

## On the threshold of life:

# Viruses prove small but deadly

Richard Dubinsky

The distinction between living and inanimate matter is difficult to discern, but the transition point can be studied by examining the virus.

Viruses are the smallest known biological structures that are able to "eat" (i.e. absorb materials from the environment). This ability allows them to grow and multiply into exact copies of themselves. Extremely small, (the next step up in size from molecules) viruses can only be seen with an electron microscope.

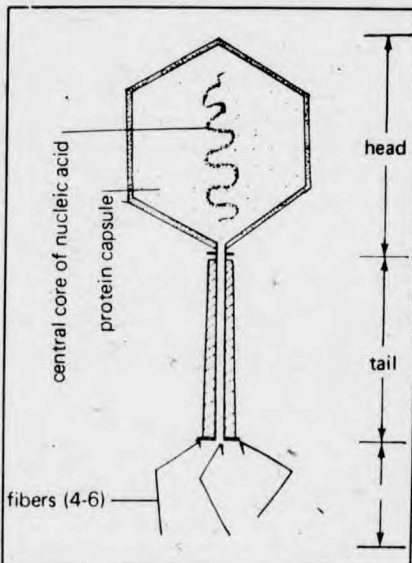
When the virus attacks the cell, the protein part (outer core) attaches itself to the surface, where it remains. The inner coil of RNA acts like a corkscrew and bores into the cell where it reprograms the cell's chemistry. In a short time the cell is making copies of the virus and not itself. Eventually the cell contains thousands of duplicates of the virus and bursts, allowing them to invade surrounding cells where the process repeats itself.

The process of growing starts with the absorption of materials near the virus. These elements are synthesized into new compounds not found in the environment, then put

together in a complex structure that is a replica of itself. It is in this way that viruses infect and occasionally kill organisms.

When the virus is isolated from living matter it crystallizes into beautiful geometric forms which resemble non-living or "dead" chemicals. There is no indication of any life properties; but when placed into a plant or animal the virus springs to deadly action.

The first viruses discovered are normally found in tobacco plants and cause the "mosaic disease". The virus crystallizes



into a hollow rod shape made of protein molecules; in the core there exists a coil of RNA (ribonucleic acid). It is the RNA that actually kills the host cell which is attacked by the virus.

Another type of virus is the T-2 Bacteriophage which only infects bacteria. This virus has a protein tail attached to a geometric head. There is a single DNA molecule (Deoxyribonucleic acid) snugly fit into the head and wound around the tail. The virus stabs the outer membrane (skin) of the host cell with its tail and presumably pushes the DNA molecule into the cell. The head then rotates, allowing the DNA molecule to snake its way in through the opening to begin the destruction.

DNA is found in all living cells. It is not a living thing but rather only a large chain (polymer) made up of sub-units called nucleotides which are chemicals made of simple atoms such as carbon, nitrogen, hydrogen and oxygen.

This is the threshold of life, at least as we know it on earth. The doorway is still not completely clear but scientists are continuing to explore this microscopic realm of existence.

# New discovery at Jerk University

The world renowned Department of Irresponsible Physics, DIP, at Jerk University has released the announcement of a recent miraculous discovery — a universal solvent and cleaning agent.

This new discovery is AQUA, an acronym for A Queer & Unique Abstergent. AQUA not only augments but actually replaces previous solvents such as alcohol, gasoline and turps which have been used as cleaning solvents since time immemorial. Although required in large quantities, AQUA is reasonably easy and inexpensive to produce.

## Millions to be made

Chairman of the Physics Department Dr. M. Eeghads claims patent rights to the solvent and estimates that millions can be made by manufacturing AQUA. "This discovery should be worth a pretty pecuniary coz there's a lot of dirty people needing to be cleaned up out there," said Eeghads.

Unlike common solvents such as gasoline, tests show that with AQUA there is no danger of combustion or explosion and the fumes are non-hazardous. Initially about five million gallons could serve the Toronto Area. When asked about the storage problem Prof. Eeghads replied, "We intend to store this material in open reservoirs and underground. Initial talks with the TTC were promising with the Yonge and Bloor subway lines being considered as storage depots. These have been designated critical areas in need of cleaning for some time.

Associated departments in the Science Faculty at Jerk are showing a keen interest in AQUA. Dr. Raped Pickles of the

Centre for Research in Atmospheric Physics announced the approval of a fifty million dollar federal contract providing for the natural dissemination of this solvent. Dr. Pickles claimed, "From complex calculations and years of experimental atmospheric research I believe we may be able to distribute AQUA effectively by precipitating clouds throughout the entire country. However, additional funding may be required."

An authority from the University of Taranta's Engineering Department said that they would strongly oppose storage of AQUA unless stringent precautions were followed. At the very least AQUA would need to be contained in stainless steel pressure vessels surrounded by a double enclosure of reinforced concrete.

Friends of the People claim to have obtained a sample of AQUA and found that it caused clothes to shrink and pieces of meat to discolour if left in the solution overnight. If it does this to cotton and meat, imagine what it will do to people!

