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CALIFORNIA INSTITUTE OF TECHNOLOGY
PASADENA

ASTROPHYSICAL OBSERVATORY

October 7, 1932

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President Max Mason
Rockefeller Foundation
61 Broadway
New York.

Dear Mason:

I am sure that you will be interested in the enclosed photographs and the accompanying copy of a letter from Dr. Day. The results, as far as can be determined from these preliminary tests, are certainly very satisfactory.

Kindly return the photographs at your convenience, as we have no other copies for reference.

With best regards,

Yours ever,

George E. Hale

GEH:G

COPY

GEOPHYSICAL LABORATORY
Washington, D.C.

September 30, 1932

Doctor George E. Hale,
Mt. Wilson Observatory,
Pasadena, California.

Dear Doctor Hale:

I have just returned from three days in Corning, during which I saw the 60" disc, which has just come out of the annealing furnace, and had opportunity for consultation with the Corning group on many of the details of preparation for the 120" disc.

The 60" disc is a beautiful piece of work. I am sending you a few photographs which will give you a better idea of its present appearance and of certain of the annealing details than I could possibly convey to you by description alone. The ribbed structure came through splendidly and did much to support our confidence in this plan for reducing the mass of the 200" disc. I can discover no reason for anticipating strain or inhomogeneity in the ribbed structure more than in a solid disc; indeed I am inclined to believe there is even less. That is to say, the annealing proves to be even better than we would expect to get in a solid disc of equivalent dimensions.

There is also much evidence here to dissipate any fear of devitrification, of which both you and Dr. Mason expressed some apprehension. I could discover no sign of devitrification at the mold contacts anywhere, although the material of the mold is well calculated to afford nuclei for such incipient crystallization. Neither do floating bits of silica powder, scum, or occasional bubbles show any sign of devitrification in their neighborhood.

The disc, when I saw it, was still resting in place upon the central portion of its mold, the sides and a few inches of the base had been removed so as to permit strain measurements in the outer zone, which is of course the only area in which stresses are uncompensated. More than 30 measurements were made in the half-inch band forming the outer rim (most of which will of course later be cut away). The highest measured strain amounted to 48 mμ; the minimum 40 mμ. The corresponding figures for the adjacent outer rib, which will remain permanently a part of the design, are 39 mμ and 31 mμ in an equal number of measurements. If I remember rightly these measurements average almost identically the same as those in the 30" disc, which is already in your hands. This corresponds exactly with theoretical expectations and is most satisfactory.

The amount of glass is sufficient to provide a clearance of about 3/8 of an inch to the center of the final (convex) figure. Of course at the rim about 2" of glass will be removed in figuring. The face of the mold appears to show a very symmetrical distribution of glass over it, such that when the figuring is complete the effective thickness of the face plate will be uniformly 2" as planned.

Perhaps I should add, by way of explanation of the photograph of the disc, that the clear images of the mold segments give some idea of the quality of the glass for they are photographed through 3" or more of it.

The wavy surface lines need not be misleading. They are merely surface scum less than a millimeter in thickness which you will of course face off as soon as the

blank comes into your hands. The three parallel bands across the surface represent slight depressions due to the warping of the T beams which supported the bricks of the annealing cover. They will also disappear in the facing. It is rather interesting, though of course fortuitous, that this accidental contact of foreign material (iron) also left no trace of devitrification in the adjacent glass.

I hope this information may give you a fairly clear idea of the condition of the disc and the encouragement which it offers for the success of the larger ones to follow.

Now in regard to the plans for the 120" disc, they are complete as shown in Dr. McCauley's drawing, which has been sent to you, save in one small detail of rib design concerning which Dr. McCauley will write to Dr. Pease. It has to do with the terminal point of the alternate ribs which do not reach the rim and is in the interest of a slightly greater symmetry in the distribution of rib mass. The suggestion probably has no important significance but any detail calculated to perfect symmetry of structure is obviously in the interest of safety in providing against uncompensated stresses.

Preparations for casting the 120" disc have gone as far as they can go until authorization is received for a hoisting mechanism. The program has been delayed in fact for several weeks pending the decision in regard to the crane now at West Lynn, which cannot be used in Corning on account of its dimensions, and the working out of a substitute mechanism which can be used in the space available there and which will have sufficient power to handle the 200" disc as well. You have been advised I think that a suitable hoist has now been found and bids have been obtained on it. I understood that the matter now awaits only your authorization. There will be some further delay even after the authorization is received, due to the time necessary to deliver and erect this hoist. Very possibly you will have given this authorization before this letter reaches you. I think all the other materials necessary for proceeding with the 120" are now in hand.

With best wishes, believe me,

Very sincerely yours,

(Signed) Arthur L. Day

ALD/E.