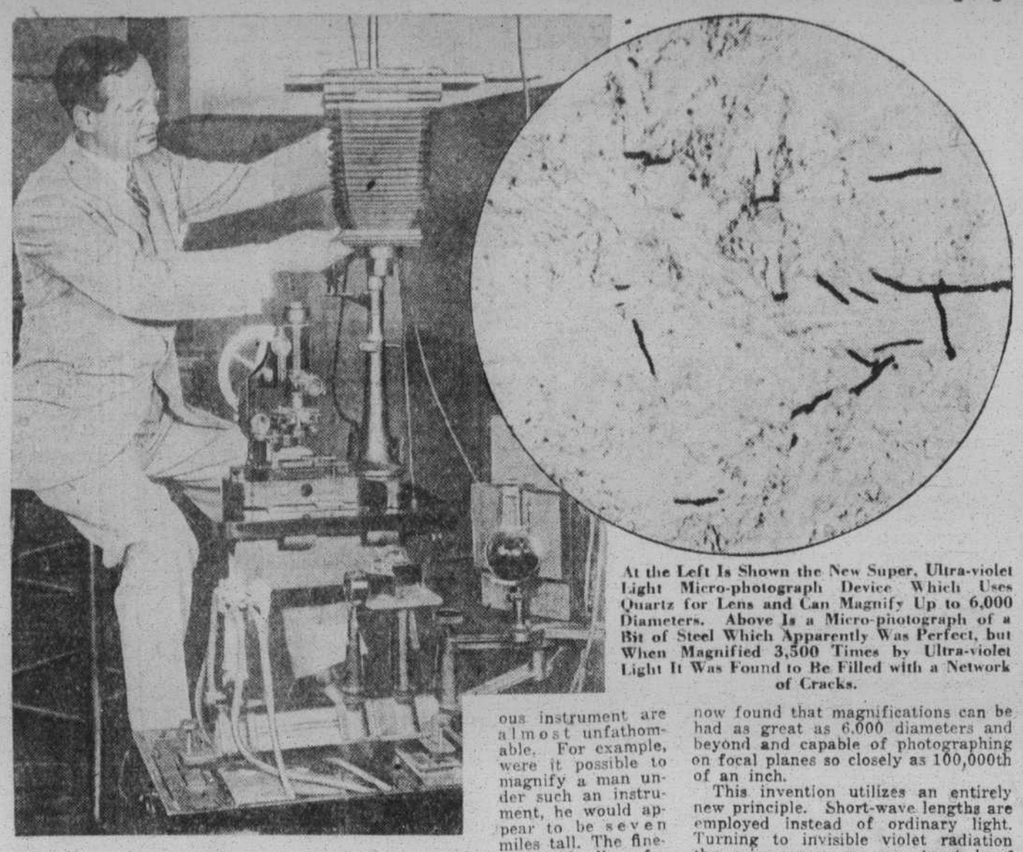
Latest Facts from Science, Mechanics and Invention

How a Man Is Made to Appear Seven Miles Tall

The New Super-Microscope, Using Invisible Ultra-Violet Light, May at Last Enable Scientists to Discover the Secrets of Living Cells.



At the Left Is Shown the New Super, Ultra-violet Light Micro-photograph Device Which Uses Quartz for Lens and Can Magnify Up to 6,000 Diameters. Above Is a Micro-photograph of a Bit of Steel Which Apparently Was Perfect, but When Magnified 3,500 Times by Ultra-violet Light It Was Found to Be Filled with a Network of Cracks.

CAN you imagine a man so high as to be 36,960 feet tall? His head surely would be above the clouds, for he would be exactly seven miles in height. Since the average height of American men is five feet and eight inches, then the seven-mile monster man would be 6,522 times taller. At least so he would appear when viewed under the new super-power ultra-violet microscope which recently has been perfected and may well be considered one of today's seven wonders.

The powers and uses of this marvelous instrument are almost unfathomable. For example, were it possible to magnify a man under such an instrument, he would appear to be seven miles tall. The fineness of adjustment would allow for 1,500 cross sections to be photographed from his head to his foot.

But while this enormous magnifying power could and will be used in biological studies, its most likely use will be in the field of mechanics. Photo-microscopes of metals are being made with it that will give a new insight into the formation of metals, of alloys, of strength and of weaknesses.

Carl Zeiss, of Germany, has long been experimenting with a combination of high-powered lenses and ultra-violet light, seeking to unravel the secrets of the infinitely small. He has now found that magnifications can be had as great as 6,000 diameters and beyond and capable of photographing on focal planes so closely as 100,000th of an inch.

