

OUR ASTRONOMICAL COLUMN.

A NEW COMET.—The Astronomer Royal informs us that he has received the following telegram from Prof. O. Baeklund, director of the Pulkova Observatory:—"New comet Neujmin., 11 o mag., February 24, 9h. 17m. Simeis M.T., R.A. 8h. 58m. 40s., declination 16° 24' N. Motion slow. Probably south." A further observation telephoned to us as we go to press is as follows:—R.A. 8h. 58m. 29.8s., declination +14° 42' 58", February 27, 11h. 33.6m., G.M.T.

COMET 1915a (MELLISH).—Additional measures of the condensations in the tail of this comet are given in Lowell Observatory Bulletin, No. 70. Photographs taken with the 40-in. reflector have been measured by Mr. C. O. Lampland. Mr. E. C. Slipper made visual micrometric measures with the 24-in. refractor.

The following positions of the comet are extracted from an ephemeris given in Circular 501 of the *Astronomischen Nachrichten*:—

	12h. G.M.T.			R.A.	Dec.	Mag.	
	h.	m.	s.				
March 2 ...	3	37	24	...	+20 56.6	...	11.7
6 ...	4	40	12	...	21 27.2	...	
10 ...	4	43	9	...	21 56.9	...	11.9

U.S. NAVAL OBSERVATORY, 1915.—We have received a copy of the report of the superintendent of this extremely active institution. The Gaithersburg Station of the International Latitude Service has been discontinued. Dr. F. E. Ross has been transferred to Washington, together with the photographic zenith tube for continuous determination of the variation of latitude.

A DAYLIGHT METEOR.—An extremely interesting account of a great meteor seen over the Chusan Archipelago during the forenoon of February 13, 1915, has been given by Capt. W. F. Tyler, R.N.R., in a paper communicated to the North China Branch of the Royal Asiatic Society (Journal, vol. xivi.). Capt Tyler's attention was directed to the matter by the report of the light-keeper at Steep Island that a man-of-war had fired an aerial torpedo which nearly hit the tower. The combined observations from a number of adjacent islands and from Shanghai seem to be best fitted by assuming the meteor followed a strongly curved path, at first travelling a little east of north, and finally moving towards the south-east. The meteor was seen to fall into the sea near Video Island, and a violent explosion was heard over a very wide area. It is notable that exceptional meteoric displays have been recorded about this date in previous years.

A TRANSNEPTUNIAN PLANET.—The first number of the first volume of the Memoirs of the Lowell Observatory deals with this alluring subject. Although the cometary evidence which has been held to indicate the existence of an additional member of the solar system may be open to other interpretation, yet it may be confidently predicted that extended knowledge of the motions of the known outer planets will ultimately settle the matter if, that is, the hypothetical body, or bodies, exist. It is interesting to compare the material Dr. Lowell finds available with that which led to the capture of Neptune. In the first place, the latter has not yet been known long enough to enable its theory to be developed with the accuracy required as a basis of a search for a source of perturbation, hence instead of the planet next in the series, recourse must be made to the antepenultimate Uranus. Then, secondly, the residuals given by Gaillot's theory of Uranus do not exceed 4.5" at any point of its path (1709-1910), whilst in 1845 Uranus showed an unexplained discrepancy amounting to 133". A comparison of the present residuals, small though they be, with

the probable errors of observations, shows that they are too large to be due to the latter. By a lengthy process of trial by error Dr. Lowell shows that the hypothesis of a single outside perturbing body can reduce the residuals 71 per cent., or, including errors of observation, by 90 to 100 per cent. Two solutions are found to be equally indicated, one with the unknown situated (July 0, 1914) in heliocentric longitude 84.0°, for the other in 262.8°. The distances, masses, and eccentricities are closely alike, being about forty-four times the earth's distance from the sun, 1/50,000 of the sun's mass, and an eccentricity about 0.2, indicating a visibility of 12-13 magnitude, and a disc greater than 1" in diameter.

ARTIFICIAL IRRIGATION IN THE WESTERN STATES OF NORTH AMERICA.¹

THE hydrological department of the United States Geological Survey finds nowhere, perhaps, so important and fruitful a field of operations as in the great tract of country which lies west of the 100th meridian of west longitude. The difficulties attending the agricultural development of regions in which the rainfall is so scanty as to be almost negligible are sufficiently obvious, but the lack of adequate supplies of water is no less felt for mining and industrial purposes, to say nothing of ordinary domestic requirements. Hence arises the necessity for a close and searching investigation into all such sources as are actually available, and the conservation of supplies from streams and wells, so that they may be utilised to the best advantage, with the reduction of waste and loss to a minimum.

Such are the conditions prevailing on the south-eastern portion of the State of Nevada. Large areas of fertile soil lie idle for want of moisture to make them productive, and very little vegetation survives, unaided, the long periods of drought. The average annual precipitation of rain at seven gauging stations in different localities ranges from 3.42 to 11.99 in. When a rainfall does occur, it often takes the form of a cloudburst, in which a large quantity of water falls on a small area in a very short space of time. Much consequently is lost. The majority of the upland streams, moreover, disappear in the alluvial slopes at the foot of the mountains, and only flood waters from heavy rains reach the central valleys. Wells and springs, therefore, constitute some of the most important sources of supply, and they are found to give the best yield in the unconsolidated sedimentary deposits which partly fill the structural basins of the district. The lower indurated strata, forming what is called the "bed-rock," are much less productive. These lower formations are usually hard, compact, and impervious layers, representative of various systems, mostly sedimentary, but with some igneous intrusions. They serve the useful purpose of confining the water which enters the "valley-fill," and of preventing its downward escape.

Tularosa Basin, in New Mexico, with an area of 6000 square miles, is another arid region with similar climatic conditions. The sky is generally clear, the atmosphere dry, and the average rainfall in the lower

"Ground Water in South-Eastern Nevada." By Everett Carpenter (Water Supply Paper 265.) Pp. 86, with diagrams and 5 plates.
 "Geology and Water Resources of Tularosa Basin, New Mexico." By O. E. Meiner and R. F. Hare (Water Supply Paper 343.) Pp. 316, with diagrams and 19 plates.
 "Springs of California." By Gerald A. Waring (Water Supply Paper 338.) Pp. 410, with diagrams and 13 plates.
 "Ground Water for Irrigation in the Sacramento Valley, California." By Kirk Bryan (Water Supply Paper 375 A.) Pp. 49, with diagrams and 2 plates.
 "Ground Water Resources of the Niles Cone and Adjacent Areas, California." By W. O. Clark (Water Supply Paper 345 H.) Pp. 43, with diagrams and 9 plates.
 (Issued by United States Geological Survey, Washington, 1915.)