

# The Bee's Home Magazine Page

## Bringing Up Father

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## Drawn for The Bee by George McManus



## In Nature's Maze

By EDGAR LUCIEN LARKIN.

To secure some absolutely pure distilled and redistilled chemically, and therefore optically, pure water—quite a difficult task—and get two carbon or metallic terminals to insert in an electric current of sufficient pressure and amperage to form an electric arc under water.

Place the terminals after they have been sterilized, made pure absolutely, under the water in a sterilized glass vessel and switch on the current of electricity. Separate the ends of the terminals as in an arc lamp to a distance such that an electric arc will play between them and put a particle of chemically pure metal in the arc or crater or employ ends of rods or terminals of the metal themselves. When the electric heat is of sufficient intensity the metal will be torn apart and separated into inconceivably minute particles, so small that the turn-off quantity may be called a vapor of the metal. But at once the pure water holds these myriads of particles in solution, not mere mechanical suspension.

Next procure a first class new type of ultra-violet-energy-ray microscope. Discard the old-fashioned flat glass plates to hold objects under the lenses, and substitute the new ingenious glass cell for rectangular, or reflection microscopy, instead of transmitted or perpendicular ray manipulation. Clean the cell and bear in mind that the word clean here has a world of meaning. Take the complex into a clean room, an optical laboratory whose air is free from dust. Oiled floors and walls must be the order and the air of the room freed from harassing dust by allowing it to enter by bubbling through a solution of glycerine in water.

When the cell is known to be clean put a drop of the water-vaporized metal therein, arrange it in the path of the rays of light from the sun sent in from a heliostat outside, direct from the sun and horizontally. Place cell under the lenses and look into the eyepiece.

A new kind of universe will be on display; metallic particles so small that it had not been before thought possible to bring within range of human sight will be seen. But all wonders are as nothing when compared to the incessant motions of the flying particles. Rest is unknown, the particles of each different metal move with their own set, specific speed and to fixed distances.

Put on a micrometer eyepiece and try to measure the velocities and distances; failure is sure, the millions cannot be separated by any magnifying power, nor can one particle be isolated and measured.

Now dilute the drop of charged water in the cell as do the good homeopaths, dilution of the dilution to the most remarkable potencies. Watch with the micrometer, measure the diameters of the particles and distances moved over in a given time and record all findings in a table. Then become disgusted with discrepancies after repeated trials and throw

the tables into the fire as useless. The variations in the measures are too great to publish as scientific.

Secure kinetograph, a moving picture, rapid, instantaneous micro-photographic camera of great sensitiveness. Attach it to the microscope, cut off all troublesome nonphotographic waves in the sunlight, admit the short-rapid ultra-violet and begin renewed research. Now all is changed; the changing scene evanescent on the retina is fixed on the rapid silver-bromid films. The secret is solved; nature is caught all unawares; she cannot lift a finger without being photographed. Watch a rapid particle of gold, platinum, silver, titanium, etc., and then photograph it at a rate of, say thirty-six times per second. Then the development films can be measured with an ordinary microscope at leisure with the astonishing result that the distances traversed in the thirty-sixth part of a second can be measured with the extreme accuracy of modern measurement. For since man came on earth no device has yet been made that surpasses this combination of ultra-ultra-violet-energy-wave microscope, and the mighty science of rapid photography of flying particles.

The literature of this new science is now enormous and is attracting the attention of scientific men everywhere. Often have I published articles on these mysterious Brownian motions, but now the entire science is quintupled in its magnificence. Set a solution aside during a year, carefully take out a drop, place in a cell, look, behold, the perpetual motion is still there in intense activity. Divide any substance known into particles small enough not to settle and the solution will always reveal the most wonderful motion. Dig into a mountain, take out a geode, break its walls of quartz, secure the inclosed liquid, if there is any; place a drop in the cell, behold, the ancient motion is still on.

