of the southern heavens have not been entirely neglected of late years. The public observatories are perhaps too closely occupied with other work to allow of much being expected from them in a class of observation peculiarly suited to the amateur astronomer, but there must be a grand field of operations for private observers, in southern double and variable-star astronomy.

Capt. Jacob's last orbit of p Eridani may be written thus :—

Peri-astron passage	1819·83
Node	110° 40′
Node to peri-astron in direction of motion ...	285° 50′
Inclination	46° 36′
Excentricity	0·323
Semi-axis	4″·25

Mean annual motion, −3°·3645, or period of revolution 107 years.

The components are of equal brightness, and hence it is to be expected some measures may be registered 180° different from others; accordingly, to work the whole series into any supposable orbit it is necessary to add 180° to Sir J. Herschel's micrometrical measures (Cape Obs., p. 276), and indeed it will be seen that he has so recorded the angles of the 20-feet sweeps, p. 174.

The errors of the above orbit are, for

1835·00	Pos. ($c-o$)	+ 2°·5	Dist. ($c-o$)	0″·00
1857·96	,,	− 1°·6	,,	+ 0″·03

The following are deduced from the same orbit :—

1875·0	Pos.	218°·9	Dist.	3″·92
76·0	,, ...	216°·3	,, ...	3″·89
77·0	,, ...	213°·7	,, ...	3″·86

As the measures of this star are, so far, scattered in several volumes, they are collected here for convenience of reference. Dunlop's angle was evidently registered in the wrong quadrant, as is pointed out both by Sir J. Herschel and Capt. Jacob; the correct reading appears to be 343° 6′.

Dunlop	1825·96	Pos.	343°·1	Dist.	2″·5
Herschel	35·00	,,	302·3	,,	3·65
Jacob	45·88	,,	276·0	,,	4·16
,,	46·83	,,	277·0	,,	4·32
,,	49·82	,,	270·0	,,	—
,,	50·80	,,	268·73	,,	4·32
,,	51·79	,,	266·38	,,	4·30
,,	52·76	,,	264·84	,,	4·14
,,	53·99	,,	263·24	,,	4·36
,,	56·09	,,	261·12	,,	4·70
,,	57·96	,,	258·18	,,	4·49

The place of p Eridani for the commencement of 1876 is in R.A. 1h. 35m. 5s., and N.P.D. 146° 49′·5.

(2) O. Σ 387.—Between the epoch of Mr. Otto Struve's measures in 1844 and Baron Dembowski's in 1868, the angle in this binary has retrograded 77°, and no doubt if measures are obtained this year a very considerable further change will be manifested: yet the distance, if we except Secchi's estimate in 1856, has been found about half a second, as long as the star has been under observation. A first approximation to the elements may soon be practicable. The place of this object for beginning of 1876 is R.A. 19h. 44m. 6s., and N.P.D. 55° 0′·1. The number applies to the Pulkova Catalogue of 1850.

THE MINOR PLANETS.—No. 150 of the group of small planets has been reached, Prof. Watson, director of the Observatory of Ann Arbor, Michigan, having detected another member, apparently on the night of October 18; the place as yet doubtful, the telegrams through the French and English cables being discordant. It is stated to be of the 10th magnitude, and is therefore brighter than the great majority of planets discovered during the last few years. Considering the close scrutiny which the ecliptical region of the sky is receiving at the present day, we must surely soon be in a position to pronounce with some degree of confidence whether any trans-Neptunian planet as bright as stars of the 13th magnitude exists within $2\frac{1}{2}°$ or 3° from the ecliptic, and in the event of greater inclination, the scheme of Prof. Peters, on its completion, may afford an equally definitive conclusion. There have been some curious alarms in this direction, as in the autumn of 1850, during observations of the minor planet Hygeia at Washington, when an apparently slow moving object was compared with the planet on more than one evening; but although sought for diligently on the supposition of its being a distant body, was not recovered, nor, we believe, has since been seen in the observed place. The change of position was larger than could well be attributed to casual errors in micrometric observations; but there seems to be no other explanation of this case, except admitting error of observation and the existence of a variable star of long period in that spot.

NOTES FROM THE "CHALLENGER"

PROF. WYVILLE THOMSON has just sent me from the *Challenger* an account of certain results of Deep Sea dredgings in the North Pacific. In these dredgings was obtained a Gymnoblastic Hydroid of such colossal dimensions that the largest form hitherto known sinks in comparison with it into utter insignificance. Prof. Thomson has determined the Hydroid as a MONOCAULUS or nearly allied form, and a beautiful drawing which accompanies his letter confirms this view.

