

writer's observations indicate that the former substance is more stable than the latter, which rapidly becomes more or less coloured; not improbably these two forms are polymerides, the first being  $C_{21}H_{26}N_2O_6 + H_2O$ , the second  $(C_{12}H_{13}NO_3)_n \cdot nH_2O$ . Opianic acid\*, on heating, furnishes an anhydride of formula  $C_{40}H_{38}O_{10}$ ; this tends to show that the formula of this acid is not less than  $C_{20}H_{20}O_{10}$ ; not impossibly, therefore, the formula of narcotine may be double that usually ascribed to it, and the dimethylnornarcotine, methylnornarcotine, and nornarcotine of Matthiessen may be derivatives not of ordinary narcotine, but of its polymerides.

The different modifications of the cinchona alkaloids are not impossibly polymerides of one another.

The Table (p. 288) exhibits the principal differences between codeia and the polymerides above described.

II. "Researches on Solar Physics."—III. By WARREN DE LA RUE, D.C.L., F.R.S., BALFOUR STEWART, LL.D., F.R.S., and BENJAMIN LOEWY, F.R.A.S. Received March 12, 1872.

(Abstract.)

The authors present in this paper the third instalment of the determination of the areas and heliographic positions occupied by the sun-spots observed by the Kew photoheliograph, comprising the years 1867, 1868, and 1869. They announce that the fourth and last instalment is in active progress, and will be preceded by the final discussion of the whole ten-yearly period, during which the photoheliograph has been at work. This final discussion will contain the determination of the astronomical elements of the sun on the basis of photographic observations; and this work, they anticipate, will not only settle the question of rotation for a considerable time to come, but will also throw light upon many points which have only recently been brought under the consideration of scientific men. The results in general, they believe, will prove the superiority of photographic sun-observations over previous methods. The second question which will be discussed is the distribution of sun-spots over the solar surface. The facts already brought out indicate that the progress of the inquiry may lead to some definite laws which regulate the distribution; there appear to exist centres of great activity on the sun, and the different solar meridians seem to have various but definite intervals of rest and activity. In conclusion the authors point out the necessity of devoting in future greater attention to the study of the faculæ, and express a hope of seeing photographic sun-observations carried on in this country on a more extended system, connecting from day to day solar phenomena with terrestrial meteorology and magnetism.

\* Proc. Roy. Soc. vol. xvii. p. 341, § III. (Matthiessen and Wright).