

XV. *On the places of 145 new Double Stars.* By Sir WILLIAM HERSCHEL,
President of this Society.

Read June 8, 1821.

AN account of the places of 145 new double stars, which were intended to be arranged like those of my two catalogues printed in the *Philosophical Transactions*, as soon as the four particulars of their comparative magnitudes and colour, mutual distance and angle of position could be ascertained. Some of the places of these double stars are taken from a first and second review of the stars with my seven-feet Newtonian telescope; the former being made with a magnifying power of 227, the latter with 460. Some of these double stars are also collected from a review of the ecliptic with a very high magnifier. The rest are taken from my sweeps of the heavens, with the twenty-foot telescope, and a power of 157.

The places of the double stars will be found sufficiently accurate for finding them, as these objects, by their singular appearance, will be easily discovered in a field of view of a large diameter. It should be mentioned, that 15 of these objects were communicated to the late Rev. Mr. FRANCIS WOLLASTON, and inserted by him in his catalogue, distinguished by (M. S.).

It will be seen, by my observations of these double stars, that few of them contain more than one or two of the required particulars, and that the distance and position of the two stars when given, are only in terms of general estimations: so that any lover of astronomy, furnished with a proper telescope and micrometers, who wishes to undertake the work of completing these observations, will find sufficient employment in this interesting pursuit. If this should be the case, it will be an apology for my laying the following observations, in their imperfect state, before this Astronomical Society.

WILLIAM HERSCHEL.

Slough, near Windsor,
February 1, 1821.

Observations of the new Double Stars.

(1.) 125 Sweep, Jan. 24, 1784. A very pretty treble star, making an equilateral triangle, all equal and w. 3d class far, or 4th near. 93 (τ) *Virginis* f. . . . n. $0^{\circ} 5'$, R. A. $14^h 4' \pm''$, P. D. $87^{\circ} 24'$. * *

(2.) 162 Sw. March 11, 1784. A double star preceding the head of *Monoceros*, not in Fl., a very considerable star. 15 *Monocerotis* p. $10' 30''$, n. $1^{\circ} 12'$, R. A. $6^h 18' 43''$, P. D. $78^{\circ} 43'$.

682 Sw. Jan. 11, 1787. Double. 75 (l) *Orionis* f. $14' 3''$, n. $1^{\circ} 24'$, R. A. $6^h 19' 22''$, P. D. $78^{\circ} 35'$.

(3.) 183 Sw. March 21, 1784. A very pretty treble star, making an isosceles triangle, the vertex preceding, and the base in the same meridian. All equal stars w. of the 4th class, near I suppose. 48 *Serpentis* f. $20' 15''$ n. $0^{\circ} 19'$, R. A. $16^h 22' 0''$, P. D. $72^{\circ} 28'$.

(4.) 210 Sw. May 9, 1784. About $18'$ south of 51 (ξ) *Librae* double 3d class far.

(5.) 218 Sw. May 16, 1784. Suspected an extended nebulosity between two stars, but 240 showed two double stars, making a parallelogram without nebulosity. 58 (ϵ) *Herculis* f. $22' 42''$, n. $1^{\circ} 20'$, R. A. $17^h 15' 16''$, P. D. $57^{\circ} 27'$. ** *

(6.) 236 Sw. July 12, 1784. Between three nebulæ (10, 11, 12, V class) is a double star of the 2d or 3d class. 5 (i) *Sagittarii* f. $2' 42''$, n. $0^{\circ} 49'$, R. A. $17^h 49' 39''$, P. D. $113^{\circ} 27'$.

(7.) 236 Sw. July 12, 1784. A very close treble star, making a triangle, whose vertex is following. 16 (ψ) *Capricorni* p. $11' 48''$, s. $0^{\circ} 25'$, R. A. $20^h 21' 28''$, P. D. $116^{\circ} 26'$.

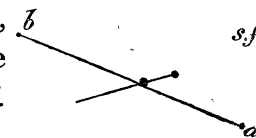
(8.) 240 Sw. July 18, 1784. A double star 33 :: *Vulpeculæ* f. $11' 18''$, n. $0^{\circ} 8'$, R. A. $20^h 59' 53'$, P. D. $68^{\circ} 22'$.

301 Sw. Oct. 20, 1784. Double, equal, 4th class near. 33 *Vulpeculæ* f. $12' 18''$, n. $0^{\circ} 7'$, R. A. $21^h 0' 52''$, P. D. $68^{\circ} 23'$.

963 Sw. Oct. 3, 1790. Double 4th class, equal, both considerably large. 33 *Vulpeculæ* f. $12' 21''$, n. $0^{\circ} 3'$, R. A. $21^h 1' 12''$, P. D. $68^{\circ} 26'$.

(9.) 243 Sw. July 22, 1784. 5 *Aquilæ*, treble, the 3d excessively small. Position following the other two, the line bending a little towards the south. Distance almost the same from the 2d, as the 2d from the 1st.

Review, August 5, 1796. 5 *Aquilæ*, treble. Distance of the largest and next to it 0 rev. 24.5 parts + $4\frac{1}{2}$ for zero = $11''\cdot9$. Position 2 rev. - 61.3 parts + 1.1 for zero = $31^\circ 27' 3''$, *b* considerably unequal. The 2d and 3d very unequal. The 1st and 3d extremely unequal. s. f. The 3d is more s. f. still, and requires some attention to be seen. Lw. S. dr. 3d very obscure; 460 shows it better than a lower power.



(10.) 247 Sw. August 10, 1784. Double, 3d class. 19 *Capricorni* p. $6' 30''$, s. $0^\circ 14'$, R. A. $20^h 36' 7''$, P. D. $108^\circ 58'$.

40 feet Journal, 1st Sw. eclip. Sept. 21, 1791. Double 19 *Capricorni* p. $6' 30''$, s. $0^\circ 15'$, R. A. $20^h 36' 31''$, P. D. $108^\circ 57''$.

Rev. of eclip. Oct. 18, 1792. Double, a little unequal, 3d or 4th class. Position p. It is the preceding of two pretty L. stars; they are near 2 degrees following 15 (*v*) in a line parallel to 12 (*o*) and 43 (*κ*) *Capricorni*.

