PICTURING THE PLANETS.

PORTRAITS OF JUPITER, MARS, AND SATURN, AND HOW THEY WERE MADE AT THE LICK OBSERVATORY.

NOTWITHSTANDING the successes which have been achieved by photography in the pictorial representation of various classes of celestial objects, there is one part of this field, and that an important one, in which the older methods still maintain their ascendancy. For representing the surface features of a planet, recourse must still be had to the pencil guided by ocular observation, although there is abundance of light for affecting the photographic plate. It is not difficult to see why this is so. In dealing with a faint object, such as a nebula, no advantage is gained by the eye in long-continued gazing; but it is exactly in such a case as this that the camera finds its most successful application. The effect upon the photographic plate is cumulative, and the impression which is not produced in one hour's exposure may appear in two or three. The difficulty in photographing a planet arises from the close juxtaposition of the markings on its disk, and their slight contrast in brightness.

Unavoidable spreading of the photographic image is one source of indistinctness, relatively important in so small an image;[1] moreover, on account of atmospheric disturbances, the details are continually blurring and overlapping in the tremulous image formed by the lens, and, as the exposure must continue for a considerable part of a minute, a correspondingly blurred picture is the result. The eye seizes some minute detail which is visible only for an instant, perhaps, in the course of an hour's steady gazing, and even if an "instantaneous" exposure were possible, this detail would appear upon a photograph only in case it had been taken at that particular instant.

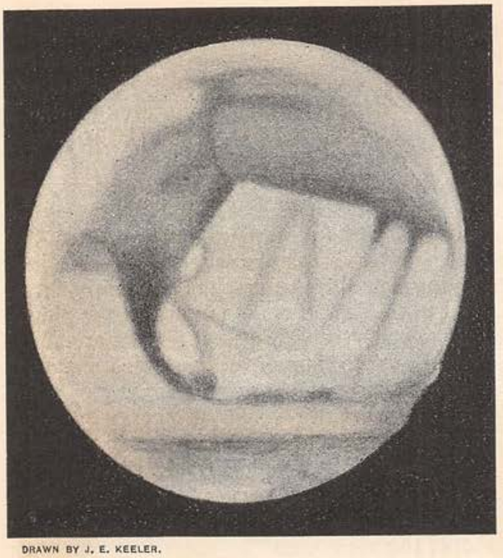
But progress is rapid. The success with which the moon can now be photographed has already been made known to the readers of THE CENTURY, and really useful photographs of Jupiter have been obtained at the Lick observatory. There is every reason to expect that with improvements in apparatus and methods, and the selection of the best sites for purposes of observation, photography of the planets will soon have passed the experimental stage.

For the brief researches of the average Saturday-night visitor who makes the ascent of Mount Hamilton to gratify his curiosity in regard to the far-off worlds in space, the planets offer the most inviting field. They are members of our own family, and yet our knowledge of their personal characteristics is still so incomplete that they excite the curiosity which we feel in regard to strangers. In the telescope they are brilliant objects, visible without effort on the part of the observer. To many persons who have never before looked through a telescope, the view with the great instrument on Mount Hamilton is disappointing; the beauty and size of the object fall far below their expectations, and it occasionally happens that a dissatisfied visitor indignantly declares his conviction that the whole institution is a fraud.

A large part of this disappointment is due to lack of experience in observing, as well as to exaggerated expectations. To see with a telescope, simple as the operation appears to be, is an art which is not immediately acquired. In illustration of this may be mentioned the fact that the majority of visitors who look at the rings of Saturn with the great telescope fail to see the broad black line or division which was discovered by Cassini in 1675 with one of the imperfect telescopes of that time. Some experience in observation, and some knowledge of the object observed, are necessary in order to appreciate the powers of a great telescope.

Only three of the planets — Mars, Jupiter, and Saturn — exhibit surface-markings sufficiently definite to engage the attention of the astronomical draftsman. Mercury and Venus, whose orbits lie within the orbit of the earth, are sometimes marked by very faint spots, but they are so vague and indefinite in character that even yet the rotation times of these planets are subjects of dispute. Faint belts have been suspected on Uranus, but the evidence of their existence is far from satisfactory; while Neptune, the farthest of the planets, shows a pale, uniformly illuminated disk, on which the most powerful telescopes have failed to show the slightest trace of details. The three planets first mentioned, however, exhibit a vast variety of intricate and often highly perplexing detail, taxing to the utmost the skill of the draftsman,

[1] The image of Jupiter in the focus of the photographic lens of the Lick telescope is only a little more than one eighth of an inch in diameter; and although the image may be enlarged some ten times by suitable apparatus, all the difficulties mentioned are not overcome in this way, and some new ones are introduced.