The animal itself has not yet arrived, but the letter which gives an account of its capture contains so many points of general interest, that the following extract will, I feel sure, be acceptable to the readers of NATURE :—

"H.M.S. *Challenger*, N. Pacific, July 24, 1875.

. . . . . .

"On the 17th of June, in the North Pacific, lat. 34° 37′ N., long. 140° 32′ E., depth 1,875 fathoms, temperature at bottom 1° 7 C., bottom grey mud, the trawl brought up three or four examples of what seems to be a species of MONOCAULUS, or something allied to it. The point which naturally struck us most was that the hydranth in a specimen measured fresh by Moseley and myself, was nine inches across from tip to tip of the expanded (non-retractile) tentacles, and the hydrocaulus was seven feet four inches high! On the 5th of July, lat. 37° 41′ N., long. 177° 4′ W., depth 2,900 fathoms, with bottom temperature the same as before, and a bottom of red clay with manganese nodules, the trawl, which was torn to pieces by having taken in too great a weight of nodules of manganese, brought up entangled in its outer netting another fine specimen of this same form. It was put in weak picric acid, and then into weak alcohol, and you have it in the short piece of test-tube among the horsehair. This specimen was not measured, but the hydranth was carefully sketched by Mr. Wild, and I enclose you the sketch.

"These delicate things, drawn up rapidly through the water from a depth of nearly four statute miles, and transported into such totally different conditions of temperature, pressure, &c., suffer greatly from the violent change: they are in fact almost knocked to pieces, and their finer tissues are in a nearly deliquescent state, so that our great anxiety is to get them at once into some reagent which will harden them somewhat. It is wretched to see them melting away absolutely under one's eyes: when put into any of our fluids they at once contract out of all form, but that cannot be helped. I thought it best you should have them as well preserved as we could manage, so I only gave them a cursory glance and sent them on.

"The hydrocaulus is enormously extensile—it is of a pale pink colour, and our specimens, when distended in the water, were about four feet or so long: one, as I mentioned before, which Moseley and I measured, was seven feet four inches high, but that one was stretched over the surface of the trawl net, and although it must of course have been capable in life of extending to that degree, it might not have been a normal attitude. When at what

seems to be its normal state of distension, the diameter of the hydrocaulus is about half an inch. Its structure you can make out for yourself. The proximal ends of several of them were coated with mud when they came up; the longitudinal striæ were very evident in the soft tissue; fluid gravitated down the centre of the hydrocaulus, and collected in a bladder-like expansion at the base. The base of this stem was of a darker colour than the rest—a dull rose—in most of them (not in the one figured by Wild). As I did not mean to describe the creature I did not look out for processes or fibrillæ at the proximal extremity; you may find them in the spirit specimens. The total length of the hydranth when moderately extended was 1½ inches.

"The proximal range of tentacles number about a hundred, and these are about four inches long—they are almost transparent in life—of a pale pink colour in most specimens. The sporosacs are in close tufts of a maroon colour just at the base of the proximal tentacles. The specimen I looked at was a male, but the tissues were so soft—almost slimy—that I did not like to tease it too much. The walls of the body-cavity were yellowish, and seemed to contain some vertical rolls of glandular matter, and the hypostome terminates in a fringe of about forty-eight or fifty extensile tentacles round the mouth. So much for our gigantic Corymorphoid! These are the only two occasions on which we got it, or anything like it. I should have liked to get a haul or two in Behring's Sea, for there doubtless we should have had it in shallow water. I can only tell you one thing more about it—its associates. On the 17th of June, 1875, in 1,875 fathoms, it was associated with many fishes (Ophidoids, Macrurids, Scopellids—all the usual deep-sea lot), several Gasteropods, many Crustaceans (Dorippe, Galatea, Caridids, &c., and a fine Scalpellum), a few Annelids, many Echinoderms (Brisinga, Phormosoma, Ophiurids, two very fine Holothurids of a new group), species of Isis, Primnoa, Polythoa, and Actinia. On the 5th of July, in 2,900 fathoms, there were some worms (Aphroditacean), an Urchin allied to Diadema, two Holothuriæ, and one or two sponges; but the trawl-net was torn by the weight of the manganese nodules, so we had scarcely a fair sample of the fauna. In the bottle with the tube you will find among the horse-hair one or two pieces of *Heliopora cerulea* from Moseley. He sends at the same time a paper on it to the Royal."