Rev. Oct. 12, 1801. Double, the preceding of 2 p. L. stars, about the middle between 12 (*o*) and θ *Capricorni*. 3d class, a little unequal. The preceding is the smallest.

(11.) 258 Sw. Sept. 6, 1784. Double 3d class near, 7 m., both taken together in time and number. 64 *Pegasi* p. $14' 18''$, n. $1^\circ 9'$, R. A. $22^h 57' 2''$, P. D. $58^\circ 13'$.

(12.) 264 Sw. Sept. 10, 1784. Double. 20 *Arietis* f. $14' 36''$, s. $0^\circ 30'$, R. A. $2^h 17' 56''$, P. D. $65^\circ 44'$.

(13.) 269 Sw. Sept. 13, 1784. Double. 21 (*η*) *Cygni* p. $10' 12''$, n. $1^\circ 7'$, R. A. $19^h 37' 55''$, P. D. $54^\circ 22'$.

(14.) 275 Sw. Sept. 16, 1784. Two large stars, the time and number taken between them; the second is double. 5 *Pegasi* f. $16' 6''$, n. $0^\circ 19'$, R. A. $21^h 43' 41''$, P. D. $71^\circ 19'$.

(15.) 279 Sw. Sept. 20, 1784. Double. 63 (*χ*) *Aquarii* f. $19' 18''$, n. $0^\circ 57'$, R. A. $22^h 45' 52''$, P. D. $94^\circ 24'$.

(16.) 313 Sw. Nov. 12, 1784. 57 (*m*) *Pegasi* double. Position about 20 or 30° sp. L. r. S. b., considerably unequal, 4th class.

(17.) 316 Sw. Nov. 16, 1784. A double star of the 2d class. 65 (1st *κ*) *Tauri* p. $16' 35''$, n. $0^\circ 45'$, R. A. $3^h 55' 52''$, P. D. $67^\circ 28'$.

(18.) 312 Sw. Nov. 17, 1784. Double 2d class, near: sp. perhaps 1° ; a large star, followed by two more. 11 *Eridani* f. $15' 0''$ n. ..., R. A. $3^h 8' 41''$:: P. D. $113^\circ 38'$::

(19.) 326 Sw. Nov. 20, 1784. Double 2d class, both L. 11 (*e*) *Navis*

p. 22' 23", s. 0° 43', R. A. 7^h 25' 12", P. D. 113° 1'. Is n *Argus* in *Puppi*, L. c. 656.

(20.) 326 Sw. Nov. 20, 1784. 6 m. double, 6th class. Position directly preceding; considerably unequal. 15 *Navis* f. 1^h 32' 3", n. 1° 2', R. A. 9^h 30' 22", P. D. 112° 38'.

(21.) 340 Sw. Dec. 13, 1784. 17 (1st ρ) *Orionis*. Double, 2d class. Position n. f. unequal.

Rev. Jan. 17, 1809. Distance between 3 and 4 diameters of L. A pretty object.

(22.) 353 Sw. Jan. 6, 1785. Double, 3d class, equal; position nearly in the meridian, 8.8 m. 87 (c) *Leonis* f. 47' 38", s. 0° 59', R. A. 12^h 6' 57", P. D. 92° 48'.

674 Sw. Dec. 29, 1786. Double, of the 4th class, near, equal, nearly in the meridian; but the most south is the preceding. Position about 82°, 8.8 m. 29 (ν) *Virginis* p. 23' 41", s. 2° 29', R. A. 12^h 7' 13", P. D. 92° 46'.

Rev. of ecl. March 14, 1793. Double, 4th class, 3½ degrees south of 15 (η) *Virginis*; a large star.

(23.) 360 Sw. Jan. 29, 1785. Double, equal 8.8 m., nearly in the meridian; 3d class near, or 9.9 m. 42 (ψ) *Tauri* p. 26' 12", s. 0° 20', R. A. 3^h 27' 25", P. D. 61° 56'.

(24.) 362 Sw. Jan. 31, 1785. 39 (A) *Eridani* has a very small star to the south. 2d class very near. Position in the meridian.

Rev. Jan. 17, 1809. Extremely unequal. I see it best with the double eye-piece. Very unequal will be more proper. With 240 it will not bear light enough to see the wires: it is, however, about 85° sp. With 160 the distance is about between 2 and 3 diameters of L.

(25.) 368 Sw. Feb. 7, 1785. Double, nearly equal, both w. about 9 m. 3d class far. Position nearly in the parallel. 6 (3d b) *Hydræ* and *Crat.* p. 49' 7", n. 1° 53', R. A. 9^h 53' 51", P. D. 107° 5'. (Is 40 *Felis* of BODE's Cat.)

(26.) 379 Sw. March 5, 1785. 7.6 m. has a star about 8.9 m. following 6th class. 20 *Sextantis* f. 65' 29", n. 0° 18', R. A. 11^h 8' 23", P. D. 96° 1'.

(27.) 380 Sw. March 5, 1785. 72 (1st L) *Virginis*, double, extremely unequal. Position about 30° n. f. 4th class near. L. w. S. r.

913 Sw. March 20, 1789. 72 (1st L) *Virginis*, double.

(28.) 383 Sw. March 10, 1785. Double, very unequal; 3d class. 24 *Libræ* p. 15' 2", s. 1° 28', R. A. 14^h 45' 0", P. D. 110° 26'.

Z

(28.) 1008 Sw. May 25, 1791. Double, considerably unequal. Position sp. but near the parallel; 3d class, 7.8m. MAYER's 575 z. f. $22' 10''$, s. $0^{\circ} 58'$, R.A. $14^h 45' 17''$, P.D. $110^{\circ} 28'$.

(29.) 385 Sw. March 12, 1785. 7 m. has a very small star just preceding, about 4th or 5th class. 72 (τ) *Cancr* f. $25' 36''$, s. $1^{\circ} 5'$, R.A. $9^h 20' 39''$, P.D. $60^{\circ} 34'$. (Is 29 *Leonis* of BODE's Cat.)

(30.) 386 Sw. March 13, 1785. A very small and close double star (with 240); the sweeping power made me suspect it to be nebulous. 72 (τ) *Cancr* f. $1' 6''$, n. $1^{\circ} 15'$, R.A. $8^h 57' 3''$, P.D. $58^{\circ} 18'$.

