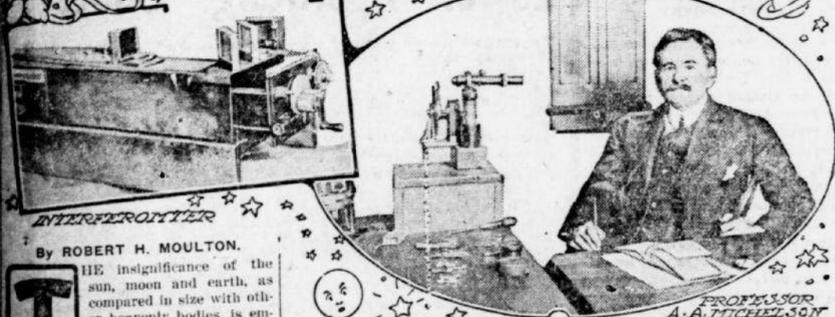


Our Earth a Speck in the Universe



By ROBERT H. MOULTON.

THE insignificance of the sun, moon and earth, as compared in size with other heavenly bodies, is emphasized with startling clearness by the latest invention of Prof. A. A. Michelson, the eminent physicist of the University of Chicago.

The human race, which for thousands of years fondly believed their little solar system to be the center of the physical universe, but later unwillingly revised that opinion, can now be assured that neither the earth nor the flaming sun itself is even visible from great stars which scientists are measuring, and which are proving to be prodigious size.

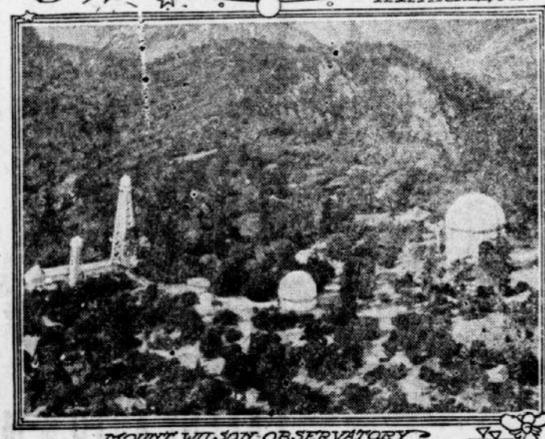
Experts, working under Professor Michelson's direction, have just computed the diameter of Alpha Orionis, a star in the constellation of Orion, which, except among astronomers, is usually called Betelgeuse. Using the new invention, they found that Alpha Orionis, or Betelgeuse, is 300,000,000 miles in diameter, a diameter 300 times as large as that of the sun. And since the mass of the sun is about 332,000 times greater than that of the earth, the relative sizes of Alpha Orionis and earth can be seen easily.

Figures like these are hardly to be grasped by the mind until they have been put into everyday terms. The diameter given means that Alpha has a circumference of more than 900,000,000 miles. A railroad train traveling without a stop at the rate of 60 miles an hour would require 15,000,000 hours, or 625,000 days, or 17 1/2 years, just to go completely round the star. And computing the life of a generation at 25 years, it would be the fifty-second generation of the original passengers of the train who would see the end of the journey. To be completing the trip now, ancestors of the present passengers would have had to start upon their journey in the year 200 A. D. Light, which travels at the rate of 186,000 miles a second, would require 6,850 seconds, or 80 1/2 minutes, just to flash around the staggering bulk of Alpha Orionis.

Earth Very Small.
The planet Mars, that familiar red point in the sky, maintains an average distance of 141,000,000 miles from the sun, which means that the entire orbit of this planet as it goes hurtling through space is smaller than the diameter of Alpha Orionis. The Mariner year is 687 days, but even the terrific speed of Mars would not enable it to encircle Alpha within that period.

