

**ALVAN GRAHAM CLARK.**

In our last issue we gave a brief biographical sketch of Alvan Graham Clark, the famous telescope lens maker and astronomer; now, through the courtesy of the family, we are enabled to present an engraving of the late Mr. Clark, and also give further details of his life and work.

The sudden death of Alvan Graham Clark, the last member of the dynasty of lens makers, came as a shock to all those who are in any way interested in the progress of astronomical science. It is gratifying to note that, though Mr. Clark is the last of the family of expert opticians, the business will not be discontinued on account of his death. For the past twenty-five years, the Clarks have had for their chief assistant Mr. Carl Lundin, who has already achieved a personal reputation for skill and painstaking work. He and his sons will now carry on the manufacture of telescope lenses as before, in the interests of the family of Mr. Clark.

Mr. Clark was descended from old pilgrim stock and was the younger of the two sons. He was born in Fall River, Mass., July 10, 1832. He received a good school education and, developing an interest in mechanical pursuits, fitted himself for a practical machinist. About this time his brother George and his father turned their attention to telescope making and, realizing the possibilities in this direction, Alvan joined the firm which has since become famous under the name of Alvan Clark & Sons. The difficulties in the way of fostering a scientific enterprise are always great, but it is due to the persistence, painstaking and ingenuity of the Clarks, father and sons, that they obtained so great a success. Though no such feats of optical skill have ever been equaled elsewhere as the manufacture of the 36 and 40 inch telescopes of the Lick and Yerkes observatories, yet it was Mr. Clark's ambition, nay, even his expectation, to produce a still more powerful instrument from the largest disks of glass that could be obtained. As it is, the production of the objective of the great telescope of the Yerkes Observatory will remain as Mr. Clark's greatest achievement.

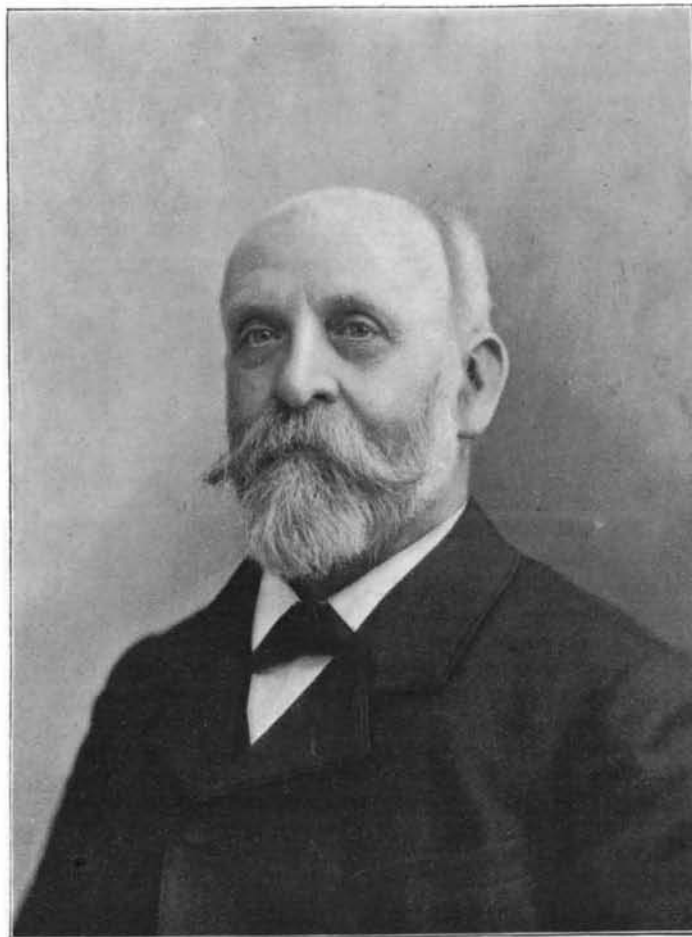
Valuable as were Mr. Clark's services to science as a great manufacturer of telescope lenses, he was also celebrated as an astronomer. He discovered fourteen double stars and he was a member of the expedition which went to Spain to observe the total eclipse in 1870 and to Wyoming eight years later. In 1862, he received the Lalande prize from the Academy of Sciences of France for his discovery of the companion star of Sirius. He was a fellow of the American Association for the Advancement of Science and an honorary member of several foreign societies.

