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# A Portrait - Painter Who Studied the Moon.

Extracted from an article by E. J. STONE, M.A., F.R.S., entitled "Note on a Crayon Drawing of the Moon by John Russell, R.A., at the Radcliffe Observatory, Oxford," printed in the Monthly Notices of the Royal Astronomical Society, and published here by permission.

THE eccentric hobby of the Royal Academician who took to star-gazing and moon-painting would probably nowadays be matter for some comment. In the eighteenth century, scientists and astronomers hailed the combination with joy on the occasion when John Russell, R.A., whom everyone knows as a portrait-painter, turned amateur astronomer and completed his celebrated moon map.



THE "SELENOGRAPHIA" INVENTED BY JOHN RUSSELL: A GLOBE SHOWING THE VISIBLE SURFACE OF THE MOON.

This globe is also fitted with an apparatus to show how the moon turns a slightly different face to us at various times. The small globe represents the earth, neither its size nor its distance from the moon being, of course, to scale.

In his day Russell was well employed, and commanded about the same prices as Sir Joshua Reynolds (his contemporary). But, despite royal patronage, he never became a fashionable painter.

Astronomy was Russell's "hobby": he spent many years completing the series of minutely accurate pencil-drawings which were the raw material for his large pastel picture of the moon (reproduced in this issue); and he also invented the moon globe, or "Selenographia," illustrated on this page. The accuracy of eye and "feeling" required of a portrait-painter he found he could employ with singular satisfaction, in his leisure hours, in recording the exact appearance of the lunar features.

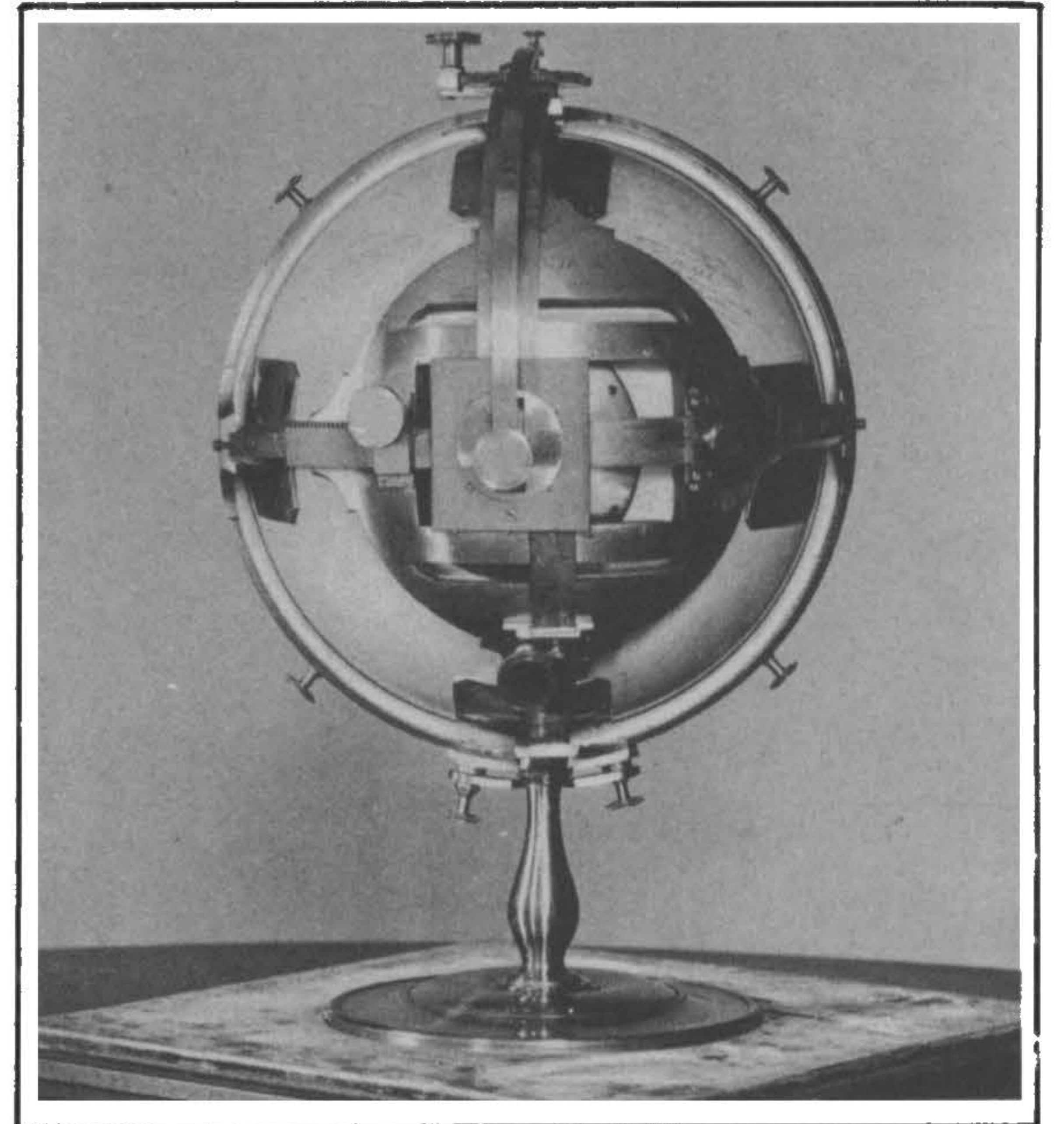
The following passages quoted from a letter written by John Russell to Dr. Hornsby, the Radcliffe observer in 1789, giving his own views on the work of delineating the moon, show how the technique of a portrait-painter and a Royal Academician was adapted to scientific ends. "Before I began to delineate the Moon," wrote John Russell, "I never saw any other representation, but the very inferior Prints to be met with in common Dictionaries, such unsatisfactory imitations, both as to incorrectness of Form and Effect, led me to conclude I could produce a Drawing in some measure corresponding to the Feelings I had upon the first sight of the gibbous Moon through a Telescope. . . . But as you, Sir, would inform me, the Moon requires much attention to be well understood, being composed of so many parts, of different characters, so much similitude in each Class of forms, and of such a variety in the minutiae composing those Forms, and this difficulty also most considerably increased by the various effects caused by the different situations of the Sun; that I am persuaded many improvements may be made, in correctness of Form in the spots, their situation and distinctness of parts . . ."

He makes a suggestion—confirmed since his day

by astronomers—that it had been "too hastily concluded that the large dark parts upon the Moon's Face were Seas," and he inclines to think that it was this idea which had led the astronomer Cassini (who had prepared a famous moon map) "to represent these parts of one almost uniformly smooth, and unvaried effect, which, upon a strict inspection, will appear to be full of parts as various and nearly as multitudinous, as that portion of the Moon which has generally been considered to be Land, and is certainly elevated above the level of the former: even in the parts of the Moon which have been most considered by Cassini I think it will appear some considerable room is left for improvement. But there is a deficiency which I have found in all these Maps of the Moon, and that is, as I before hinted, in point of Effect; the just proportion is not maintained in the Gradations between the inherent Light and Dark parts of the Moon, by which all pleasurable distinctness of character is produced. . . . It was my intention first to produce a representation of the Full Moon as it is generally illuminated by the Sun, but several very respectable Astronomers favored me with their opinion, and by their approbation of one of my Crayon Drawings, which describes the Moon two days after the first quarter, very easily prevailed upon me to alter my resolution and prefer this in which the boldness and expressive elevations of Plato, Copernicus, and Tycho ("craters" on the moon), "and some others near the Boundary of the Line of illumination, convey so distinct an Idea of these parts opposed to those situated near the centre of the Moon which very faintly express their character, compared to the former, as they are nearly lost in the general Blaze of Light"—i.e., at full moon. (It is interesting to note that similar objections to delineating the moon as she appears at Full are made by M. Lucien Rudaux, the modern French astronomer, whose coloured moon map will be found reproduced on another page.)