Compared with the monster stars measured by means of Professor Michelson's invention at the Mount Wilson observatory in California, the sun is about the size of a midge. Certain remote stars are proving to be much vaster than previously supposed. Unless the results of the new mode of measurement are successfully challenged, the astronomers will have to revise many of their calculations in regard to the universe of stars. The perfection of Professor Michelson's method for ascertaining the exact dimensions of stellar bodies was announced at a session of the American Association for the Advancement of Science, held in Chicago recently. It has been described as an event of stupendous importance in scientific progress.

The method also has been applied by a member of the staff at Mount Wilson observatory in measuring the star Capella, which has been known from spectroscopic evidence to be the really a double star, although the stars are so near each other that they appear as one, even through the most powerful telescopes. By using Professor Michelson's attachment on the eight-foot telescope at the observatory, it was found possible to measure the minute angle, only .045 of a second, subtended by the two stars and to determine their successive positions as they revolved in their orbits. Put in the language of the market place, it was like measuring the head of a pin more than 1,000 miles away.



adjustable in width and distance apart. When the telescope is focused on a star, instead of the star's image appearing on the mirror there appears a series of interference bands, arranged at equal distances apart and parallel to the two slits. With the slits properly adjusted, a distance between them is finally attained at which the fringes disappear. A simple formula then gives the angle of the subtended star, and when this angle and the distance of the star from the earth are known, its diameter can easily be figured.

Alpha is a star of the first magnitude, but from Alpha, say the astronomers, our earth and our sun must be quite invisible. If Alpha were as close to the earth as the sun is, its brilliant surface would fill out the whole visible heavens.

Scientists point out that the new method of measurement must necessarily be based upon the splitting up of light for the ray of light which we get from a fixed star is all we have to deal with, as in the case of Venus and other planets. In the case of a star the most powerful telescope shows only a point of light without magnitude; to measure the breadth of this lustrous beam was the task undertaken by Professor Michelson. The accuracy of the new method is such that it will measure to a 1-10,000th part of a second of arc, which means an accuracy of 400,000,000,485.

Professor Michelson is one of the foremost scientists in the world. In 1907 he was awarded the Nobel prize for physics and is the only American who ever achieved that honor. While Professor Michelson has made numerous scientific discoveries of the highest importance, his special work has been the study of light. Accurate determination of the velocity of light is considered of such importance in physics that scientists have been working on it for centuries. The first determination was made by a Dane in 1676; he fixed it at 192,000 miles a second. Professor Michelson's method, which was the first achievement to bring his name to the attention of the scientific world, determined the velocity of light at 186,330 miles a second.

The "Interferometer."
In order to solve the problem of the earth's rigidity, Professor Michelson invented a marvelous instrument, which he called the "interferometer." This instrument is 50 times more powerful than an absolutely perfect microscope would be. The microscope's power is limited by the length of a light wave; and the smallest distance it can reveal is one-half a wave length, or one one-hundred-thousandth of an inch. By utilizing the properties of light in another manner, the interferometer can reveal a distance equal to the one-five-millionth of an inch. It is the principle of the interference method which Professor Michelson has applied in measuring the size of stellar bodies.

It was Professor Michelson's discoveries that led to the formulation of the

seemed to swelter in the sun, and the villa walls to burn whiter and whiter. It was the end of May, and nearly everybody but the Florentines had gone out of Florence, dispersing to Villa Reggia by the sea, to the hills of Pistoja, and to the high, cool air of Siena.—William D. Howells.

Eighty-mile Precipice.
A member of the British expedition that explored Dutch New Guinea describes what may be the greatest unbroken precipice in the world. It runs,

he says, for a distance of 80 miles from Mount Carstanz westward to the Charles Louis mountains. Its greatest sheer height is at Mount Leonard Darwin. The explorers were never in position to measure with the theodolite a sheer height of this immense precipice exceeding 6,500 feet, but from many views obtained of it while he was climbing, Captain Rawling has no hesitation in stating that the greatest perpendicular height is not less than 10,500 feet, or almost exactly two miles.

is specially applied is very extraordinary. With what resembles two slender legs and a fall-like trunk upraised from its head, the flower startles the beholder with its resemblance to some fantastic and monstrous insect. The resemblances of these flowers to animals are so exact that even birds are sometimes deceived by them.

