On the Different Methods of Constructing a Catalogue of Fixed Stars. *By* J. Pond, *Esq. F.R.S. Astronomer Royal.* Read May 21, 1818. [*Phil. Trans.* 1818, *p.* 405.]

The method hitherto adopted in the Royal Observatory for constructing a catalogue of stars, either in declination or right ascension, has been to take some one star as a point of departure, and thus to determine the position of the rest by direct comparison. The declinations were determined by direct comparison with γ Draconis, and α Aquilæ was chosen as the common term of comparison in right ascension. In observations with the transit instrument, this mode of proceeding is highly objectionable; for every result is subject to a double error,—that committed in the observation of α Aquilæ, and that in the observation of the star itself. Besides which, if the observation of α Aquilæ be omitted, then the other observations become useless. Hence, although extreme accuracy was ultimately thus obtained by the late Astronomer Royal, the method was tedious and objectionable.

The method which Mr. Pond proposes to substitute, and which he describes in this paper, has the advantage of affording, in a single year, a catalogue equally accurate with one formerly obtained in three, and equally applicable to the mural circle and transit instrument. No particular star is in either case assumed as a point of departure in preference to the rest. On the contrary, every star is in its turn assumed as a point of reference to the others. It is thus endeavoured, in the first instance, to establish their relative distances from each other, or from the equator or meridian, leaving the choice and determination of some common point of departure as a subject for future consideration. The principles of proceeding applicable to both instruments are then detailed at length, and the striking coincidence of the author's catalogue, and that of the late Dr. Maskelyne, adverted to.

In respect to the accuracy of the results afforded by the new transit instrument, Mr. Pond thinks that 120 observations enable him to define the place of a fixed star to one tenth of a second of a degree.

A Description of the Teeth of the Delphinus Gangeticus. *By Sir* Everard Home, *Bart. V.P.R.S.* Read June 4, 1818. [*Phil. Trans.* 1818, *p.* 417.]

In the 7th volume of the Asiatic Researches, published in 1781, Dr. Roxburgh describes the *Delphinus Gangeticus*, but gives a very imperfect account of its teeth; nor is any detailed account of them given in any other work. As the jaws and teeth of this species of Delphinus form its most remarkable character, Sir Everard thinks the subject of sufficient interest to the comparative anatomist and geologist, to be laid before this Society.

These teeth, as in the whole tribe, generally have the rudiments in the gums, from which the teeth grow in both directions; upwards

through the gum in the form of the point of a flattened cone, which is coated with enamel, and downwards towards the jaw, increasing in breadth, but not in thickness, till it is imbedded in the substance of the jaw itself. The lower portion has no enamel; the number of teeth is, as described by Dr. Roxburgh, 120.

Description of an Acid Principle prepared from the Lithic or Uric Acid. By William Prout, *M.D. Communicated by* W. H. Wollaston, *M.D. F.R.S.* Read June 11, 1818. [*Phil. Trans.* 1818, *p.* 420.]

The object of this paper is to show that the purple substance obtained by heating a mixture of the lithic and nitric acids, is a compound of ammonia with a peculiar acid principle, which the author proposes to call Purpuric Acid, a term suggested by its peculiar tendency to form red or purple compounds.

The purpuric acid is obtained by digesting pure lithic acid in dilute nitric acid, neutralizing the excess of the latter by ammonia, and evaporating till granular crystals, consisting of purpurate of ammonia, separate. The ammonia is removed by sulphuric or muriatic acid, and the purpuric acid thus obtained in a free state.

The author next points out the characters of this acid. It is very sparingly soluble in water, and insoluble in alcohol and ether. In the mineral acids, and in the alkalies, it readily dissolves. It is insoluble in dilute sulphuric, muriatic, phosphoric, oxalic, citric, and tartaric acids. When heated it neither melts nor sublimes, but becomes purple, from the production of ammonia, and then burns gradually without any particular odour. It unites with the metallic oxides; and when aided by heat, expels carbonic acid from the alkaline carbonates. It does not unite with any other acid. Upon these characters the author thinks that its properties, as an acid, are sufficiently established.

Dr. Prout then proceeds to describe its compounds with different bases, which, with few exceptions, are of a purple or reddish colour: he thinks that some of them might be used as pigments, or employed in the art of dyeing.

Astronomical Observations and Experiments, selected for the purpose of ascertaining the relative Distances of Clusters of Stars, and of investigating how far the Power of our Telescopes may be expected to reach into Space, when directed to ambiguous Celestial Objects. By Sir William Herschel, *Knt. Guelp. LL.D. F.R.S.* Read June 11, 1818. [*Phil. Trans.* 1818, *p.* 429.]

Having shown in a former paper that by an equalization of the light of stars of different brightness, their relative distances from the observer in the direction of the line in which they are seen may be ascertained, and having deduced from this equalization a method of turning the space penetrating power of a telescope into a gradually