The Rife Microscope Cancer Cure Story

Strange Beliefs: Cancer Cure
Created 12/28/2001 - Updated 11/20/2007

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The Reasonable Persons Guide to Strange Ideas next examines one of the most astounding claims on the net.

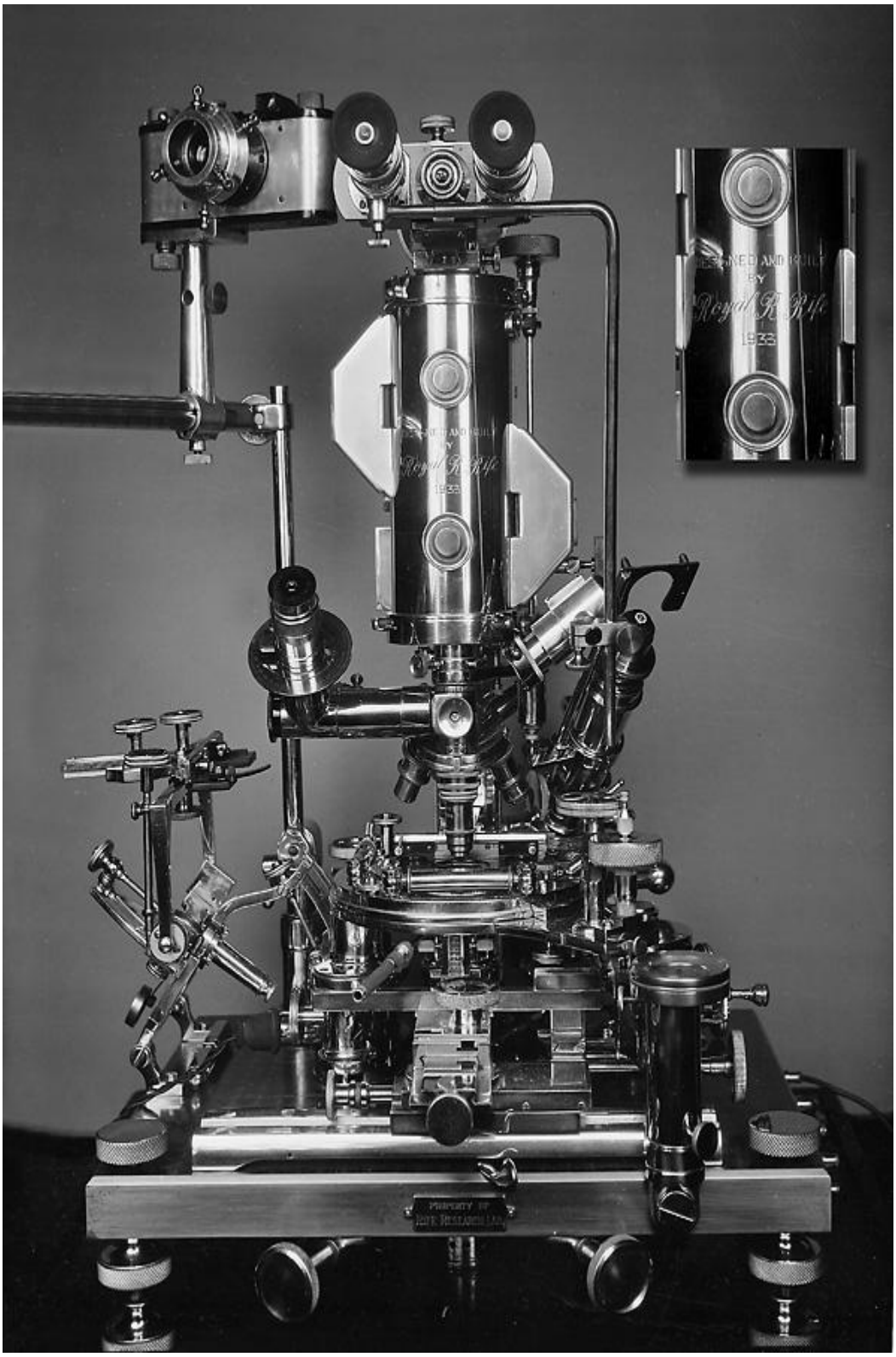
Overview of Claims

Some claim that Dr. R. Raymond Rife **1.** developed a super microscope, **2.** was able to see live viruses, **3.** which gave off their own unique light, by which he found that **4.** all that forms of human cancer he studied were caused by the same viral infection (BX virus), and that **5.** these cancer viruses will shatter both on microscope slides and in living animals when exposed to certain frequencies (of ?). **6.** His 1934 Rife Ray Equipment at the University of Southern California cured 14 helpless cancer cases after 3 months and eventually 100% of the 16 cures attempted. **7.** Rife worked with top people in medicine at his time including doctors at the Mayo Clinic. **8.** Rife won scientific awards. **9.** Drug companies and electron microscope competition suppressed him and all others who succeeded in duplicating his work.

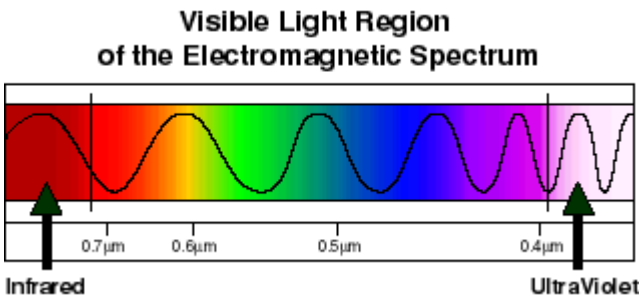
Was Rife a scam artist? Did he cure cancer?

The Rife Microscopes

No one doubts that Royal Raymond Rife was a real individual who did indeed create several unique microscopes. Some very fine pictures of his scopes exist today. The one below is the Universal Microscope, one of 5 scopes purported to have been capable of seeing living viruses.



One microscope expert reading this article wrote that Baush and Lomb offered Rife "a ton of money" in the late 1930's but B and L ran because the microscope was a fraud. So far my request for documentation of this claim has gone unanswered as has my question: If no Rife scope worked, how does one explain the nice photos of Tetanus spores and Typhoid Bacillus taken by Rife's Universal Microscope published in the 1944 Smithsonian Report?



Goal of This Article

This author hopes to entice you to think, to learn and to explore science. This article (still a work in progress) will walk you through various Rife claims from the perspective of an open minded independent scientist. Our aim is to make this intelligible to anyone with a basic high school or college education.

To understand the claims, we must first define a few terms such as: "Abbe Limit," "Resolving Power" and "Microscope Diameters."

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How Rife Broke the Vision Barrier

Gerry Vassilatos in the book Lost Science (1999 by Adventures Unlimited Press) reports that Dr. R. Raymond Rife was able to see live viruses because he broke the "vision barrier," a theoretical limit imposed on optical microscopes by physicist Ernst Abbe. Vassilatos and others state that the superior abilities of the Rife Universal Microscope resulted from the following combination: 1. Use of transverse monochromatic deep Ultraviolet light (UV) rays for illumination, 2. adjustable prisms to select different wavelengths of UV light with which to illuminate specimens which caused them to give off light (UV? Visible?) as vanishingly small point sources, 3. all quartz optics to maintain parallel light rays and 4. heterodyning light to achieve amplification (and conversion from UV to visual?)

If you're lost, good! You've come to the right place. Let's learn some science!

Wavelength of Light Limits Vision

The average size human hair is about 75 microns in diameter. The naked eye can not usally see anything smaller than 30 microns.

Light has both wave and particle properties. Visible light's wavelengths vary from 0.7 microns to 0.4 microns.

We percieve different wavelengths of light as different colors. Since the smallest wavelength of visible light is 0.4 microns (deep violet). A scientist named Abbe calculated, therefore, that with an

optical microscope it is impossible to resolve (distinguish different parts of) anything smaller than 0.15 microns.

NOTE: The 0.15 micron Abbe Limit is the same as 150 nanometers which is the size of only the largest viruses.

Why? To be seen by an ordinary light microscope, a feature must reflect (change the direction of) the light hitting it. For any feature smaller than the length of light waves directed at it, the light waves can "roll right over" the feature without being changed. If this happens, the feature is invisible. For this reason shorter wavelengths of light have a greater probability of hitting things and of being deflected.

Seeing With Deep UV Light

According to Lost Science Emile Demoyens (1911) discovered "tiny mobile specs" with his optical scope which were visible only at noon during the months of May, June and July, when "great amounts of deep ultraviolet light" were available. Does that claim make sense? Not exactly as stated. Here's why:

Ultraviolet light (UV) is what causes sun burns. In 1932, The International Congress on Light divided UV into three areas: UV-A (400 to 315 nm), UV-B (315 to 280 nm) and UV-C (280 NM and shorter *). Deep ultraviolet wavelengths are in the UV-C range, the farthest from visible light. By definition all ultraviolet ('beyond violet') light is outside the visual spectrum. Most mammals and the normal human eye cannot see it.

Furthermore, and most importantly, all solar short-wavelength UV-C radiation is absorbed and 90% of solar UV-B radiation is absorbed by the ozone layer. Everything I've been able to find says that "great amounts of deep ultraviolet light" would certainly NOT be available at the Earth's surface, since even at noon in the Summer, since 100% of UV-C is blocked.

There are, however, increased amounts of UV-A and UV-B as well as **deep violet** (visible) light at these times which may have been responsible for improved vision. While we can thank Vassilatos for an inspiring book, his science terms need clarification. When speaking of the Abbe limit he refers to "the extreme ultraviolet light of 0.4 microns". 0.4 microns is 400 NM which is the closest to deep violet visible light. In other words, 400 NM is actually shallow UV-A, or barely visible VIOLET light. Extreme ultraviolet would be in the invisible UV-C range.

Note: The terms UV-A, B & C are used by those who study the biological effects of UV light, not by optical scientists, but this article is about thinking outside the box. Including these terms was useful to help us discover that instead of "deep ultraviolet light" the author probably meant that Rife used "deep violet light".

Multi-Colored Light Limits Vision

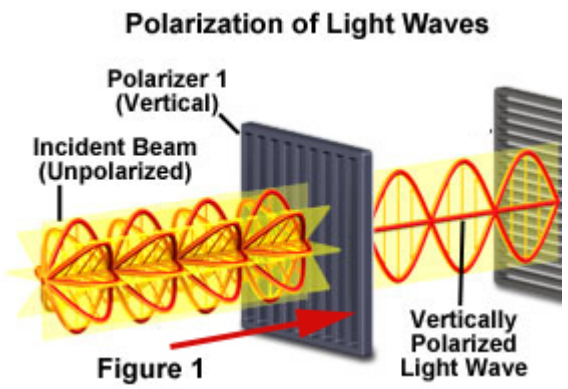
Why use monochromatic light, that is, light of only one color (wavelength)?

Answer: We saw above why you'd want to use primarily deep violet light: shorter wavelengths reveal smaller details. There is another related reason. A light source with waves that are all same color prevents blurring known as chromatic aberration. This is so because different wavelengths are deflected at slightly different angles. Put another way, the index of refraction of the glass in a lens is different for different wavelengths. (This is explained in more detail on the next page.)

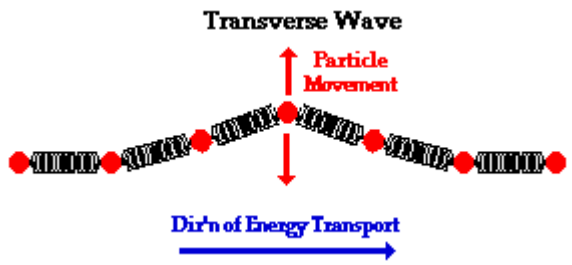
So far so good, we want monochromatic deep violet light to illuminate our specimine.

Transverse Polarized Light

Another claim is that Rife used parallel "transverse" light to improve vision. All light waves are transverse, that is, all photons move up and down perpendicular to the direction of the light beam (at 90° from the direction of propagation of the wave). We know light waves are transverse because only transverse waves can be polarized. By comparison, sound waves are longitudinal, that is, they result from compression along the direction of motion. Light emitted from most sources is unpolarized, that is, the light waves vibrate in all transverse directions.