(31.) 393 Sw. April 6, 1785. Double, equal, 3d class, nearly in the same parallel. 12 (e) *Comæ Ber.* p. $1' 54''$, n. $1^{\circ} 12'$, R.A. $12^h 9' 47''$, P.D. $61^{\circ} 45'$.

(32.) 405 Sw. May 1, 1785. Double, 4th or 5th class. 7 (ζ) *Coronæ* f. $7' 6''$, s. $0^{\circ} 13'$, R.A. $15^h 38' 36''$, P.D. $58^{\circ} 52'$.

(33.) 411 Sw. May 28, 1785. Double, 4th class near, equal. 50 *Libræ* p. $22' 8''$, s. $0^{\circ} 17'$, R.A. $15^h 27' 9''$, P.D. $98^{\circ} 5'$.

Rev. May 22, 1797. My double star of 411 sweep is about $1^{\circ} 40'$ n. f. 37 *Libræ*. (Fl. star, observed page 45, north of 37, is in its place.)

(34.) 430 Sw. Sept. 1, 1785. Double. 19 *Piscis Austr.* p. $11' 37''$, n. $1^{\circ} 11'$, R.A. $22^h 27' 47''$, P.D. $119^{\circ} 28'$.

(35.) 478 Sw. Nov. 27, 1785. 6 m. double, very unequal. Position ... following. 74 *Aquarii* f. $44' 16''$, s. $1^{\circ} 30'$, R.A. $23^h 26' 25''$, P.D. $104^{\circ} 16'$.

(36.) 521 Sw. Feb. 2, 1786. 35 *Sextantis*. Double, 3d class near. Position south preceding.

675 Sw. Dec. 30, 1786. 35 *Sextantis*, double, 3d class far, a little unequal. Position south preceding.

(37.) 521 Sw. Feb. 2, 1786. Double, both 8m; 3d class near. 64 *Virg.* f. $1^h 42' 7''$, n. $0^{\circ} 3'$, R.A. $14^h 53' 27''$, P.D. $83^{\circ} 41'$.

557 Sw. April 29, 1786. Double, equal, 3d class, 8.8 m. 3 *Serpentis* p. $11' 2''$, n. $0^{\circ} 37'$, R.A. $14^h 53' 31''$, P.D. $83^{\circ} 40'$.

(38.) 548 Sw. March 27, 1786. Double, equal $1\frac{1}{2}$ diameter, 7.7 m. 24 (ι) *Crateris* f. $1^h 2' 24''$, n. $0^{\circ} 11'$, R.A. $12^h 30' 11''$, P.D. $101^{\circ} 50'$. (Is 58 *Corvi* in BODE's Cat., a star of HEV.).

(39.) 559 Sw. April 30, 1786. Double, 3d class near, a little unequal. Position almost in the meridian 23 (τ) *Scorpii* p. $11' 22''$, s. $1^{\circ} 24'$, R.A. $16^h 11' 11''$, P.D. $119^{\circ} 10'$. (It is MAYER's 644 z. L. c. 1366.)

(40.) 566 Sw. May 26, 1786. A double star within neb. IV. 41. 14 *Sagittarii* p. $11' 58''$, s. $1^{\circ} 15'$, R.A. $17^h 49' 30''$, P.D. $113^{\circ} 1'$.

(41.) 595 Sw. Sept. 20, 1786. 53 *Aquarii*, double (cloudy).

1050 Sw. Sept. 6, 1793. 53 *Aquarii*, double, equal; 2d class, or 3d class near. Position about 15° from n. p. to s. f.

(42.) 613 Sw. Oct. 17, 1786. 13 *Lacertæ* has an extremely small star following, 3d class.

(43.) 616 Sw. Oct. 18, 1786. 10 (κ) *Pegasi*, double, extremely unequal, the small star almost n. but a little preceding; 3d class near I suppose.

(44.) 619 Sw. Oct. 18, 1786. Double, equal, 3d class. 4 (ω) *Aurigæ* p. $28^\circ 0'$, n. $2^\circ 1'$, R.A. $4^h 16' 33''$, P.D. $50^\circ 26'$.

Rev. Oct. 16, 1795. $1^\circ 40'$ sp. 58 (e) *Persei* in a line parallel to β and ι *Aurigæ*, double; 3d class, equal.

(45.) 621 Sw. Oct. 24, 1786. Double. 41 (δ) *Andromedæ* p. $7' 55''$, n. $0^\circ 46'$, R.A. $0^h 47' 51''$, P.D. $46^\circ 26'$.

Jour. Sept. 18, 1794. About $1^\circ 45'$ n. p. 41 *Andromedæ*, double, nearly equal, in a line parallel to 57 (γ) and 42 (ϕ) nearly; a considerable star, 2d or 3d class. The southmost is the smallest. Position not far from the meridian; 7 feet. 41 *Andromedæ* p. $7' 55''$, n. $0^\circ 46'$.

Rev. August 5, 1796. The double star $7' 55''$, p. 41 *Andromedæ*. Position 3 rev. $+ 31.5$ parts $- 1.1$ for zero $= 74^\circ 20'.4$ sp. Considerably unequal. Distance 0 rev. 13.9 parts $+ 2\frac{1}{2}$ for zero $= 7''.2$ L. w. S. w. rather pretty unequal.



(46.) 654 Sw. Dec. 19, 1786. Double. 69 (λ) *Eridani* p. $0^\circ 48'$, n. $0^\circ 5'$, R.A. $4^h 58' 47''$, P.D. $98^\circ 56'$.

Rev. Jan. 17, 1809. 69 (λ) *Eridani* $\frac{1}{2}^\circ$ preceding the nearest of two. Considerably unequal. L. w. S. r. Position with 240 0 rev., 27.2 parts $+ 2.5$ for zero $= 6^\circ.683$ or $6^\circ 41'.2$. It is IV. 43 of my first catalogues; λ 69 is a single star.



(47.) 692 Sw. Jan. 17, 1787. 7 m. double L. r. S. b., extremely unequal. 14 *Trianguli* f. $3' 43''$, n. $1^\circ 11'$, R.A. $2^h 23' 16''$, P.D. $53^\circ 38'$.