This invention utilizes an entirely new principle. Short-wave lengths are employed instead of ordinary light. Turning to invisible violet radiation the microscope was constructed of quartz instead of glass. This has meant absolute accuracy in the grinding, for it is necessary that there shall be no distortion for even the limited light range. The instrument operates about as follows:

First, the object to be studied is brought into approximate focus by means of a "searcher eyepiece." This is a bit of fluorescent glass upon which the invisible light gives a visible image. Very fine accuracy of adjustment is necessary in the mechanical parts.

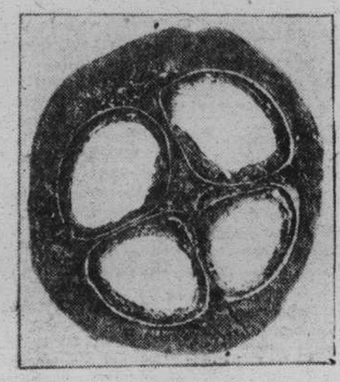
After the focus is obtained the searcher eyepiece is removed and the camera arrangement is put in its place and several photographs taken by means of ultra-violet light.

The practical uses are enormous. Ultra-violet super photo-microscopes will tell much more about the strength and construction of metals. It is expected to tell why metals grow "fatigued," or brittle and break. The secrets of crystallization will be better known. One most important discovery has already been made. In heating metals for the purpose of hardening them minute cracks develop. These cracks have been so small that ordinary microscopes have not revealed them. Using ultra-violet light and enormous magnifying power, they are now made visible and can be studied.

In the value of actual saving this initial discovery will be enormous both in money and in terms of human safety.

In the field of biology the microscope opens new worlds. Attempts are now being made to study the smallest living units—single cells. By means of such super-microscopes each layer of the single cell can be photographed and then studied. A sufficient number of pictures can be made which will enable the scientist to learn the working of the cell and its construction. There are scientists who believe that a cross-section study of this kind may reveal the secret of life and why and how the cells move and have their being.

The Upper Illustration Shows a Tung Nut from Which Oil Used in Making Varnish Is Extracted. Below Is a Cross-Section View of the Kernel of a Tung Nut, Each of the Three to Eight Seeds of Which Average 21 Per Cent of Their Weight in Oil.



Rings in Eggs

SINCE there are dozens of facts about eggs which are not generally understood, an explanation of a few of the most puzzling ones will probably be welcomed.

What is the dark ring which sometimes forms around a hard-cooked egg yolk? How can it be prevented? This ring, as Marion Baily King explains in the Forecast, is caused by the uniting of the iron in the yolk with the sulphur in the white, to form an iron salt. This salt is not harmful, although unattractive in appearance. It can be prevented by cooking the egg at a low or moderate temperature, as the union of the two egg minerals only takes place at high temperature, or under long continued heat. Plunging the egg into cold water, when cooked, also helps to prevent such a ring.

Why, when hard-cooked eggs are shelled, does the white separate easily into layers, especially if some of the white clings to the shell? Because the egg yolk, as it passed down the egg canal of the hen, revolves and causes the white to be deposited on the yolk in layers, as it turns.

Are deep-yellow egg yolks richer in nutrients than lemon-colored ones? This has yet to be proved. It is known that the more green food a hen eats the deeper the yellow of the yolk.

The Making of Tung Oil

A STUDY of the results of selective planting in connection with Florida's newest industry—the production of tung oil—has shown some most interesting facts. Of trees grown from selected seeds in some instances 90 per cent have run true to the type of the parent tree, while successive selective plantings under cultivation have shown improvement in type and increased yield.

Of the trees planted experimentally 18 years ago, without selection as to seed, five have shown a yearly average per tree over a ten-year period of one and a half gallons of oil, or 38.6 pounds of shelled nuts, while the other five gave an average yearly yield of 12.8 pounds, or less than half a gallon of oil per tree.

Plantings at varying distances apart have shown that with selected seed groves can be made to produce oil at the rate of 1,200 pounds per acre per year, and taking the average of the price range for tung oil for the last ten years, this shows average gross income yearly of about $180 an acre.

In that section of Florida where the soil favors growth of tung oil trees, cost of production is very small, and the same acreage yields a secondary profit as grazing ground for horses, sheep or cattle. Planted with crotalaria the groves are partially fertilized, and conditions for gathering the tung oil nuts are improved by the grazing, which makes it easier to find and gather the crop after the nuts fall to the ground.

Experiments have proceeded far enough to demonstrate that tung oil, formerly procurable only from China, and used in the finest grades of paint and varnish, can be developed into a source of great additional wealth in large areas in Florida where soil conditions are suitable for the growth of the tung oil tree. Tests have proved that the dry nuts with efficient pressing methods yield from 20 to 22 per cent of their weight in oil, while the residue left after pressing the nuts has a by-product value.

Breaking Up a Glacier With a Ship's Whistle

TONAL bombs in the form of blasts from the powerful whistles are to be thrown by steamships at the face of Taku Glacier this Summer and icebergs, loosened by the resulting vibrations are expected to break off from the famous mass of ice and tumble into the sea.