A single polarizing filter will block the light not vibrating in the polarizing direction, leaving only light that vibrates in a single plane. Light is wonderfully complex and multi-dimensional. It can even be circularly or elliptically polarized. For the purpose of this article and the claim that Rife used parallel light waves, however, we will assume he used linearly polarized light.



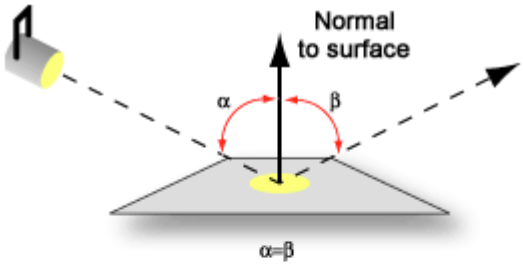
Human vision does not distinguish between polarized and unpolarized light. How, then, can linearly polarized light help us to see more?

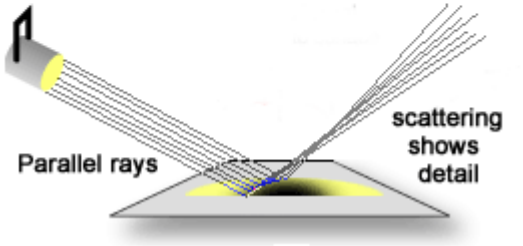
"Polarized light microscopy (Figure 1) provides all the benefits of brightfield microscopy and yet offers a wealth of information, which is simply not available with any other optical microscopy technique." - microscopyu.com

According to one site, "Many samples that are optically isotropic to the unaided eye show various kinds of contrast when illuminated by polarized light. This polarization contrast is induced by dichroism or birefringence."

Translation: Things which look the same in all orientations show added details under plane-polarized light because when rotated in different orientations under this type of light a specimine can reflect different colors and/or may split into double images.

Diffraction Limits Vision

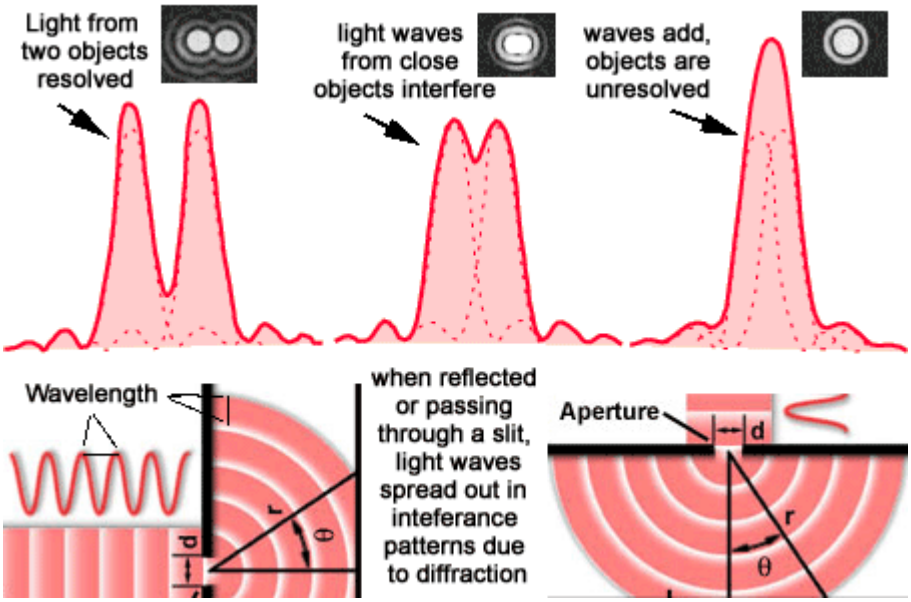




Differaction presents another obstacle to seeing very small things.

You may recall this picture from high school physics: the angle of incidence (the angle at which light hits a surface) will equal the angle of reflection. When light particles hit a surface, they are reflected at slightly different angles by the irregularities of the surface. The differences in the scattering of light from different features is seen as contrasting areas of light and dark which we see as detail.

In reality, things are a little more complicated, because particles of light (called photos) travel linked together (we don't really understand how) as waves.



Waves bend behind obstacles, that is, they diffract. Diffraction is the bending of light as light waves pass the edges of objects. Waves also interfere. In addition to diffraction, another property of waves is that they add and subtract as they merge, causing interference patterns. As close parallel light waves bend due to diffraction, they overlap. As light waves overlap, they are simultaneously amplified in places and cancel out in others.

An optical microscope is said to be "diffraction limited" when the interference patterns from reflected light of very close objects cancel each other out so they cannot be distinguished from one another.

If you followed to this point, you now understand light and the of the limits of vision far better than most people!

How Rife Overcame Diffraction

It is claimed that Rife turned his specimens themselves into light sources. For any two features closer than the diffraction limit, you can't normally resolve them optically ... but you can cheat if you can selectively cause only one of the features to glow! This has been done with modern technology to obtain Far-field fluorescence microscopy beyond the diffraction limit. To overcome diffraction, it is claimed that Rife flooded specimens with brilliant UV-rich light, forcing each to emit its unique absorption spectrum.

Remember, this was done in the 1930's. Modern fluorescence microscopes use wavelengths down to 340 nanometers (UV-A) as well as quartz and other special glass formulations. The Rife scope, using an optic path of solid quartz crystals (see next page) limited divergence (separation over a distance) of light rays from the specimen to the ocular. In other words, the quartz crystal optics kept the light rays parallel. You'll find the same in modern scopes.

Heterodyned Light

Now we step beyond even most expert's understanding.

According to one Austrialian researcher, A particle much smaller than the wavelength of illumination will deflect the path of a light wave to as much as a full 90 deg (according to **Kingslake** 1992.)

The resulting UV image could then be heterodyned with a transverse parallel UV beam back to a light image if desired for live observations. Rife could throw away all light except for highly refracted photons by adjusting Rochon prism alignments which is how he was able to see the BX virus when it was mounted as a dilute solution. 102

Heterodyning is common in radio transmission. 104 A wave of one frequency can be translated to a new frequency by adding *or subtracting* a new wave. Would this work for UV Light? Could invisible UV photons from the Rife apparatus be combined with additional UV light to create new frequencies in the visual spectrum ... allowing a peek at the world of the super small?!?

Light Frequency

First, you'll need to know this... We've been talking about wavelengths of light, but light waves also have frequencies. Frequency is the number of times the light waves "wave" per second. These cycles per second are known as Hertz and are abbreviated "Hz". Visible light ranges from red: 390 trillion Hz (TerraHertz or THz) to violet: 769 THz. (103) UV light vibrates between 750 THz and far UV at 1.5 petaHertz (1000 - 1500 THz) and beyond to X-rays. To see UV light we might subtract two different UV frequencies from each other to end up with a frequency in the visual range (390 THz to 769 THz). If you could get the specimen to emit UV at 900 THz, for example, you could see it as green (550 THz) if you could then get the specimen emitted light to subtract from another UV beam at 1450 THz.

How to Change Light's Frequency

No, you can't just use a filter. A blue (for example) filter blocks non-blue wavelengths of light. It does not convert existing wavelengths (visible or invisible) to blue wavelengths.

There are several ways to convert UV to visible light, including fluorescent phosphors and advanced polymers, but we are interested in this: The idea of Heterodyning light to view the "super small". Here is a heterodyne optical near-field microscope. Shifting frequency in this device is accomplished by two complex crystalline structures called acousto-optical modulators.

"Optical mixing: Optical beating, i.e., the mixing, i.e. , heterodyning, of two lightwaves (incoming signal and local oscillator) in a nonlinear device to produce a beat frequency low enough to be further processed by conventional electronic circuitry. Note: Optical mixing is the optical analog of heterodyne reception of radio signals. [After FAA] Synonym optical heterodyning." - Institute for Telecommunications Science

This Japanese company makes fiber optic tools and claims the "adoption of UV- visible conversion glass".

Reply From a Physicist

According to an email reply from a Senior Staff Physicist at a modern crystal manufacturer: "It is possible to perform difference frequency generation with a 900-THz (333 nm) [that's UV] radiation and 350-THz (857 nm) [that's Infra-red] radiation to produce 550-THz (545 nm) [that's green] difference frequency radiation. If the 333-nm radiation is a weak fluorescence, it probably would be better to detect it directly rather than converting to 545 nm. The strong 857-nm radiation could be generated by a titanium:sapphire laser tuned to that wavelength. Quartz will not work as the nonlinear crystal because it will not phase match for the process, and it has a small nonlinearity. A type-I barium borate (BBO) crystal (theta=34.70 degrees) could be used for the process. If this frequency conversion is to be done continuously, conversion efficiency is going to be very low (random counts of single photons)."

Did Rife heterodyne UV and *Infra-red* (IR) into visible light? This is possible, but the above raises some doubts that it could have been done as claimed, using quartz crystals at detectable levels in real time.

A Modern UV Microscope

"Equipped with the UV-option, the Leica INM300 is suitable to fulfill the new design rules featuring 0.18 micron or 0.15 micron resolving power and ultra-high contrast. Using the highest numerical apertures, dry (non-immersion) objectives, non-destructive, contamination-free inspection of feature sizes as small as 120nm is now possible with an advanced light microscope." (123)

This modern scope advanced light microscope (250x diameters and NA of .95) can see things as small as 150 nanometers. Viruses range from 3 to 300 nanometers, so this modern scope could see some viruses. Note: 1 nanometer is about 10 atoms across.

How does this scope translate "UV" into something visible? I've asked the company. Hopefully the answer will cover my questions about Rife and his supposed use of UV light.

Microscope Diameters

To evaluate claims about Rife's microscopes we should also understand the word "diameters."

DIAMETER is a measure of the magnifying power of a lens. A lens that magnifies an object 5 times, is said to be 5 diameters, or 5X. (more) Magnification is how big the image you see is, compared to the actual image seen with the naked eye at a distance of 10 inches. (119) Magnification, isn't very important by itself. You also need resolving power and contrast. That is, you need differences in light to be able to distinguish features.

Today, the optical limit is about 3,000 "diameters" which can resolve (distinguish different parts of) objects as small as 150 nanometers. This has been pushed as high as 6,000 diameters, but typically 1500 X is the highest practical optical magnification. (26|42)

Rife Scope Resolutions

Rife's Prismatic Microscope in 1930 gave "resolutions of 17,000 diameters" and his Universal Microscope of 1933 provided "resolutions to 31,000 diameters," with magnifications in excess of 60,000 diameters. With photographic enlargement, he was able to provide 300,000 diameter magnifications according to Vassilatos and others. 24 | 26 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37

Rife Scope's Numerical Aperature

Here is more inforomation about the Rife Universal Microscope.

Journal of the Franklin Institute

Volume 237(2):103-130 (1944)

The New Microscopes

"... the achromatic condenser which, incidentally, has a numerical aperture of 1.40. ... The objectives used on the Universal Microscope are a 1.12 dry lens, a 1.16 water immersion, a 1.18 oil immersion, and a 1.25 oil immersion."

The rays of light refracted by the specimen enter the objective and are then carried up the tube in parallel rays through twenty-one light bends to the ocular, a tolerance of less than one wavelength of visible light only being permitted in the core beam, or chief ray, of illumination.

Now, instead of the light rays starting up the tube in a parallel fashion, tending to converge as they rise higher and finally crossing each other, arriving at the ocular separated by considerable distance as would be the case with an ordinary microscope, in the Universal tube the rays also start their rise parallel to each other but, just as they are about to cross, a specially-designed quartz prism is inserted which serves to pull them out parallel again, another prism being inserted each time the rays are about ready to cross.

These prisms, inserted in the tube, which are adjusted and held in alignment by micrometer screws of 100 threads to the inch in special tracks made of magnelium (magnelium having the closest coefficient of expansion of any metal to quartz), are separated by a distance of only thirty millimeters.

