

SEP 27 1933

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1103.1CALIFORNIA INSTITUTE OF TECHNOLOGY  
PASADENA

ASTROPHYSICAL OBSERVATORY

Mr. Trevor Arnett  
President General Education Board  
61 Broadway  
New York.

Dear Mr. Arnett:

June 26, 1933  
Ack RDB 7/11

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The casting of the 120-inch disc at Corning was witnessed by Dr. Theodore Dunham, Jr., one of the ablest members of our staff. The following extract from his letter will interest you:

"The casting of the 120-inch disc this morning (June 24) was a magnificent spectacle. Everything went exactly according to schedule, and when I left there was every indication that the disc would be satisfactory. Of course it was too soon to say, since the glass was still at 1250° inside the bee-hive furnace, but examination through three doors indicated that nearly all the bubbles had risen to the surface and that in two hours more the last significant bubble would be out of the way. Dr. Hostetter expected to remove the furnace at about 3 P.M., to let the disc cool to a dull red heat for 10 or 12 hours, and then to transfer it to the annealing oven tonight. The pouring began at 5 A.M., so that the entire process will probably occupy less than 24 hours.

"Everyone at Corning is very enthusiastic about the special glass used in this disc. As you must know, it has about the same amount of silica as laboratory Pyrex, but has more boric acid and less alkali, the result being to reduce the coefficient of expansion from 32 to 26, and to reduce noticeably the tendency to devitrification. They have not yet decided finally how long to allow for annealing. They are experimenting with a small model which will be tested for stress, and then an estimate of the necessary time for the 120-inch will be made, assuming that the required times will be proportional to the squares of the dimensions. They think it entirely possible that a month will suffice! This seems to me most surprising. I think they will try to push it as fast as possible. It almost makes one wonder whether to do so would be taking something of a chance. Of course I am in no position to have any opinion. I suppose their decision will be passed on by Dr. Day and others who can be relied upon. The present plan provides for only one cooling process, not a quick cooling followed by an annealing process such as you described to me recently. They hope to ship the disc by October at the latest.

"The Toronto disc (about 75 inches, I think) was cast on Thursday with a 7-inch hole, and appears to be very satisfactory so far. Being solid, it will require nearly three months for annealing. They hope to pour the 200-inch some time this summer (annealing it perhaps only three months), as soon as they remove the 120-inch from the annealing oven. All that is necessary is to build the larger mould and bee-hive furnace. Part of the present melt of glass will be used, but more will have to be added, and the furnace will have to be started three weeks before pouring the disc.

"I am much impressed with the steel table which holds the disc and its mould. The table is supported from below by four large screws operated by worm-gears which insure precision in raising and lowering. The table will be lowered

Mr. Trevor Arnett

-2-

June 26, 1933

away from the furnace tonight, run about 30 feet sideways and then raised to place the disc in the annealing oven. Dr. Hostetter does not trust a crane for such delicate work and thinks his experience with this table might be useful in designing equipment for the optical shop.

"Dr. Hostetter is anxious to cast all the secondary mirrors at the same time with the 200-inch, if possible, in order to avoid the great expense of heating the furnace a second time with another melt of this special glass. He would be glad to know how many discs will be required, by the end of July if possible. He may be able to do the Texas and Harvard discs at the same time".

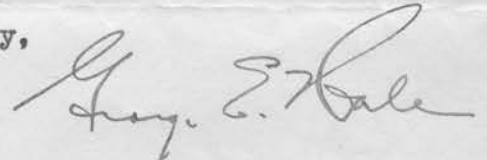
Dr. Day will be here tomorrow to discuss all questions regarding the glass, annealing time, etc.

It is a satisfaction to us to know that the appropriation by the General Education Board for the 200-inch telescope is proving so widely useful to astronomy. The development at Corning of the new low expansion glass, accomplished during the past winter, is of the greatest importance, because of its remarkable properties. It will be used, not only for the 200-inch reflector, but also for the 75-inch Toronto telescope, and for the large Harvard and University of Texas reflectors. In the same way all of our new accessory apparatus, which has already multiplied the efficiency of the 100-inch Mount Wilson reflector several fold, will do as much for these other instruments. Thus your generous gift, instead of advancing science merely through a single institution, will have a much broader range.

As I understand that Dr. Mason and Dr. Weaver have gone abroad, perhaps you may wish to send a copy of this letter to them for their information.

With kindest regards,

Yours very sincerely,



GEH:G