FLORAL CHIMERAS.

There are orchids of the tropics which exceed in strangeness of form and splendor of color anything produced in conservatories. Among the most remarkable of these plants are those belonging to the genus Masdevallia. One species closely imitates the trunk of an elephant, and is named accordingly Masdevallia elephanticeps. Another looks like a flying pigeon. The species to which the name "chimeras"

Daily Thought.
Nature fits all her children with something to do.—Lowell.

IMPROVED UNIFORM INTERNATIONAL Sunday School Lesson

By REV. P. B. FITZWATER, D. D., Teacher of English Bible in the Moody Bible Institute of Chicago. (©, 1921, Western Newspaper Union.)

LESSON FOR JULY 31 SAUL TEACHING AT ANTIOCH.

LESSON TEXT—Acts 11:19-20. **GOLDEN TEXT**—A whole year they assembled themselves with the church, and taught much people.—Acts 11:25. **REFERENCE MATERIAL**—Acts 6:42; 1 Tim. 2:27; II Tim. 2:2. **PRIMARY TOPIC**—Carrying Help to Jerusalem. **JUNIOR TOPIC**—Saul Helping Others in the Christian Life. **INTERMEDIATE AND SENIOR TOPIC**—Entering Upon a New Career. **YOUNG PEOPLE AND ADULT TOPIC**—A Year's Teaching in Antioch.

When God was about to launch the missionary enterprise among the Gentiles, He arranged for a new religious center. Antioch was admirably adapted for such a center. The upper classes were Greeks and used the Greek language. The government officials were Romans and used the Latin tongue. While the masses were Syrians, sprinkled among them were Jews who had come for commercial purposes; also travellers from all parts of the world were in evidence.

I. A Religious Awakening at Antioch (vv. 19-21).
1. The occasion (v. 19a). The persecution at Jerusalem scattered the disciples abroad. This God permitted in order to separate them from the home people at Jerusalem.

2. The preachers (v. 19a). They were ordinary men and women, not officials, but they were filled with the yearning desire for lost souls and witnessed of the Lord Jesus in the power of the Holy Ghost.
3. What they preached (vv. 19b, 20). They preached the "Word" and the "Lord Jesus." All who preach the Word will preach the Lord Jesus; for He is its center. The real reason why there are not conversions today is the failure of ministers to preach the Word.

4. To whom they preached (vv. 19, 20). (1) Some of these disciples who were scattered because of persecution went among the Jews only with the gospel message. They had not yet come to see that the gospel purpose was wider than the Jews. (2) Some preached to the Greeks also. These were from Africa and Cyprus. They were further removed from the Jewish center, and therefore were a little more liberal. The success of their preaching was so great that the news of it reached Jerusalem, the mother church.

II. Barnabas Sent to Inspect the Work at Antioch (vv. 22-24).
This was a wise selection.

1. The character of Barnabas (v. 24). He was a good man. It is highly important in sending a man to follow up a work of the Spirit that his character be good. He not only must be of an unblemished character, but his sympathies must be broad. He must be capable of entering into full appreciation of the things about him. Much mischief often results from sending injudicious men to look after the Lord's work. He was full of the Holy Spirit. This is an essential qualification for pastoral work. Only a Spirit-filled man can appreciate the workings of the Spirit of God. He was also a man of great faith.
2. Work done by Barnabas (v. 23). He gladly endorsed the work and earnestly exhorted them to steadfastly continue in the faith, clinging unto the Lord. There are many allurements to tempt young Christians. The rejoicing of Barnabas shows that he was a man who could rejoice in the work of others. He did more than inspect the work; for many people were added unto the Lord. Doubtless he preached.