Thus, the greatest distance that the image in the Universal Microscope is projected through any one media, either quartz or air, is thirty millimeters instead of the 160, 180, or 190 millimeters as in the empty or air-filled tubes of an ordinary microscope, the total distance which the light rays travel zig-zag fashion through the universal tube being 449 millimeters, although the physical length of the tube itself is 229 millimeters." http://www.navi.net/~rsc/seidel.htm

Smithsonian Report: New Microscopes

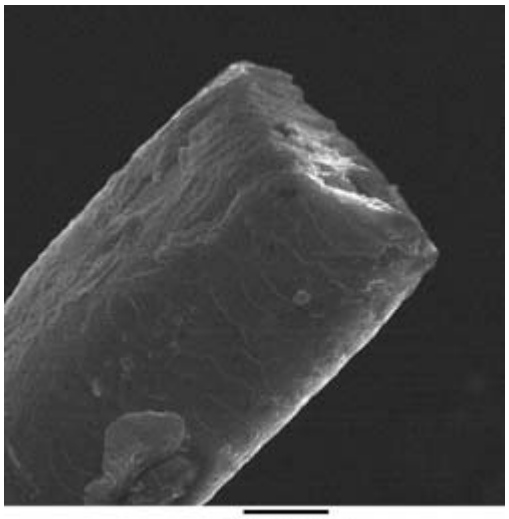
The Annual Report of the Board of Regents of the Smithsonian Institution, 1944, pp 193-219, entitled "The New Microscopes" by R E Seidel and M E Winters says:

"Working together back in 1931 and using one of the smaller Rife microscopes having a magnification and resolution of 17,000 diameters, Dr. Rife and Dr. Arthur Isaac Kendall, of the

department of bacteriology of Northwestern University Medical School, were able to observe and demonstrate the presence of the filter-passing forms of Bacillus typhosus." 05 | 08

Resolutions Compared to Microns / Nanometers

What does it mean to "give a resolution of 17,000 diameters"? What sizes could he see ... in microns or nanometers?



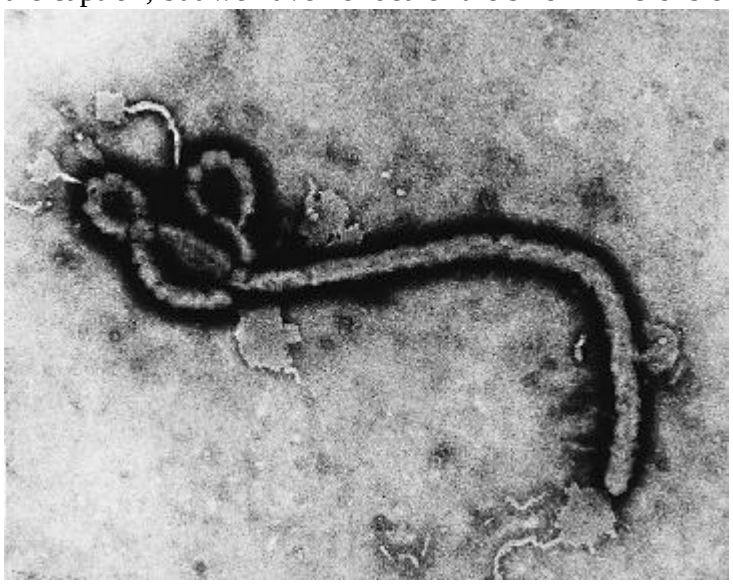
20µm 1000X

In the picture of a human hair above we can see what 20 microns looks like at 1000 diameters. 06

QUESTION: If you can resolve a 20 micron (20,000 Nanometer) human hair at 1000X, what magnification would you have to reach to resolve a 3 to 300 nanometer virus?
ANSWER: 17,000 may or may not be enough. In the photo below, 160,000 diameters are shown in a view of a virus. As we saw above, the optical limit is 150 nanometers, so you SHOULD be able to pick a good number of viruses (which range from 3 to 300 nanometers) out from their surroundings with a good optical scope. In other words, seeing viruses does not necessarily mean that Rife broke the Abbe limit.

Example Virus: Ebola

The Ebola virus ranges from 50 to 300 nanometers. 11 This picture included the magnification in the caption, but we have no idea of the size in microns of this particular specimen.

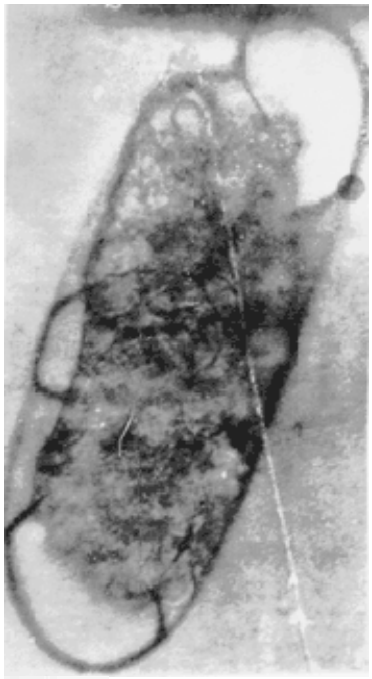


"Electron micrograph of Ebola Zaire virus. This is the first photo ever taken, on 10/13/1976 by Dr. F.A. Murphy, now then at CDC. Diagnostic specimen in cell culture at 160,000 x magnification." 10

If Rife got up to 160,000 diameters and beyond as claimed, he would indeed have been able to see LIVING viruses and he would have been the first person to do so.

Are there any surviving photo records that prove Rife was able to attain results beyond those of a normal scope? Surprisingly, yes.

Rife's Microscope in Action

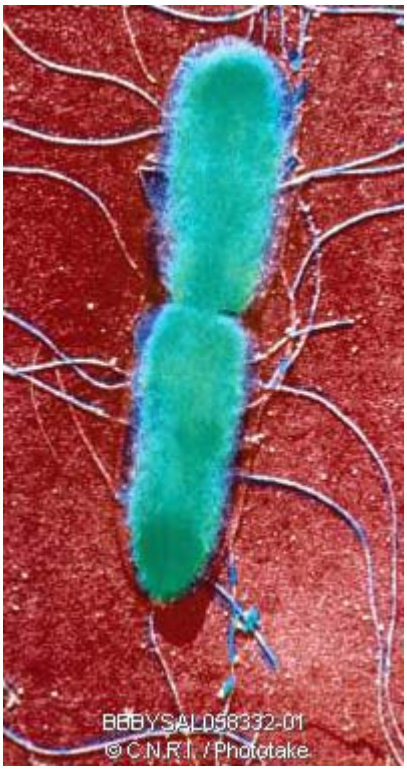


Here on the left is a Rife Micrograph of Bacillus Typhosus (responsible for Typhoid fever) shown here at 23,000X on 35 mm film and enlarged 300,000X. 23

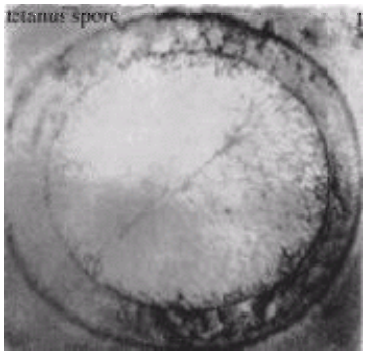
This is from "The New Microscopes, Seidel and Winter, 1944"

As an independent observer, how can we know this is really magnified at 23,000 diameters (which recall, is a 23,000 times larger magnification than you would see under clear glass.)

We could compare this to an electron micrograph of Bacillus Typhosus, we'd have a strong clue that Rife had exceeded the 2500 to 5000X limit of optical microscopes.



The image on the right is a "Colorized scanning electron micrograph of the Salmonella typhosa bacterium (Bacillus Typhosus), mag. 4300X (at 24 x 36mm). This species of salmonella is the agent of typhoid fever, which may last from 7 to 11 weeks at the 100-103 degree range and 97-100 during convalescence."

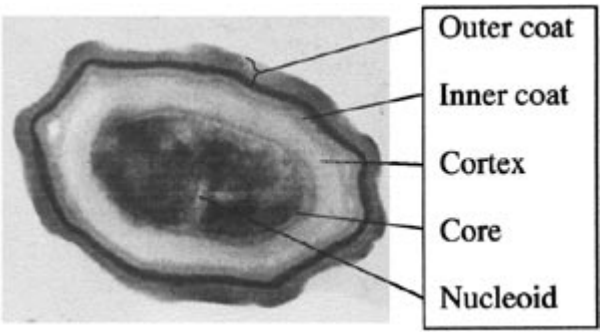


According to those who label Rife such things as "a giant in the medical quackery and pseudoscience worlds," magnifications of the type seen on the left do not really exist because "physicists" and "microscope manufacturers" claim they are "impossible using visible light and only attainable with electron microscopes." (124) Shall we not believe your eyes, then? Rife's image of "Bacillus Typhosus" shows more detail than the 4300X electron micrograph.

But perhaps this is just something that looks like BT but is really something else. Are there any more photos from the Rife super microscope?

Bacterial Spore Sizes

Yes. On the left is a cross-section of single tetanus Spore Dissected with Rife's Micromanipulator 25,000x on 35 mm film, enlarged 227,000x. Also from "The New Microscopes, Seidel and Winter, 1944"



This one is harder to see. Again comparison to an electron microscope's view of a tetanus spore should be compared.

On the right is a "colorized transmission electron micrograph of the Clostridium tetani (tetanus spore) at the end of desporulation, magnified 15,000 times. Copyright © C.N.R.I. / Phototake -- All rights reserved."

Again the Rife Scope image shows detial on the surface of the spore which is not visible on the electron micrograph. Taking a look at both Rife scope images and comparing them leaves me convinced that despite the debunkers, Rife's scope worked.

Here are some more things to consider:

1. In general bacterial spores have "diameters of around two microns - about one-hundredth the width of a human hair - they are smaller than the resolution limit of most light microscopes"

2. Spore sizes vary enough from bacteria to bacteria that spore size differences may be used to identify the bacteria.

3. Although spores are supposed to be the dormant stage of bacteria, scientists at Berkeley have discovered that spores swell up to 4% under high humidity and that this swelling may be preparation for reproduction. 101 The Bacillus subtilis spore to the right is 1.2 microns across (by S. Pankratz)

A Copy of the Report

From the University of California library, I obtained the Annual Report of the Smithsonian Institution for the year 1944 (Q11 S6 1943/44). Full page photos of the above do indeed appear claiming 23,000X to 25,000X resolutions. The Universal Microscope is indeed described in detail in this article.

Consulting a Microscope Man

When showing these photos to a senior microscope repairman at a nearby University, his comment was "I have a hard time imagining how you would get an objective that big. That would be a BIG objective." He confirmed that resolutions of this size should not be possible with an optical microscope. Could monochromatic light would improve resolution? He honestly didn't know. Can people see live viruses with an optical scope? Sure, Tobacco Mosaic Virus, but that's huge.

Are any scopes today constructed with quartz prisms? Yes. The Confocal scope can resolve at very high powers. In practice, the best resolution of a Confocal microscope is about 0.2 microns. (Viruses are 0.003 to 0.3 microns.)

How expensive are quartz prisms? A single quartz prism could be obtained from Zeiss, but would probably cost from $5,000 to $8,000.

Conclusion

Rife may have seen live viruses even without breaking the Abbe limit. There is no surviving supporting photographic proof beyond the Smithsonian prints claiming resolutions which rival the electron microscope (17,000 - 300,000 diameters), but the few images which do exist are compelling proof that the Rife Microscopes worked.

SOME DEFINITIONS (Skip this unless you need a refresher.)

INCIDENT LIGHT: Incident light is simply the light falling on something --- as opposed to the light reflected from it.

RESOLVING POWER: The ability to distinguish different parts of an object. If two details are very close, you will see them as one single detail. Many stars you can see with the naked eye are actually two or more stars. Telescopes allow you to resolve seemingly single stars into the true components.

DIFFRACTED WAVE: Wave whose front has been changed in direction by an obstacle or other non homogeneity in a medium, other than by reflection or refraction.

DIFFRACTION LIMITED: Capable of producing images whose separations are as small as the theoretical limit imposed by diffraction effects. $\sin \theta = 1.22\ \lambda/a$; a is the diameter of the aperture.