(48.) 700 Sw. Feb. 13, 1787. Double. 1 *Lupi* p. $21' :: 43''$, n. $0^\circ 44'$, R.A. $14^h 39' :: 45''$, P.D. $119^\circ 58'$.

(49.) 704 Sw. Feb. 22, 1787. 8 *Sextantis* 5 m. Fl. 6 m. Double, 4th or 5th class, extremely unequal. Position n. p.

(50.) 710 Sw. March 15, 1787. δ *Ant. Pneum*, L. C. 933. WOLL. Cat. zone $119^\circ 10'$ Double, very unequal; 2d class. Position about 40° sp.

(51.) 711 Sw. March 15, 1787. 4 (h) *Centauri*. Double, very unequal. Position 80° sp.; 3d or 4th class.

(52.) 714 Sw. March 17, 1787. Double, very unequal: 2d class, about 80° sp. L. r. S. b. 7 m. 6 *Canum Ven.* p. $5' 37''$, s. $1^\circ 7'$, R.A. $12^h 9' 45''$, P.D. $50^\circ 54'$.

(53.) 722 Sw. March 20, 1787. 54 (ν) *Ursæ*, double, very unequal, 60 or 70° s. f.; 2d class.

(54.) 748 Sw. July 10, 1787. 7 m. Double, 3d class. Position preceding, a very little south L. w. S. d. 37 (k) *Aquilæ* p. $1^h 3' 46''$, n. $0^\circ 7'$, R.A. $18^h 19' 27''$, P.D. $100^\circ 55'$.

Rev. Aug. 6, 1796. Of 748 Sw. South of 1 *Aquilæ*, double, L. w. S. d. very unequal. Distance 0 rev. 27.0 parts + 2.5 for zero = $12''.9$. It is difficult to measure on account of the position. Position 0 rev. + 65.4 parts - 1.1 for zero = $14^\circ 28'.1$. It is the preceding of two large stars near 3° south of 1 *Aquilæ*.



(55.) 752 Sw. August 19, 1787. Double, 2d class, equal, nearly in the meridian. 17 (θ) *Sagittæ* f. $4' 16''$, n. $1^\circ 19'$, R.A. $20^h 4' 46''$, P.D. $68^\circ 25'$.

(56.) 754 Sw. Sept. 11, 1787. 41 *Aquarii*, double, 2d class near, very unequal. Position s. f.

(57.) 765 Sw. Oct. 14, 1787. Double 7.7 m. 3 *Lacertæ* p. $30' 30''$, n. $3^\circ 38'$, R.A. $21^h 44' 42''$, P.D. $35^\circ 11'$.

768 Sw. Oct. 16, 1787. Double. 14 *Cephei* p. $10' 15''$, s. $2^\circ 11'$, R.A. $21^h 44' 22''$, P.D. $35^\circ 11'$.

(58.) 794 Sw. Dec. 13, 1787. Double 7 m., 2d class, near, equal. 25 (σ) *Andromedæ* p. $17' 42''$, s. $3^\circ 7'$, R.A. $23^h 49' 19''$, P.D. $57^\circ 31'$.

981 Sw. Nov. 26, 1790. Double, 2d class, nearly equal, not far from the meridian. 73 *Pegasi* f. $24' 30''$, n. $0^\circ 12'$, R.A. $23^h 48' 44''$, P.D. $57^\circ 28'$.

Journal, Sept. 18, 1794. Sp. 25 (σ) *Andromedæ*, a pretty considerable star; the largest of two. A pretty double star, 1st or 2d class, very nearly equal. Position not much from the meridian. 25 *Andromedæ* p. $17' 42''$, s. $3^\circ 7'$.

(59.) 806 Sw. Feb. 3, 1788. Double, unequal. 49 (π) *Hydræ* p. $10' 16''$, n. $1^\circ 7'$, R.A. $13^h 43' 29''$, P.D. $114^\circ 33'$.

(60.) 813 Sw. March 4, 1788. Double, 4th class, equal from sp. to nf. 50 *Aurigæ* p. $2' 21''$, s. $1^\circ 23'$, R.A. $6^h 21' 49''$, P.D. $48^\circ 42'$.

(61.) 815 Sw. March 9, 1788. 20 *Lyncis*, double, equal, sp. to nf. 8.8 m. 4th class.

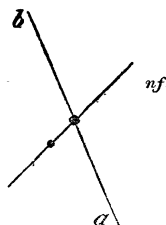
(62.) 834 Sw. April 27, 1788. Double, equal, 4th or 5th class, nearly in the meridian. 37 (ξ) *Bootis* f. $21' 37''$, n. $0^\circ 4'$, R.A. $15^h 3' 10''$, P.D. $69^\circ 57'$.

835 Sw. April 28, 1788. Double, that to the north is a very little smaller, and a little following the meridian of the other. 37 (ξ) *Bootis* f. 21' 44", n. 0° 6', R.A. 15^h 3' 17", P.D. 69° 55'.

1006 Sw. May 24, 1791. Double. 37 (ξ) *Bootis* f. 21' 41", n. 0°, 5', R.A. 15^h 3' 23", P.D. 69° 57'.

Rev. July 25, 1796. The most north of three that form an arch ; double. Position 3 rev. + 40 parts + 8.4 for zero = 78° 23', 4. It is the double star following (ξ) *Bootis* of the 834 Sweep. A little unequal.

Rev. August 6, 1796. The most north of three, double. Distance 0 rev. 54.6 parts + 2.5 for zero = 25", 0. A little unequal. L. r. S. dr.



(63.) 842 Sw. May 5, 1788. Double, 5th or 6th class, equal, 7.7 m. Nebula observed in this sweep at 15^h 1' 36", p. 10' 38", s. 3° 8', R.A. 14^h 52' 51", P.D. 35° 23'.

927 Sw. April 24, 1789. Double, 7.7 m.

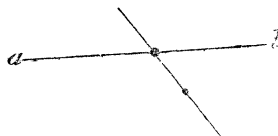
(64.) 872 Sw. Oct. 30, 1788. Double, of the 2d class, nearly in the parallel. 2 *Lacertæ* f. 2' 16", s. 1° 13', R.A. 22^h 14' 30", P.D. 45° 44'.