But the geode may be anywhere from 10,000,000 to 100,000,000 years of age. Recent results are that colloid solutions of electrically prepared gold particles contain flying bodies of pure gold whose diameters range from twenty to eighty microns parts of an inch. And their average paths traveled before turning aside at an acute angle in zigzag motion are around and about the one-sixth thousandth part of an inch. The entire problem of kinetic energy of matter now seems to be in a fair way toward experimental solution.

A greater eye than the microscope, however, has already peered into these deep profound—the all-seeing eye—the calculus. The flying particles of electrically blown silver and platinum do not differ greatly from those of gold in diameter, frequency and specific speed. Beyond all doubt the cause of the Brownian motion is kinetic energy, the force that makes all matter move incessantly from electrons up, and up to molecules.

## Advice to the Lovelorn

By BEATRICE FAIRFAX

Dear Next Dispute End It.  
Let Miss Fairfax, I am 20 and am very much in love with a young lady of 18. We have been engaged for nearly one year. She and I both have a very high temper and are very impatient. She causes us to disagree and fuss and burst up for a short time only. Now, I think the world and all of this young lady, and sometimes try to give her advice in the right direction, as I think, because she is young and has never had the experience of love. For the love I have for her I have stuck to her through all anger and tears.

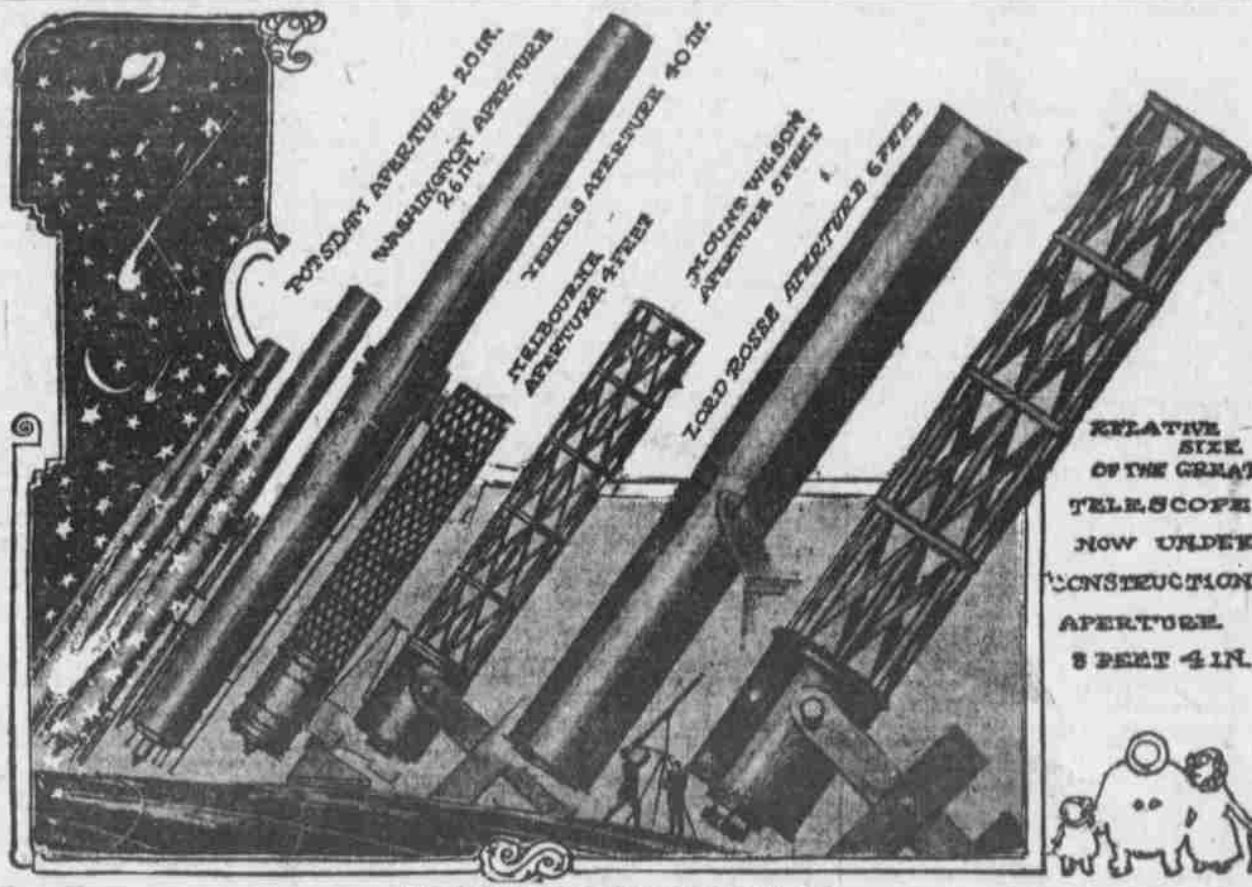
Now our engagement has been put off the second time, once on account of (I think) this girl being the main support of her family, and her mother persuaded her out of the notion, telling her to put it off a while longer; and then, when we had a little disagreement a few weeks ago, I quietly left her, but did not tell her that I would not be back, thinking that perhaps she would let me hear from her, and in the wind-up get married on the phone; but, on account of her independence, she failed to call me. Finally, her conscience made her speak to me, so she called me over the phone and told me she was in the wrong and wanted us to try it once more, which, of course, I gladly accepted and went back. Would you go on with the young lady and continue my love and affection for her, and in the wind-up get married on the day she wishes, after she has already been the cause of two broken engagements? TROUBLED.