INTERFEROMETER: two or more separate telescopes (or other EM collectors) that combine their signals almost as if they were coming from separate portions of a telescope as big as the two telescopes are apart.

MAGNIFICATION: Is how big an object can be made. If you magnify an object 500,000 times, but you lack resolving power, you will still see not see the details in the object. [05]

METER: Defined as the length of 1,650,763.73 wavelengths of the orange-red radiation of 86Kr in a vacuum. [102]

MICRON: One millionth of a meter. Also called a micrometer. A human hair is about 50 to 200 microns wide, and a single human red blood cell is 5 microns across. **[01 | 02 | 04]**

NANOMETER: One-billionth of a meter. That is, 10-9 meter, or one millionth of a millimeter. A virus 0.1 microns in size is also 100 nanometers in size. A human hair is about 50,000 nanometers in the diameter. 1 nanometer is about 10 atoms wide. [01]

BACTERIA SIZE: A common bacteria is about one-hundredth the size of a human cell. Bacteria are 0.3 to 30 microns long and may be 0.1 microns wide. They can be seen with a common optical microscope. [03 | 04 | 07]

VIRUS SIZE: They vary from 0.003 to 0.3 microns, that is, smaller than the resolving power of an optical microscope. [04 | 07 | 09]

DIAMETERS: The magnifying power of a lens. A lens that magnifies an object 5 times, is said to be 5 diameters, or 5X. Diameters measure magnification, not resolving power. You can increase magnification without increasing visible detail.

ELECTRON MICROSCOPE: The resolving power of a typical electron microscope is 1 nanometer, but these scopes kill all the specimens they examine. They can not be used to examine live specimens

COLOR: Ordinary sunlight contains all wavelengths (colors) of light in the visible spectrum. The color we perceive an object to be depends on the wavelengths of light that object absorbs and reflects. Only the reflected wavelengths reach our eye and are seen as color.

NONLINEAR: Not having a one to one relationship for input to output, that is elastic. .

NOTES: Abbe's law of limiting resolution (also see Rayleigh Criterion) says that optical microscopes cannot resolve (distinguish different parts of) objects smaller than .15 to .2 microns (millionths of a meter, or µm). This is because optical resolution (visually seeing different parts) depends entirely on the wavelength (color) of incident light (light falling on an object), the limit being one third of the wavelength used for illumination. 43

Light travels as waves and different colors of light have different wavelengths. A microscope is said to be diffraction limited in its ability to see details when illuminated structures cause light returned to the viewer to bend due to diffraction.

From another source, "in diffraction limited instruments, such as the microscope, the Abbe limit of optical resolution at an average wavelength of 550 nanometers (0.55 microns) is 220 nanometers (0.22 microns) when using an objective lens having a numerical aperture of 1.4." **101**

UV Notes: Scientists divide ultraviolet into three different regions: near, far, and extreme ultraviolet. Near UV is closest in wavelength to visible light and extreme UV is closest to X-rays. The Sun is a strong UV emitter of all types, but only near UV reaches the surface of the Earth because the ozone in the atmosphere absorbs all wavelengths below 290 nm. Artificially, UV light is usually produced with mercury-vapour and deuterium lamps. These lamps also produce a certain visible light content. So when you turn them on they glow white or pink.

There is a device called a UVB-1 Pyranometer that uses a fluorescent phosphor to convert UV-B light to visible light. Fluorescent phosphors can be used to convert visble to UV as well, but this isn't exactly what we are looking for.

According to Science (283 663) a crystal of lithium gadolinium fluoride doped with europium - emits two visible photons for every UV photon it absorbs using a new technique known as quantum cutting.

According to the IEEE Journal of Quantum Electronics from November 1967, Robert C. Miller and W. A. Nordland accomplished *Conversion of near infrared to visible light by optical mixing.* This additive and we are looking for conversion from UV.

Research News 11/1997 New polymer coatings can make ultra-violet light visible to the human eye. They convert UV rays into blue light. Applications extend from light bulbs to UV detection systems and UV protection in horticulture.

Frequency conversion by 3-wave nonlinear processes is the conversion of electromagnetic radiation from one frequency into two other frequencies or from two into one. ... it is possible to greatly enhance the frequency conversion effect through a phenomenon known as phase matching. This occurs when the interacting components of light travel through the material with the same velocity and optimized phase... - clevelandcrystals.com. Also see Sam's Laser FAQ.

(*) Others separate UV-A and B at 320 nm and end UV-C at 190 nm so you'll see various figures.

Polarizers create linearly polarized light by selective absorption, reflection, or refraction of the two orthogonal polarizations of unpolarized light. Circularly and elliptically polarized light are obtained by introducing a phase shift to linearly polarized light with a retardation plate.

Hugh Powell made very high power objectives, an apochromat immersion lens of NA 1,50 in 1896 for instance. (122)

Do Viruses Glow?

It is claimed that Rife was able to get viruses to give off light and that each one, due to it's unique chemical structure gave off it's own unique color spectrum. ... A special Bisely prism which works on a counter rotation principle selects a portion of the light frequency which illuminates these virus in their own characteristic chemical colors by emission of coordinative light frequency and the virus become readily identifiable by the colors revealed on observation. 8000 to 17000x magnification is sufficient to see them. 37 Pollen gives off its own light under several wavelengths of light. When any object is seen according to one theory [Berne and Pecora, "Dynamic Light scattering" John Wiley, 1975], the electric field of the light hitting the mater induces an oscillating polarization of electrons in the molecules. These molecules become a secondary source of light and radiate(scatter) light.

"The frequency shifts, the angular distribution, the polarization, and the intensity of the scatter light are determined by the size, shape and molecular interactions in the scattering material, thus from light scattering characteristics of a given system it should be possible, with the aid of electrodynamics and theory of time dependent statistical mechanics, to obtain information about the structure and molecular dynamics of the scattering medium." - Theory of Dynamic Light Scattering

Photos of the Cancer Virus?

Are there any photographs of viruses that would prove this? I know of no pictures of viruses captured with the Universal Microscope that currently exist. A description of the process for photographing the cancer virus with the Rife scope, however, still exists.

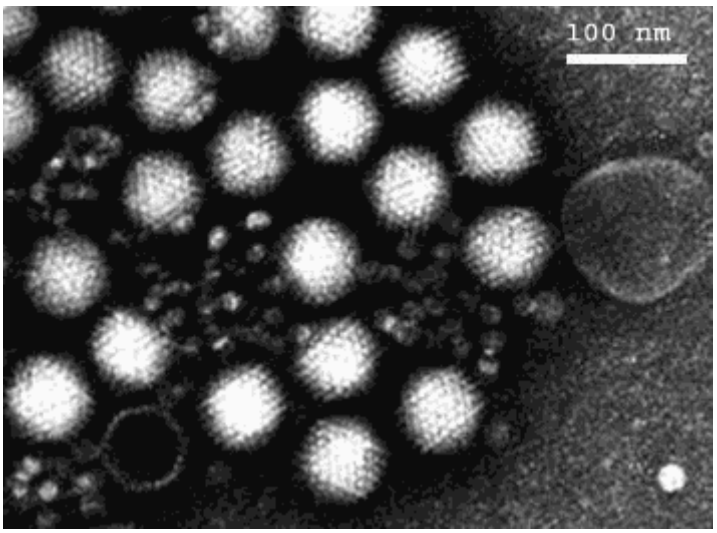
In a paper titled "HISTORY OF THE DEVELOPMENT OF A SUCCESSFUL TREATMENT FOR CANCER AND OTHER VIRUS, BACTERIA AND FUNGI" Rife does describe the process for taking pictures of the cancer virus. THE PROCESS TO PRODUCE THE CANCER VIRUS PHOTOMICROGRAPH (Copyright 1953) A pure culture of cancer virus is taken from a known tumor and filtered through a 000 Berkefeld (sic. should be berkfelt) W porcelain filter under 10 mm vacuum. From this filtrate a sample is drawn off with a thin glass tube which has previously been

heated, sterilized, and drawn to a fine orifice. One micro-drop is placed on a quartz slide and covered with a quartz cover slip.

The slide is positioned on the stage of the universal microscope. The universal microscope is focused on the cancer virus and a 16 mm or 35 mm camera is mounted to expose the (positive) negatives. The (positive) negatives are developed and dried and then placed in a 1000 watt enlarger and exposed for .9 second to a 3 inch by 4 inch glass slide negative which is developed in microdal fine grain developer. From this slide, the photomicrograph copies are reproduced. 18 | 19 | 20

Round Balls of Dried Particles

Lacking a picture of the cancer (or other) virus taken with Rife's Universal Microscope, below is a Negative-stain Transmission Electron Microscopy photo of Adenovirus and Parvovirus. Note that the viruses appear, once killed by the electron microscope, as Rife says: round balls of dried up particles.



Rife Interview Question

The following is part of a facinating interview with Rife that was to be introduced at a trial (from rife.de)

QUESTION: What is necessary, in order to make bacteria and viruses visible under the microscope?

RIFE: First there must be high enough power to enable the observer to see them and second they must be identified by a frequency of light which coordinates with the chemical constituents of the virus or filterable form in question. To my knowledge there is only one instrument today which will even show these virus and that is the Rife prismatic virus microscopes which I built for this work. The electron microscope is a useless device for this study because the virus are killed instantly and you don't know what form you are seeing them in and generally appear as round balls of dried up chemical particles.

Special Light Properties of Quartz

Vassilatos states that the first key to Rife's super microscope was the use of quartz for both the prisms and lenses. That he filled the

".. entire objective with cylindrically cut quartz prisms. There would be no difference in the refractive index from start to finish along the optical path. Quartz prisms would "open out" each ray convergence, maintaining strictly parallel ray cadence. An increased ray content being thus returned to the ocular, the image would be brilliant in appearance and of high resolution."

What does that mean? First off, the objective is the main part of the microscope, the part with the lenses. Why quartz prisms? Check this out:

UV Spectrophotometer

"The first prototype UV-vis spectrophotometer, dubbed the Model A, was developed in 1940. ... The Model B prototype, shown in Figure 2, replaced the glass Fery prism with a quartz prism, greatly improving its usefulness in the UV. ... Quartz prisms are very rarely seen today, and have been almost entirely replaced by (other) filters (which) have negated the stray light that led Cary and Beckman to choose a quartz prism in the Beckman Model B prototype. The cost of gratings are now much less than quartz prisms ... " 47

Note: 1. Quartz prisms are expensive, 2. Quartz prisms were used in real scientific instruments in the past 47 | 48 because they do not cause stray light. This has to do with something called the Refractive Index.

Refractive Index? What's that?

Also called the "index of refraction" it is a constant for any two materials defined as the speed of light in material #1 divided by the speed of light in material #2. 12

Wait a minute! Light travels at different speeds!? I thought it was a constant! You know, the "c" in *E = mc2*. Light travels at 300,000,000 meters per second, right?

Only in a vacuum. (And I don't mean a vacuum cleaner. Vacuum, as in SPACE or a glass tube, jar, etc. on earth with the air pumped out.)