(65.) 880 Sw. Nov. 4, 1788. 35 *Cassiopeæ Hevelii*, double, 2d class, very unequal. (In zone 23° ... 2^h 11', &c. WOLL. Cat.)

(66.) 894 Sw. Dec. 18, 1788. 4 *Camelopardalis Hevelii*, double, very unequal, 3d or 4th class. (WOLL. Cat., zone 35° ... 3^h ..)

(67.) 894 Sw. Dec. 18, 1788. 1 *Camelopardalis*, double, 3d class, a little unequal. Position n. p.

Rev. Mar. 22, 1795. 1st *Camelopardalis*, double, considerably unequal. Position with 164 n. p. 2 Rev. — 26.7 parts + 3.5 for zero = 39° 46', 8: 2d measure 2 rev. — 26.1 parts + 3.5 for zero = 39° 54', 9.



(68.) 919 Sw. April 12, 1789. Double, pretty unequal. 64 (γ) *Ursæ* p. 38' 46", s. 0° 56', R.A. 11^h 3' 59", P.D. 36° 4'.

(69.) 940 Sw. March 10, 1790. f. *Hydræ* 1153 L. c. double, a little unequal, 3d class, pretty near. Position about 75° sp. (WOLL. Cat. zone 115° ... 13^h ...)

(70.) 953 Sw. March 19, 1790. Double, 3d class. Position a little n. f. a little unequal. 76 *Ursæ* p. 1^h 13' 7", s. 3° 5', R.A. 11^h 18' 12", P.D. 29° 13'.

1039 Sw. April 9, 1793. Double, equal, 3d class, near. Position nearly in the parallel. 42 *Ursæ* f. 41' 4", n. 0° 26', R.A. 11^h 19' 29", P.D. 29° 9'.

(71.) 956 Sw. May 3, 1790. Double, unequal. 9 *Draconis* f. $1^h 24' 8''$, n. $1^\circ 4'$, R.A. $14^h 15' 53''$, P.D. $21^\circ 12'$.

(72.) 958 Sw. Sept. 7, 1790. Double, very unequal, with a third at no great distance preceding. 20 *Cygni* f. $23' 8''$, n. $0^\circ 1'$, R.A. $20^h 8' 29''$, P.D. $37^\circ 31'$.

(73.) 959 Sw. Sept. 11, 1790. 50 (α) *Cygni*, 2m. It has a very small star directly following, about $1'$ distance.

Rev. Jan. 17, 1809. The small star is extremely small, and in the 10 feet with 240 will bear no illumination for seeing the wires. Its position is a few degrees from the parallel, on the following side.

(74.) 970 Sw. Oct. 9, 1790. Double, very unequal, 3 or 4° n. f., 3d or 4th class, 6 m. 5 *Pegasi* f. $13' 48''$, n. $0^\circ 27'$, R.A. $21^h 41' 40''$, P.D. $71^\circ 10'$.

(75.) 980 Sw. Nov. 13, 1790. Double, equal, both 7 m. 26 *Aurigæ* f. $2' 47''$, s. $1^\circ 0'$, R.A. $5^h 27' 59''$, P.D. $60^\circ 39'$.

(76.) 983 Sw. Dec. 2, 1790. 7 m., double, extremely unequal. Position about 80° s. f., 2d class, very near. 65 (ι) *Piscium* p. $16' 53''$, n. $0^\circ 34'$, R.A. $0^h 21' 41''$, P.D. $62^\circ 52'$.

(77.) 989 Sw. Dec. 28, 1790. Double, equal, 3d class. 41 *Persei Hevelii* f. $35' 50''$, s. $0^\circ 37'$, R.A. $4^h 38' 25''$, P.D. $40^\circ 51'$.

(78.) 999 Sw. March 24, 1791. Treble, the two largest equal, 3d class. The first star very small, north, preceding the other two; a little further from the preceding of the two, than they are from each other. (R.A. By the sweep $11^h 37' :: 23''$, P.D. $121^\circ :: 1'$, no star in the sweep to settle its place.)

(79.) 1000 Sw. April 2, 1791. Double, 4th class, near, equal. 14 (τ) *Ursæ* f. $2' 6''$, s. $1^\circ 52'$, R.A. $8^h 55' 38''$, P.D. $27^\circ 30'$.

(80.) 1008 Sw. May 25, 1791. Double, equal, 7.7 m. Distance about $1'$, or a little more. MAYER's 575 z. p. $9' 16''$, n. $0^\circ 30'$, R.A. $14^h 13' 51''$, P.D. $109^\circ 0'$.

(81.) 1014 Sw. May 28, 1791. Double. Position sp., extremely unequal; not in WOLL. 20 (1st ν) *Coronæ* p. $0' 8''$, n. $0^\circ 8'$, R.A. $16^h 14' 26''$, P.D. $55^\circ 34'$.

Rev. March 20, 1795. Fl. 20 (ν) *Coronæ*, consists of two equal stars 6 m. 6 m. The most north and preceding of them has a very small star on the preceding side.

Rev. March 22, 1795. The preceding and the most north of the two stars 6 m. 6 m. has its little star about 50° sp., which is also nearer to the star than the small one of the former double star is to its larger one. (See VI. 18.)

(82.) 1021 Sw. April 20, 1792. Double, equal, 4th or 5th class. 8 (η) *Bootis* f. 7' 24", n. 0° 58', R.A. 13^h 52' 10", P.D. 69° 34'.

Rev. August 6, 1796. I cannot find the double star of the 1021 sweep 7' 24" following η *Bootis*.

(83.) 1024 Sw. August 22, 1792. Double, extremely unequal. Position directly preceding 7 m. 4 (ϵ) *Sagittæ* p. 2' 57", s. 0° 11', R.A. 19^h 24' 52", P.D. 74° 11'.

Rev. Oct. 17, 1795. I cannot see the small star of the double star in the 1024 sweep observed at 19^h 25' 33".

Rev. August 7, 1796. I cannot see the small star of the double star in the 1024 sweep observed at 19^h 25' 33", with the 7-feet telescope. I see a very small star following 6th class, but the star I look for should be preceding.