DRAWN BY J. E. KEELER.

MARS. JULY 6, 1890. 9 HOURS 25 MINUTES PACIFIC TIME. THE LONGITUDE OF CENTRAL MERIDIAN IS ABOUT 320°.

and offering abundance of material for profitable study.

The drawings which accompany the present article were made from sketches and measurements with the Lick telescope, and they fairly represent what is shown by the instrument under good conditions. It may be well to mention here that in an astronomical drawing the prominence of the markings must be exaggerated, for otherwise those details which are of the last degree of faintness could not be shown at all. The amount of exaggeration must depend upon the taste and judgment of the draftsman, but it certainly should not be carried so far as to offend the cultivated eye, and the same scale of relative intensities must be preserved throughout.

What the various spots and markings shown in the drawings really mean can seldom be determined by simple inspection with the telescope. Their changes, if any, must be studied; they must be viewed under all possible differences of position resulting from the planetary motions; and information derived from all the branches of astronomy must be taken into consideration. In some cases, as for instance in the question as to the constitution of Saturn's rings, rigid mathematical analysis is applicable, and our interpretation must not conflict with its conclusions.

Taking the three planets mentioned in the order of their distance from the sun, let us first consider the two drawings of Mars. In both drawings the axis of the planet is vertical, and the south pole is at the top.[1] The dark spots are regarded as representing oceans, and the light spots continents; but it should be borne in mind that even in making this first assumption, which is evidently of fundamental importance, we are passing beyond the bounds of certain knowledge. If erroneous, all our speculation on the meaning of the fainter markings must be futile. However, in thus pointing out the lack of certainty in the assumption, I would by no means deny the probability of its correctness. Adopting this interpretation, we may regard indentations of the outlines of the bright spots as "bays," and small bright spots surrounded by a dark shading as "islands." The principal markings have been named in accordance with this view.

At each pole of Mars is a brilliant white spot, generally a very conspicuous feature of the surface; and from the way in which these spots increase and diminish with the changing Martian seasons, we conclude that they are snow-caps, similar to the great masses of ice and snow which surround the poles of the earth. In the drawings the northern or lower snow-cap is inclined slightly toward the observer, but in 1890 it was not strongly marked. The limb or edge of Mars is bright, and the snow-cap is lost in the general brightness of the limb.

The ruddy color of Mars is due to the continents. The oceans are not red, but gray, with occasionally a greenish shade. That it is not the atmosphere of Mars which imparts the red color to the continents we know from the fact that the snow-caps are white, notwithstanding the great depth of atmosphere through which the light reflected from them must pass to reach our eye.

On both drawings are shown faint dark lines connecting dark spots on different parts of the planet. When Professor Schiaparelli, the eminent Italian astronomer, following out the system of nomenclature which has already been referred to, gave the name of "canals" to these faint lines, he probably did not perceive the mischief which lurked within the name. "Oceans" and "continents," although perhaps suggesting more than is strictly justified by our present knowledge, imply the action of natural causes only, but the term "canal"[2] implies the work of intelligent beings like ourselves. Hence has probably arisen the impression, which, judging from the inquiries of visitors who come to Mount Hamilton, is very widely spread, that Mars is actually known to be inhabited. As these markings must have a width of at least

[1] Because in an astronomical telescope objects are always seen inverted.

[2] It should be mentioned, however, that the Italian word *canale*, used by Schiaparelli, signifies a canal, channel, pipe, or conduit, and hence has a broader meaning than the English "canal," into which it has been translated.

twenty miles in order to be visible at the distance of the earth, and have been observed by Professor Schiaparelli to change in the course of a single day to a pair of parallel lines from one hundred to two hundred miles apart, it is evident that they have very little resemblance to our terrestrial canals. According to Schiaparelli, whose visual powers for detecting such faint tracings seem to be extraordinary, these canals cover the whole surface of the Martian continents with a complicated network. He has suggested that they are natural waterways, following the course of cracks in the original surface, by which the polar floods find a passage toward the equator. The "gemination" of the canals has been observed at Mount Hamilton and at other observatories, but its nature is still a profound mystery.