Correct Speed of Light

Actually, the correct speed is 299,792,458 m/s. By rounding up to 300 million meters per second, we make light 207,452 m/s (464,057 miles per hour!) faster than it actually is. Where would these exact speeds of light be important? They matter when you look at the "Index of Refraction"

The "speed of light" actually depends on the material that light is moving through. Light moves slower in glass than in air, and slower in air than in a vacuum . 13 How much slower? Light is 89,911 m/s (201,125.5 miles per hour) slower in air than in a vacuum. 14

Speed of Light in Different Materials

Medium	Speed of Light in Medium	Index of Refraction (IR)
vacuum	299 792 458 m/s	1.0 (by definition)
air	299 702 547 m/s	1.0003
ice	228 849 204 m/s	1.31
water	225 407 863 m/s	1.33

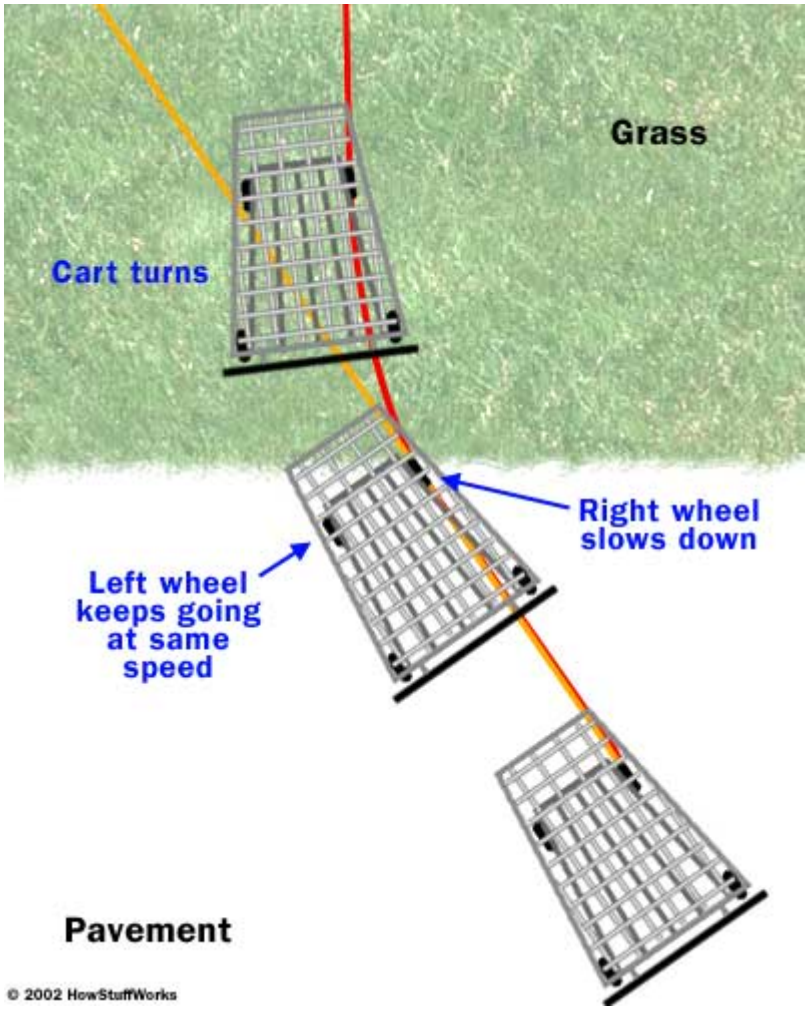
glass	199 861 638 m/s	1.5
quartz	see if you can calculate this!	1.46

Still with me? You can tell the speed of light in some material by looking up its Index of Refraction. If you know the Index of Refraction for glass is 1.5, you divide the speed of light in a vacuum (299,792,458 m/s) by 1.5 to get 199,861,638 m/s.

Why Light Bends

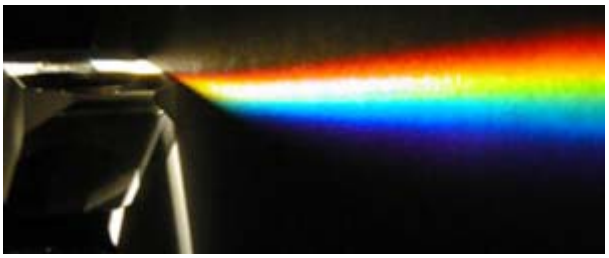
Here's the why the Index of Refraction matters in microscopes:

As light is slowed down passing from one material to the next, it BENDS!



The higher the index of refraction of the material, the more it will bend all light.

The bend happens every time light moves from one type of material into the next. The reason you see rainbows is that different colors of light are slowed down at different speeds. Red light bends the least and blue light bends the most. UV with the shortest wavelength bends even more.



Why should light change direction when moving from one material to another? Take a look at the illustration from HowStuffWorks. The key is that light travels as a connected structure and different parts of the structure experience drag at different times during the transition.

UV Light and Quartz Crystals

What about quartz? Does it have the highest IR? Is the goal to bend light a lot? There are different kinds of quartz, but Fused quartz has an IR of 1.46 and Flint Glass has is 1.61. 16 The lower IR means quartz bends light (and especially UV light) LESS and this results in less scattering.

This also means that more rays of light will make it from the specimen to your eye so it will be more brilliantly lit. UV is the portion of sunlight that gives you a tan! If you are behind glass, you won't get a tan, but if you were behind a quartz glass you would, because quartz allows UV to pass without scattering it.

WARNING: Looking at directly at a UV light source will burn your retina and YOU'LL GO BLIND! I assume Rife shifted the UV light from his scope into the visible spectrum and adjusted the brightness very carefully to protect his own eyes.

If I'm right about the index of refraction being the key to quartz, why not use ICE LENSES? ICE has an even lower IR than quartz. It may be that quartz has the best combination of lowest IR, most purity and most stability. Why not freeze REALLY pure water and make prisms out of that? Has it been done? Too many problems with the cold fogging up everything else?

A Healthy Glow

A normal white light bulb gives off many different colors of visible light. You can prove this to yourself by separating the light with a glass prism. According to Vassilatos, Rife used a brilliant ultraviolet-rich light source pin pointed into the heart of the specimen to stimulate internal fluorescence. His specimens then radiated their own brilliant ultraviolet rays.

Is there any reason to believe this story? In fact, there may be. Today we have fluorescence microscopes. They use a high intensity light which then causes the specimen to emit light of a longer wavelengths. "Certain molecules, by virtue of their chemical structure, have the ability to emit light of a specific wavelength following absorption of light of a shorter, higher energy wavelength. " 39 | 44

Another clue can be found in something called the green fluorescent protein (GFP) from the jellyfish *Aequorea victoria*. A footnote in a paper by Shimomura et al. states that "a protein giving solutions that look slightly greenish in sunlight through only yellowish under tungsten lights, and exhibiting a very bright, greenish fluorescence in the ultraviolet of a Mineralite, [a brand of light] has also been isolated ..." 40 | 41 | 45

Conclusion

Did Rife make viruses glow? The use of UV light and quartz prisms does not seem unreasonable. Since viruses are composed of DNA or RNA, and protein molecules 47 , and since we know that some proteins like GFP others 46 do glow when excited by UV light, this part of the story does not seem entirely far fetched. Only a few proteins seems to glow visibly when lit by ordinary UV light. Would they all emit if properly lit? I don't know.

Notes

WHY THE SKY IS BLUE: The sky is blue, not because all but blue wavelengths are absorbed, but because blue wavelengths are scattered the most.

Oxygen molecules are smaller than red light's wavelength, but bigger than blue light's wavelength. Red light comes from the sun, through the oxygen to your eyes, in a relatively straight path. Blue light however, when it tries to go through oxygen, gets bent. Blue light bounces around and comes at your from all directions, rather than just one direction, making the sky blue. (This is also why, if you look at the sun briefly on one of those very rare cloudy days where it it safe, the sun does not look blue, it looks red.)

WORLD DEATH RATE: "Since 1950, the death rate has been cut in half, from about 20 to fewer than 10 deaths per year per thousand people. At the same time, average global life expectancy has risen from 46 to 66 years." [29]

WORLD POPULATION GROWTH: In 1804: world population reached 1 billion
1927: 2 billion (123 years later)
1960: 3 billion (33 years)
1974: 4 billion (14 years)
1987: 5 billion (13 years)
1999: 6 billion (12 years)
[28]

CANCER DEATHS PER YEAR: Statistics vary greatly but here's a hint: millions killed worldwide by Cancer: 6.6 (1995), 6.3 (1996), 6.2 (1997) [27].

BACTERIA SHAPES: Rods = bacilli (sing. bacillus). View bacilli in a scanning electron micrograph (SEM), Spheres = cocci (sing. coccus), Spiral forms = spirilla (sing. spirillum).

Cancer Linked to Infectious Agents

According to the Center for Disease Control, "Infectious agents are known or suspected to play a role in a number of ... forms of cancer." 54

Infectious organisms include bacteria, chlamydia, fungi, parasites, prions, rickettsias, viruses and others. [74]

Cancer Virus Evidence

Is there any evidence that viruses in particular cause cancer? Yes, several. Liver, Breast, Cervical and others. According to Scientific American, "Over the past 20 years... investigators have not only proved that many different types of cancer indeed stem from viruses, bacteria or parasites, they

have also learned that perhaps as many as 15 percent of the world's cancer deaths can be traced to them." 92

Liver Cancer: HBsAg Virus Suspected to Play a Role

"High rates of liver cancer have been described in the Alaska Native population [Heyward et al 1981] and the role of infection with hepatitis B virus in the development of primary liver cancer has also been observed [Alward et al 1985]. One study in this population estimated the relative risk of developing primary liver cancer of HBsAg-positive carriers to be 148 times that of non-carriers [McMahon et al 1990]." 54

From these studies we can say that cancer is somehow closely connected with certain viruses, but that does not confirm that these viruses cause liver cancer. Correlation does not prove causation. How do you prove that something causes cancer?

Suggested Experiements

Here's how an experimental scientist might think: Take a sample of liver cancer cells, filter them to obtain the HBsAg virus and inject this into a compatible animal. Will the new animal develop the liver cancer? Will you find HBsAG-positive carriers EVERY time? If you kill (disable) the HBsAg before injecting it, does the animal then not get the cancer? If you kill HBsAg in a live animal with the cancer, does the cancer go away? Are there any other factors that might lead you to a wrong conclusion, such as an interaction between HBsAg and another cancer cause?

Breast Cancer: Strong Link to Human Mammary Tumor Virus

LOS ANGELES, Posted 12:45 p.m. August 13, 1999 -- A researcher has found a strong link between a virus and breast cancer, a major breakthrough in the search for a cause to the disease. Scientists are calling the virus the human mammary tumor virus, reported CBS 2 News. In mice and other animals, it's long been known that a virus can cause breast cancer, said the television station. But it was only recently that researchers identified a similar virus in human breasts. The scientists found the virus present in 85 percent of all human breast cancers. It's only found in 20 percent of healthy breasts. "I think this is very intriguing because it is another virus linked to human cancer," said Dr. Martin Kast, of Loyola University. "Something is going on." The theory is the virus attaches to cells and transforms their DNA. Those cells then start dividing uncontrollably, said CBS 2 News. So if breast cancer is caused by a virus, it might one day be preventable with a vaccine, the television station reported. Similar vaccines for other cancers are already being developed. Researchers at Kast's Loyola laboratory are working on a vaccine for cervical cancer, a tumor proven to be caused by a virus. If the same proof is found for breast cancer, a simple shot might one day prevent that disease. Doctors believe the cancer is passed down genetically from parents to children. There are other contributing factors for breast cancer, but the virus could be the most important. 63

Something is going on. We have viruses implicated in liver cancer [64] and now we have a "strong link" to breast cancer. [63 | 65]

Cervical Cancer: Caused by Human Papilloma Virus

"The WHO's International Agency for Research on Cancer (IARC) classified HPV infection as "carcinogenic" to humans (HPV types 16 and 18), "probably" carcinogenic (HPV types 31 and 33) and "possibly" carcinogenic (other HPV types except 6 and 11)" 80 | 81

More than 95% of all Cervical Cancer cases can be attributed to three types of human papilloma virus (HPV) the virus that causes genital warts.

Here's how it works: In humans and animals, cell division is regulated largely by two proteins, Rb and p53 [82]. Two genes in HPV, the "E6" and "E7" genes, produce proteins that can attach to Rb and p53. When the viral gene proteins attach to Rb and p53, they block their effect on regulating cell division. Infected cells then reproduce without any control. (Massimi and Banks 1997). 75 | 76 | 78

The American Cancer Society calls HPV a "risk factor" which is somewhat curious in light of the fact that HPV-16 and HPV-18 are classified as "carcinogenic" and the causative model is crystal clear. Good luck finding the word "virus" on the American Cancer Society web site.

Kaposi's Sarcoma: Caused by Herpes Virus Type 8

"Patients with AIDS often develop a type of cancer called Kaposi's Sarcoma. Recent research has discovered that a virus, called Human Herpes Virus type 8 (HHV8) causes these cancers." 66

SV40 Monkey Virus Causes Rare Cancers in Humans

"In 1955, Jonas Salk performed a medical miracle when he discovered how to mass produce polio vaccine by growing it on the kidneys of rhesus monkeys. While there is no question that thousands were saved from the ravages of polio by the Salk vaccine, by 1960 a problem had surfaced..."

