Science Notes

E. E. FREE

The Strangest Star

Imagine a substance four thousand times heavier than lead. A paper weight made of this substance would be too heavy for a dozen men to lift. It would probably go right through the table and on down to the basement, as a heavy safe would crash through a flimsy house. A rifle bullet made of this substance would weigh over two hundred pounds. Only the strongest men could lift it.

Fortunately there is no such substance on earth. A few years ago scientists would have said that no such substance was probable anywhere in the universe. This is changed now. Not only does such a marvelously heavy substance exist, it is probable that there is a whole world made

of it.

This world is a star, a star long known as the faint companion star of Sirius. Sirius is the dog star, the brightest fixed star in the sky. It rises about one o'clock these October mornings, well down in the eastern sky, below the familiar belt and sword of Orion. The Sirius that we see is really the brighter of two companion stars. Sirius is a double star. Long ago astronomers discovered this fact and computed as accurately as they could the orbits in which the companion stars revolve, and the weights, sizes, and other characteristics of the two. The weight of the heavy star came out very high, so tremendously high in proportion to the star's size that the astromomers refused to believe their own figures. It was ridiculous, they said, to imagine the existence of matter thousands of times denser than lead. The calculations must be wrong.

There the matter rested until last year. Professor Eddington, the distinguished astronomer of Cambridge University, then suggested that perhaps these ridiculous calculations were right after all. Atomic theory indicated, he urged, a bare possibility that extremely dense matter like this might be real; not on earth, of course, but under some conditions of temperature and pressure which were at

Illustrated XXVI

least conceivable in the stars. Now our own Mount Wilson Observatory, in California, has tested this suggestion. Eddington was right. The matter of this strange star, the companion of the brilliant dog star, really is many hundreds of times denser than any kind of matter yet found

or produced on earth.

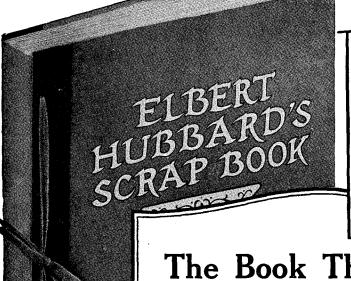
In reporting these Mount Wilson tests, Dr. Walter S. Adams, Director of that Observatory, points out that they provide, also, a new test of the Einstein theory. It is one of the conclusions of this theory that light is affected by gravity. One of the three tests proposed for the theory was the shift of the position of certain red lines in the spectrum of sunlight, due to the fact that the light rays forming these lines had started from the surface of the sun where gravity is much stronger than on earth. On the tremendously heavy star of the Sirius system this shift ought to be, theoretically, some thirty times greater. Gravity is so much more intense.

To measure this shift of the spectrum lines in light from the tiny star was difficult, but it was accomplished. The expected greater shift was found. So we now have good evidence not only for the essential correctness of the Einstein theory, but also for the reality of a star so heavy that if the average substance of it were made into silver dollars they would weigh nearly three hundred earthly pounds

apiece.

Water-Drop Wonders

The secret of the tremendous density of this star-twin of Sirius is an atomic secret. Something has happened, Dr. Eddington and Dr. Adams believe, to the atoms of matter in the star. These atoms crowd closer together. Matter becomes more condensed. Whether we shall ever be able to duplicate this condensation here on earth and thus manufacture for earthly wars a supply of two-hundred-pound rifle bullets is very doubtful. Only very limited ranges of pressure and temperature are attainable on earth.



During Elbert Hubbard's DURING Elbert Hubbard's life-time he made an amazing scrap book. He clipped and preserved the selections that helped him most, the quotations that inspired him, the choice bits of wisdom and philosechy to which he wanted ophy to which he wanted constantly to refer. This scrap book grew slowly with the accumulations of years — a remarkable di-gest of all the best ideas and thoughts encountered by Hubbard in his lifetime of reading. This priceless scrap book has now been published, and a copy is yours for the price of a best seller!

The Book That Took Lifetime to Prepare

More than 500 master thinkers and writers are represented, and every field of human interest is included. volume—but the fascinating and inspiring compound of many volumes!

ELBERT HUBBARD was unquestionably one of America's most versatile and prolific writers. Added to this he was a brilliant lecturer, a remarkably successful business man, an editor, publisher, craftsman.

One reason why Elbert Hubbard was able to write and talk so well on so many widely varying subjects is because he kept a scrap book of the thoughts and ideas that otherwise might have eluded him. He did not trust his memory, but preserved everything he found worthy of preservation. He read incessantly, studied carefully, weeded the gold from the drossand each thought that inspired him, each idea that helped him, each flash of brilliance that solved some problem, went into his private scrap book.

Slowly but surely this scrap book grew with the accumulation of years — and became at last Hubbard's chief source of inspiration. How could it be anything but inspiring, this glorious scrap book compiled from the best writings of the best thinkers of all ages!

Examine It Free

You must see it. You must be swept into the current of its pages. You must judge for yourself why it helped carry Hubbard so quickly to fortune and fame.

That is why we offer to send you the extraordinary Elbert Hubbard Scrap Book entirely free and without obligation for 5 days. Within that period you have the privilege of returning it without cost, or keeping it as your own and sending only \$2.90 (plus few cents postage) in full payment.

You are the judge! You do not keep this amazing and unique Scrap Book unless you are inspired, stimulated and delighted. Mail the coupon today, before you forget. Wm. H. Wise & Co., Roy-croft Distributors, Dept. 1210, 50 West 47th Street, New York City.

Wm. H. Wise & Co., Roycroft Distributors Dept. 1210, 50 West 47th Street, N. Y. C.

You may send me for five days' free examination a copy of Elbert Hubbard's Scrap Book in the cloth-lined butcher paper binding. Within the five-day period I will either return the Scrap Book without obligation, or keep it for my own and send only \$2.90 (plus few cents postage) in full payment.

Name	 	

☐ A few copies are available in a de luxe binding of semi-flexible basket weave buckram for only \$1 additional. Please check in the square at the left if you want this de luxe binding, with the same return privilege.

Only

— and hundreds of other great minds, from every age, every country, writing on almost every subject of general interest. Here is a liberal education in one inspiring scrap book!

Choice Bits

From H. G. WELLS FRANCIS BACON GEORGE BERNARD SHAW

RABBI BEN AZAI HARRIET BEECHER STOWE

JOHN RUSKIN RALPH WALDO EMERSON

BENJAMIN FRANKLIN

GEORGE BERNARD S OSCAR WILDE MADAME DE STAEL DANIEL WEBSTER CHARLES DARWIN CONFUCIUS

DISRAELI

ARISTOTLE

BALZAC

MAETERLINCK

When writing to advertisers kindly mention THE FORUM

Illustrated XXVII
Section