Lower down Russell continues: "My first efforts, Sir, were made with Crayons, representing the colour of the Moon in its general form according to the particular Phase; upon this I laid the larger Spots of" (*sc.* Mare) "Mediterraneum, Serenitatis, Tranquillitatis, etc. etc.—these I adjusted by degrees giving them their general Forms and grand bearings endeavouring to preserve with as much truth as time would admit the proportional difference of dark

pleasure to several Gentlemen whose approbation is very flattering to me. . . . I used other means in drawing the parts which are more minute, the fine point of a black Lead pencil I think the best for the purpose and have furnished myself with a great number of Drawings in this manner, of the different Spots in the Moon under the circumstances they present themselves in the different Phases, from these



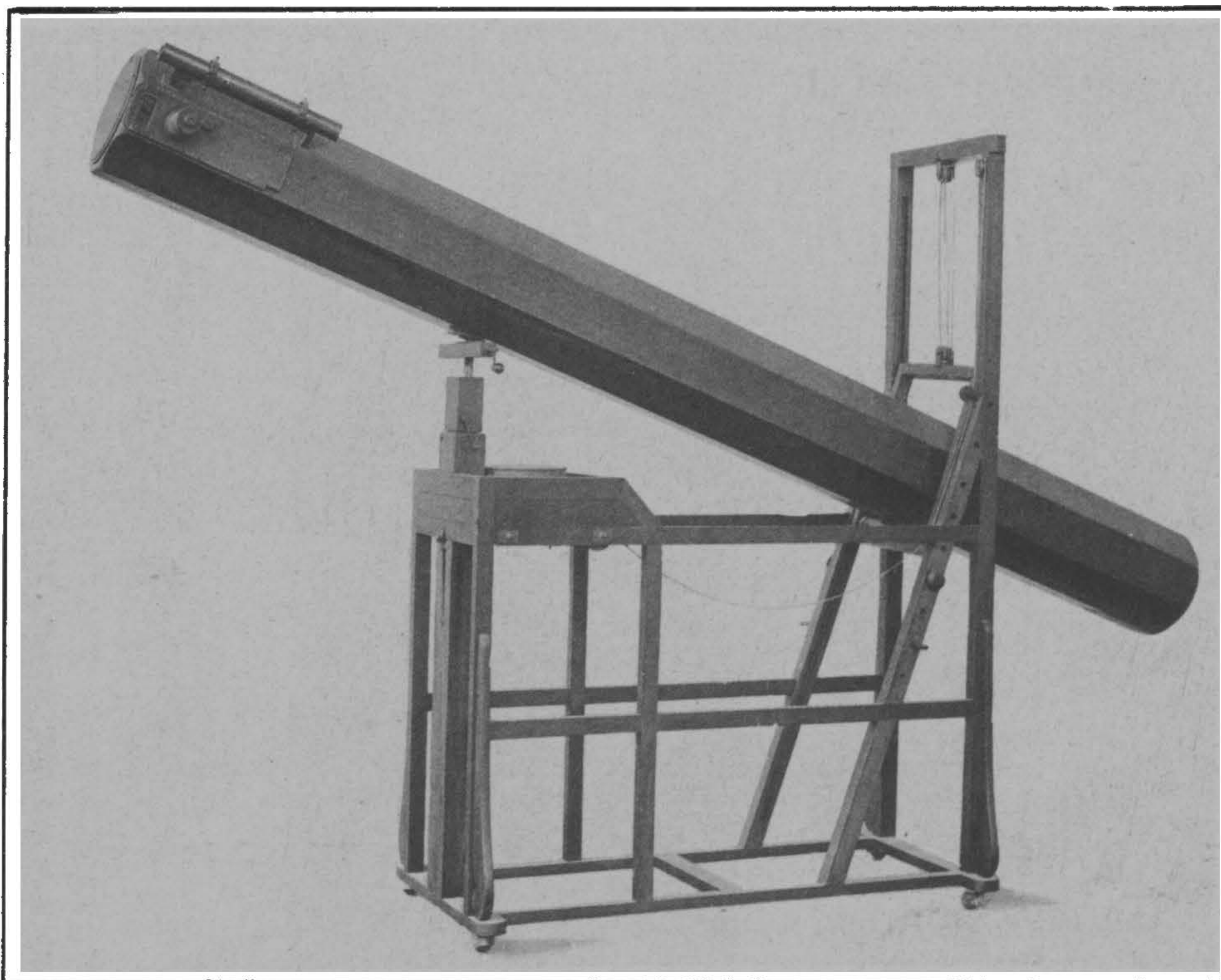
AN ASTRONOMICAL MODEL INVENTED BY JOHN RUSSELL, THE PORTRAIT-PAINTER: THE REVERSE OF HIS "SELENOGRAPHIA," SHOWING ITS COMPLICATED APPARATUS.

Drawings, and in continual reference to the Moon itself, I am proceeding upon the larger picture, producing the effect from the Drawings made with Crayons and the small parts from those with black lead pencils.

"As a painter, it is no vanity for me to say, much may be done in regard to accuracy by the Eye only assisted by the Telescope. We are used to consider the size, form and proportion of the parts, it is the first principle of our Art, it must be acquired; but I have not presumed upon this imaginary power of correctness, the Eye is capable of being deceived and as I want to approach as near as may be to perfection, I am induced to measure distances of as many parts as will set the rest in the proper places. As I have no micrometer such as would describe minutes etc. and if I had, thro my inexperience and want of sufficient power of calculation, I should be embarrassed by the Moon's Variation and its Diameter, at different times, I have constructed one which serves my purpose. A hair is strained in the Focus of the short tube of my Telescope, upon this Hair is made marks of different sizes and at various distances. A scale upon paper has been fixed upon a wall at a certain distance, and by this scale I have ascertained the size of the Marks and the Space which separates each from the other: a counter scale proportioned to work the large picture with is all I need to keep my mind satisfied that I do not proceed in Vain for I have by a particular method prevented the inconvenience which the want of a cross Bar and perpendicular would otherwise have occasioned."

John Russell's description of his technique, and of the pains he took

to insure accuracy, does great credit to the industry of an age when photography was unknown and scientific instruments relatively undeveloped. We are reminded of Leonardo da Vinci's exquisite botanical and anatomical studies—works in which, as in Russell's moon map, Art has worked as a patient handmaid to Science; but into which she has infused a "feeling" which the products of the infallible camera rarely, if ever, possess.