Members of the technical staff of a Pacific steamship company announce that they have found the exact whistle tone that will loosen the icebergs. This has been done in the past after numerous attempts, but more by accident than anything else. But now Mr. J. D. Gilmour of Seattle, the steamship company's port engineer, states that he has found the correct pitch for a steamship's whistle that will cause an iceberg to break up.

Mr. Gilmour discovered that one liner in particular has been able to tear down more ice than any other ship. Its whistle seemed to possess the correct tonal bomb pitch that set up similar vibrations in the face of the glacier, jarring loose masses of ice. This pitch is, according to Mr. Gilmour, one that corresponds to the middle range of the keyboard of a piano.

Now whistles on all Alaska-bound ships of this steamship line are being tuned to this successful pitch.

In experimenting with the vast power locked up in vibrations scientists have found that if a musical note of the correct pitch can be found to set up similar vibrations in the steel skeleton of a great skyscraper or a steel bridge, such structures can be destroyed by being shaken to pieces.

Steamship Whistles, as Tonal Bombs, Are Now Pitched to Set Up Corresponding Vibrations in a Glacier and Thus Break Off Great Masses of Ice.

Making Electricity from Wind

A FAMILIAR old adage says that "it is an ill wind that blows nobody good." Now science goes wisdom one better and even puts idle winds to work.

The first step in this direction recently was taken by the constructor of the Koenigswusterhausen radio tower power works in Germany toward providing that entire country with cheap electrical current.

Sixty towers of the kind shown in the accompanying illustration, each nearly 900 feet high and weighing about four million pounds and surmounted by giant wind wheels, are to be erected in various parts of Germany and equipped to develop electrical power. The wheels are to work as generators and deliver current of high power in the so-called "storm position."

Hermann Honnef, a German electrical engineer, also proposes to erect a tower 1,300 feet high, on the top of which it is planned to install giant windmills capable of producing about 700 million kilowatt hours annually. The current is to be used to supply heat to hot houses in the vicinity.

Giant Wind Wheels Mounted on Steel Towers Nearly 900 Feet High and Designed to Work as Generators for Developing Cheap Electrical Power.

Floating Bricks Made of Clay

CLAY bricks light enough to float and yet strong enough to support their weight if built into a tower 6,250 feet high, which is five times the height of the Empire State Building in New York City, recently were demonstrated by Dr. Charles Burgess.

These floating bricks are only one-fifth the weight of an ordinary brick, of high heat-insulating quality, porous, yet resistant to the entrance of water, and of a crushing strength sufficient to support their weight if built into a tower nearly one and one-fifth miles high.

It has been found that it takes a bricklayer sixty-five seconds to lay one brick. This led to an effort to reduce the high cost of building by lightening the brick. It was figured out by Howard F. Weiss, a New York expert, that under prevailing rates, it costs four times as much for the labor of laying a brick in place as it does to manufacture it.

Mr. Weiss then suggested the making of a new brick so that a bricklayer will be enabled to lay two bricks with the same amount of physical effort he now uses in laying one.

This, in fact, now appears to have been made possible by the floating brick which Dr. Burgess demonstrated, although the process is still in the development stages and the technical practice has not been perfected.

Why Your Tears Are Salty

SALTY tears, according to a theory advanced by Dr. Laurence D. Redway, of Ossining, N. Y., are evidence of man's marine existence in prehistoric times.

Before the American Association of Anthropologist, meeting recently at the National Museum in Washington, Dr. Redway told how human tears and even the human eye can be traced back to the days "when you were a fish and I was a tadpole," as it were. This, of course, is based on the theory that all life arose out of the primeval ocean.

Man's eyes, Dr. Redway contends, have never reached complete independence of the sea. Therefore, he claims, the body has been forced to manufacture its own supply of sea water, in the form of tears, since it became adjusted to a land environment.

An Electrical Machine for Manicuring

MARCHING ceaselessly onward the great machine age now has invaded another field and henceforth that personal touch the attractive manicurist used to impart to her work may soon be a thing of the past. Those nimble and expert fingers that formerly put that high polish on dull fingernails is about to be replaced by such an impersonal thing as a machine.

Inventive genius has just perfected an electrical manicuring machine which, it is claimed, can do in the most efficient manner everything the skilled human manicurist can do in making one's fingernails objects of glistening beauty. By means of its various attachments this new electrical device shapes, buffs, removes cuticle and finishes off the nails in the most efficient and sanitary manner in just about half the time it takes the present manicurist, no matter how skilled and fast a worker she may be.

The Electrical Manicuring Machine Which, It Is Claimed, With Its Various Attachments, Can Shape, Buff, Remove Cuticle and Finish Off the Fingernails in Half the Time It Takes a Manicurist.