio vaccine, but Sabin's vaccine is now commonly used. Nevertheless, injection of living viruses into the human body makes many uneasy—no matter how weak they may be.

The next issue in this series will discuss the work of Dr. Archie Kalokerinos which suggests that immunization may increase nutritonal requirements, especially for vitamin C.

REFERENCE: Locke, **Ibid.**, p. 39.

NEXT ISSUE IN THIS SERIES:

- **Learn how the body repels viral invaders.**
- **See why the AIDS virus is so dangerous.**
- **Unique characteristics of the herpes simplex virus.**
- **Learn the role of the nutrient lysine in countering viral attack.**

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