Numerical results exceeding the grasp of the comprehension, furmished alike by the minutest organisms and the socalled fixed stars, 30 ; encouraging views on the subject, 31 .

Optical and physical double etars, 200 ; often confounded, 200.
Orbits of double stars, calculation of the, 211; their great eccentricity, 211 ; hypothesis, that the brighter of the two stars is at rest, and its companion revolves about it, probably correct, and a great epoch in cosmical knowledge, 212 .
Orion, the six stars of the trapezium of the nebula of, probably subject to peculiar physical attraction, 210, 211.

Pantschata or Pantschatra, the Indian theory of the five elements, 31 .
Parallax, means of discovering the, pointed out by Galileo, 188; number of parallaxes hitherto discovered, 190 ; detail of nine of the best ascertained, 190.
Penetrating power of the telescope, 145, 146.

Periodically changeable stars, 164.
Periods within periuds of variable stars, 168 ; Argelander on, 168.
Peru, climate of, unfavorable to astronomical observations, 103.
Peters on parallas, 192.
Photometric relations of self-luminous bodies, 89; scale, 99.
Photometry yet in its infancy, 94 ; first numerical scale of, 94 ; Arago's method, 96 .
Plato on ultimate principles, $12,13$.
Pleiades, one of the, invisible to the nalsed eye of ordinary visual power, 48 ; described, 141.
Pliny estimates the number of stars visible in Italy at only 1600, 108.
Poisson, his view of the consolidation of the earth's strata, 36,37 .
Polarization of light, 45, 47.
Poles of greatest cold, 36 .
Pouillet's estimate of the temperature of space, 36.
Prismatic spectra, 44; difference of the dark lines of, 45 .
Ptolemy, his classification of the stars, 90; southern constellations known to, 137.

Pulkowa, number of multiple stars discovered at, 205, 206.
Pythagoreans, mathematical symbolism of the, 12 .

## Quaternary systems of stars, 210.

Radiating heat, 35.
Ratio of various colors among the multiple and double stars, 209.
Rays of stars, 52, 126-128; number of, indicate distances, 128 ; disappear when the star is viewed through a very small aperture, 128, 129.
Red stars, 131 ; variable stars mostly red, 365

Reflecting sextants applied to the deterre ination of the intensity of stellar light, 92.

Reflecting and refracting telescopes, $\mathbb{\infty}$.
Pegal stars of the ancients, 136.
Resisting medium, proved by observations on Encke's and other comets, 39.
Right aecension, distribution of stars according to, by Schwinck, 140.
Rings, colored, measurement of the intensity of light by, 96 .
Ringe, concentric, of stars, the hypothesis of, favored by the most recent obeervations, 149.
Rosse's, Lord, his great telescope, 65 ; its services to astronomy, 66.
Ruby-colored stars, 135 .
Saint Gall, the monk of, observed a new star distant from the Milky Way, 162.
Saussure asserts that stars may be seen in daylight on the Alpa, 57; the aesertion not supported by other travelers' experience, 58.
Sarary, on the application of the aberration of light to the determination of the parallaxes, 194; an early calculator of the orbita of double stars, 211.
Schlegel, A. W. von, probably mistaken as to the high antiquity of the Indian zodiacs, 121.
Schwinck, distribution of the fixed stars in his "Mappa colestis," 140.
Scintillation of the stars, 73 ; varietions in its intensity, 76; mentioned in the Chinese records, 77: little observed in tropical regions, 77, 78; alwaye accom. panied by a change of color, 202.
Seidel, his attempt to determine the quantities of light of certain stars of the first magnitude, 93.
Self-luminous cosmical bodies, or suns, 199.

Seneen, on discovering new planets, 28.
Simplicius, the Eclectic, contrasts the centripetal and centrifugal forces, 12; his vague view of gravitation, 18.
Sirius, its absolute intensity of light, 95 ; historically proved to have changed its color, 131 ; its association with the earHiest development of civilization in the valley of the Nile, 133; etymological researches concerning, 133, 134.
Smyth, Capt. W. H., calculations of the orbits of double stars by, 211 .
Smyth, Plazzi, on the Milky Way, 146, 147; on a Centauri, 185.
Sothis, the Egyptian name of Sirius, 133, 134.

South, Sir James, observation of 380 double stars by, in conjunction with Sir John Herschel, 205.
Southern constellations known to Ptolemy, 137.
Southern Cross, formerly visible on the shores of the Baltic, 138.
Southern hemisphere, in parts remarkably deficient in constellations, 112; distances of ita stars, first measured about the end of the sixteenth century, 138.