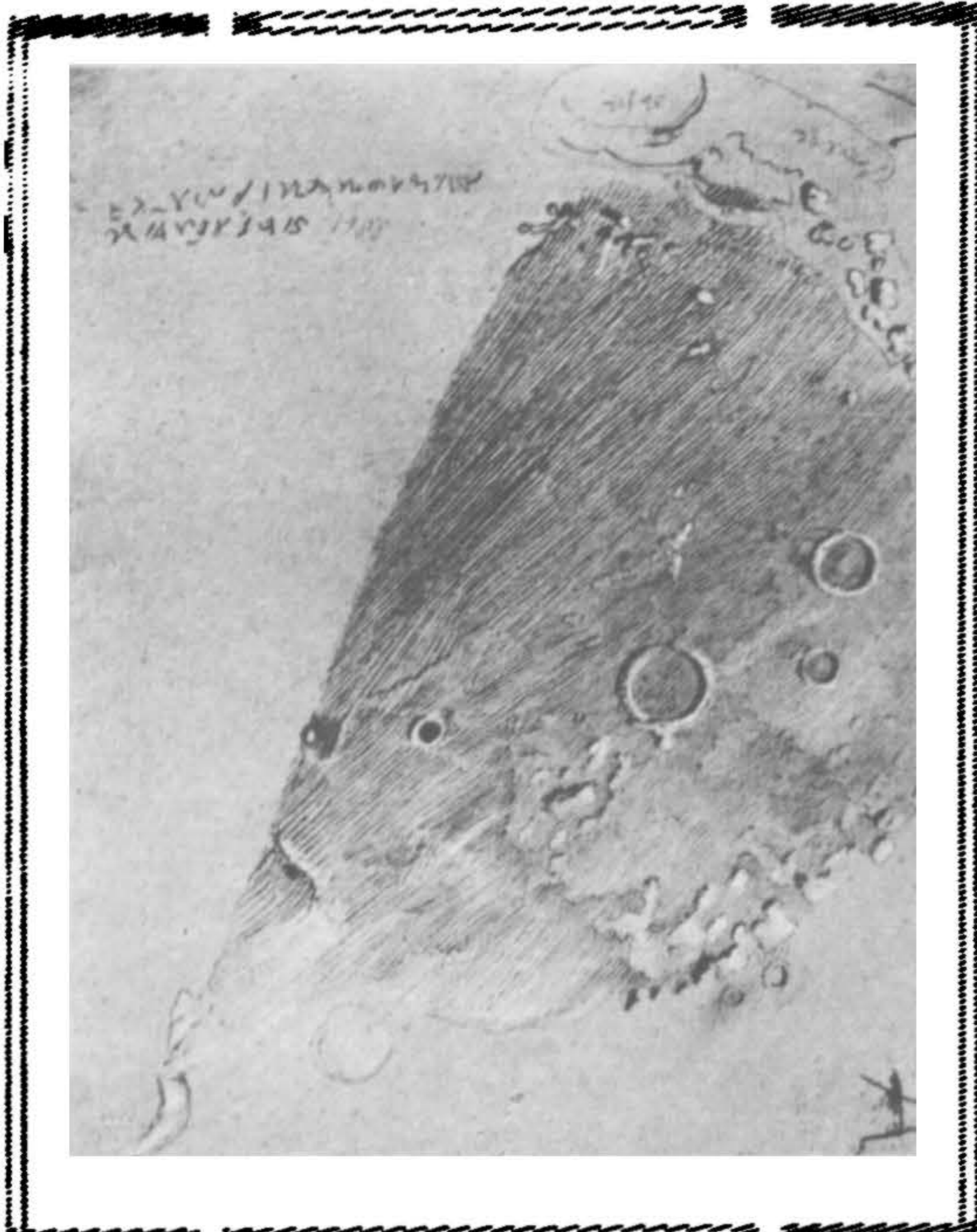
SIMILAR TO, THOUGH LARGER THAN, THE TELESCOPE BY MEANS OF WHICH RUSSELL MADE HIS DRAWINGS: A NEWTONIAN REFLECTOR MADE BY SIR WILLIAM HERSCHEL AND BELONGING TO THE RADCLIFFE OBSERVATORY AT OXFORD.

and Light; by which one part is subordinate to the other; and proceeding so long as the Moon was to be seen: executing the minutiae as far as time would permit, being always attentive to the most considerable parts before those which are subordinate. The Effect of the Moon thus produced, surrounded by a dark Blue colour has a novelty as well as an expression in its appearance, which has given some