Your very mature way of questioning the girl's good sense is amusing. You say she is 18 and too young to know better; and you are only 20!

Moreover, I don't like your complacency. You are too quick to think she is in the wrong.

For her sake, let the next dispute be the last. I am sure she can do better.

## The World's Mightiest Telescope That Is to Stand on Top of Mount Wilson, and Others



The Great Telescopes of the World.

By GARRETT P. SERVINS.

The gigantic telescope that the Carnegie Solar Observatory is to possess on the summit of Mount Wilson in California will be by far the most powerful instrument of observation that man has ever turned upon the heavens. It will be even a greater advance in its line than the mighty Imperator is among steamships.

A year or two ago it looked as if it might prove impossible to construct this immense instrument, because the disk of glass, made in France, to be shaped into a concave mirror at Pasadena, exhibited bubbles and imperfections which, it was feared, would interfere with its usefulness. But further examination indicates that the difficulties may be avoided and the work of grinding and polishing is going forward.

This telescope will have a clear "aperture" of 100 inches, or eight feet four inches. By aperture is meant the diameter of the round glass as it is exposed to the stars.

There are two kinds of telescopes—"reflectors," which have a concave parabolic mirror to catch the rays of light and bring them to a focus, and "refractors," which possess, instead of a reflector, a compound lens, called the "object-glass," which brings the rays of light to a focus on the side away from the object under examination. In using a reflector the observer, so to speak, turns his back upon the heavens, while with the refractor he looks directly through the telescope toward the object in the sky. In both cases what he really sees is an image of the object formed by the rays of light in the focus, and the magnifies the image with a kind of microscope, called the "eye-piece."

The new giant, as already indicated, is to be a reflector. Both kinds of telescope have their peculiar advantages, but the reflector is superior in astronomical photography.

In the picture accompanying this article you will find a graphic representation of six of the greatest telescopes now in existence, compared in size with the new telescope for Carnegie Solar Observatory.

Three of the telescopes shown, with their names and apertures attached, are refractors, as is indicated by their long metallic tubes. They carry their object-glasses at the upper end of the tube.

The fourth and largest closed tube is that of the great Lord Rosse telescope in Ireland, which was made in the middle of the nineteenth century, and was long the wonder of the astronomical world. It, however, is not a reflector, but a reflector, the maker having chosen to give

it a closed tube, which has now been found to be unnecessary.

