CITY—COUNTY SECTION FINANCIAL NEWS

The San Diego Union

CITY—COUNTY SECTION IMPERIAL VALLEY

SAN DIEGO, CALIFORNIA, SUNDAY MORNING, NOV. 3, 1929

LOCAL MAN BARES WONDERS OF GERM LIFE

NEW APPARATUSES UNVEIL HIDDEN MICROBE UNIVERSE TO HUMAN EYE

Super - Magnified Lockjaw Bacillus Evidences Vegetable Composition; Disease Study Advanced.

Record Tourist Season in Prospect for San Diego, Railroad Man Says

Making Moving Pictures of Microbe Drama

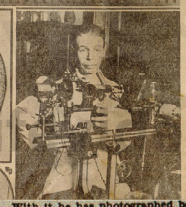
Finds East 'Sold' on This City

CITY HAS BIG DRINK OF WATER ON HAND: 44,886,159,457 GALS.

L.A. PLEDGES AID IN MOVE TO MAKE SAN DIEGO A MAIL TERMINUS

ARREST TWO MEN ON HIGHWAY WITH ALLEGED ALCOHOL

QUICK DISPOSAL OF CRIMINAL CASE



NEW APPARATUSES UNVEIL HIDDEN MICROBE UNIVERSE TO HUMAN EYE

Super-Magnified Lockjaw Bacillus Evidences Vegetable Composition; Disease Study Advanced.

Can you imagine a motion picture film where boy is king enough to use the head of a pin for a ballroom floor and invite all his neighbors to come in for a dance?

Going one step further, can you imagine the film showing that tiny herd being formed within the egg, breaking the shell to escape, living the normal span of life and dying at a ripe old age?

It takes a bit of imagining, true enough, but it's being done right out on Point Loma. Microbes, bacilli and the smallest units of the vegetable and animal kingdoms are yielding up the secrets of their lives to the moving picture camera.

They are magnified, as the film records their movements, as much as 11,000 diameters. As they pass through the movie projector, their size is limited only by the size of the screen. And still their outlines are sharp.

SUPERIOR EQUIPMENT

This is one phase of the work being accomplished here by R. B. Rife, who operates a two-by-four scientific laboratory on Point Loma that contains equipment which, he says, is not equaled or even approached by the most impressive institutions of New York, Munich or Vienna.

With it he has photographed bacillus tetanin, or the germ of lock-jaw, at 13,000 times original size. This enlargement, he says, gave it a "tail" that never before had been seen, making it appear similar to a lollipop on a stick.

Then he concentrated on the lollipop or spore, disregarding the stick, and by building it up to 217,000 diameters he made it look like a chrysanthemum. And it turned out to be what he identified as a member of the vegetable—not the animal—kingdom. This picture, taken from a microbe so small that the average man cannot even think about it, measures three inches in diameter.

His equipment allows him to arrive at some intimacy with the "unseen world" of parasites that infest the human system, and almost the parasites that infest those parasites. He has, he says, isolated the microbe of malaria from the corpuscles in the blood, and he believes that he has distinguished sex cleavage in these microbes.

DRAWS DISTINCTION

This super-photography enables him, he says, to distinguish for the first time the germ of typhoid from an entirely harmless living organism that infests most humans in large quantities. Ordinary microscopes, according to Rife, leave the harmless and the deadly parasites looking like twins. The flagellae, or "feelers" of the typhoid bug cannot be seen.

Rife is doing much to bring this hidden universe of "nits that worry gnats that plague mosquitoes" within range of human eyes. He takes moving pictures that go a long way down the scale. Once seen, these minute pests can be studied and—perhaps—exterminated.

How small the ultimate organism is, can be decided only by future generations if at all, but already he has enlarged human conception by putting guesswork on film.

Rife is an expert in more lines than the average man has time to dabble in. He is an able bacteriologist, embryologist, electrical and scientific engineer, metallurgist, chemist, photo-micrographer, and he plays with scientific crime detection. As recreation he takes to target shooting in terms of half-inch bullseyes.

His chief enthusiasm, however, is the inquiry into the causes, agencies and forms of diseases, and it is this enthusiasm that has caused him to develop his various pieces of apparatus and to refine them to an efficiency beyond all precedent.

SCOFFS AT REWARD

He laboriously seeks out the exact requirements of a new mechanism, builds it on the premises, and applies it successfully to the problem that neither he nor any other man could solve without it.

And after all this he refuses to make money from it. His most startling achievements are not produced commercially. His creed is that of the "pure scientist" who believes that when money comes in the door, science flies out the window.

Cash for his experiments and his astonishing mass of equipment is derived from certain minor patents, and from an occasional industrial "job" in the field of chemistry or metallurgy which saves a matter of a million dollars a year or so to one of America's giant industries.

His greatest developments in the field of scientific apparatus, created during the past six or eight years, are

1—The Rife Micromanipulator, whose flexibility outclasses any similar machine known to science. With this machine an operation can be performed on a single blood corpuscle, as a surgeon removes an appendix, while the corpuscle is enlarged as much as 10,000 diameters.

2—The Rife fine-micrographic apparatus. This incubates and reproduces on motion picture film the entire life cycle of the tiniest organism—enlarged by 11,000 diameters.

3—The Rife Super-regenerative ray, which produces a destructive ray seventeen times as powerful as the

(Continued on Page 6)

Local Man Bares Wonders of Germ Life

(Continued from Page 1)

X-ray for the treatment and control of malignant organisms.

4—The Rife Refractometer, which has unparalleled flexibility for the measurement of bacteria, parasitic organisms or the prismatic angles of crystals.

