

motile and shews a sharper outline while the pigment has a peculiar metallic lustre and tends to collect in clumps.

Another observer asserts that three hours after the administration of a small dose of quinine, the amœboid movements of the tertian parasite shewed a marked diminution in activity, and in several hours they are diminished in number and some even are pigmented. In the case of the æstivo-autumnal type it has been noted that after quinine there is no increase in the number of the shrunken brassy corpuscles and that the included parasites are incapable of further development. But all observers agree that the crescents are affected slowly if at all by quinine. More recently it has been shewn that quinine destroys the staining properties of the chromatin of the nucleus and that segments of the rosette forms show no nucleolus.

Further, it has been shown that the drug acts most readily during and immediately after sporulation, when the parasites are free in the circulation. In the words of Marchiafava and Bignami "Quinine acts on the amœba of malaria during those phases of its life in which it absorbs nourishment and develops; when the nutritive activity comes to an end, the transformation of the hæmoglobin into black pigment being accomplished and the phase of reproduction begins, the quinine becomes inefficacious against this process."

It is also possible to have some effect on the parasites of the tertian and quartan parasites in the intra-corpuscular stage by a dose of quinine 10 to 12 hours before the paroxysm. This is not so easy in the case of the æstivo-autumnal. Hence it is the endeavour of the thinking physician to have a maximum amount of quinine in circulation at the time of the paroxysm and shortly before. A large dose of quinine (10 grs.) just before the paroxysm is expected, will not prevent the paroxysm, but will destroy a large portion of the group of parasites and so prevent its further recurrence. The best practice is to give large doses of quinine, says 20 to 30 grains in 24 hours for first three days and reduce to 2 to 5 grains daily, for next two or three weeks. Larger doses may be necessary in the æstivo-autumnal variety, but 30 to 40 grs. daily should be sufficient. By giving single doses some hours before sporulation it is possible to change a double tertian into a single tertian, and a double or triple quartan into a single or double quartan.

*Forms of Administration:*—The pills and tablets are not suitable as they do not dissolve readily enough. Capsules of the sulphate is a good method. Quinine in solution is also of service. When it is important to get the system under the influence of the drug very rapidly, as in the æstivo-autumnal variety with pernicious symptoms, the drug may be administered hypodermically as the bisulphate (30 grs.) in conjunc-