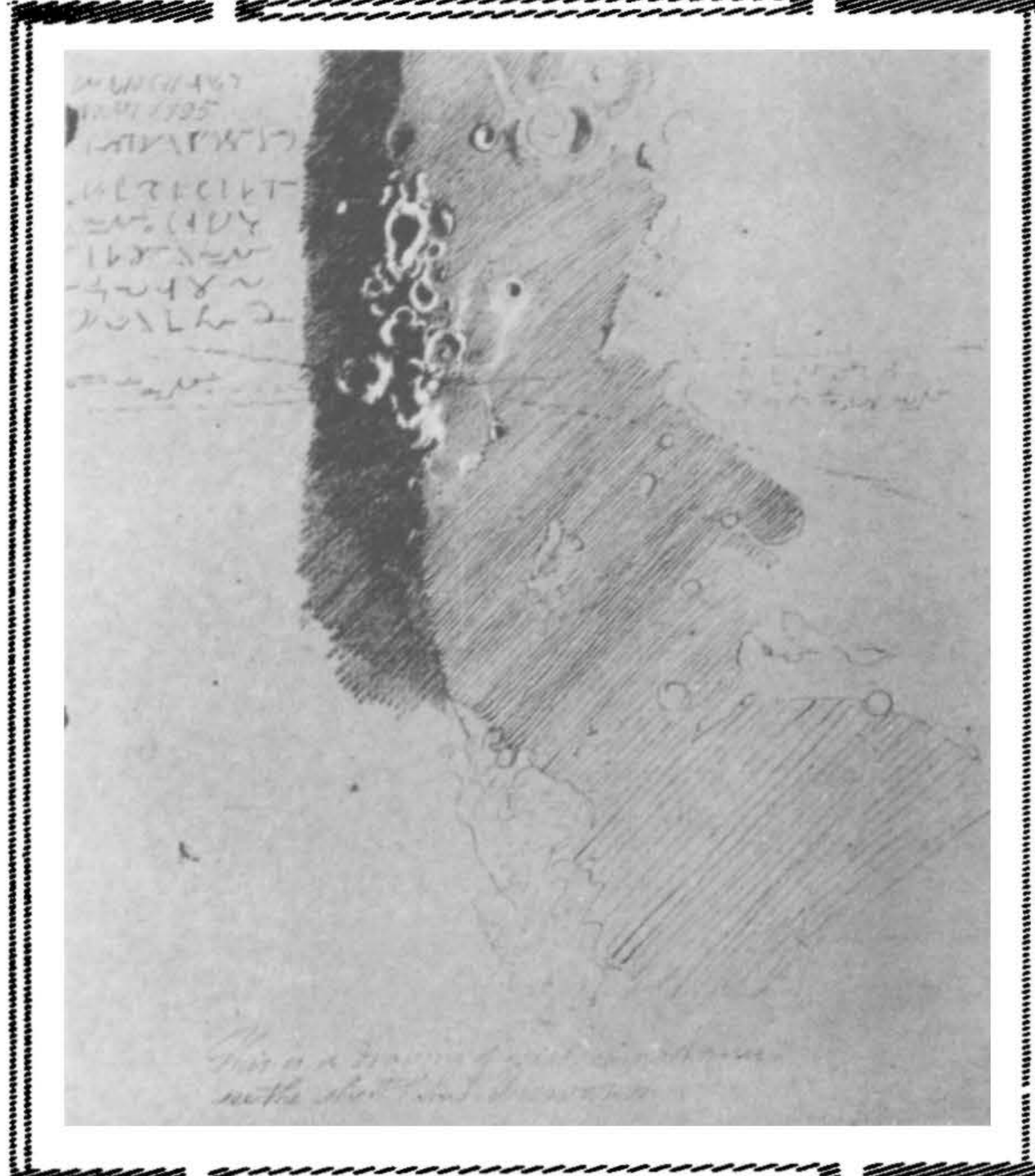


# MOON-MAPPING BEFORE PHOTOGRAPHY: A PORTRAIT-PAINTER'S HOBBY.

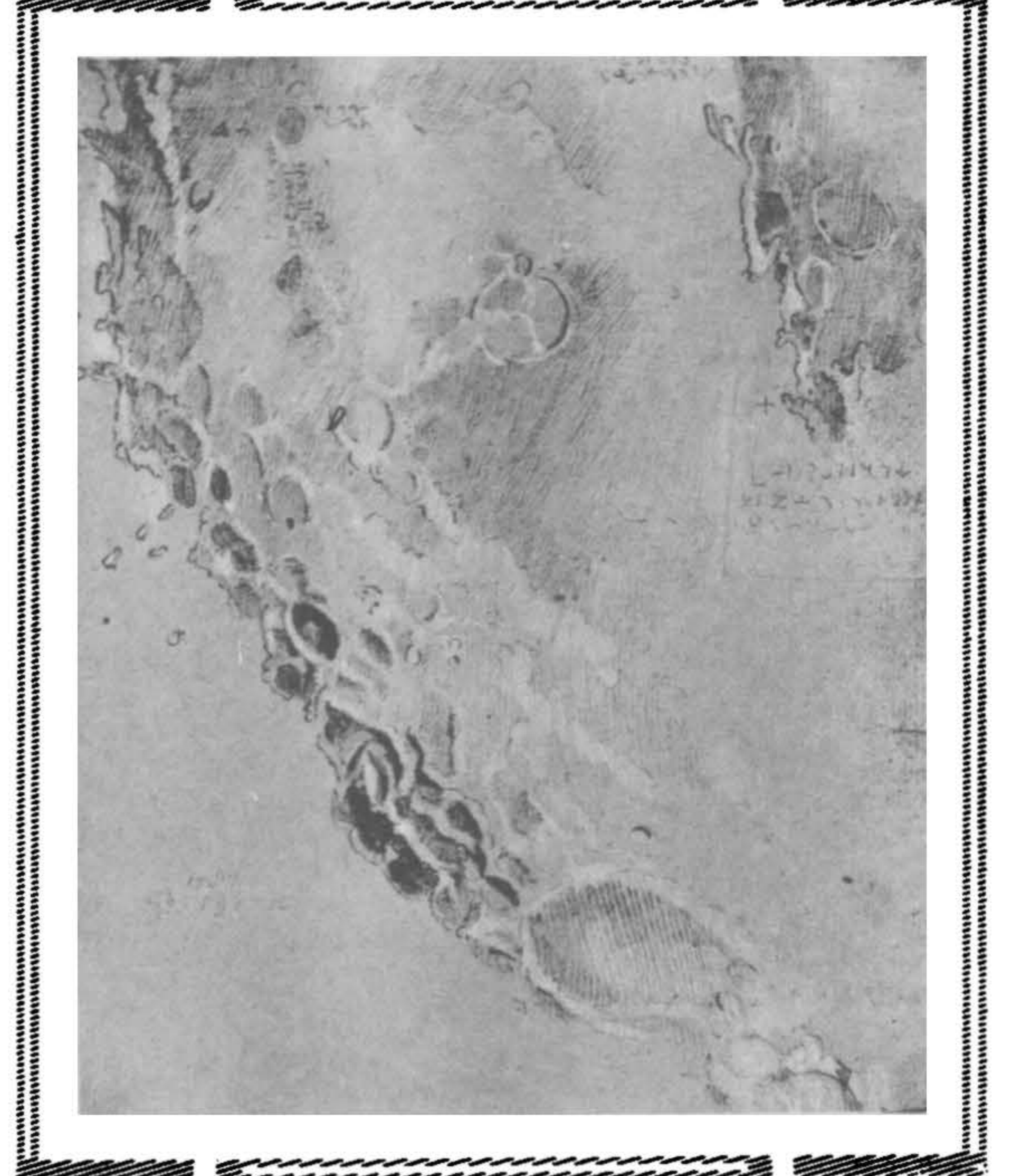
PHOTOGRAPHS REPRODUCED BY COURTESY OF DR. H. KNOX-SHAW, M.A., RADCLIFFE OBSERVER.



A PENCIL STUDY OF THE MOON'S SURFACE: THE REGION LYING BETWEEN THE LUNAR ALPS AND APENNINES.