That the enormous depths from which this colossal Hydroid has been brought up should favour the development of gigantic representatives of the diminutive forms of shallower zones, and that in the tenants of these sunless regions of the sea we should find colour not less vivid than that of their light-loving relatives, are facts full of significance.

It is also worth noticing that the sexual zooids of the great Hydroid are to all appearance simple sporosacs, instead of the medusiform zooids which are so frequent in the Gymnoblastic Hydroids of our littoral regions. Indeed, among the many Hydroids which I have examined from deep water, I have never found one which could be referred with probability to a form characterised by the production of medusiform zooids. It would seem that these zooids—delicate and active organisms which are among the most abundant captives of the towing-net in the surface-zone of the sea—are unable to endure, either before liberation from their parent Hydroid, or for a period however short in their free state, the darkness and pressure and other conditions to which the dwellers in the deep sea are exposed. GEORGE J. ALLMAN

NORDENSKJÖLD'S ARCTIC EXPEDITION

A LETTER from Prof. Nordenskjöld to Mr. Oscar Dickson, of Gothenburg, appears in the *Goteborgs Handels Tidning* of the 14th inst. It is dated "On board the *Pröven*, at anchor at the mouth of the Jenesej, 16th August, 1875." The following extracts may be of interest to our readers:—

"We are now employed as busily as possible in equipping the boat in which I, accompanied by Dr. Stuxberg, docent Lundström and three men, intend to sail up the Jenesej, with the view of returning to Europe across Siberia, while the other part of the expedition returns to Norway by sea, on board the *Pröven*.

"After the *Pröven*, on the 8th of June, was towed free of cost out of Tromsö by a little steamer of the same name, we were compelled to lie at anchor in the sound between Carlsö and Renö for five days, on account of a head wind. Finally, on the 14th, we could again weigh anchor and get to sea through Fuglö Sound. We thereupon set our course past North Cape, which we passed on the 17th, to the southern part of Novaya Zemlya.

"During spring and the early part of summer the west coast of this double island is, for some distance from the land, surrounded by a compact ice girdle, impassable at most places, which disappears later in the season, and in which, according to the experience of the fishermen, there are formed, generally at an early period, two sounds which are covered only with thin passable drift-ice, and by which the ice-free belt of water along the coast is connected with the ice-free ocean westwards. One of these open channels is usually situated off Matotschkin Scharr, and its formation is caused by the strong currents which prevail in that sound; the other is to be found about the latitude of Severo Gusinnoi Mys, or North Goose Cape. The latter was chosen by me for the *Pröven*, and was passed without any special difficulty on the 22nd of June. The expedition thus, in seven days from its departure from Carlsö, cast anchor for the first time at Novaya Zemlya, in a little ill-protected bay immediately north of North Goose Cape.

"During the voyage there were set on foot, when the state of the weather permitted, frequent soundings and dredgings, examinations of animal and diatom life in the surface of the sea, determinations of the temperature at different depths, &c. Our operations were generally very successful, and showed that in this sea we may reckon on reaping rich harvests in natural history. We also made repeated trials at different depths of a new instrument for bringing up specimens of the bottom, constructed for the expedition by Dr. Wiberg, which showed itself very well adapted for the purpose, and easily managed."

After visiting and examining various parts of the coast for many days, the *Pröven* was directed to the Sea of Kara, and on the 26th July the anchor was let go off Cape Grebeni, on Waigats Island. So violent a storm was raging, however, that a boat could not be sent out till the 30th July to land on Waigats Island. "A rich collection was here made of Upper Silurian fossils, strongly resembling those from Gotland, and therefore of special interest for Swedish geologists. Here we for the first time encountered Samoyedes, who when they sighted the vessel drove down to the shore in peculiar high sledges adapted for travelling in both summer and winter, and drawn by three or four reindeer. They immediately gave us to understand that they wished to come on board, whither they also accompanied us in our boat, and where they were soon afterwards well entertained by us.

"During our stay on the west coast of Novaya Zemlya we of course instituted numerous investigations regarding the geology, animal and vegetable life, &c., of the regions visited by us, and the number of the places on the coast where we landed rendered it possible for the scientific staff of the expedition to collect materials for ascertaining the natural relations of these regions, which are certainly far more extensive than have been brought home by any of our predecessors." At last on August 2 the sound was successfully passed, and on the *Pröven* reaching the Sea