According to CNN, "... An estimated 10 to 30 percent of the (polio) vaccine given to humans between 1955 and 1963 was contaminated with the (cancer causing SV40 monkey) virus, exposing between 10 to 30 million Americans."

According to the same CNN article, there is strong evidence that simian virus-40 (SV40) "... results in a number of rare cancers including non-Hodgkin's lymphoma; mesothelioma, a rare form of cancer found in the sac lining the chest or abdomen; osteosarcoma, a type of bone cancer most often occuring in children; and ependymoma, a rare form of brain tumor."

SV40 SIDE NOTE: One article I found says the Lancet published clear evidence that the polio vaccine "**planted the seeds of a deadly cancer that kills over 20,000 people every year in the US."** and that this is even more tragic because we know that **"polio can be prevented in most people simply by eliminating sugar from their diet."**

According to one site, "... SV-40 was introduced into the general population via polio vaccines starting in the 1950's. Since that is after the time of Rife's discovery of the BX and BY cancer-causing viruses we can assume that other frequencies may be needed to kill these newer viruses."

More Microbe - Cancer Links

According to one researcher, an article in Business Week July 14th 1997 listed cancer links to various viruses, and bacteria, and parasites.

virus	cancer type
Retrovirus (HTLV-2)	Hairy-cell leukemia
Papillomaviruses (HPV-5,HPV-8,HPV-17)	Skin cancer
Epstein- Barr virus (EBV)	Burketts Lymphoma naso pharyngeal cancer
Hepatitis B Virus	Liver Cancer
bacteria	cancer type
Helicobacter Pylori	Stomach Cancer
B. Burgdorferi	Skin and Breast cancer

Is Any Cancer Not Caused by a Virus?

We still hear that "Most human cancers are not caused by virues." 66 Upon what data is that conclusion based? In other words, is it simply our inability to detect fragile viruses with current techniques that causes this assertion?

The American Cancer Society says the cause of cancer is currently unknown. They say that with lung cancer, for example, smoking is a risk factor. Can we be certain, however, that even with lung cancer there is not a dormant virus causing tumors when lung tissues are weakened to a certain point? This would explain why not all smokers get cancer. Keep in mind that I'm no expert. I'm just a curious bystander with an interest in science who is trying to understand as much as possible.

Conclusion

There are now cancers which are proven to be caused by viruses. In this claim if nothing else, Rife was many years ahead of his time.

The Opera Singer and the Crystal Glass

An opera singer's voice can break a thin crystal glass if the singer can match the glasses' natural frequency. Energy input into an object at its natural frequency will cause the object to resonate and shatter. Could Rife shatter the physical structure of viruses in this way? Why not? The Quackwatch site had this to say:

One of Abrams's [Albert Abrams, M.D. (1864-1924)] many imitators was Royal Raymond Rife (1888-1971), an American who claimed that cancer was caused by bacteria. During the 1920s, he claimed to have developed a powerful microscope that could detect living microbes by the color of auras emitted by their vibratory rates. His Rife Frequency Generator allegedly generates radio waves with precisely the same frequency, causing the offending bacteria to shatter in the same manner as a crystal glass breaks in response to the voice of an opera singer. The American Cancer Society has pointed out that although sound waves can produce vibrations that break glass, radio waves at the power level emitted a Rife generator do not have sufficient energy to destroy bacteria [4]. - March 6, 2000. [67 | 69 | 37 | 38]

Virus, Bacteria or Something Else?

The interview with Rife at this site [68] says that viruses were the cause, not bacteria. Which was it? Did he find a virus-sized bacteria, or something entirely new? Rife called BX a cancer "virus" simply because it could pass through the finest of Berkefeld porcelain filters, the 000 filter. BX is a motile ovoid .066 microns by .05 microns driven by a proton transport flagella. Bacteria aren't

supposed to be smaller than about 0.2 microns [84 | 86]. A brief surf on google brings us to a parallel discovery that may explain the virus-bacteria confusion: Cancer microbes.

"Over the past century physicians such as William Russell, Wilhelm Reich, James Young, John Nuzum, Virginia Livingston, and numerous other researchers, have reported on the existence of a specific bacterium associated with cancer. The microbe is an ubiquitous, pleomorphic, cell wall deficient ("mycoplasma-like") organism with a complex life cycle. In its various guises, the microbe may resemble staphylococci, diphtheroids, bacilli, fungi, host cell inclusions, viruses, and Russell bodies" [88 | 89 | 90 | 91]

Color of auras?

Using the word "auras" makes a serious scientist sound like spiritualist. Rife said viruses were "identified by a frequency of light which coordinates with the chemical constituents of the virus" [68]. This is scientifically sound as we saw in the last article. The chemical constituents of some proteins do make them glow. I doubt that the Quackwatch doctors would suggest researchers at the Howard Hughes Medical Institute; University of California, San Diego and other established medical research facilities think that Green Fluorescent Protein (GFP) glows because it gives off "good green vibes" or "positive green Karma."

Either the Quackwatch folks didn't have access to Rife's correct position, or the rife.de site is wrong. Did rife.de take a quack (Rife) and completely fabricate a serious character with supporting evidence? If Rife.de is wrong, they must even have also fabricated an award won by Rife, a Research Fellowship in Bio-Chemistry by a nationally-known Institute for Scientific Research: the Andean Anthropological Expedition. [68]

The Power of Resonance

The really important part of the Quackwatch statement is that radio waves at the power level emitted by a Rife generator do not have sufficient energy to destroy bacteria. Even if this statement is 100% true, what about 50 to 100 nanometer viruses? How much power holds them together? How much power is required to break them?

Consider: Sometimes you can't get your truck out of the mud unless you rock it back and forth.

You probably don't have enough power to kick your feet one time and push or pull yourself to the highest mark when you are on a swing in a playground. However, by kicking your feet and adding to the direction of the existing momentum, you can build and build.

Rife used vibrations, of an "oscillative ray at a cycles per second vibration of 11,780,000" which he claimed destroyed the cancer virus he called BX. This frequency is said to have been "modified" by an audio frequency of 2127 or 2008 MHz. [70].

What was the power level?

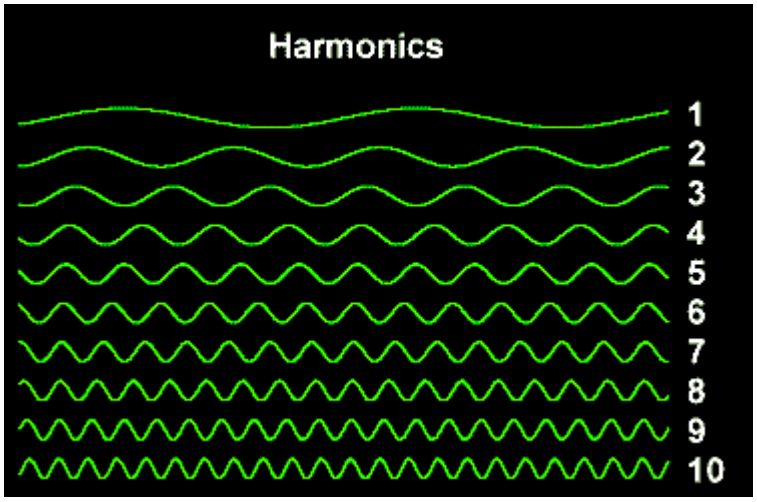
Killing Bacteria With Vibrations

According to ABC News, "Lambda Technologies in North Carolina believes that microwaves can kill the anthrax bacteria. ... These machines use what is known as variable frequency microwave technology. This allows them to tune the machine to obtain the most efficient killing. The technology also eliminates arching, or sparks, that form when metal is put in conventional

microwave ovens. According to Howard Reisner, an immunologist at the University of North Carolina at Chapel Hill, it has been reported by several sources that microwaves can kill bacteria and bacterial spores." [72]

Okay you medical expert guys... either you can vibrate germs to death or you can't. Which one will it be?

"We sweep through 4,000 different frequencies," according to Dick Garard of Lambda Technologies. ... Garard says the same technology ... will also kill viruses and bacteria without hurting what surrounds them. VFM energy can even be tuned to kill pathogens in blood products without damaging blood proteins." [71] October 18, 2001 - ABC News. Note that In October they didn't yet know if this would kill spores.



A month later: "In preliminary tests conducted by the company along with researchers at the University of North Carolina Pathology Department, Lambda's VFM system proved effective in killing test spores inside envelopes within minutes of exposure to the microwaves generated by the system." [73] - November 5, 2001 Yahoo Business News.

If you can kill pathogens safely in blood products, why not in living creatures? As to the 4,000 different frequencies part, might they eventually find that just one or two correct frequencies in that range are doing the killing?

Harmonics

Rife was surpised to find that the viruses he studied exploded at much lower frequencies than he calculated. Was the effective frequency a harmonic of those he used? Try a simple experiment. Open up a well tuned baby grand piano and play a single loud note at 440 Hz with some other instrument, but don't touch the piano strings. Now stop and feel the piano strings. In addition to the A (440 Hz) string vibrating in resonance with the note you played, you'll notice that other piano strings are also moving. These other notes are Harmonics.

Harmonics are tones whose frequencies are integral multiples of the fundamental frequency of the wave. For an A played at 440 Hz, the frequencies of the harmonics will be 880 Hz, 1320 Hz, and so on. The harmonics are numbered in order of increasing frequency. The first harmonic is the fundamental frequency, the second is twice the fundamental frequency, and so on.

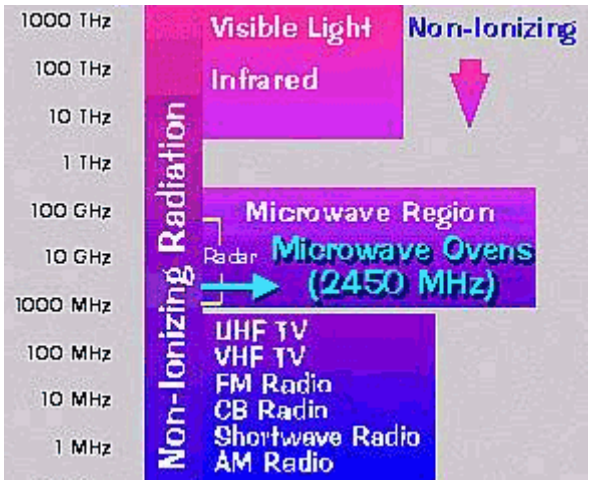
Similarly, any vibration at a rate of 11,780,000 hertz (11.78 million times a second or 11.78 a megahertz) produces waves in the range of a shortwave radio. These waves, like sound waves, will create harmonics up into the adjacent 300 MHz to 3 gigahertz (GHz) microwave band. [74]

If I understand correctly, the 86th harmonic of a 11.78 MHz radio wave is a 1.01308 GHz

microwave. The power of each harmonic diminishes depending on the source. Some sources are rich in harmonics.

Radio Waves vs. Microwaves

Did you know that "radio waves" and "microwaves" are just different frequencies of the same waves? The diving line is one we defined for convenience. If microwaves can vibrate a something to death, so might radio waves.



Ultra Violet Light Kills

There is no controversy about killing germs with UV light. Ultra violet light, like visible light, radio waves and wicrowaves, is part of the electromagnetic spectrum. The UV-C light is germicidal.