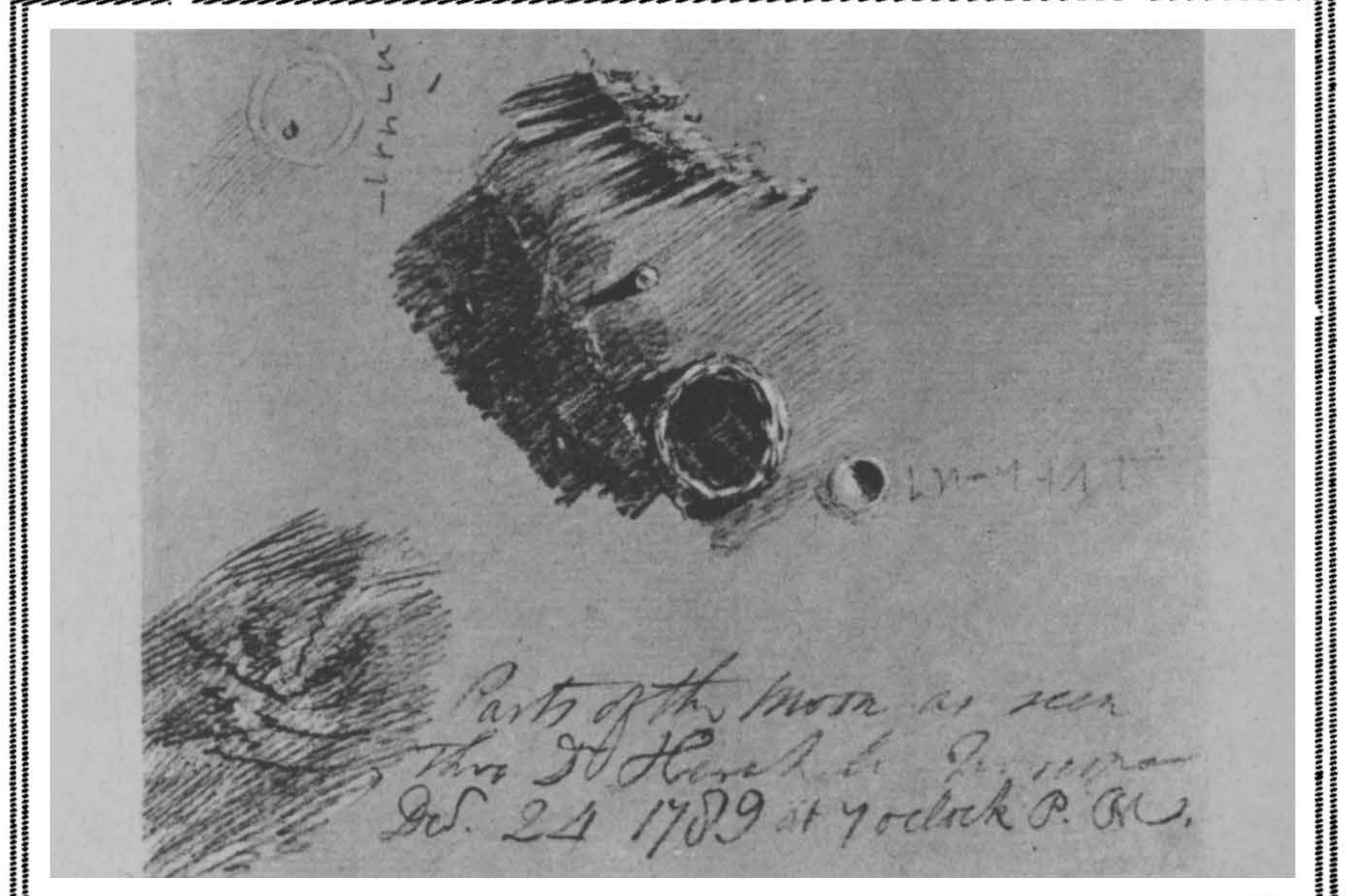
RUSSELL'S PENCIL STUDY OF THE "CRATERS" OF THEOPHILUS CAPELLA AND CENSORINUS: AN AREA ON THE NORTH EDGE OF "MARE TRANQUILLITATIS."



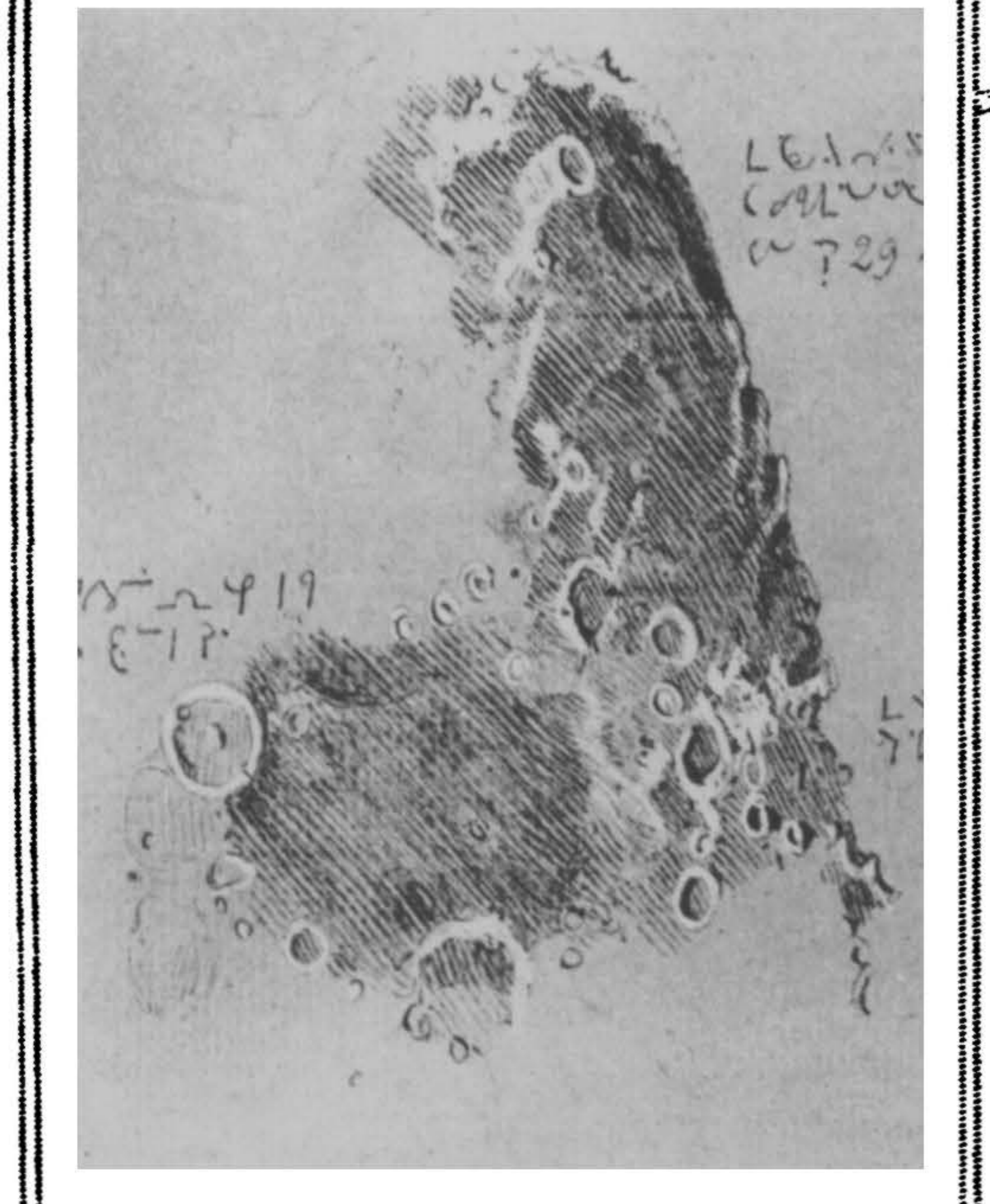
THE NEIGHBOURHOOD OF THE "CRATER" GASSENDI: TO BE FOUND ON THE SOUTH EDGE OF "MARE HUMORUM."



