NEW ALLOY NEEDED FOR GIANT TELESCOPE

A super-telescope 25 feet in diameter, dwarfing all other existing astronomical instruments and making possible scientific discoveries of far-reaching importance is perfectly feasible, if only $12,000,000 or so were forthcoming to make it. Francis G.Pease of the Mount Wilson Obervatory describes in detail this hypothetical astronomical giant in an article published in the Proceedings of the Astronomical Society of the Pacific.

Such a huge instrument would of necessity be a reflector, in which a concave mirror replaces the convex lens of the small spy-glass. While the mechanical problems of such an instrument would be relatively easy to solve, says Mr. Pease, there is at present no ideal material from which the mirror could be made.

The big 100 inch telescope at Mount Wilson, the largest in the world at present, in the design and construction of which Mr. Pease had an important part, has a mirror of glass, on the upper surface of which is a coating of silver. The making of a glass mirror 25 feet in diameter possesses no more inherent difficulties than did the construction of the 100 inch, he believes, but glass has certain disadvantages, such as change in shape with variations in temperature, and tarnishing of the silver coating. Astronomers therefore look forward, says Mr. Pease, to a material such as a hypothetical alloy, which he calls " Mirrorite". Mirrorite , when made into a mirror, should reflect light as well as silver, should be free from tarnish like the stainless steel now often used in cutlery, should not change appreciably with the temperature, a property now possessed by a steel alloy known as invar, and should be as light as magnaliun, an aluminum-magnesiun alloy which has already been used for some smaller telescope mirrors.

Mr. Pease believes that the hope for such a substance is no idle dream. "There is a promising field for research in the investigation of metal alloys suitable for mirrors." he states. "When one considers the enormous number of possible combinations of metals, it should be possible to find an alloy which would be light in weight, which could be cast either solid or as a ribbed plate, and which could be easily silvered, if not in itself possessing excellent permanent reflecting properties.

"Alloys are now known which possess some of these desirable properties, and it may be that the addition of other metals, or new combinations of them would yield the desired material."

If the money that a telescope with a 25 foot mirror would cost were available, it might not be necessary to wait for the discovery of "mirrorite" to make it, Mr. Pease believes. A reasonably satisfactory substance would be found in glass containing a large percentage of quartz. The telescope would be of the "Cassegrain" type, in which the light from the big mirror is reflected back to a smaller one, and then back again through a hole in the big one to the observer. The hole in a 25 foot mirror would be at least seven feet in diameter, says Mr. Pease, and so the strains due to changes with temperature would be less than in a solid disc. Such an instrument would require excellent atmospheric conditions for its most efficient use, but Mr. Pease states that his experience leads him to believe that it could be used at Mount Wilson to the same excellent advantage as the 100 inch.