Two of the others for three, including the unfinished giant) have openwork tubes. These are all reflectors.

Now, in order that the reader may get an idea of the relative power implied by the different apertures shown, it is necessary to say that that is measured by the amount of light that the lens or the mirror "grasps." This would appear from a mere inspection of the comparative sizes. It depends upon the square of the aperture. Thus, it will be seen that the new telescope is 100 inches in aperture, while the Rosse telescope, the next in size, has an aperture of seventy-two inches. But to measure the real superiority of the new instrument we must compare the squares of these numbers. The square of 100 is 10,000, and that of seventy-two is only 5,184. So we see that the one is very nearly double the other.

But this does not tell the whole story. The Rosse telescope has a very imperfect mirror, made of an special material called speculum metal, which is far inferior for the purpose to glass covered with a reflecting film. On this account the effective superiority of the new instrument will be much greater than a comparison of the squares of the respective apertures indicates.

The new giant will, on the same principle, be six and a quarter times more powerful than the great Yerkes telescope, the largest refractor now in existence, and about two and three-quarter times more powerful than the five-foot reflector already in action on Mount Wilson.

One naturally wonders what this telescopic monster will reveal in the heavens. I observe that it has been said that it will show "objects of the size of a man" on the moon. But this statement must be taken with a grain of allowance. If it were not for atmospheric difficulties, which we know at present no means of avoiding, a 100-inch telescope might bear a magnifying power of 10,000 diameters, which would bring the moon within an apparent distance of only a little more than twenty miles when it is actually nearest to the earth. In fact, however, it is doubtful if such a power will ever be employed, and if employed it would not give a distinct image.

But the immense amount of light gathered by the great mirror will make much lower magnifying powers far more effective than hitherto, and most interesting discoveries may confidently be expected from this cause. Its principal use, however, will be in photographing, on an unprecedented scale, the great nebulous clouds and streams and clusters of stars that abound in the universe, and here its superiority will be so commanding that the man will almost seem to have provided himself with a new and marvelous eye for surveying the illimitable wonders of space.

## The Constitution and the Guerriere

By REV. THOMAS B. GREGORY

It was 101 years ago—July 12, 1812—that the Constitution sailed out of Boston harbor to begin the immortal fight for "Free Trade and Sailors' Rights."

It was in the Bay of Fundy, down in the Land of Evangeline, that it began its actual work by capturing several British vessels bound for Quebec and Montreal, and on July 12 it had its famous encounter with the Guerriere off the Grand Banks of Newfoundland. The Constitution put its shot so effectively that inside of half an hour the Guerriere was a helpless wreck.

Captain Hull sent an officer to ask if the Guerriere had surrendered. "I do not know as it would be prudent to continue the engagement any longer," replied Captain Decres. "Do I understand you to say that you have struck?" asked the American. "Not precisely, but I don't think that it will be worth while

to fight any longer." "If you cannot decide I will return and we will resume the engagement," replied the Yankee. "Why, I am pretty much here de combat already," said Decres. "I have hardly my left to work a gun, and my ship is in a sinking condition." "I wish to know, sir," demanded the American, "whether we are to consider you a prisoner of war or an enemy. I have no time for further parley." "I believe there is no alternative," answered Decres. "If I could fight longer, I would do it with pleasure. I must surrender myself a prisoner of war."

The Constitution's next fight was with the Java, off the coast of Brazil, in December, 1812. The Java was pounded into pulp, and after its crew was taken aboard the victor the wreck was blown up.

Upon returning with the news of its victory, the Constitution was christened "Old Ironsides," the name by which it has ever since been proudly remembered. After repairs, Old Ironsides sailed for the Barbadoes, where it made several captures, and on February 15, 1815, off Cape St. Vincent, it met two British vessels, the Cayne and Levant, and made prizes of them both. It was the gallant ship's last engagement, as peace had already been concluded.

## The Discontented Girls

By ELLA WHEELER WILCOX (Copyright, 1913, by American Journal-Examiner.)