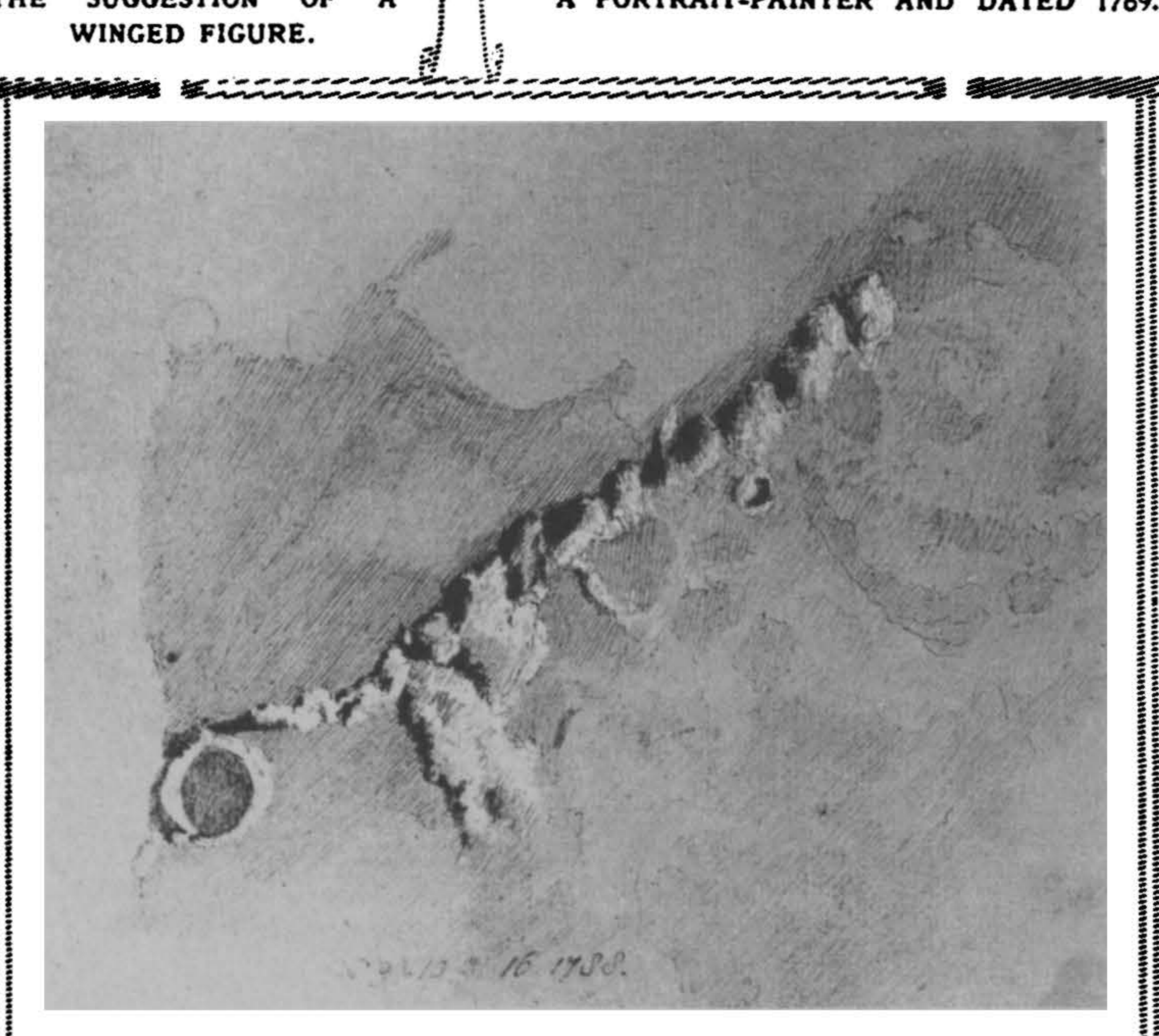
WHERE THE ROYAL ACADEMICIAN HAS OUSTED THE ASTRONOMER: A DRAWING OF SINUS IRIDUM (GULF OF RAINBOWS), WITH THE SUGGESTION OF A WINGED FIGURE.



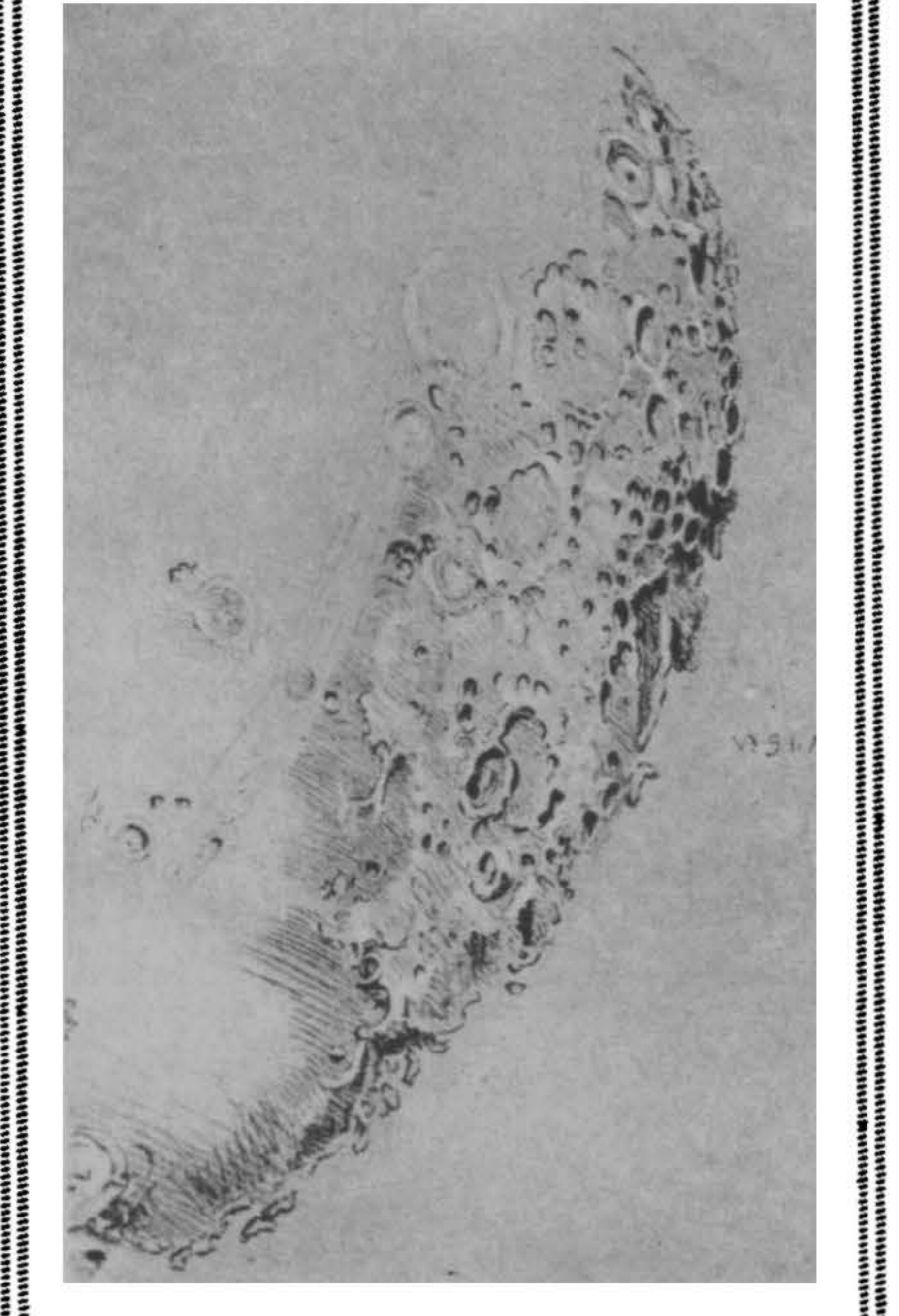
WITH SHARP BLACK SHADOWS CAST BY THE ALMOST HORIZONTAL RAYS OF THE SUN: A PENCIL STUDY OF A PART OF THE MOON'S SURFACE, DRAWN BY A PORTRAIT-PAINTER AND DATED 1789.



REPRODUCING FAITHFULLY THE APPEARANCE OF THE SURFACE: "MARE NECTARIS" AND THE EDGE OF "MARE FECUNDITATIS."



