

the public, and they deserve the utmost condemnation. If physiologists can make out a case for themselves, I for one am prepared to give it the utmost attention, but they must not bring to their aid false illustrations from a branch of science with which I think I may be permitted to say I have had a large experience.

LAWSON TAIT

Birmingham, October 6

It seems sufficient for me to observe, in reply to the above, that before writing my review of "Physiological Cruelty" I took the trouble to acquaint myself thoroughly with the latest edition of Mr. Tait's pamphlet.

GEORGE J. ROMANES

#### Breeding of "Hapale jacchus" in Captivity

MR. MOSELEY'S Marmosets (NATURE, vol. xxviii. p. 572) are by no means the first instance in Europe, or even in England. Edwards, more than a hundred years ago, recorded a case in Portugal; and Frederic Cuvier had three born in Paris in 1819 (*vide* Sir William Jardine's Natural Library—Mammalia, vol. i.). A relative of mine brought a pair of this species from Pernambuco in 1863, and kept them in his kitchen at Surbiton. In April, 1865, I was shown two living young ones which had been born a few days before. In the *Proc. Zool. Soc.* for 1835, births of marmosets of an allied species (*H. penicillatus*) have been chronicled as occurring in this country.

W. C. ATKINSON

Streatham, S.W., October 13

#### TELESCOPIC WORK FOR THE AUTUMN

WITH Mars, Jupiter, and Saturn so favourably visible in the sky during the ensuing autumn and winter months, we think it may be interesting to call attention to some of their more prominent features, and to ask amateurs and others who devote themselves to the attractive field of planetary observation to make a combined effort, not only to substantiate such facts as are already known with regard to the physical appearances of these bodies, but to endeavour to glean something new concerning them. For, notwithstanding the diligence with which these planets have been scrutinised in past years and the many curious facts that have been brought to light, it must still be confessed that there remains much to be done. Our knowledge is admitted to be extremely incomplete. The powerful instruments of the present day do not seem capable of rendering us efficient aid in this respect; indeed we shall find by a comparison of results that we owe most of our discoveries to telescopes of moderate aperture. The real explanation probably is that, with increase of aperture, definition, especially of the brighter planets, becomes less perfect. Faint markings are obliterated or seen unsteadily and uncertainly in large instruments owing to glare, the difficulty of getting a sharp, hard disk with so much light, and the constant undulations of the atmosphere. With moderately small instruments the conditions are in many respects more favourable. The image is sharply defined, and though the quantity of light may be somewhat deficient, there is an absence of glare and of that atmospheric interference which are inseparable from large apertures. Moreover, the eye is more capable of prolonged observation and is enabled to glimpse the faintest details on an image of moderate intensity. The deficiency of light in small instruments is therefore to some extent a recommendation when it is accompanied with extreme sharpness of definition and when the amount collected by the object-glass or speculum is sufficient to allow a power to be used which displays a fairly large disk without destroying the quality of the definition. Indeed one great desiderative in such cases is to utilise light and power in agreeable proportion, for this is a very essential requirement, which is, however, often neglected, and is frequently the source of disappointing experiences. Amateurs who are careful to consider these matters will be enabled, though their instruments may be of comparatively small reach, to do

much useful work in many departments of observation, and particularly in that relating to planetary markings.

With regard to Mars, high powers are very requisite because of the small diameter of the planet. Hence a fairly large aperture is necessary, for, unless the disk is considerably expanded, it is impossible to trace the chief features satisfactorily. In the case of Jupiter the use of high magnifying powers does not apply with so much force, the apparent diameter of the disk being greater. But this planet is a somewhat difficult object to define satisfactorily. The best telescopes will often fail to show the contour of the disk with desirable sharpness. Hence it is that this object with large apertures is troublesome and to some extent disappointing. This is certainly the case when we consider how efficiently and successfully small instruments perform upon this planet, and with what readiness the faintest and more minute of the details are distinguished. As to Saturn, the conditions are somewhat different. Here there is less light and the telescopic definition is better, so that large glasses possess an undoubted advantage.

The ensuing opposition of Mars is not a favourable one, but many of the most interesting and now well-known features of the planet may be observed in good instruments. The curious network of "canals," as discovered by Schiaparelli, and their duplication, as seen by the same observer during the last opposition, in the winter of 1881-82, should be looked for, as some doubts have been expressed as to the reality of these phenomena. The question is naturally asked, How is it that they are now seen with so much distinctness again and again with a refractor of only eight inches aperture, when large instruments have utterly failed to reveal them? Schiaparelli, it is true, works in a climate highly favourable to such delicate work, and his telescope, though comparatively small, is yet of the finest possible quality. But even with the prevailing conditions so eminently conducive to the attainment of such important results, it must still remain matter for surprise that, as the celebrated Italian astronomer himself put it, "the greater number of canals and of their pairs were observed with comparative ease whenever the air was still, and only a few cases required a special effort on the part of the observer."

These so-called canals appear from Schiaparelli's charts to be very narrow dark markings, running generally in straight lines, and often intersecting each other so as to constitute a perfect network about the equator and in the region south of it. Many of these lines were seen to be double in January and February, 1882, and the inference is that, as these duplications had escaped observation during the more favourable opposition of 1879, they are subject to periodical variations, or in any case represent phenomena of temporary character. They undoubtedly exhibit a most extraordinary arrangement, and such as naturally to call forth some amount of objectional comment from those who, though familiar with the telescopic aspect of the planet, have never seen it as Schiaparelli depicts it. In fact his delineations give a boldness and definiteness of outline in the smallest details which no other observer is able to corroborate. The extreme delicacy of shading and softness of outline so characteristic of many of the features of this planet as displayed in our best telescopes seem wholly wanting, and we have presented to us an elaborate complication of hard, dark lines which bear little analogy to our own impressions.

It has been suggested that many of these so-called "canals" are the edges of half-tone districts on the planet, and possibly this may be so in certain cases. But we must not forget that the eminent author of these important discoveries expresses himself very confidently as to their existence, for he has seen them repeatedly, and at times when the conditions were not favourable to the detection of such difficult markings. Probably something