objective of his telescope, discovered a small binuclear, planetary nebula. Its position for 1880 is R. A. 21h. 2m. 11.8s, Dec. 47° 22.2′ N.

Washington, December 23, 1880. W. C. W.

SWIFT'S COMET.

The following are two more positions of this comet. These were obtained by the aid of a ring micrometer. Nov. 20, 1880, R. A. 1h. 6m. 24s. : Dec. +54° 22′ 39″ : Time is 10h. 49.1m. Washington *m. t.* Dec. 5, 1880, R. A. 4h. 7m. 49.2s. : Dec.+48° 30′ 10″ Time is 9h. 49m. Washington *m. t.* I have also an observation of position for Nov. 7, which has not been reduced as I have not yet managed to find the position of a fifth magnitude star, to which the comet's position was referred. The star's position will soon be obtained.

Nashville, Tenn., Dec. 21, 1880. E. E. BARNARD.

NEW COMPANION TO ζ FORNACIS.

Sir John Herschel entered this as No. 2161, of his Fifth Catalogue of Double Stars, by reason of a distant eleventh magnitude which he detected, at an estimated distance of 45″, in the direction of 169 4°. This star was measured by me in 1879 in connection with a series of observations of a class of stars given in "Smyth's Bedford Catalogue." Since then, in repeating the measure of the Herschel Star, I have discovered a much nearer component, which fairly entitles the large star to be classed as double. The new star is very faint, and a rather difficult object with the 18½-inch refractor of the Dearborn Observatory. This, however, is partly due to its low altitude in this latitude, it being 25° south of the Equator. The mean result of my measures of these companions on four nights is :—

A and B	P=144.4°	D=11.53″	1880.93
A and C	157.0°	48.85″	1880.68

I have estimated the new companion as thirteenth magnitude. This, it will be remembered, is in the Struve scale of magnitudes, which would make it very much smaller than Herschel's twentieth magnitude.

The place of the principal star for 1880 is :—

R A. 2h. 44m. 33s.
Decl. —25° 3″

S. W. BURNHAM.

CHICAGO, Ills., December 21, 1880.

To the Editor of SCIENCE :

Professor Winchell, in the last number of "SCIENCE," refers to what he supposes "to be some errors in the dates in the list of minor planets discovered by the late Professor Watson," viz. :

(133) Cyrene, discovered Aug. 14, 1873, *Am. Jour. Sci.* III., VI., 296.
(174) Phaedra, " " 8, 1877, " " " III., XIV., 325.
(175) Andromache, " Sept. 2, 1877, " " " III., XIV., 325.

In correcting these supposed errors Prof. Winchell has fallen into more grievous ones.

Owing to a misprint in the *Astronomische Nachrichten* I was led to record the date of the discovery of (133) as August 26 ; it should be August 16, vid. *Astron. Nach.* 82,241 *Am. Jour. Sci.* III., VI., 296.

(174) Phaedra was discovered September 2, 1877, vid. *Am. Jour. Sci.* III., XIV., 325. This date is given September 3 in *Circ. Berl. Jahr.* No. 76. September 2 is undoubtedly the correct date. The object discovered August 8 turned out to be (141) Lumen, vid. III., XIV., 429, *Circ. Berl. Jahr.* No. 76.

(175) Andromache was discovered October 1, 1877, vid. *Astron. Nach.* 91-127 ; also *Circ. Berl. Jahr.* No. 81. The object called (175) in *Am. Jour. Sci.* III., XIV., 325 was really (174) Phaedra, as is explained in *Circ. Berl. Jahr.* No. 81. AARON N. SKINNER.

U. S. NAVAL OBSERVATORY,
WASHINGTON, D. C., Dec. 22, 1880.

BOTANY.

PILOSITY AS A TERATOLOGICAL PHENOMENON.—Hitherto teratologists have considered undue pilosity, or the adventitious production of hair in plants, as a matter of minor importance, but M. Ed. Heckel, in a recent note to the French Academy, (*Comptes Rendus*, xci., p. 349), insists that there are certain phases of this sort of change in plants which have a higher significance than that of a simple variation. He proposes to divide the phenomenon into the following three categories :

(1.) *Physiological Pilosity*, which includes the formation of hairs, or the increase in number of these, on the parts of plants where they are normally present, or even entirely wanting. Such cases are oftenest seen when plants change their habitat from a wet to a dry soil. This sort of physiological adaptation takes place within quite narrow limits ; and it varies from glabrousness to pilosity unaccompanied by any alteration of specific characters.

(2.) *Teratological Pilosity*, which begins at the moment the specific habit is altered, and acquires its maximum when the modifications are profound enough to suggest the idea of a new species. A large number of conditions capable of producing nutritive troubles in plants may give rise to this peculiar phenomenon, which M. Heckel proposes to introduce into teratological literature under the distinctive term of "Deforming Pilosity" (*Pilosisme deformant*).

(3.) *Pilosity due to the Sting of Insects or to Organic Variations*, which is clearly distinguished from the former in being very localized (e. g. certain galls, the filaments of *Verbascum* with aborted anthers, etc.,) and which cannot change the habit of the species.

Of changes due to *deforming pilosity*, M. Heckel gives two prominent examples which he has studied, *Lilium Martagon*, L., and *Genista aspalathoides*, Lam. The alterations in the last named plant are so profound that its monstrous state has even been described by De Candolle as a species, under the name of *G. Lobelii;* while by Morris it has been regarded as a marked variety, and named by him var. *confertior*.

MICROSCOPY.

The remarks of the "Fellow of the Royal Microscopical Society," who so ably advises *The English Mechanic* on Microscopy , on the faulty construction of many forms of "Student's" microscopes, is well timed.

In regard to the system of getting as much as possible for the money, he says : "It is just this petty economy in the original outlay on a practical stand that cramps the student when he has acquired some manipulative dexterity. Dealers and manufacturers are, of course, driven to supply what is recommended by the 'authorities.' The continued refrain of 'cheapness, cheapness,' brings down the construction of the microscope until it has become (in far too many instances) the baldest tube, stage, mirror, objective, and eyepiece with which it is possible to view a speck of saliva on a slip of glass. This perpetual reduction of the finish and design of the microscope tends to exclude all the better opticians from supplying students' microscopes, for they cannot do justice to themselves when the price is to be cut down as it has been during the last few years. The consequence is that an enormous number of common French or German instruments has been imported into this country and America ; students have been 'set up' with these things, to discover later on, when they have become experienced enough to judge of such matters, that they have no market value except as lumber.

The severe competition, lately, has been mainly confined to the production of *low-priced* microscopes, *not* the production of an *efficient* instrument at a moderate cost ; the consequence appears to have been that manufacturers whose appliances are about equal to the task of making gas-fittings have been induced to enter the competition ; a model of stand has been placed before them which they have copied 'more or less ;' at any rate, the