

ASTRONOMY

"Hidden" Stars Studied

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► ASTRONOMERS have found a way of getting through the blaze of light of some of the biggest and hottest stars in the universe to tune in on the hitherto hidden light of their cooler companion stars.

Even though the fiery companion may be much hotter than its cooler brother star, it is possible to distinguish between the two stars and estimate the size and distance of the cooler companion by means of the star's infrared light, invisible to the naked eye.

In the infrared part of the spectrum the light of the "hidden" star overwhelmingly predominates and tells its own story without interference from its white-hot companion, Dr. P. C. Keenan of the Yerkes Observatory of the University of Chicago and Dr. J. A. Hynek of the Perkins Observatory of Ohio Wesleyan University and Ohio State University, both now doing war research, report. (*Astrophysical Journal*, May.)

Ability to determine the distances and sizes of the cooler stars from the relative intensities of selected lines in the infrared spectrum resulted from the development of more efficient spectrographs and of photographic plates much more sensitive to infrared light. The recently-

installed infrared spectrophotograph attached to the 69-inch reflector, the fifth largest telescope in the world, of the Perkins Observatory, was used in studying the stars.

The new method proved particularly effective in the case of stars whose temperature ranged from about 4,000 to 7,000 degrees Fahrenheit, which are particularly rich in light to which ordinary photographic plates are not sensitive.

Astronomers can now estimate the distance of these stars simply by examining the infrared spectrum. In the past much could be told about the hotter stars from the ordinary visible region of the spectrum, but the infrared end was not examined separately.

One of the double stars studied by means of its infrared spectrum was the famous eclipsing pair, VV Cephei, the red component of which is one of the largest stars known. Peculiarities which cannot be detected by visible light were revealed—the ultraviolet light of the hot companion acting on the "red" star excites spectral lines which are entirely foreign to a normal cool star. These lines can be used as sensitive indicators of the relative physical condition of the two whirling components.

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PHYSICS

Fantastic Nazi Claim

German report of a stratosphere platform that would float 5,000 miles above the earth seems tall story when analyzed. Still plenty of gravity at that height.

► WHEN German scientists are reported to have been working on a "master secret weapon consisting of stratosphere platforms to float 5,000 miles above the earth from which death rays could be focused on any part of the world," Jules Verne must have stirred uneasily in his grave.

For this tall tale, relayed from an Army press conference in Paris, is by no stretch of the imagination in the same class with the very real and technically effective V-1 and V-2 German bombs and rockets. Even Verne's fantasies, many of

which were materialized in a sense by scientists of later generations, were at least plausible by the scientific knowledge of his day.

Putting anything 5,000 miles above the earth and making it stay there would be difficult. The effect of gravity by no means disappears at that height. A 150-pound man would weigh 30 pounds at that distance from the center of the earth because gravity varies with the square of the distance. (The earth's surface is about 4,000 miles from the earth's center, so you can figure this for yourself.)

It would take a lot of energy to be supplied to jet or rocket devices just to keep any sort of structure at that distance above the earth, to say nothing of getting it there in the first place. Balloons and propellers would not do in that airless region.

With the practical development of some kind of subatomic energy, which has long been a dream, it might be possible to have enough energy in sufficiently small weight to solve the problems involved, but who knows whether the energy of the atom will ever be tapped?

Supplying oxygen to the human beings to man the platforms would be somewhat like supplying the pilots who fly at high altitudes. This would not be impossible, although the supply problem of transporting the necessary oxygen from the earth's surface, even if some regeneration method were used, would not be a simple one.

At such heights beyond the protecting ozone that cuts off much of the sun's ultraviolet radiation, any unshielded human would indeed find the sun's rays death rays. But protecting the crew against the sun's rays would not be insurmountable.

As for the giant sodium mirrors supposed to be placed on these platforms for collecting and focusing the sun's rays, they would not be as formidable weapons as the Schrecklichkeit imaginations of the German scientists would imply. (Why complicate the design by suggesting mirrors of sodium, a metal that in air or moisture bursts into flame spontaneously? Aluminum would do quite well.) As in all burning-glass devices, the light collected would need to be concentrated upon a much smaller area than the collecting surfaces. If the mirrors on high were two or three square miles in area, they could not do as much damage as a few B-29 loads of incendiaries.

Evidently there are still grandiose ideas among the Nazis questioned or our Army investigators got hold of some party leaders more fantastically indoctrinated than scientific. There may be some interesting and useful researches that the Germans had underway, but the chances are they will be closer to earth than this one.

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The *banana* is the largest of all plants that do not have a woody stem above ground; the true stem of the banana is below ground, and the part above is a leaf sheath and is called the "false stem."