III. Barnabas Brings Saul (vv. 25, 26).
The work grew to such an extent that help was needed. Barnabas had the good judgment to seek Saul for this important work. Barnabas knew that the bringing of Saul would mean his taking a secondary place. It is the duty of Christian leaders to seek out men who are qualified for the Lord's work and bring them from their places of obscurity, setting them to work in the Lord's vineyard. There are many men in obscurity which it requires a Barnabas to bring forth.

IV. The Disciples First Called Christians (v. 26b).
They were not called Christians in derision, as is so often asserted. It was a consequence of Saul and Barnabas teaching there for a year that they were called Christians. The name was a consequence of the teaching. In all Saul's teaching he showed the unique relation which the Christian sustains to Christ. Since the body closely resembles its head, Christ, they were called Christians.

V. The Church at Antioch Sends Relief to Jerusalem (vv. 27-30).
The Holy Spirit through Agabus made known a great dearth throughout the world. This came to pass in the days of Claudius Cesar. Every man according to his ability determined to send relief unto the brethren which dwelt in Judaea. They made up money for the poor saints at Jerusalem and sent it by the hands of Barnabas and Saul. This act not only proved the genuineness of the work at Antioch, but it emphasized the fact that there is no division between Jew and Gentile.

The Stone the Builder Rejected.
Ye also are lively stones acceptable to God by Jesus Christ. Wherefore also it is contained in the scripture, behold, I lay in Zion a chief cornerstone, elect, precious; and he that believeth on him shall not be confounded. Unto you therefore which believe he is precious; but unto them which believe he is disobedient, the stone which the builders disallowed, the same is made the head of the corner.—I Peter 2:5-7.

CALOMEL LOSING OUT IN SOUTH

Mr. Dodson, the "Liver Tone" Man, Responsible for Change for the Better.

Every druggist in town has noticed a great falling off in the sale of calomel. They all give the same reason. Dodson's Liver Tone is taking its place. "Calomel is dangerous and people know it." Dodson's Liver Tone is personally guaranteed by every druggist who sells it. A large bottle doesn't cost very much, but if it fails to give easy relief in every case of liver sluggishness and constipation, just ask for your money back.

Dodson's Liver Tone is a pleasant-tasting, purely vegetable remedy, harmless to both children and adults. Take a spoonful at night and wake up feeling fine; no biliousness, sick headache, acid stomach or constipated bowels. It doesn't gripe or cause inconvenience all the next day like violent calomel. Take a dose of calomel today and tomorrow you will feel weak, sick and nauseated. Don't lose a day.

Independence.
"What is independence?"
"Eating onions without caring who knows it."

A Feeling of Security

You naturally feel secure when you know that the medicine you are about to take is absolutely pure and contains no harmful or habit producing drugs.

Such a medicine is Dr. Kilmer's Swamp-Root, kidney, liver and bladder remedy. The same standard of purity, strength and excellence is maintained in every bottle of Swamp-Root.

It is scientifically compounded from vegetable herbs.

It is not a stimulant and is taken in teaspoonful doses.

It is not recommended for everything.

It is nature's great helper in relieving and overcoming kidney, liver and bladder troubles.

A sworn statement of purity is with every bottle of Dr. Kilmer's Swamp-Root.

If you need a medicine, you should have the best. Ask at all drug stores in bottles of 50c, 1.00, 2.00, 5.00 and 10.00. However, if you wish first to try this great preparation send ten cents to Dr. Kilmer & Co., Binghamton, N. Y., for a sample bottle. When writing be sure and mention this paper.

Most of the shadows that cross our path are caused by our standing in our own light.—Dinger.

Natives of Greenland are a cold and distant people.

FOR SUNBURN OR SORENESS Apply Vacher-Balm; it relieves at once.

If we have no agent where you live, write to E. W. Vacher, Inc., New Orleans, La.

Touching Appeal.
The wind bloweth, the farmer soweth, the subscriber oweth and the Lord knoweth that we are in need of dues.

So come a runnin', let's have the moan in, this thing of dunnin' gives us the blues.—Exchange.

