or 3 minutes, and the effect of the slow train only lasted about 1 minute instead of 2 or 3 as at B. This, coupled with the irregularities of the fast train, would possibly indicate that station C, 0·93 mile from the railroad, was near the edge of the belt of ground over which the disturbance extended. At both B and C, while the fast trains shook the mercury enough to prevent reflection observations, the effect of slow trains up grade, although distinctly noticeable, was not more than frequently has to be borne from surface-breezes or other local disturbance in an observatory, and was not enough appreciably to hinder satisfactory bisections of the reflected image of a star.

At station D, distant 0·81 mile (that is, slightly nearer than B and considerably nearer than C), there was no effect from the fast trains down grade, except for about 10^s or 15^s, when the train seemed to be crossing a small bridge about a mile from D; but even then this disturbance from the fast trains was very much less than from the slow ones at B and C, both of which were more distant from the railroad. The soil in which the post was set at D was almost exactly the same as at A; and the most probable explanation of the very marked difference of disturbance here and at the other places is the presence of a small ravine or valley, about 50 or 60 feet deep, between D and the railroad and within 300 or 400 feet of D, in which case, if the vibrations at this distance from the railroad did not reach very deep below the surface, the ravine would tend to cut them off.

The four stations were all on the same side of the railroad, and all within a circle of about 2 miles in diameter; and, as far as indicated by excavations for railroad cuts and the digging of wells, they all appear to rest on similar strata of clay and gravel to a considerable depth.

Experiments were also made on two other sites, to test the effect of carriage-driving on a public road, and it was found that a hack carrying four persons and drawn by two horses, driven up and down on a gravel road about 400 or 500 feet from the instrument, made a temporary shaking of the mercury whenever a wheel struck a stone or hollow, and also while crossing a small wooden bridge about 500 feet distant; but there was no serious continuous disturbance till the carriage approached within 200 or 300 feet of the instrument.

H. M. Paul.

Small Planetary Nebulæ discovered at the Harvard College Observatory.

The name of Planetary Nebulæ was originally used to designate such nebulæ as presented a pretty well-defined and nearly circular

disk, so that they resembled planets in general appearance. The discovery of Huggins, that these objects are also distinguished from most other nebulæ by their gaseous spectra, seems to make it expedient to include in the same class all nebulæ, however small, which have gaseous spectra and an approximately circular form. A very small nebula of this sort is undistinguishable from a star in an ordinary eyepiece, but retains its original appearance when viewed through a prism, instead of being distorted like ordinary stars under the same circumstances.

The objects named in the following list have been detected during an extensive examination of the stars with the aid of a direct-vision prism attached to the large equatoreal telescope of this Observatory. They are mostly undistinguishable from stars when the prism is removed from the eyepiece, but a few of them have small disks. The regions examined have been selected with the view of affording a fair means of learning something with regard to the distribution of these objects in the sky, and it is remarkable that all those which have been found occur in or near the Milky Way. This was previously known to be the case with the larger planetary nebulæ having gaseous spectra.

The observations have all been made by myself, in the intervals of other astronomical work, a definite portion of the sky being usually swept over with the telescope on each occasion.

The sixth object of the list is the Durchmusterung star +1° 3979. Its brightness and distinct stellar appearance would facilitate micrometric observations, and the study of its possible parallax might therefore be worth undertaking.

No.	Date of discovery.	R.A., 1880.	Dec., 1880.
1.	1880, July 13	$18^h\ 25^m\ 10^s$	$-25°\ 13'$
2.	July 14	18 4 19	−28 12
3.	Sept. 3	18 14 23	−26 53
4.	1881, Nov. 25	20 6 27	+37 3
5.	1882, July 15	17 58 6	−19 51
6.	July 16	19 16 50	+ 1 17
7.	Aug. 18	18 7 44	−20 19
8.	Aug. 18	17 41 22	−16 26
9.	Aug. 18	18 5 13	−19 7
10.	Aug. 19	18 56 27	− 0 37
11.	Sept. 4	19 28 40	+ 5 26

Three small nebulæ occurring in Sir John Herschel's General Catalogue or in Dreyer's Supplement to that work, Nos. 4333, 5851, 5942, were encountered during the progress of the work and were found likewise to have gaseous spectra.

Harvard College Observatory,
Cambridge, U.S., Sept. 9, 1882.

EDWARD C. PICKERING.