instrumental values of the latitude. Circumstances prevented him from carrying on the work until six years later, when he took up the problem again. The results then obtained are published in a series of eighteen papers in the *Astronomical Journal* (1891–94), exclusive of a series of five papers upon a topic closely related thereto, namely, the aberration-constant. These papers have been noted from time to time in this column, so it is unnecessary to do more than refer to them now.

In connection with variable stars, besides the incidental work of observation and discovery which Dr. Chandler has contributed to it, his work has involved the collection of all the data in astronomical history, their discussion, and the formulation of the elements of their light-variations into numerical laws. His important researches upon cometary orbits are also well known to astronomers.

A LECTURE EXPERIMENT.

A FURTHER description of the use of the electric furnace recently exhibited at the Royal Society, for the purpose of lecture demonstrations, may be useful, as pictures, some six feet across, of the interior of the furnace may readily be projected on the screen. This is effected by the aid of the device which has already been given in NATURE (p. 17, Fig. 2). The result is really very beautiful, though it can only be rendered in dull tones by the accompanying illustration (Figs. A, B). It may be well, therefore, to state briefly what is seen when the furnace is arranged for the melting of metallic chromium. Directly the current is passed, the picture reflected by the mirror, E (Fig. 2, *loc. cit.*), shows the interior of the furnace (Fig. A) like a dark crater, the dull red poles revealing the metallic lustre and grey shadows of the metal beneath them. A little later these poles become tipped with dazzling white, and, in the course of a few minutes, the temperature rises to about 2500° C. Such a temperature will keep chromium well melted, though a thousand degrees more may readily be attained in a furnace of this kind. Each pole is soon surrounded with a

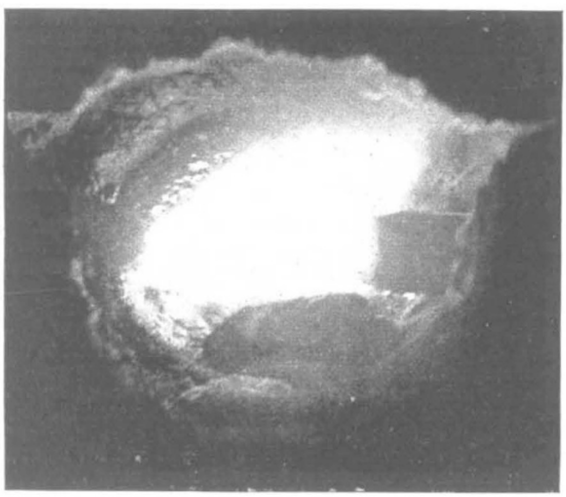

FIG. A.—This represents the interior of the furnace containing molten chromium as is seen either by reflection on a screen or by looking into the furnace from above, the eyes being suitably protected by deeply tinted glasses.

lambent halo of the green-blue hue of the sunset, the central band of the arc changing rapidly from peach-blossom to lavender and purple. The arc can then be lengthened, and as the poles are drawn further and further asunder, the irregular masses of chromium fuse in silver droplets, below an intense blue field of light, passing into green of lustrous emerald; then the last fragments of chromium melt into a shining lake, which reflects the glowing poles in a glory of green and gold shot with orange hues. Still a few minutes later, as the chromium burns, a shower of brilliant sparks of metal are projected from the furnace, amid the clouds of russet or brown vapours which wreath the little crater; while if the current is broken, and the light dies out, you wish that Turner had painted the limpid tints, and that Ruskin might describe their loveliness.

The effect when either tungsten or silver replaces chromium is much the same, but, in the latter case, the glowing lake is more brilliant in its turbulent boiling, and blue vapours rise to be condensed in iridescent beads of distilled silver which stud the crater walls.

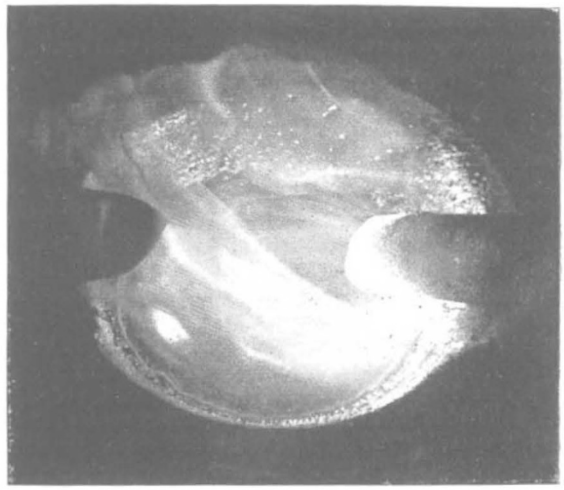

FIG. B.—In this case the arc was broken the instant before the photograph wa taken. The furnace contained a bath of silver just at its boiling point. The reflection of the poles in the bath, the globules of distilled silver, and the drifting cloud of silver vapour, are well shown.

Such experiments will probably lend a new interest to the us of the arc in connection with astronomical metallurgy, for, as George Herbert said long ago—

> "Stars have their storms even in a high degree,
> As well as we";

and Lockyer has shown how important it is, in relation to such storms, to be able to study the disturbances in the various strata of the stellar or solar atmosphere. Layers of metallic vapour which differ widely in temperature can be more readily obtained by the use of the electrical furnace than when a fragment of metal is melted and volatilised by placing it in the arc, in a cavity of the lower carbon. W. C. ROBERTS-AUSTEN.

THE LIFE-HISTORY OF THE CRUSTACEA IN EARLY PALÆOZOIC TIMES.

IN his recent anniversary address to the Geological Society, the President, Dr. Henry Woodward, F.R.S., after the usual distribution of medals and awards, the reading of obituaries of deceased Fellows, and some preliminary matters relating to the affairs of the Society, including the moot question of the introduction of ladies as visitors to the evening meetings, devoted the remainder of his address to a brief discussion of "Some Points in the Life-history of the Crustacea in Early Palæozoic Times." Dr. Woodward continued as follows:—"Of the various groups of the Invertebrata whose ancestry extends into Palæozoic times, none possess a greater interest for the geologist than the Crustacea, whose existence is proved as far back as the Lower Cambrian rocks; while their near allies, the Arachnida, have been met with in strata as old as the Silurian.

"My earliest papers on the Eurypterida appeared in 1863 and 1864, and an account of *Stylonurus* and *Hemiaspis* was communicated to this Society in 1865, just thirty years ago. In that year (1865) I had the pleasure, with my friend and fellow-worker, the late J. W. Salter, F.G.S., of publishing a 'Chart of Fossil Crustacea,' in which an attempt was made to show the evolution in time of the various forms belonging to this class, graphically depicted on an engraved folding-sheet, with explanatory text. In it we pointed out that the main development of the crustacea in Palæozoic times consisted of the great groups of the Trilobita, the Eurypterida, the Xiphosura, the Phyllopoda, and the