**A Volcano as a Weather Prophet.**

Under the heading "Stromboli as a Weather Prophet," *Gaea* (Leipsic, September) publishes an interesting notice from which we learn that this volcano has been used from the earliest times, both by mariners and by those who live in its vicinity, as a means of predicting the weather. A recent exhaustive study of the subject, while it does not confirm quite all that has been claimed for the volcano in this line, amply justifies the confidence that has been placed in it. Probably other volcanoes of the same class would give equally trustworthy indications, and it may be that nature has thus been furnishing us with a means of local weather prediction that has been somewhat neglected. The *Literary Digest* translates below the article referred to:

"Among the Lipari Islands, between Sicily and Calabria, Stromboli is the best known on account of its active volcano. 921 meters [3,000 feet] high. Even in ancient times this served the sailors of the Tyrrhenian Sea as a weather sign. Pliny relates that the inhabitants of the island could tell from the smoke of the volcano what the direction of the wind would be, and Martianus Capella says that the king of the island was Æolus, who knew the changes of the wind from its flame and vapor. These tales are true in so far as the smoke column of the volcano, ascending, as it does, far into the upper air, can give indication of the air currents that prevail there, before these have made themselves felt on the ground. Later on, Stromboli became still better known as a weather prophet, and Dolomieu, who in 1781 visited the Lipari Islands, tells us that in general this volcano is noticeably more active in winter than in summer, and also more active on the approach of stormy weather than in a calm. Spallanzani, who visited Stromboli in 1788, investigated the weather indications that the inhabitants had derived from the volume of smoke and the brightness of the flame of the volcano, and found by actual observation in seven cases that these rules for the most part were not trustworthy. The well known expert in vulcanology, Poulett Scrope, was led to believe in a connection between the activity of Stromboli and the atmospheric pressure, because an alteration of this

pressure must alter the balance of the expansive forces in and under the crater. Judd also regards it as beyond doubt that in stormy weather, and especially in winter, the eruption of Stromboli is most violent, and he cites the testimony of the islanders in favor of this. The same opinion is held by Mercalli, who ascribes to meteorological conditions a preponderant influence on the activity of the volcano. Quite recently Alfred Berget, of Munich, has taken up the question anew, and in 1894 he made a long geological study of the Æolian Islands. In a paper in the Proceedings of the German Geological Society, he describes his own observations on the alleged connection between the changes of atmospheric pressure and the activity of Stromboli, from which it appears that such a relationship is unrecognizable. Moreover, he has compared all the eruptions of Stromboli since 1881 with the condition of the atmospheric pressure, and has found that there is no evidence for the hypothesis that the energy of the volcano increases with diminution of the pressure, nor can any lowering of activity be shown to follow upon a rise of the barometer. Finally, he also found that the list of eruptions given by Mercalli cannot safely be depended upon. He also carried out a theoretical investigation of the subject, that led him to the conclusion that no noteworthy influence on the activity of the crater can be ascribed to the pressure of the atmosphere, although it has been regarded by some as a natural barometer. But how about the popular belief, which regards Stromboli as a weather prophet?

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Dr. Bergert answers this question as follows: He notes that this belief has to do only with the smoke that issues from the volcano. It is, he says, water vapor, which seems to envelop the summit of the volcano as a cloud. If moist masses of air blow over Stromboli, the vapor that rises from the volcano will become more clearly visible than when dry winds are blowing in the upper regions of the air. In this way the volcano acts as a very sensitive hygroscope and at the same time as a weather vane also, and by the combination of its indications . . . skillful mariners have for a long time been able to derive trustworthy prognostications of the weather. 'When the air is moist,' says Dr. Bergert, 'if the cloud of vapor over the volcano's summit is thicker, the reflection from the light that shines upward through the crater will also be more evident, which was probably what gave rise to the idea that the volcano is more active in stormy than in clear weather.' The question by what conditions the eruption of the volcano is influenced is at present not to be answered with certainty. Bergert believes that Mercalli was right when he regarded the varying activity of such a volcano as Stromboli to depend chiefly on the stoppage of the lava channel and the subsequent clearing out of it. Bergert expresses the hope that an observatory may be established on the isle of Æolus for the special observation of its volcano, so that the action of meteorological causes may be clearly separated from other influences on the varying activity of the volcano."