A VERY CHARACTERISTIC LUNAR FORMATION: THE "CRATER" OF ERATOSTHENES AND THE LUNAR APENNINES.



THE REGION SOUTH OF TYCHO "CRATER" AND "MARE HUMORUM": A MUCH-PITTED PART OF THE MOON.

The pencil studies reproduced above were made by John Russell, R.A., and represent the result of many arduous hours spent at the telescope; and they formed the raw material for his large pastel-picture of the moon which is reproduced on the opposite page in this number. Some 200 of these drawings were presented to the Radcliffe Observatory in 1873 by John Russell's grandson. The various regions reproduced in the drawings on this page can easily be identified by a reference to the diagram of the moon's surface which will be found in this number with M. Lucien Rudaux's

modern moon-map, reproduced in colour on pages II and III. In this diagram the French equivalents of the Latin names will be found—"Mare Iridum" becoming "Mer des Iris," "Mare Humorum" "Mer des Humeurs," etc. Preceding this present page of Russell's drawings will be found an article in which an extremely interesting letter, written by John Russell himself in 1789 to Dr. Hornsby (the then first Radcliffe Observer), describing the methods he employed, and giving the artist's own views on this almost unique achievement, is largely quoted from.



## A Remarkable Astronomical Study by an 18th-Century Portrait-Painter.



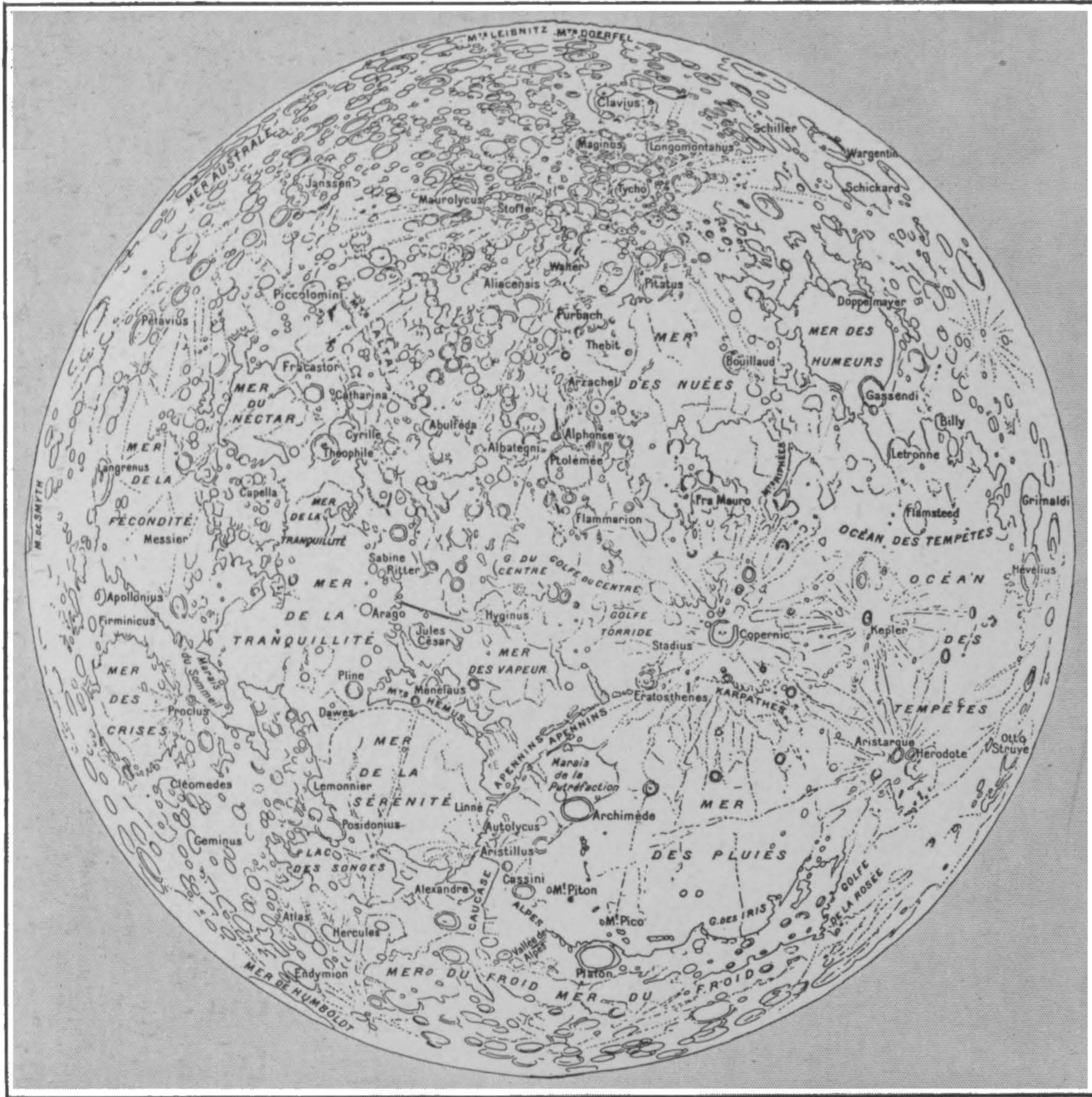
FOR COMPARISON WITH THE MODERN SCIENTIFIC MOON MAP REPRODUCED ELSEWHERE IN THIS NUMBER:  
AN EXTRAORDINARILY ACCURATE PORTRAYAL OF THE MOON MADE IN 1795 BY JOHN RUSSELL, R.A.

The above reproduction is of a crayon drawing of the moon at two days after the first quarter made in 1795 by John Russell, R.A. The picture measures five feet square, and the detail was copied from a series of pencil drawings which Russell made over a period of about ten years at the eye-piece of his own telescope (a 6-in. reflector by Sir William Herschel). A collection containing over 200 of these pencil drawings (a few of which are reproduced on another page) was presented to the Radcliffe Observatory in 1873 by a grandson of the artist. They show a great wealth of minute detail, and represent the result of many arduous hours spent at the telescope with a lead pencil. On many of the drawings are annotations by Russell in a system of shorthand. Needless to say, the completed work is of extraordinary interest, showing as it does the general appearance of the moon as it presented itself to the eye and was delineated by a skilled artist about a hundred years ago. To a more or less cursory inspection there have been, as might be expected, during these hundred years, no distinct indications of change on the lunar surface. The large pastel picture was slightly damaged by water in its journey to Oxford in 1824. It was subsequently most skilfully touched up by the artist's daughter, but the appearance of the crater Copernicus (seen near the right-hand lower edge of the illuminated surface) suffered in the process. Wet stains

can still be made out on the dark-blue background of the sky. John Russell, the artist responsible for this remarkable astronomical record, was a well-known portrait-painter who specialised in pastel. His pictures commanded in his day about the same price as those of Sir Joshua Reynolds, and among his sitters were John Wesley, William Cowper, Mrs. Siddons, and Sir Joseph Banks, President of the Royal Society. The story goes that Russell's interest in our satellite was awakened in 1784, when he made his first drawing of the moon "in the garden of John Bacon, R.A., 17, Newman Street." (His friendship with Bacon no doubt arose from both men being active Methodists.) A conversation with Sir Joseph Banks set him upon drawing the moon, when certain men of science "would not let him rest till he had promised to comply." He had a 6-in. reflector of Dr. Herschel's and a telescope fitted with a micrometer, and conducted a series of observations covering twenty years, making a quantity of delicate pencil drawings of sectors of the moon in various phases of illumination. From these he worked up the large picture reproduced above. On another page will be found a reproduction of a modern lunar map, the work of a French observer, M. Lucien Rudaux, which forms an extremely interesting object of comparison with the work of the eighteenth-century Royal Academician seen above.