(84.) 1024 Sw. August 22, 1792. Double, considerably unequal. Position about 25° np. 5 α *Sagittæ* p. 0° 46', s. 1° 24', R.A. 19^h 30' 0", P.D. 73° 51'.

Rev. Oct. 17, 1795. The double star observed in 1024 sweep at 19^h 30' 37". Of the 5th or 6th class, very unequal. L. deep red: S. blueish or dusky. Position np.

Rev. August 6, 1796. 1° south of 6 *Sagittæ*. Double, very unequal. Position np. 2 Rev. — 59.8 parts + 1.1 for zero = 31° 47' 6 L. r. S. b.

Rev. August 7, 1796. 1° south of 6 *Sagittæ*, in a line parallel to 5 and 4 *Sagittæ*; a pretty small star. Distance 0 rev. 59.6 parts + 2.5 for zero = 27", 2.

(85.) 1025 Sw. August 23, 1792. Double, very unequal L. r. S. b. Position nf. 5 *Vulpeculæ* f. 0' 9", s. 0° 12', R.A. 19^h 17' 16", P.D. 70° 30'.

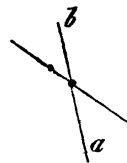
(86.) 1027 Sw. Sept. 15, 1792. 8 m. Double. Neb. IV. 72, joins to it. 34 *Cygni* p. 5' 10", n. 0° 23', R.A. 20^h 4' 53", P.D. 52° 13'. (Time not accurate.)

(87.) 1027 Sw. Sept. 15, 1792. Double, of the 2d class, unequal. 34 *Cygni* f. 21' 5", n. 0° 28', R.A. 20^h 31' 8", P.D. 52° 8'.

(88.) Rev. of eclips. Sept. 15, 1792. Double (between 87 and ϕ 90 *Aquarii*).

(89.) 1028 Sw. Sept. 16, 1792. Double, a little unequal, 4th or 5th class. 3 *Cephei Hevelii* f. 13' 10", n. 0° 3', R.A. 20^h 21' 44", P.D. 33° 58'.

(90.) Rev. of eclips. Oct. 16, 1792. Double: c is α the double star, and a b c d e are about the 80 α *Aquarii*. α β γ δ ϵ



(91.) Rev. of eclips. Oct. 16, 1792. Double, 1st class, very near, a little unequal. It is a very small star, about 2 degrees south of 18 (λ) *Piscium*. With 900 I saw them very well. The line goes to 18 and 17 (λ & ι) *Piscium*.



(92.) Rev. of eclips. Oct. 21, 1792. Double, a pretty object, a little unequal, less than a diameter asunder. Position nf., a third star following at some distance. It is the preceding of two in a line between 98 (μ) and 110 (σ) *Piscium*, and about half way between them. The line from μ , in which the two stars are (of which it is the preceding), passes a little north of 110 (σ).

Rev. Oct. 5, 1801. Double, 1st class. A beautiful minute object with 400. It is a star sp. 110 (σ) towards μ , the largest of two.

Rev. Dec. 9, 1801. Double, 1st class, extremely close, equal. It is a star $1^{\circ} 40'$ nf. μ , the first of two in that line. It is a very beautiful object. A third large star in view. They are less than half a diameter asunder. Position about 80° nf. The northern star is rather the smallest.

Rev. Dec. 10, 1801. The double star nf. μ *Piscium*; as described last night.

(93.) Rev. of eclips. Jan. 4, 1793. Double, 2d class, a little unequal np. 36 (A.) *Tauri* $1\frac{1}{2}^{\circ}$ in a line parallel to 54 (ν) and *Pleiades*.

(94.) Rev. Jan. 8, 1793. 55 (δ) *Geminorum*, 6m. One double towards 43 (ζ).

Rev. March 25, 1795. Sp. δ *Geminorum*, near 2° in a line parallel to 60 and 27 (ϵ) *Geminorum*. Double, with a third star near. About the 4th class.

(95.) Rev. of eclips. Jan. 8, 1793. Double, 3d class, s.f. 55 (δ) *Gemin.*

Rev. Dec. 14, 1795. S.f. δ *Geminorum* towards r, and about $25'$ from r. Double, 3d class, a little unequal.

(96.) 1033 Sw. March 4, 1793. ϵ *Pixidis Naut.* L. c. 831 6 m. Double, very unequal, 5th or 6th class. Position about 50 or 60 degrees S.f. L. r. S. dr. (WOLL. Cat. Zone 119° ... 9^h ...)

(97.) 1038 Sw. April 8, 1793. Double, considerably unequal. Position nf. 39 *Ursæ* f. $16' 14''$, n. $1^{\circ} 43'$, R.A. $10^h 46' 51''$, P.D. $30^{\circ} 0'$.

1039 Sw. April 9, 1793. Double, as described last night. 42 *Ursæ* f. $8' 42''$, s. $0^{\circ} 26'$, R.A. $10^h 47' 7''$, P.D. $30^{\circ} 1'$.

(98.) 1042 Sw. May 12, 1793. Double, 1st class, equal. Position directly in the meridian, $1\frac{1}{2}$ diameter asunder. *Bootis* 19 *Hevelii* p. $10' 50''$, s. $0^{\circ} 22'$, R.A. $14^h 3' 5''$, P.D. $83^{\circ} 35'$.

(99.) 1042 Sw. May 12, 1793. Double, 1st class, very unequal. Position directly preceding: 1 diameter of L. asunder. *Bootis 19 Hevelii* p. 7' 52", n. 0° 16', R.A. 14^h 6' 3", P.D. 82° 57'.

(100.) 1047 Sw. August 25, 1793. Double, equal. Position from np. to s. f. 2d class. 3 *Vulpeculæ* f. 3' 47", s. 0° 46', R.A. 19^h 18' 6", P.D. 64° 54'.

(101.) 1053 Sw. Sept. 27, 1793. Double, 3d class. Position from np. to s. f., equal. 1st *Piscis Austr.* p. 18' 59", n. 1' 46", R.A. 20^h 29' 30", P.D. 121° 17'.

(102.) 1054 Sw. Sept. 28, 1793. Double, equal, 3d class. Position from np. to s. f. but nearer the parallel. 31 (*o*) *Aquarii* f. 12' 41", s. 0° 47', R.A. 22^h 5' 17", P.D. 93° 56'.