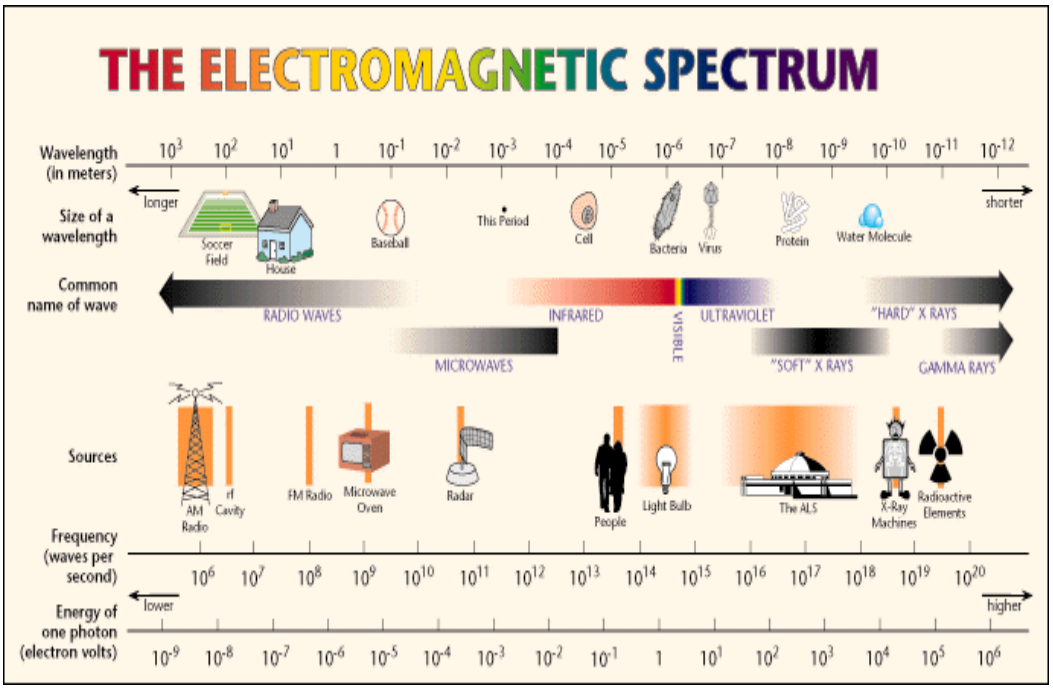
UV-C deactivates the DNA of bacteria, viruses and other pathogens. It destroys their ability to multiply and cause disease. One way UV-C light kills is by causing damage to the nucleic acid of microorganisms by forming covalent bonds between adjacent thymine bases in their DNA. In other words, it doesn't shatter germs, it sort of injects a glue into their reproduction instructions. The formation of such bonds prevents the DNA from being unzipped for replication, and the organism is unable to reproduce. When the organism tries to replicate, it dies.

A 17-1/2 inch UV-C bulb can put out 30,000 microwatts, over 3 times the amount of UV required to kill anthrax. Microorganism Destruction Levels in µwsec/cm squared are shown below. Ultraviolet energy at 253.7 nm wavelength results in 99.9% destruction of these microorganisms. Obviously each type of germ has a different chemical construction and thus requires different amounts of energy to be destoyed if you use a constant wavelength.

Bacillus anthracis	8,700	Mycobacterium tuberculosis	10,000
Shigella dysentariae (dysentery)	4,200	Bacteriophage (E. Coli)	6,500
Corynebacterium diphtheriae	6,500	Pseudomonas aeruginosa	3,900
Shigell flexneri (dysentery)	3,400	Hepatitis	8,000
Dysentery bacilli (diarrhea)	4,200	Salmonella (food poisoning)	10,000
Staphylococcus epidermidis	5,800	Influenza	6,600
Escherichia coli (diarrhea)	7,000	Salmonella paratyphi (enteric fever)	
Streptococcus faecaelis	10,000	6,100	

Legionella pneumophilia 3,800 Poliovirus (poliomyelitis) 7,000
Vibro commo (cholera) 6,500 Salmonella typhosa (typhoid fever) 7,000
Baker's yeast 8,800

The above says that 253.7 nm wavelength of UV light will kill germs. Rife said certain frequencies kill. What is the relationship?



If the velocity of light is 299 702 547 m/s, find the frequency of a wave whose wavelength is 253.7 nanometers (nm).

1. EQUATION: speed of light / wavelength = frequency

2. 299 702 547 m/s / 253.7 nm = ? Hz

3. Convert to like units:

(299 702 547 m/s) / (253.7 x 10^{-9} m) = ? Hz

(299 702 547 m/s) / (.0000002537 m) = ? Hz

= 1,181,326,554,986,204.1782 Hz =

ANSWER: 1.181 x 10^{19} waves per second

From the above chart, this UV light wavelength in air has the same frequency as hard x-rays or gamma rays. Am I missing something? Why is this called UV-C light instead of soft X-rays?

UCDMC Doctors Kill Breast Cancer Cells with Radio Waves

3/19/02: Vijay Khatri, assistant professor of surgery at the Cancer Center, John McGahan, professor of radiology, and Bijan Bijan, assistant professor of radiology were announced to be leading a pilot study on women with very small early stage breast tumors according to UC Davis' Dateline March 15, 2002.

"Radio-wave therapy, also known as radiofrequency ablation, has been used for many years to treat liver and bone cancers at UC Davis and other centers. And some researchers around the country are studying the therapy as a treatment for lung and prostate cancer."

The difference seems to be that heat from a probe kills the entire tumor cells. There is no claim that a viral or bacterial cause of cancer is destroyed by this process.

Conclusion

Germs can be destroyed by electromagnetic radiation. Lambda's VFM system has shattered germs with microwaves. Water purifiers use UV-C light to kill germs. It is not impossible that Rife killed viruses and bacteria as claimed.

Notes

UV-A 400nm-315nm: Often referred to as 'blacklight'. The longest wavelength region and lowest energy, it represents the largest portion of natural UV light.

UV-B 315nm-280nm: Partially blocked by the ozone layer this is the most aggressive component of natural UV light and largely responsible for sunburn (erythema).

UV-C 280nm-100nm: Only generally encountered from artificial light sources since it is totally absorbed by the earth's atmosphere.

Many Claim Rife Cured Cancer

The Associated Press newspaper San Diego Evening Tribune ran a story on Friday May 6th, 1938 with the headline "Dread Disease Germs Destroyed By Rays, Claim of S.D. Scientist."

THE ASSOCIATED PRESS ☆ ☆ THE INTERNATIONAL NEWS

EVENING TRIBUNE

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'Klan' Threat To Filipino Guardsmen

DRY SEASON ON; FIRE OFFICIALS URGE PRECAUTION

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Deal Is Raked By Hoover as 'Dictatorship'

Petition O. K.'d In Scramble By Solons

Apparatus of San Diegan Seen as Boon to Medical World

Cancer Blow Seen After 18-Year Toil by Rife

Boost in Cost Of S. D. Relief

'WON'T RUN IN '40,' ROOSEVELT QUOTED IN PARIS PAPER

Successful Treatment?

This excerpt gives an idea of what is claimed. Rife describes his cancer treatment in 1934:

"With the frequency instrument treatment, no tissue is destroyed, no pain is felt, no noise is audible, and no sensation is noticed. A tube lights up and 3 minutes later the treatment is completed. The virus or bacteria is destroyed and the body then recovers itself naturally from the toxic effect of the virus or bacteria.

Several diseases may be treated simultaneously. The first clinical work on cancer was completed under the supervision of Milbank Johnson, MD which was set up under a Special Research Committee of the University of Southern California. 16 cases were treated at the clinic for many types of malignancy. After 3 months, 14 of these so-called helpless cases were signed off as clinically cured by the staff of five medical doctors and Dr. Alvin G. Foord, MD Pathologist for the group. (Editor's Note: a few months after the conclusion of the clinic, the other two recovered completely)

The treatments consisted of 3 minutes duration using the frequency instrument which was set on the mortal oscillatory rate for 'BX' or cancer (at 3 day intervals). It was found that the elapsed time between treatments attains better results than the cases treated daily. This gives the lymphatic system an opportunity to absorb and cast off the toxic condition which is produced by the devitalized dead particles of the 'BX' (Bacillus X) virus. No rise in body temperature was perceptible in any of these cases above normal during or after the frequency instrument treatment. No special diets were used in any of this clinical work, but we sincerely believe that a proper diet compiled for the individual would be of benefit." [25]

According to the same source above, Rife, who'd found a 100% cure for cancer, died penniless in 1971.

Conclusion

Some say Rife cured cancer in 1938. Others say he did not. I'm not sure how you would ever prove Rife's claims without a serious carefully controlled double-blind study. I know of no such studies past present or future that I would cite as evidence on either side.

Rife: Successful Scientist or Scam Artist?

The strongest anti-Rife opinion I found on the net comes from someone named Harry H Conover. Harry's claims are:

1. Rife's scam was based upon the very successful scam promoted by Abrams.

Here's what I don't get. What kind of a scam artist spends 18 - 40 years slogging away in a lab? Rife must be one of the strangest scam artists ever to have scammed a scam. What is his supposed connection to Abrams? Did the two ever meet?

2. Rife's education was limited to that of a machinist (as) an optical instrument maker (optician).

What about that research fellowship in Biochemistry from the Andean Anthropological Expedition? Would you not let a person educated in dentistry, for example, turn a hose on your house and put out a fire? Are credentials more important than results?

3. Rife's discoveries have all long since been refuted by contemporary micro-biology.

I'd like to know more about this. Which discoveries? Cancer is caused by virus? Germs can be killed with vibrations? That they can be made to glow?

4. His universal microscope didn't offer performance significantly different from any instrument of comparable aperature.

Perhaps you didn't see the pictures? 23,000X is a lot more resolution than 5,000X. Are the photos taken with the Universal Microscope (comparing it to the new electron microsope) in the 1944 Annual Report of the Regents of the Smithsonian Institution some kind of hoax or a mistake?

5. The quack term 'vibration' surfaces in almost every pseudo-scientific scam that has ever surfaced.

I don't get it. Does this person not believe that anything vibrates? Would a list of hard science instruments that rely upon "vibration" be helpful? Are atomic absorption spectrophotometers now a tool of pseudo-science?

6. It was all done for show. Rife's box contained a high-frequency generator, a cross between a Tesla coil and a 75-Watt ham transimitter with an 807 tube which he attached to a Geissler Tube type discharge device. This produced an effect like the plasma discharge globes sold today at Radio Shack and other chain retailers. He also modulated his high-frequency (r.f.) generator with the output of an off-the-shelf audio oscillator.

An interesting proposal. Rife did work with a millionaire and he purchased a lot of fancy equipment. Could it have all been some kind of a stage show? The idea of someone spending years of careful research just to pull off a hoax doesn't fit the profile. If there was any scam at all, perhaps he was under pressure to produce something after spending all that money. Perhaps he did run a scam in desparation at the end after years of failure?

7. The audio, not the r.f. frequency, which has probably never (been) measured, is the basis of the Rife treatment frequencies shown.

11,780,000 hertz is the r.f. used for cancer and it was modified by the audio frequencies. I agree that this is the most fuzzy part of the story. What does "modified" really mean?

8. Curing entire rooms full of people by simply exposing them to the effects of his "Rife Generator" flies in the face of Rife's claims that specific frequencies of 'vibration' were associated with specific types of cancer.

I may not understand this criticism either. I thought Rife said that there are only two different frequencies that killed all cancer. Anyway, you can certainly expose rooms full of people to as many specific frequencies as you like. What do you think musicians do for a living?

9. Almost all of Rife's cures happened in patients that who had never been diagnosed with cancer in the first place.

How does he know that? Is there some list of Rife's cures somewhere that I haven't seen?

"Just for what it's worth, this entire discussion makes me ill. It is very offensive to me that people at the close or the 20th Century would fall for this silly nonsense (how has education failed them), and even more so to believe that there are people that consider themselves human that would sink to such a despicable exploitive act. If there is a Hell, I trust and hope that the souls of both Abrams and Rife have found there way there, because that's exactly where they belong. Harry C."

Always check character by looking at someone's other writings. Looking around a bit more on the net we find this exchange:

Another Opinion

"H Conover: I've been posting actual engineering information addressing technical aspects of selling power back to the grid.

N Pine: Trouble is, a lot of it's wrong.

H Conover: Oh? Which part bothers you...?

N Pine: One of the things that bothers me about your postings is that you don't understand the difference between a stand-alone inverter and a simple synchronous inverter. You made this quite evident in your previous posting. Ignorance is excusable. So is stupidity. So is mispelling. But when you combine all this with arrogance I find it amusing, and a waste of time. Nick"

What Happened to Rife and His Cure?