## “Oceans” and “Mountains” in the Moon: A Modern Study of the Chief Features and of the Coloured Areas of the Moon’s Surface.



A PLAN OF THE MOON'S SURFACE, MADE BY A FRENCH ARTIST, WHICH SERVES AS A KEY TO THE MAIN FEATURES IN THE ACCOMPANYING COLOURED REPRODUCTION: LUNAR "OCEANS," "CRATERS," AND MOUNTAINS WITH THE FRENCH EQUIVALENTS OF THEIR ASTRONOMICAL NAMES.

IN the reproductions on this page the moon's disc is seen orientated as in the eyepiece of a telescope which inverts objects—the North Pole at the top and the South Pole at the bottom. To the observer—artist full moon—that is, the period at which she is lit vertically by the sun—is not the best time for seeing the detail of the moon's surface clearly. The lunar features show up best when the hills and "craters" are attended by long dark shadows—such as are cast by the more oblique rays of the sun in her earlier phases. But at such times her surface is only partially illuminated. The accompanying coloured diagram aims at combining the scope of an observation taken at full moon with the detail of which knowledge is chiefly to be gained by watching the partially illuminated disc in its earlier phases. It must, of course, be understood that the coloration of the chart is considerably exaggerated; this has been done to show the contrasts presented by the moon's surface more clearly than would appear in actual reality. On this page will also be found a photographic record of the moon's appearance, giving an idea of the very marked contrasts which exist between different parts of the moon's surface, both in "texture" and in power of reflecting



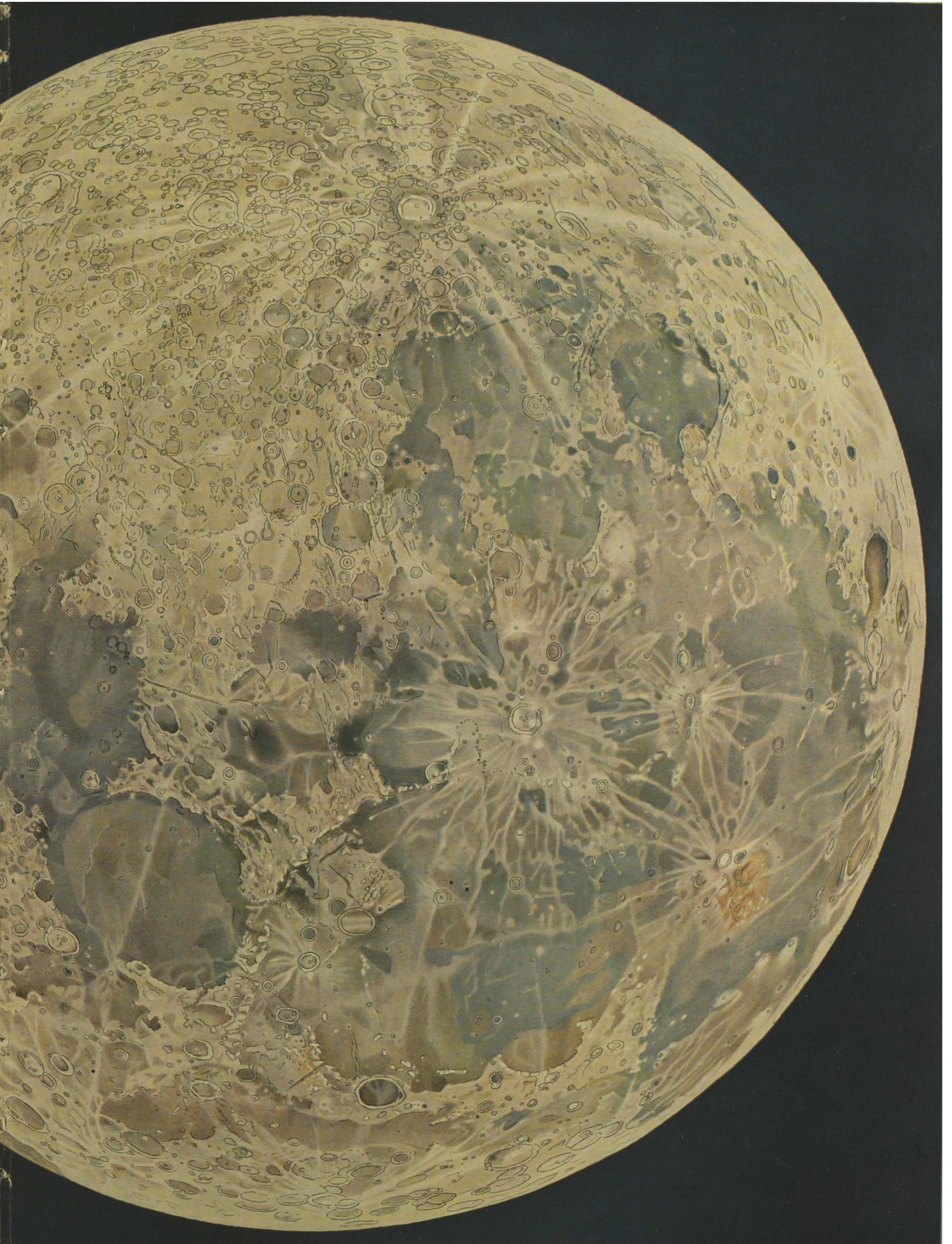
A PHOTOGRAPH OF THE MOON: SHOWING THE STRONGLY MARKED DARK AREAS WHICH IT WAS ONCE THOUGHT WERE "OCEANS."

light. The black-and-white diagrammatic map gives the French versions of the astronomical names of the principal lunar regions and of the numerous "oceans," "marshes," "gulfs," mountains, and "craters," which mark her surface. The key also facilitates any comparison which the curious reader may like to make between M. Lucien Rudaux's moon map reproduced on this page and other lunar charts which have been prepared at different times, often with objects and on principles varying from this one. The unusual opportunity of a comparison is offered between the modern moon map here reproduced and the record of her appearance made by John Russell, R.A., in 1795, which will be found on another page of this issue. John Russell was a famous portrait painter of his day; his pastel picture of the moon is remarkable for its minute accuracy, besides being in itself a great artistic achievement.



A LUNAR "MAP," BASED ON THE MOST RECENT PAINTING OF THE MOON'S APPEARANCE





NT OBSERVATIONS, IN WHICH THE COLOURS HAVE BEEN EXAGGERATED TO EMPHASISE THE CONTRASTS ON THE MOON'S SURFACE: A MODERN BY M. LUCIEN RUDAUX, SET IN THE SAME POSITION AS THE EIGHTEENTH-CENTURY PASTEL OF THE SAME SUBJECT—ON ANOTHER PAGE.