(103.) Journal, Feb. 25, 1794. $\frac{1}{2}$ degree south of the 15th *Monocerotis*; double, a pretty considerable star, very unequal, 3d class far.

(104.) 1058 Sw. April 19, 1794. Double, 3d class, a little unequal, a few degrees np. 12 (δ) *Hydræ Crat.* p. 3' 37", s. 1° 33', R.A. 11^h 5' 27", P.D. 105° 14'.

(105.) Rev. of eclips. Jan. 13, 1795. Double, the middle one of an arch, almost in the meridian: 2d class, unequal; the southern one is the smallest. It is near 2 degrees south of 19 *Arietis*.

Journal, Jan. 15, 1795. Double: it is the most south but one of four small stars in a crooked row, which is nearly in the meridional direction, and it is about 1° 50' south of the 19th *Arietis*. 1st class, unequal.

(106.) Rev. of eclips. Jan. 13, 1795. Double, 3d class, the middle one of three in the meridian nearly, the most south of which I suppose to be 29 *Arietis*; or $\frac{3}{4}$ ° north of 29 *Arietis*.

Journal, Jan. 15, 1795. Double; it is the middle one of an arch of three stars, that are nearly in a meridional direction, the most south of which is the 27 *Arietis*. Or it is about $\frac{3}{4}$ degree north of, and a little following, the 27 *Arietis*. 2d class, unequal.

(107.) Rev. of eclips. Jan. 13, 1795. Double, very unequal, 3d class, 1° 25' sp. 37 (*o*) *Arietis*.

Journal, Jan. 15, 1795. Double, 1° 25' sp. 37 (*o*) *Arietis*: 2d class, very unequal.

(108.) Rev. March 20, 1795. 2° 40' s. f. 54 (λ) *Geminorum* towards β *Cancr.*, double, 1st class, pretty unequal.

(109.) Rev. Oct. 16, 1795. About 10' south of 17 (χ) *Cygni* in a line pa-

rallel to 58 and 21, is a very small star, which is double, 1st class, nearly equal; the preceding however is the largest: 1 diameter of S.

(110.) Rev. Oct. 16, 1795. About $\frac{3}{4}^{\circ}$ or 50' south of 17 (χ) *Cygni* in a line parallel to 6 and 10. A considerable star, double, 5th class, very unequal.

(111.) Rev. Oct. 16, 1795. About 25 or 30' nf.

18 (ν) *Geminorum*. A very small star, double, 5th class.

L. r. S. d., very unequal, or rather extremely unequal.

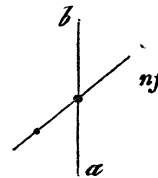
Position 3 rev. + 20 - 7 for zero = $77^{\circ} 12'$ s. f.



(112.) Rev. Oct. 30, 1795. $1^{\circ} 40'$ north, following 93 *Aquarii*. A considerable star, double, pretty unequal. The preceding is the smallest. It is in a line parallel to ν and ω *Piscium*. 3d class I believe.

(113.) Journal, Nov. 9, 1795. A small telescopic star nf.

15 *Cygni*, double, 2d class, very unequal. It is about 5' or 6' from 15 *Cygni*, and its position with 15 is 4 rev. - 37 parts - 23.2 for zero = $71^{\circ} 55'$.



Journal, Dec. 30, 1795. The small double star north following 15 *Cygni* follows it $17''.5$ in time: 7-feet reflector, power 115.

(114.) Journal, April 5, 1796. 7-feet reflector, power 460. (ζ) *Bootis*, double, 1st class. Very nearly in contact; I can however see a small division. A little unequal, the preceding is the smallest.

Rev. August 6, 1796. ζ *Bootis*, double. Position 2 rev. - 14.5 parts + 1.1 for zero = $41^{\circ} 59', 1$ n.p. With 460 a division is but barely visible $\frac{1}{4}$ of S. Both w. A little, or pretty unequal.



Rev. July 12, 1807. ζ *Bootis*. They are fine, equal, whitish stars: the interval between their apparent disks with 460 is $\frac{1}{3}$ of the diameter of either.

(115.) Rev. July 26, 1796. $2^{\circ} 50'$ n. p. *Arcturus*. Double, 2d class I believe. Considerably unequal. In a line parallel to ϵ and ρ : it is a very small telescopic star.

Rev. August 6, 1796. $2^{\circ} 40'$ n. p. *Arcturus*. Double. Distance 4 diameters of L. In a line parallel to 32 and α *Bootis*. Position n.f. 2 rev. + 78.2 parts - 1.1 for zero = $62^{\circ} 20', 9$.



(116.) Rev. August 10, 1796. About 4 degrees n.f. 23 (θ) *Bootis*, the second star in the line from θ to this, double, 3d or 4th class, considerably

unequal. Almost directly following I believe, instead of n. f. ; but the evening is bad.

(117.) Rev. Oct. 25, 1797. The star most south of my double star VI. 119, is double of the 1st class. Considerably unequal. Position n.f. *
1st class. The angle is such, that a line continued and met by one *
from the other star, so as to make an isosceles triangle, would meet *
the line of position at a little more than twice the distance of the two large stars. I verified it with 460, after having looked a considerable time with 920, by way of getting the eye in order. A division can hardly be perceived. But the situation is so low, that certainly the greatest difficulty of seeing the stars arises from that cause. Both together might conveniently stand between the two stars of ζ *Aquarii*, and leave a considerable interval on each side.

(118.) 1066 Sw. Dec. 10, 1797. Double, close of the 2d class, considerably unequal. Distance 1 diameter of L. L. r. S. dr. (See 1068 Sweep.)

1068 Sw. Dec. 12, 1797. The double star of 1066 sweep. 5 *Draconis Hevelii* f. $13' 54''$, s. $0^\circ 23'$, R.A. $12^h 24' 12''$, P.D. $14^\circ 4'$.

(119.) 1076 Sw. Sept. 5, 1798. 7 m. Double, extremely unequal. Position s.f. 52 (h^2) *Sagittarii* p. $7' 2''$, s. $2^\circ 1'$, R.A. $19^h 17' 34''$, P.D. $117^\circ 20'$, 1st class. (It is q. L. C. 1600. And MAYER's 786 z.)