Baby's little dresses will just simply dazzle if Red Cross Ball Blue is used in the laundry. Try it and see for yourself. At all good grocers, 5c.

Guessed Near Enough.
I have rather a variety of flowers in my garden, and when picking them I occasionally give a few sprays to Grace, my neighbor's daughter, who seems to enjoy the gifts. At such times I make it a point to impress upon her the names of the flowers. The other day I gave her some forget-me-nots, telling her what they were. Her mother was out on the lawn, and, running up to her, Grace said: "Mamma, look—my think-of-mes."—Exchange.

Took Everything in Sight.
A certain dandy "extra" appeared on the Hal E. Rouch "lot" one morning a picture of woe, and he insisted upon telling his "misery" to that popular film actor, Harold Lloyd. "You don't mean to tell me that the furniture movers took everything, do you?" asked the film star after listening to the tale. "At's what ah do, Mistah Lloyd," was the answer. "They took everything but the sidewalk on they promised to come back for that."—San Francisco Chronicle.

Positively Absurd!
An airplane flew over an Irish asylum, to the consternation of the inmates. Next day two of the lunatics were discussing the machine. One said: "Do you know, I dreamt last night I made one of those contrivances and flew to Australia in sixty minutes."

"That's strange," said the other. "I had a similar dream. I went to Melbourne in sixty seconds."

"How did you go?"
"Right through the earth."

"Look here, my friend, you're not a lunatic—you're a blithering idiot, that's what you are."

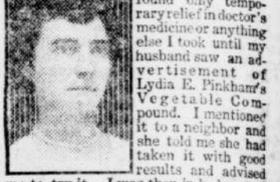
Backbiters.
"Don't you detest people who talk behind your back?"
"Yes, especially in a theater."

A Couple of Experts.
She—You kiss like an expert.
He—You criticize like a connoisseur.

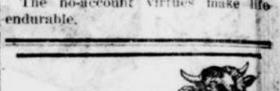
DRESSMAKER MADE WELL

Followed a Neighbor's Advice and Took Lydia E. Pinkham's Vegetable Compound

Vernon, Tex.—"For three years I suffered untold agony each month with pains in my sides. I found only temporary relief in doctor's medicine or anything else I took until my husband saw an advertisement of Lydia E. Pinkham's Vegetable Compound. I mentioned it to a neighbor and she told me she had taken it with good results and advised me to try it. I was then in bed part of the time and my doctor said I would have to be operated on, but we decided to try the Vegetable Compound and I also used Lydia E. Pinkham's Sanative Wash. I am a dressmaker and am now able to go about my work and do my housework besides. You are welcome to use this letter as a testimonial as I am always glad to speak a word for your medicine."—Mrs. W. M. STEPHENS, 118 N. Commerce St., Vernon, Texas.



Dressmakers when overworked are prone to such ailments and should profit by Mrs. Stephens' experience. Write to Lydia E. Pinkham Medicine Co. (Confidential), Lynn, Mass., about your health. Your letter will be opened, read and answered by a woman and held in strict confidence. The no-account virtues make life endurable.



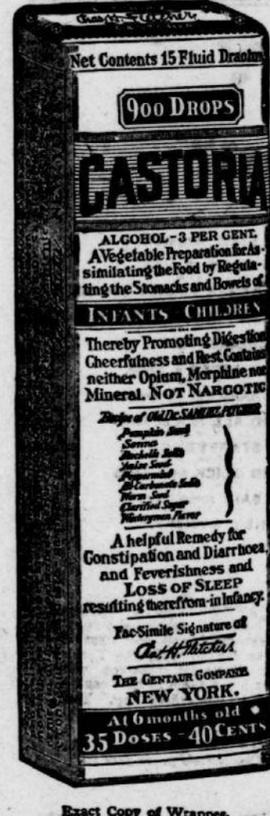
GENUINE "BULL" DURHAM
tobacco makes 50 good cigarettes for 10c

Shame on Them.