AN observatory at Odessa is to be established as a branch of the observatory of Pulkowa.

**The Basilicas of Rome.**

Christianity was emerging from catacombs and hiding places and ousting the heathen worship everywhere. In the region "over the Tiber" they had been grudgingly allowed to worship in some building where now stands the basilica of Santa Maria in Trastevere. The edict of Constantine left them free to worship in public: the temples were deserted in Rome, though heathen rites expired more slowly in the villages, and the question at once arose, What buildings should they worship in? The temples were objectionable from their associations; they were rejected. Not so, however, their materials; this must be borne in mind, as it exercised an immense influence upon the future designs of churches. Columns and bases, but especially the former, were freely had recourse to when building operations began. But at first they were well content to use the structures allotted to them by the Christian emperor. These were the basilicas.

The word is derived from the Greek basilike, "royal," and in early times probably meant the place where the ruler himself administered justice. In Rome they were used as law courts, though commercial business was often transacted in them besides. There were many in the city, some on a scale of great magnificence, usually situated near the different fora or market places, and named from their founders the Æmilian, the Porcian, the Julian, after the first Cæsar, and the Ulpian, which is represented on a coin of Trajan. An approach through a colonnaded court was sometimes provided,

and, in common with the practice of most ancient cities, they were rarely quite isolated. The building was usually oblong in plan. On entering, the visitor saw on either hand a line of columns dividing the structure from end to end into three sections, the center, called from its long, narrow shape the *navis*, or ship, the side alleys, much narrower, *aisles*. These are the original "nave and aisles" of our modern churches. At the far end the wall was curved into a deep apse, a semicircular recess covered by a half dome or "shell" (*concha*) which it resembled; in its center, upon a narrow platform approached by steps, was the judge's seat. Here he sat looking down the building and facing the entrance; on either side were his assessors, their curving stone seats filling the rest of the semicircle. Over the side aisles were galleries. The roof of wood, and not as yet vaulted, rose very high over the central nave, high enough for small round headed windows (unglazed) to clear the lean-to roofs which covered the galleries, thus acting as a clear story to light the building. It is probable that there were no other windows at first, but those who have seen how easily a structure is lighted in Italy will not wonder at this; sometimes a single window—the others having been bricked up or partly obscured by curtains—will suffice to flood a church with light.

Greek and Roman buildings can scarcely be said to have had windows; they play no part in the designs of the public edifices, while private dwellings were built round courtyards. The original purpose of the apse is preserved in the Italian word *tribuna*, used for chambers and structures of this shape. Its raised steps were sometimes so high that rooms were built underneath them, though for what uses is unknown. Under the entire pavement of the hall a heating chamber, with the usual Roman furnaces, was generally provided. Where the judge had sat the bishop was now enthroned; his clergy occupied the half circle of seats to his right and left. The galleries were appropriated to the women, and in some cases there were separate seats for the unmarried, married, and widows. These halls, thus suddenly invested with extraordinary interest, were not planned with any particular direction; they arose as circumstances demanded, and being turned into churches, the old doors were still used. It may be for this reason, but the custom of "orientating," or turning churches to the east, is almost unknown in Italy. St. Peter's, for instance, is entered from the east end, and not, as with most of our churches, from the west. The materials of the old temples were abundant on every side; the walls would be of little use, but columns and architraves were taken by scores. And an extraordinary use was made of them; for as the original basilicas were superseded by new ones, "basilica" thus becoming synonymous with "church," a conflict began between the traditions of the orders and the wants of the new worship.—Temple Bar.

MR. LAWRENCE BRUNER, of the University of Nebraska, has sailed for the Argentine Republic to study the ravages of the locust, which have recently developed into a terrible pest, certain regions being completely devastated by them. The Argentine government has granted \$400,000 for relief, and a syndicate of business men have raised the funds to employ Mr. Bruner to investigate the subject from the entomological side.