(120.) 1078 Sw. Sept. 13, 1798. Double, considerably unequal. The small star is blue, 3d or 4th class. 66 *Draconis* p. $12' 16''$, n. $2^\circ 10'$, R.A. $19^h 50' 15''$, P.D. $26^\circ 25'$.

(121.) 1081 Sw. Oct. 7, 1798. Double, considerably unequal, 3d or 4th class. Position preceding, or a few degrees sp. 16 *Cephei* f. $8' 30''$, s. $3^\circ 0'$, R.A. $22^h 4' 31''$, P.D. $20^\circ 46'$.

(122.) 1082 Sw. Oct. 7, 1798. 21 *Cassiopeæ*, double, 6th class, very unequal. Position s.f.

(123.) 1089 Sw. Jan 30, 1799. 8 m. Double, a very small star. Position directly north. 2d class, extremely unequal. 15 (π 1st) *Canis* f. $2' 1''$, n. $0^\circ 5'$, R.A. $6^h 46' 47''$, P.D. $109^\circ 55'$.

(124.) 1093 Sweep, January 21, 1800. Double, 9.9 m., 2d or 3d class. 15 (γ 2d) *Orionis* f. $22' 24''$, n. $1^\circ 33'$, R.A. $5^h 20' 38''$, P.D. $73^\circ 9'$.

(125.) Rev. Sept. 4, 1801. The 2d of two nf. 22 (λ) *Sagittarii*, probably double ; or has a larger diameter. It is about $25'$ from λ towards the stars 23, 24, 25. I am pretty sure it is double.

Rev. Sept. 12, 1801. 20' nf. 22 (λ) *Sagittarii*, double, 1st class, both very small. The smallest of 2 stars.

2 A 2

(126.) Rev. Sept. 4, 1801. About $10'$ n p. 39 (σ) *Sagittarii*, double, very close. (It is N° 191 in Cat. of omitted stars.)

(127.) Rev. Sept. 4, 1801. The middle one of 3 nf. α *Capricorni* is double, 2d or 3d class.

(128.) Rev. Sept. 7, 1801. 67 *Aquarii*, double, 1st class.

(129.) Rev. Sept. 12, 1801. 1 degree south of 39 (σ) *Sagittarii*, double, 2d class near, considerably unequal.

(130.) Rev. Sept. 12, 1801. Double, 1st class. It is a small star, equally distant from δ and μ *Capricorni*, but a little more south than either. It is a little nearer μ than δ .

(131.) Rev. Sept. 12, 1801. Within the triangle δ μ *Capricorni* and ι *Aquarii*, 18 more. 1 double, 3d class, very unequal.

(132.) Rev. Sept. 12, 1801. Double, 2d class, near. It is between α and ε *Tauri*, rather nearer α , and it is a little following the line that joins α and ε ; a considerable star.

(133.) Rev. Sept. 15, 1801. Double, 1st class, 2 degrees sp. 73 (λ) *Aquarii* towards σ .

Rev. Sept. 16, 1801. The double star 2 degrees sp. λ *Aquarii* is very unequal. Position n. p. Distance 1 diameter of L. It is not towards σ , but rather in a line between 57 (σ) and 43 (θ). The third star in view is north of the double star, or a little nf. The distance of the D. star, after long looking at it, is nearly 2 diameters of L.

(134.) Rev. Oct. 2, 1801. Double, 2 degrees n. p. 14 *Capricorni*, in a line parallel to α and β . It is the middle one of three small telescopic stars in that line; 2d or 3d class, considerably unequal. There is a star very near it in WOLLASTON'S Catalogue.

(135.) Rev. Oct. 5, 1801. Double, 1st class, both very small. One-third from 74 *Aquarii* towards 93 (ψ). In the finder it appears to be double, owing to a star very near it.

(136.) Rev. Oct. 6, 1801. Double, 2d class, equal. It is a star $35'$ nf. 17 (ι) *Piscium*, in a line from κ through ι .

(137.) Rev. Oct. 6, 1801. Double, 2d class, equal. It is south, and a little following θ *Piscium*; about $1^\circ 10'$ from it, in a line towards 16.

(138.) Rev. Oct. 12, 1801. Double, 1st class, very near. Very small stars. It is the angular star of a triangle of very small stars: $1\frac{1}{2}^\circ$ n. p. 11 (ρ) *Capricorni* towards 63 *Sagittarii*. Considerably unequal. The preceding is the smallest.

(139.) Rev. Oct. 12, 1801. Double, 1st class, very minute stars. It is a very small star south of 2 that appear coarsely double in the finder. It follows 29 *Capricorni* $\frac{3}{4}^{\circ}$ towards δ ; and forms a triangle with 29 and the above-mentioned very coarse double star of the finder.

(140.) Rev. Nov. 27, 1801. Double, 2d class, unequal. The south-preceding star is the smallest. It is $1^{\circ} 40'$ s. f. κ *Aquarii* towards ψ .

(141.) Rev. Dec. 7, 1801. Double, 2d class. It is $1^{\circ} 20'$ nf. 18 (ν) *Geminorum*, in a line parallel to γ and ϵ . Equal; or the preceding perhaps the smallest.

(142.) Rev. Dec. 7, 1801. Double, 1st class, very near. $1\frac{1}{2}^{\circ}$ s. f. 70(θ) *Leonis*, in a line from b through θ continued.

(143.) Rev. Jan. 29, 1802. $1\frac{3}{4}$ or $1\frac{1}{4}$ degree north of 32 and 31 *Virginis*, double, 1st class, extremely near, less than half a diameter of either; nearly equal. Position sp. The most south is the smallest.

(144.) 1112 Sw. Sept. 30, 1802. Double, 2d class. 32 *Ursæ* of BODE's Catalogue p. 2' 3'', n. $0^{\circ} 8'$, R.A. $8^h 36' 34''$, P.D. $18^{\circ} 29'$.

(145.) 1112 Sw. Sept 30, 1802. Double 7m. 8m: the 8m. about $\frac{3}{4}$ of a minute s. f. the 7m. 133 *Ursæ* of BODE's Catalogue p. 3' 53'', n. $2^{\circ} 17'$, R.A. $10^h 2' 47''$, P.D. $17^{\circ} 59'$.