PERHAPS there are a few mothers who do not know the virtues of Fletcher's Castoria. Perhaps there are a few who know that there are imitations on the market, and knowing this demand Fletcher's. It is to ALL motherhood, then, that we call attention to the numerous imitations and counterfeits that may be set before them.

It is to all motherhood everywhere that we ring out the warning to beware of the "Just-as-good". For over thirty years Fletcher's Castoria has been an aid in the upbuilding of our population; an aid in the saving of babies.

And yet there are those who would ask you to try something new. Try this. Try that. Even try the same remedy for the tiny, scarcely breathing, babe that you in all your robust womanhood would use for yourself. Shame on them.



Children Cry For Fletcher's CASTORIA

Your Friend, the Physician.
The history of all medicines carries with it the story of battles against popular beliefs; fights against prejudice; even differences of opinion among scientists and men devoting their lives to research work; laboring always for the betterment of mankind. This information is at the hand of all physicians. He is with you at a moment's call be the trouble trifling or great. He is your friend, your household counselor. He is the one to whom you can always look for advice even though it might not be a case of sickness. He is not just a doctor. He is a student to his last and final call. His patients are his family and to lose one is little less than losing one of his own flesh and blood.

Believe him when he tells you—as he will—that Fletcher's Castoria has never harmed the litticest babe, and that it is a good thing to keep in the house. He knows.

MOTHERS SHOULD READ THE BOOKLET THAT IS AROUND EVERY BOTTLE OF FLETCHER'S CASTORIA

GENUINE CASTORIA ALWAYS
Bears the Signature of

Chas. H. Fletcher.
THE CENTAUR COMPANY, NEW YORK CITY.

SUMMER IN FLORENCE

The spring had advanced to early summer, and the sun was lying hot and bright in the piazzas, and the shade dense and cool in the narrow streets, before we left Balazzo Pini; the Lung Arno was a glare of light that struck back from the curving line of the buff houses; the river had shriveled to a rill in its bed; the black cypresses were dim in the tremor of the distant air on the hill-slopes beyond; the olives

BOOKS THAT HAVE LIFE.

After all, is it not better that a hundred unnecessary books should be published than that one good and useful book should be lost? (Nature's law of parsimony is arrived at by a process of expense.) The needless volumes, like the infertile seeds, soon sink out of sight; and the books that have life in them are taken care of by the readers who are waiting somewhere to receive and cherish them.—Henry Van Dyke.

SKIN TROUBLES

Soothed With Cuticura Soap, 25c. Ointment 25c. and 50c. Tubes 25c.

FLORAL CHIMERAS.

There are orchids of the tropics which exceed in strangeness of form and splendor of color anything produced in conservatories. Among the most remarkable of these plants are those belonging to the genus Masdevallia. One species closely imitates the trunk of an elephant, and is named accordingly Masdevallia elephanticeps. Another looks like a flying pigeon. The species to which the name "chimeras"

THE STONE THE BUILDER REJECTED.

Ye also are lively stones acceptable to God by Jesus Christ. Wherefore also it is contained in the scripture, behold, I lay in Zion a chief cornerstone, elect, precious; and he that believeth on him shall not be confounded. Unto you therefore which believe he is precious; but unto them which believe he is disobedient, the stone which the builders disallowed, the same is made the head of the corner.—I Peter 2:5-7.

SKIN TROUBLES

Soothed With Cuticura Soap, 25c. Ointment 25c. and 50c. Tubes 25c.

SKIN TROUBLES

Soothed With Cuticura Soap, 25c. Ointment 25c. and 50c. Tubes 25c.

KODAK FINISHING

Films developed. Any size, 15c per roll, prints 4c to 6c each. Post cards, 7c each; enlargements from "Kodak" negatives, 30c to \$2 each, according to size. Good work and prompt service guaranteed. Mail Orders Solicited. JUNGKIND PHOTO SUPPLY CO. 824 Main Street Little Rock, Ark.