Do you know what a wonderfully complicated thing a human being is? Every feature, every portion of your body, every motion you make, reflects your mental organization.

I know a woman past middle life who has always been on the opposite side of every question discussed in her presence.

She was agnostic with the orthodox, reverential with the liberal, liberal with the narrow, bigoted with the liberal.

Whatever belief anyone expressed on any subject, she invariably took the other extreme. She loved to disagree with her fellow men. It was her pastime.

Now, to walk with that woman in silence is merely to carry on a wordless argument.

You cannot regulate your steps so they will harmonize with hers. She will be just ahead or just behind you, and if you want to turn to the left, she pulls to the right. A promenade with her is more exhausting than a day's labor. She is not conscious of it, and would think anyone very unreasonable and unjust who told her of her peculiarities.

I know a woman who all her life has been looking afar for happiness and peace and content, and has never found any of them, because she did not look into her own soul.

She was a restless girl, and she married, believing in domestic life lay the goal of her dreams. But she was not happy there and sighed for freedom. She wanted to move, and did move, once, twice, three, to different points of the United States. She was discontented with each change. She is today possessed of all comforts and luxuries which life can afford, yet she is the same restless soul. She likes to read, but it is always the book which she does not possess which she craves. If she is in the library with shelves book-filled she goes into the garret and hunts in old boxes for a book or a paper which has been cast aside. If she is in a picture gallery she wants to go to the window and look out on the street, but when she is on the street it bores her and she longs to go in the house.

If a member of the family is absent she gets no enjoyment out of the society of those at home, yet when that absent one returns her mind strays elsewhere, seeking some imagined happiness not found here.

I wonder if such souls ever find it, even in the spirit realm, or if they go on there seeking, and always seeking something just beyond. It is a great gift to learn to enjoy the present—to get all there is out of it, and to think of today as a piece of eternity. Begin now to teach yourself this great art: if you have not thought of it before. To be able to enjoy heaven one must learn first to enjoy earth.

## How to Be Interesting

By BEATRICE FAIRFAX

"I met a girl about four months ago," writes Harry, "and since that time we have kept company and I love her very much and I think she loves me, too. We always spend our time together. Some time ago she told me that from the day we first became acquainted I have never told her anything that would interest her. We talk of incidents of the day, and I try to tell her of all I hear downtown. Will you please tell me what more I can tell to obtain her interest?"

"Certainly, I will be glad to. I wish every young man in the world would come to me with a similar request."

You told her of the fire next door; you recounted the accident an acquaintance had with his motor boat; you recalled incidents when you were in danger on the water; you asked her what she thought of the latest murder; you wondered if she thought as you do about a certain magazine; you told her everything you could recall, from what the office boy said to the latest congressional scandal, and she wasn't interested!

Of course not. She might be, if you began this tale of a day's events with a statement you have never made. "She might be, if at any time in the months you have been keeping company with her you had ever made that statement."

And that is, "I love you."

Tell her that, and I am sure you will "obtain her interest." Tell her that you love her, and I will vouch for it that you will find yourself talking to the most interested listener you ever had in your life, whether that life be long or short.

Tell her you love her, and while she hears she will not know there are others on the planet besides you two. Tell her that, and you are telling her something that will win her interest in you for the balance of your life.

If you were a woman, you would have known long ago why she has looked bored when you have speculated in worms or bugs make the best fishing bait. It was because she did not know that you had an interest in her greater than in your subject.

Tell her you love her, and thereafter, so long as you so conduct yourself that she believes it, your conversation will be bright and stimulating as though it were made up of stars strung on moonbeams.

Tell her you love her, and prove it; and so long as love remains, the most commonplace remark you make will be received with an interest that will glorify it and give it rank (in her opinion) among the sayings of wit and wisdom that live forever.

And her opinion, my dear Harry, is the opinion of all the world to you if you love her.

## Mother's Friend in Every Home

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