THE MOON IN MODERN ASTRONOMY; SUMMARY OF TWENTY YEARS SELENOGRAPHIC WORK, AND A STUDY OF RECENT PROBLEMS

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IN

MODERN ASTRONOMY

SUMMARY OF TWENTY YEARS SELENOGRAPHIC WORK, AND A STUDY OF RECENT PROBLEMS

BY

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With 66 Illustrations and a Frontispiece

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CONTENTS

INTRODUCTION

The moon being the nearest celestial body to the earth naturally forms an object of especial interest. Its mean distance from the earth is about 238,840 miles, but, owing to the elliptical shape of its orbit, this distance is sometimes increased to nearly 253,000, and sometimes diminished to about 221,600 miles. The mean period of revolution round the earth is 27 days, 7 hours, 43 minutes, 11½ seconds, and as it rotates on its axis in the same time that it revolves round the earth, this is also the length of its day. Its diameter is about 2160 miles, so that in volume the earth is about 49¼ times larger. In mass, however, the earth is about 81 times greater, and hence the moon's density is equal to 49¼ divided by 81, or about 0·608 that of the earth, or taking the earth's density as 5·53, that of the moon is 3·36 (water equal unity). From the above data it follows that the force of gravity at the moon's surface is about one-sixth of terrestrial gravity. If, therefore, a man of 12 stone weight were transferred to the moon he would weigh only 2 stone, so that a much larger race of men than ourselves would be theoretically possible on the moon. As, however, the moon has neither air nor water, the existence of any form of life on its surface seems more

than doubtful. The moon's surface is about equal in area to North and South America, but as we only see one side of it—owing to its period of axial rotation being equal to that of its revolution round the earth—the surface we see may be stated as roughly equal to that of North America.

Examined with the naked eye or an opera glass the moon's surface is seen to be chequered with bright and dusky patches. Near the southern edge of the disc is a luminous spot known as Tycho, an immense 'crater ring,' which has been well termed by Webb 'the metropolitan crater of the moon.' Near the northern limb is a darkish spot known as Plato. In the north-east quadrant, not far from the moon's visible centre is the magnificent crater Copernicus. Near the centre is another fine walled plain called Albategnius, and between the centre and Plato a very regular one known as Archimedes. The most brilliant spot on the moon's surface is the 'crater' Aristarchus, near the north-eastern edge. The dark portions, formerly termed Maria, under the mistaken idea that they represented lunar seas, cover a considerable area of the moon's surface, and are conspicuously visible even to the naked eye. Two of these remarkable spots are seen near the northern edge. Of these the western one is known as the Mare Serenitatis or Sea of Serenity, and the eastern the Mare Imbrium or Sea of Clouds. To the south of the Mare Serenitatis is another large patch called the Mare Tranquillitatis; and to the west of this, and near the edge of the disc, is a conspicuous spot known as the Mare Crisium. Near the eastern edge is another well-marked spot

called the Oceanus Procellarum, and there are other dark markings in the south-eastern portion of the disc.

The most remarkable features of the moon's surface may be divided into: 1.—Maria or Seas; 2.—Mountain Chains; 3.—'Crater' Mountains, Walled and Ringed Plains; and 4.—Valleys and Clefts or 'Rills.'

1. *Maria.*—The most conspicuous of these have been already referred to. They are comparatively level surfaces and are known *not* to be seas from the fact that where the moon's 'terminator' (or bounding line between light and darkness) crosses them it has a broken and irregular outline, whereas the edge of the shadow would form a regular curve if it crossed a water surface. These so-called 'seas' are, however, not quite level, as they include many small hills and pits, but they may be considered as flat when compared with the other parts of the moon's surface which are exceedingly rugged and irregular.

2. *Mountain Chains and Ridges.*—These are somewhat similar in their general outlines to the mountains of the earth, but are comparatively much higher. The most conspicuous of these mountain ranges is that known as the Apennines, which runs from Copernicus to the Mare Serenitatis, a distance of about 460 miles. They are of considerable elevation with peaks ranging from 11,000 to about 20,000 feet in