5—The Rife experiment on the weight of bacteria, which established the weight of a single average specimen at one-third of a billionth of a milligram. A milligram is the thousandth part of a gram, and it takes more than 28 grams to weigh an ounce.

SEEKING NEW SYSTEM

Furthermore he has at the verge of perfection a new system for preparing slides of pathological tissue, for use under the microscope in identification, study and differentiation of disease germs. He holds a theory that the harsh acid stains used to bring out features of the tissue, as well as the complicated treatment now necessary to prepare it for the slide, conspire to defeat their own object.

He believes that the chemical baths themselves destroy the very germ that science is trying to pin under the microscope.

So he is evolving a new method that will do away with chemicals. Instead of five days' hard work being necessary before a pickled and probably worthless section of tissue can be put under the lense, he expects within three minutes to place a perfectly normal, un-doped slice of the diseased substance in position for examination.

The possibilities of this process, once it is perfected, he believes are boundless. Medical men who for all time have been destroying the very thing they were looking for, while they were getting ready to look for it, may in this one step find an end to much of human suffering.

This is Rife's great aim at present, and it has inspired much of the apparatus which he has needed, designed and built. He knows what he wants to get at, and when existing machinery will not get him there he builds himself something that will do the job.

LIFE OF HOOKWORM

Motion pictures have been taken of tiny objects before, and they have recorded on film the growth and budding of flowers. But Rife's photography of microbes, it is said, is head and shoulders above anything so far achieved in this line.

For example, Rife has a movie showing the life cycle of a hookworm. He began by placing an egg, almost extravagantly small, on an electrically heated diaphram under the microscope.

At the other end of the apparatus was a motion picture camera with a 21-jewel clockwork attachment. This will snap pictures as much as five hours between exposures, or click along at slow-motion speed, according to the nobility of the object being photographed.

Development of the egg was slow, so the exposures at first were widely spaced. At first a group of six nuclei were visible within the shell—magnified 11,000 diameters. Then, as the heat caused the egg to incubate, the nuclei merged into one and took on the shape of the worm.

At the proper time it broke the shell and squirmed from the egg. The apparatus was accelerated to catch the swift squirms of the growing animal and continued to record its evolutions, feeding and digestion until the film was complete.

The film probably never will be exhibited on any screen save at an international medical convention, or at private showings. Regardless of any money he might make, Rife restricts his inventions to "those who know how to make use of them."

SUMS UP METHOD

He feels that one of the reasons for his success at developing almost supernatural devices is his versatility. "If one man is a bacteriologist and knows what is needed and another is a mechanic who tries to build it, they may get somewhere, but they will do it slowly and imperfectly," he says.

"But if both these men are the same man he will know the set-up from both angles. Then, if you add delicacy, accuracy, mechanical skill, the willingness to keep proper records, engenuity and the patience to learn from failures, you will be well along toward solution of your problem and perfection of the necessary apparatus, whatever it is."

The patience stressed by Rife is no joke as he proved by describing one of his achievements in micro-photography. A minute object—so hopelessly invisible to the eye as to be practically nonexistent—is picked out from an organism under his micro-manipulator. The selection of the object is made by means of a mechanical finger, which is the half of a very fine human hair, split down the center and secured in a controlling device of incredible delicacy.

The shred of substance, which is tiny even in comparison with the split hair, is placed all by itself on a quartz slide, photographed—and magnified 10,000 times to a diameter of three inches.

And the picking out of this speck, in comparison with which the hairs on a gnat's wing are mountainous, takes about 18 hours!

His operations and structural experiments, performed on blood corpuscles or bacteria of any kind, are performed with this machine by the aid of an "operating chamber." This chamber is a drop of fluid, smeared on the UNDER side of a slip of quartz. Within this drop, which is more like a smear, is suspended the "patient," and with quartz pipettes and dissecting needles Rife can shake half the nucleus out of a corpuscle as pretty as you pease. Or he can stretch it, to test its resiliency. Or, as he has just done, he can extract microbes from it.

REMARKABLE INSTRUMENT

Rife's refractometer, though less intelligible to the layman, probably is just as remarkable. Its virtue is best shown by a comparison with manufactured types, which register a maximum of one arc ratio with a 65-degree rotation. Rife's device, which he invented because he happened to need it, handles seven different ratios with arcs of 90 dgrees each, in a 360-degree rotation.

Before he could work out his super-regenerative ray it was necessary for him to work out a method for changing the polarization of vacuum tubes at will. He can switch them from negative to positive, and then switch them back. That, again, is something that is not being done in New York, Munich, Vienna, or anywhere else, he says.

One revolutionary idea after another followed in the evolution of this apparatus. In its final form the juice runs all around the room through one gadget or another, and finally feeds through a platinum electrode in a quartz tube filled with helium gas. These are a few of the refinements that make it 17 times as penetrating as x-ray.

Minor details of his achievements are perhaps more astonishing than the achievements themselves, because they are more readily comprehended. A light for illuminating subjects on a slide, for instance, contains a 21-candlepower automobile headlight bulb. This little spark is built up, in a cylinder three inches long and two in girth, to a beam whose power is 2000 candlepower, cold light.

CULTURE APPARATUS

Another of his productions is the anerobic culture apparatus, with whose help a culture can be studied in vacuum or under pressure, with or without free oxygen, without disturbing the culture or troubling more than the twist of a couple of valves and the stroke of a piston. Effects of various conditions on cell structure may in this way be determined without difficulty.

An article of readable length can only scratch the surface of Rife's experiments and apparatus, even without going into those which can be comprehended only by a mind trained in bacteriology and kindred sciences.

Rife himself has been persuaded to contribute more specialized articles on various experiments, which, it is planned, will appear from time to time in The Union.