## Risks involved

This new agent would bring with it risks, particularly to humans, greater than any possible gain. Do we know what happens to this new medium when it is exposed to sunlight? It has been rumoured that it may dissociate into its elements, hydrogen and oxygen, which are known to violently explode when coming into contact with a spark! What are the effects of this material when taken internally? It has been reported that humans develop a craving for AQUA under hot and dry conditions. It is clear that this will lead to serious physical and psychological addiction.

DIP's proposals are already encountering severe criticism from local health, safety and environmental groups. Professor Innanout claims that if anyone immersed their head in a bucket of AQUA, it would prove fatal in as little as five minutes.

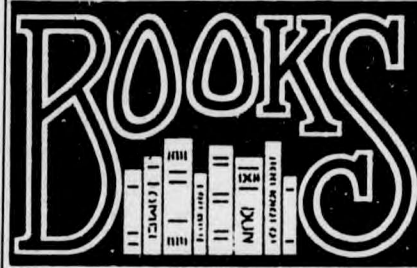
He went on to say, "If we allow AQUA to be dispensed without control, an extrapolation of my calculations show that the entire world population could die in a matter of days if everyone was to soak their head in a bucket of AQUA!"

## Extremely dangerous

Concerned personnel from the Engineering Department criticize AQUA as being "Extremely Dangerous!" One representative was quoted as saying, "We tested AQUA by throwing a pail of the stuff at the high tension, 50,000 volt electrical panel in the Farquarson Building. This caused a shower of sparks resulting in a fire and serious damage."

It was also reported that an Osgood graduate submerged a television set while sitting in a tub filled with AQUA; this resulted in immediate death.

In parliament yesterday, the leader of the opposition proposed that all funding to DIP be terminated and that the manufacture and storage of AQUA be prohibited and punishable by life imprisonment. A full investigation has been called to order and both Health and Environment Ministries are requested to form committees and provide initial reports before 1984.



# New books at Steacie

*Biology, medicine and society, 1840-1940.* edited by Charles Webster. Cambridge University Press. 1981. QH 305 B54, Steacie.

...essays on the history of interrelationships between modern biology and medicine, politics, and social action. *1982 Yearbook of Astronomy.* edited by Patrick Moore. W.W. Norton and Company. 1982. QB1 Y4 1982.

...a guide to the visual observation of the night sky of 1982 for those lucky enough to be in a place dark and clear enough to see stars.

*Genesis of relativity: Einstein in context.* By Loyd S. Swenson, Fr. Burt Franklin and Co., Inc. 1979. QC 16 E5 S95, Steacie.

...a historical study, the focus of which is to place relativity theory in its cultural context. *Life in the universe: the ultimate limits to growth.* edited by William A. Gale. AAAS. 1979. TL 795.7 L53, Steacie.

...a published symposium on the prospects of extraterrestrial development and settlement. An optimistic answer to 'Limits of Growth'.

...what sociobiology teaches us about female nature by comparative constructs with our cousins, the other primates. *Colossal Cataract: The geological history of Niagara Falls.* Edited by Irving H. Tesmer. State University of New York Press. 1981. QE 146 N6 C64.

Take a walking tour of Niagara Falls Gorge with this book in hand. You can learn where Niagara Falls began, how long it took to erode Niagara Gorge, what types of rocks are exposed along the walls of the gorge and how they formed, how the Whirlpool originated, what the future holds for Niagara Falls, and what are the effect of mankind on the falls.

*Weather for outdoorsmen: a complete guide to understanding and predicting weather in mountains and valleys, on the water, and in the woods.* by Walter F. Dabberdt. Charles Scribner's Sons. 1981. QC861.2 D3.

Not just for the outdoorsperson, this book puts you in touch with the atmosphere. It is written to make you weather conscious, and to expand your sense of the subtle changes in the air around you.

# Science Milestones

**April 1, 1578:** William Harvey was born. At the time when Galileo was teaching the world that the logic of careful experiment is more unshakable than time-honored tradition, Harvey applied Galileo's techniques to the study of the circulation system and discovered the mode of operation of heart, veins and arteries.

**April 6, 1909:** Robert Peary was the first man to reach the North Pole.

**April 12, 1961:** Soviet Cosmonaut Yuri Gagarin became the first man placed in orbit around the earth.



**April 14, 1629:** Christian Huygens was born. His lifetime spanned the gap between Galileo's death and Newton's birth. He expanded the astronomical discoveries of Galileo with his improved telescope, invented the first accurate clock by making use of Galileo's observations that a pendulum could maintain constant periodic motion, and challenged Newton's hypothesis that light is composed of particles by showing that the properties of light could be accounted for by wave motion.

**April 20, 1902:** After 4 years of effort Pierre and Marie Currie isolated 1 gram of pure highly radioactive material from 8 tons of mining wastes. They named it radium.

**April 23, 1858:** Max Planck was born. To explain the way black bodies radiate energy, Planck hypothesized that electromagnetic radiation can be exchanged only as bundles of energy, the amount of energy in each bundle being proportional to the frequency of radiation. Planck called these bundles 'quanta'.

*Monthly Milestones could not have been put together without the aid of 'Astmov's Biographical Encyclopedia of Science and Technology.'* by Isaac Astmov. Doubleday and Company, Inc. 1972. Q141 A74 1972, Steacie Reference.