Here, unfortunately, we get into one of those areas of conspiracy that like the murder of JFK, can never really be proved. Also, it is scary enough that you want to avoid it, true OR false. There are claims that authors have even been bumped off for digging too much in this area. I certainly wouldn't want to believe such a thing, but here is the basic claim:

"First, arsonists burned the Burnett Lab in New Jersey, which was validating Rife's work. Then, someone fatally poisoned Dr. Millbank Johnson, president of the Southern California American Medical Association. He died hours before a press conference where he was to announce to the world that Rife's electronic therapy had cured every patient (16 out of 16) in that medical study supervised by the University of Southern California. (First thought to be accidental death, the poison was discovered years later by federal investigators when Dr. Johnson's body was exhumed). Dr. Nemens, who had duplicated some of Rife's work just 40 miles from Rife's lab, was killed in a mysterious fire which destroyed his lab. Rife himself was finally killed at Grossmont Hospital by an accidental lethal dose of Valium. Following Dr. Milbank Johnson's murder, threats, and a string of other incidents, doctors who had actually been photographed with Rife denied they ever met him. Dr. Isaac Kendall, Rife's chief research associate and Dean of Northwestern Medical School, disappeared for years after receiving $200,000 in grants." 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100

Find a Cure, Go to Jail?

Some say Rife and others were destroyed by the owners of the electron microscope and the pharmaceutical companies.

One sleazy trial lawyer MAY have caused more needless deaths by cancer than all the world wars combined. According to one alternative medicine site, going to jail for being too successful in your field is not uncommon:

"Thirty-five years ago a writing that contradicted ‘official science' was a one-way ticket to prison. Victor Irons went to prison for what he wrote in Green Life. Wilhelm Reich died in prison for his findings on energy outside the electromagnetic spectrum. The late Dr. Carey Reams spent his life and fortune defending his biological theory of ionization and spent time in prison just the same. ... Max Gerson, M.D. (cut off by his peers, denied hospital and laboratory privileges and the assistance of trained professional help — doctors or nurses — killed in 1959 by a hit and run driver outside of his home in Philadelphia — no one was ever prosecuted)Royal Raymond Rife (cut off by his peers, his microscope and laboratory destroyed, spent time in prison, died a broken man) UPDATE: According to Gerald Foye who wrote a book about the history of Royal R. Rife entitled Royal R. Rife, Humanitarian Betrayed and Persecuted (ISBN 09659613-3-8), Rife did not spend time in prison.William Donald Kelley, D.D.S. (hounded by the AMA, IRS, and FBI, lost his dental license, poisoned, spent time in prison, a restraining order prohibited him from distributing his book, One Answer To Cancer, he appealed that decision to the U.S. Supreme Court and the lower court decision was upheld, still helping people today)Gaston Naessens (brought to trial in Canada for curing cancer, won, still treating cancer in Canada)Hulda R. Clark, Ph.D., N.D. (spied on, arrested, spent time in jail, had one case dismissed, won another case, still fighting lawsuits, still helping people at her clinic in Mexico as well as continuing her cancer research)Ed McCabe (author of Oxygen Therapies, held in prison without charges for years)Stanislaw Burzynski, MD (14 years of raids, records confiscated, cases dismissed). [21]Are any or all of the above legit? I haven't really checked. I have no idea. I'm hoping to avoid them because I don't really want to think about conspiracy theories. Did Rife's cancer cure work? One of the many Rife web sites says this:

"After nearly 20,000 unsuccessful attempts, Rife finally isolated and identified the human cancer Virus, and named it "Cryptocides Primordiales". Rife inoculated 400 lab animals with this virus,

created 400 tumors, and then eliminated every cancer tumor by using his instrument to modify its electronic signature. This is all chronicled in "The Cancer Cure That Worked" [22]

Suppression or Quackery?

Has a miracle of science been suppressed? Some claim so. Here are the two sides of the suppression claim:

SUPPRESSION	QUACKERY
The cure was suppressed to keep billions of dollars per year flowing to the pharmaceutical companies. Cancer is big business. In the 64 years since the cure of 1938, hundreds of millions people would have beat cancer and lived for who knows how long. A simple cheap cure would be disastrous for drug companies. X-rays actually promote the cancer virus, you must use the correct energies to kill them	Sadly, the world is full of scams and hoaxes that prey upon people in their most desperate hours. This "miracle cancer cure" is just one more disgusting case of quackery. There is no simple solution no matter how much we wish it were so. If this were a true cure, scientists would have (re)-discovered and reported it by now! Drugs and accepted radiation therapies are the only way. "Treatment with the device is available at clinics in Mexico and Canada. The bottom line, however, is that radionics devices have no value for diagnosing or treating anything." 37 | 50

I communicated with a Dr. from the Quackwatch web site a few times regarding another issue. He did both claim and seem to be a serious scientist. I found it unfortunate, however, that he did not have time to give me the scientific reasons behind his position. I was deflected and never did get to the heart of the problem. He was quite nice, however.

In fact, if I recall correctly, just as I was starting to understand why some people say one thing and others disagree, I was banned from discussing the topic further due to my "obsession." Perhaps I asked too many pointed questions, or perhaps I just really did take up too much of their time with my attempts to understand. I don't know.

(This was involving amalgam fillings with Mercury. The Dr. in question declined to be quoted, but the gist was that I should spend a few years studying biochemistry, then I'd get that he was right.)

Getting back to the Rife stuff, suppression or not, we might have an even more SERIOUS population problem on our hands overnight if this cancer cure worked. As they say, "Be careful what you wish for!"

Conclusion

We have only claims on both sides of this debate because no one has done and reported research that proves or disproves Rife's theory as far as I know. Was he suppressed? Were people killed to keep this secret? Think what you will. I hope not.

Finding Rife Devices

There may be places on the net selling different kinds of Rife devices, but one site says "Rife machines have been outlawed by the FDA." No matter what you think of Rife, I'd bet there are some real quacks out there ready to take your money. I also read that you can get treatment in Mexico and Europe with Rife therapies. One thing is certain, this stuff is already all over the place. Ask around. Everyone has heard of this. I was really shocked. At least twenty people have said things to me or around me recently about Rife.

Working Device?

A web site, rifetechnologies.com contains a claims that one working unit "has a fixed carrier frequency of about 4.6 Mhz. There are two other primary harmonics within the carrier of 2.15 and 9.09 Mhz. The carrier is Amplitude Modulated using a Hewlett-Wein Bridge Oscillator." Controls change the frequency band and audio frequency from 16Hz to 200 KHz. Amplitude (audio power level) is also adjustable with optimum effects found using 100 % modulation (sine, not square wave) and not overmodulation.

"The output wave of the device is gated at the AC line voltage frequency. For the USA, this would be 60 Hz. Each series of pulses within the gated envelope, is composed of a damped wave train. The three harmonics of 2.15, 4.6 ,and 9.09 are all modulated. Damped wave transmitters are now outlawed by all countries via international treaties. The plasma tube behaves as an active part of the circuit, and when placed close to the patient, couples the field to the patient. A curiosity is that frequencies utilized by this device are TEN TIMES the frequency that is presently used. For example, this device uses 21275 Hz instead of 2128 Hz."

Making Your Own Frequencies

Let's say you want to create a device to give pulses at exactly 28,825,455 cycles per second. (28825.455 Kilohertz). How would you do that? Could you hear them?

Frequencies You Can Hear

These are some frequencies that some rife sites said will kill certain specific viruses. I highly doubt that just listening to them will do anything at all, but I'm not sure of that. I've had a lot of fun combining them. Certain combinations are down right eerie.

From David M. Tumey and William H. Sheline "Royal Rife Revisited: Reconstruction of the Original Rife Ray Tube"

Micro-organism ------- Frequency (cps)

Tetanus.....120
Treponema.....660

Gonorrhea.....712
Staphlococci.....728
Pneumococci.....776
Streptothrix (fungus).....784
Streptococci.....880
Typhoid Bacteria.....712
Typhoid Virus.....1862
B.Coli--Rod form (Read E.coli).....800
B.Coli--Virus.....1552
Tuberculosis Rod form.....803
Tuberculosis Virus.....1552
Sarcoma (all forms).....2008
Carcinoma (all forms).....2128

Here they are (all square waves, .wav files). They are only 5 seconds long so you'll have to play them in an infinite loop somehow. I've included frequencies of western musical notes for comparison.

E 659 Hz | 660 Hz | F 698 Hz | 712 Hz | 728 Hz
F# / Gb 740 Hz | 776 Hz | G 784 Hz | 784 Hz | 800 Hz
803 Hz | G# / Ab 831 Hz | A 880 Hz | 880 Hz | A# / Bb 932 Hz
B 988 Hz | C 1046 Hz | C# / Db 1108 Hz | D 1174 Hz | D# / Eb 1244 Hz
E 1318 Hz | F 1396 Hz | 1552 Hz | G 1568 Hz | G# / Ab 1662 Hz
| A 1760 Hz | 1862 Hz | A# / Bb 1864 Hz | B 1976 Hz | 2008 Hz
| C 2092 Hz | 2128 Hz | C# / Db 2216 Hz

To get the full effect, you might want to hear what they sound like specially combined at one of the Xenophilia shows near you. Again, I don't really think these audio frequencies were what did the trick. It was the higher radio frequencies (I think) that killed stuff ... if it worked at all.

To play with sound more try these pages:

1. Hear any frequency 440 to 880 Hz adjustable in 1 Hz increments. (sine wave, JAVA Applet)

2. Hear tones of western music combined. View wave forms resulting from combined notes! (JAVA Applet)

Does our Western Musical Scale Encode Lost Healing Arts?

What if ... the major scale was picked by the ancients because they knew the curative powers of certain frequencies in that scale? What if we have drifted off of the correct frequencies in all of these years? Look at the musical scale above, compare it to the frequencies that Rife claimed would vibrate cancer germs to death, and decide for yourself. Can these audio frequencies open some sort of secret door?

What is a Hertz?

A hertz is one cycle per second. If you touch both ends of a battery 2 times per second, you are getting a small 2 hertz electromagnetic pulse. Since you can't move your hand on and off a battery 28.825455 million times per second, you'll need some electronics to do this for you.

EASIEST: We can get frequencies of a wide range from just downloading a Free Tone Generator. If you plug a 1/4 inch plug with frayed ends into your PC's speaker and hold the ends, you will be getting pulses at the frequency you enter. The frequencies you can get this way will depend on your sound card. Others have tried this and have reported that the limits of the comptuer do not produced the desired timings when connected to a scope.

555 Timer Chip

I hope to start by building a device that you can control anywhere from 0 to 500,000 Hz using the 555 Timer chip (Radio Shack Catalog No. 276-1723) For comparison, human hearing is in the range of vibrations between 20 and 20,000 hertz. In other words, the 555 timer chip could give all frequencies that you can hear.

DS1075 Timer Chip

To reach the 28,824,455 cycles per second (Hz) that we want, we could try another programmable chip, the DS1075 which can give from 30,000 Hz to 100,000,000 Hz frequencies.

Rife's Frequencies

Rife's original notes from Nov 20, 1932 say that cancer was killed by a setting of 11,780,000 Hz. This may have been 23,560,000 Hz according to some.

RIFE RESEARCH LABORATORY

Bacillus X (Cancer) Carcinoma
(Rife) 11-20-32

Filterable Virus: Passes W: K Medium

motile-small ovoid granule
highly plastic
visable only with mono chromatic light
angle of refraction 123/10
color by chemical refraction Purple-red
length - 1/15 u : breadth 1/20 u

Polarity
+ anode
- cathode X
Bleach rate in milliamperes 175 D.C.
Influence of X ray none
" " Ultra Violet ray slows motility
" " Infra Red - none
Thermal death point 42C. 24 hrs.
Filament voltage 10
" amperage 86
Plate voltage 928
Cycles per second 14,780,000
Wave length of super regeneration of audion tube 17 6/10 met

Looking at Rife's notes, you might wonder what an "Audion" is. Lee De Forest invented the "triode" or "audion" amplifier. This device made wireless radio broadcasting practicable. [101 |

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