The values of height obtained for Kinchingjunga will therefore be—

		Feet.
If measured	above sea-level ...	28,000
,, ,,	from bottom of the Indian Ocean	60,000
,, ,,	from the shadow cast by the mountain in Tibet ...	12,000

As pointed out by Col. Burrard there may be considerable difference between measurements, made on Mädler's method, according as the shadow falls on a plateau or on a deep crater. It is therefore necessary to make allowances for the height of the plateau or the depth of the crater, whenever this can be known. I have not read Mädler's original work on the subject, but it seems probable that practical astronomers have found some way out of the difficulty. In any case Mädler's method enables us to measure the height with reference to the surface of the shadow, and the results of his investigations confirm the discovery of Galileo that lunar mountains are comparatively much loftier than the Earth's.

Note on an Investigation suitable for Amateurs regarding Lunar Craterlets.

BY H. G. TOMKINS.

As members are aware prominent features on the lunar surface are those known by the general term craters. Like many other instances such as the canals on Mars in astronomical nomenclature, the name was given owing to the first impression created by their appearance and is perhaps rather unfortunate as it is certain that even if they are due to volcanic action, that action must have been different from anything we are acquainted with on the Earth. Consequently many selenographers prefer to call these formations walled-plains, ring-plains, etc., which are certainly more appropriate names. Careful examination of the Moon's surface, however, soon reveals the fact that, in addition to these larger formations, there are also other much smaller ones, which do in many respects more resemble volcanoes such as we know them on the Earth. These are known as craterlets and crater cones and strangely enough these small features, though they may well be a most important aid to the elucidation of lunar history, have been comparatively little studied. It is safe to say that to have brought about the extraordinary surface formations on the Moon, some very vast forces must have been at work, and at the present day although the majority of astronomers consider that these forces must have been nearly allied to what we know as volcanic energy on the Earth, that opinion is by no means universal, and moreover there are few who would venture on an opinion as to how, when or to what extent such a force operated, or whether it was comparatively sudden or extended over long ages of time. Now on the Earth the distribution and positions of the volcanoes has an important bearing on its geological history, and these alone teach us much about the forces which exist to shape the surface of the Earth. Assuming for the sake of argument that the craterlets on the Moon are similar in origin to those on the Earth a classification of them as regards position and distribution could not fail to produce important evidence as to the formation of the portions of the Moon in which they are found. Even supposing, however, we proceed on the hypothesis that nothing is known about these craterlets and that they are not similar to the terrestrial volcanoes, an investigation such as the one proposed would certainly result in information by which it would be possible to build up some sort of idea as to the part they play or have in the past played upon the Moon's surface. It would lead to a possible explanation of the craterlets themselves as well as of the country or near which they are found.

Such an investigation is one eminently suited to amateurs in the Astronomical Society of India. For a first survey at any rate no instrument whatever is required except perhaps an ordinary reading-glass, and the work can be done entirely from photographs. Later on perhaps when the first results have been obtained, further observation with the aid of a telescope may be desirable, but for the present, the material available on lunar photographs such as those taken at Mount Wilson and the Yerkes Obeservatory is ample and will provide quite as extensive a piece of work for our members as they will probably be ready to undertake to begin with. The work has the advantage that it can be done at any spare time either during the day or in the evening, and it can be done comfortably under a fan at a table during the hot weather. The only essentials are perseverance, patience and fair accuracy in classification.

A glance at the slides on the screen will give an idea of what the craterlets are like, their size and some of the positions in which they are found. The slide of Copernicus shows a large number of the craterlets round the main formation. The region is very fertile in these objects, and we find several instances of craterlets in rows, such as those mentioned in my recent lecture in connection with the bolide theory of the Moon and also a large number of single cones. In the next slide we have the hilly country south of the Moon and here are to be seen many of the craterlets on the walls and heights round the ring plains as well as some on the floors. In this third slide the Mare Serenitatis craterlets are to be seen on its floor and in larger numbers round outside the borders of the Mare.

It will be noticed that hillocks occasionally very closely resemble craterlets and care will have to be taken not to confuse the two.

It will be necessary to classify the craterlets in three ways with reference to their relation to each other, their position on the Moon and their distribution with regard to other formations.

For the first it will be necessary to distinguish between those found singly, those found in groups, and those found in crater rows. They might also be sub-divided according to their number in a group or row. The direction of a crater-row will be best indicated by means of lunar latitude and longitude as given on any of the lunar maps. I would suggest an arrangement of work so as to bring the result of the various zones of latitude together. Similarly it will be necessary to examine the longitudes together. This will bring out any tendency there may be for the craterlets either singly, in groups or as crater rows to frequent particular latitudes or longitudes. Then as to their relation to other formations—I suggest the following grouping :—(1) those on level plains : (2) those on heights : (3) those on the floors of ring plains : (4) those on the walls of ring plains, (*a*) inside, (*b*) outside, (*c*) on the crest : (5) those round the borders of the Maria, (*a*) inside the Mare, (*b*) outside the Mare : (6) those situated in the white rays proper : (7) those situated in white patches not forming part of a ray proper : (8) those in or very near to rills : (9) those crater rows related to any formation such as Copernicus and their direction with reference to it.

I propose these as a guide but of course they are not exhaustive and experience may suggest others as the enquiry proceeds. It will probably be found convenient to draw up sheets with columns in them for the various kinds of information required. This will facilitate the tabulation of the results. A spare column should of course be kept for abnormal details, etc.

Mrs. Voigt, one of our members, has already volunteered to take up this enquiry and the work is well suited to lady members. I hope others will also come forward and a start will be made. If so, it would help matters probably to divide up the classification or to collaborate. I have a certain number of photographs on which a start can be made; there are also some in the library as well as maps of the Moon and others would very easily be obtained.

Habitability of the Planets.

By U. L. BANERJEE.

Mars.

Now let us consider how far Mars is fit for habitation. This planet travels round the Sun in 687 days and its average distance is 141½ million miles against 92,900,000 miles of the Earth. Its orbit is of considerable eccentricity ; the centre of its orbit being not less than 13,000,000 miles from the Sun. At favourable oppositions it comes within about 35½ million miles from us, and it then shines as a red star of more than twice the brightness of Sirius. The globe of Mars has a mean diameter of 4,230 miles and rotates in a period of 24 h. 37 m. 23 s. on an axis inclined 24° 50′ (according to some 23° 56′) to the plane of its orbit. The substance of Mars has an average density rather less than ¾ of the Earth, or very nearly 4 times that of water. Thus its force of gravity is much less than the gravity on the Earth, inasmuch as that a pound weight on the Earth's surface would weigh only 6 ozs. 3 dwts. on the surface of Mars. Its surface is less than that of the Earth in the proportion of about 25 : 64, or, in other words, the Earth's surface is about 2½ times that of Mars. When Mars is at its mean distance from the Sun, it receives light and heat about 2¼ times less than ours.

The inclination of its axis like our Earth gives it seasons not much different in character than that on the Earth except that the length of each season is nearly double of ours. The Martial axis is situated such that it summers in the northern hemisphere when its distance from the Sun is the greatest. The same thing occurs on the Earth and the Sun is 1,500,000