

stars appears to gain ground among astronomers. The parallax of 61 *Cygni*, as determined by Bessel, is $0''\cdot34$; about one-third of a second, or 1-10000 of a degree. That of *a Centauri*, as determined by Maclear, is $0''\cdot9$, or 1-4000 of a degree.]

But besides the fixed stars and their corrections, the astronomer has the motions of the planets for his field of action. The established theories have given us tables of these, from which their daily places are calculated and given in our Ephemerides, as the *Berliner Jahrbuch* of Encke, or the *Nautical Almanac*, published by the government of this country, the *Connaissance des Temps* which appears at Paris, or the *Effemeridi di Milano*. The comparison of the observed with the tabular place, gives us the means of correcting the coefficients of the tables; and thus of obtaining greater exactness in the constants of the solar system. But these constants depend upon the mass and form of the bodies of which the system is composed; and in this province, as well as in sidereal astronomy, different determinations, obtained by different paths, may be compared; and doubts may be raised and may be solved. In this way, the perturbations produced by Jupiter on different planets gave rise to a doubt whether his attraction be really proportional to his mass, as the law of universal gravitation asserts. The doubt has been solved by Nicolai and Encke in Germany, and by Airy in England. The mass of Jupiter, as shown by the perturbations of Juno, of Vesta, and of Encke's Comet, and by the motion of his outermost Satellite, is found to agree, though different from the mass previously received on the authority of Laplace. Thus also Burckhardt, Littrow, and Airy, have corrected the elements of the Solar Tables. In other cases, the astronomer finds that no change of the coefficients will bring the Tables and the observations to a coincidence;—that a new term in the formula is wanting. He obtains, as far as he can, the law of this unknown term; if possible, he traces it to some known or probable cause. Thus Mr. Airy, in his examination of the Solar Tables, not only found that a diminution of the received mass of Mars was necessary, but perceived discordances which led him to suspect the existence of a new inequality. Such an inequality was at length found to result theoretically from the attraction of Venus. Encke, in his examination of his comet, found a diminution of the periodic time in the successive revolutions; from which he inferred the existence of a resisting medium. Uranus still deviates from his tabular place, and the cause remains yet to be discovered. (But see the *Additions* to this volume.)