The dark, funnel-shaped bay shown in the drawing of July 6 is one of the strongest and most easily recognized on Mars, and it is shown in the drawings of the earliest observers. It is called the Syrtis Magna by Schiaparelli, who has replaced the names of persons given to the markings on the planet by English astronomers by names drawn from classical geography—a change which will commend itself to unprejudiced students. All the main outlines shown in this drawing are closely in accordance with Schiaparelli's maps, although differences exist in some of the minor details. On the left of the Syrtis Magna, at its bell-shaped mouth, is the region called Libya, one of those curious regions which are sometimes bright, like the continents, and sometimes dark, like the oceans, and which may therefore be regarded as low tracts of land occasionally inundated with water. It is in this inundated condition that Libya is shown in the drawing.

One of the large continents of Mars occupies the central part of the disk. On its southern shore is a strongly marked forked bay the middle point of which is just on the equator, and which, on account of its definiteness, has been chosen as the starting-point from which to reckon Martian longitudes. A straight canal, the Gehon, extending inland from the right-hand fork of this bay, was, at the time of the drawing, one of the most distinct on the planet. From the other fork of the bay extends a somewhat similar canal, the Hiddekel. The straight canal extending horizontally from the head of the Syrtis Magna toward the right is called the Protonilus. All these canals are shown much wider than they are drawn by Schiaparelli.

The most novel feature of the drawing is a pair of white spots projecting from the east limb, or right-hand edge, of the planet. These spots were first noticed by a visitor who was looking at Mars on one of the public nights at the observatory. On the next night, Mars having made one revolution in the mean time, they appeared again at the same place, and the drawing was then made. It will be noticed that in this drawing Mars has a gibbous phase, a portion of the disk being unilluminated, and the spots are on the "terminator," or boundary between the bright and obscure portions. The most obvious interpretation of the phenomenon is that the spots are projections above the surface of Mars, and, as the elevation necessary to produce such an appearance is very considerable, that they are clouds floating high in his atmosphere. The drawing is the first known record of an appearance of this kind.

DRAWN BY E. S. HOLDEN.

MARS. MAY 21, 1890. 12 HOURS 30 MINUTES PACIFIC TIME. THE LONGITUDE OF THE CENTRAL MERIDIAN IS ABOUT 60°.

The drawing of May 21 was made when Mars was nearly in opposition, and the disk is round and fully illuminated. The forked bay from which longitude is reckoned is on the extreme left, on the point of passing out of view by the rotation of the planet. Just to the right of it is a larger bay, the Margaritifer Sinus. A curious marking, shaped like a horseshoe, in the southeast quadrant, is one of the most interesting regions on Mars. The central dark spot, or Solis Lacus, is seen at all oppositions, but the surrounding bright ring seems to change in a remarkable manner, being at some oppositions broad and bright, at others narrow and dim, sometimes traversed by canals connecting the central lake with the ocean outside, and sometimes forming a complete annulus in which the eye can perceive no break. These changes can be accounted for if we suppose the land in this region to be low and flat, so that a comparatively slight change in the water-level would have a great effect upon the configuration of the coast-line. We can picture to ourselves how greatly the shape of Florida would be changed if the ocean were to rise only ten feet. It is true that on the earth such enormous inundations are unknown, but the seas of Mars are narrow, and vast volumes of water must be set free by the rapid melting of the polar ice.

DRAWN BY J. E. KEELER.

JUPITER. AUGUST 28, 1890. 8 HOURS 14 MINUTES PACIFIC TIME. THE RED SPOT IS ON THE CENTRAL MERIDIAN.

Referring again to the drawing of May 21, the dark spots on the lower part of the disk are the Nilacus Lacus and the Acidalium Mare. In the center of the disk is the Juventæ Fons, a small, round, isolated dark spot. A little below this, toward the northeast, is the Lunæ Lacus, which seems to be the point of crossing of several canals. The two satellites of Mars are not represented. On the scale of the drawings they would be no more than pinpoints. Small as they are, their eclipses in the shadow of Mars were observed at Mount Hamilton in 1890, and again during the opposition of 1892.

Before leaving Mars, a few words may be devoted to the much-discussed question, whether Mars is inhabited by beings like ourselves. No question in astronomy excites so much popular interest as this, and none would be of more absorbing interest to astronomers if a definite answer appeared to be within even the remotest bounds of possibility. But, taking into account all that has been learned of this planet by years of study, the nearest approach that can be made to an answer is that Mars may possibly be habitable. This is certainly unsatisfactory, but no statement more definite is justified by the evidence; and while we may amuse ourselves by speculating on the character of the hypothetical inhabitants, and computing their stature from the known gravitational force at the surface of the planet, it is well to remember the slightness of the foundation on which our superstructure is reared.

Passing outward three hundred and forty millions of miles beyond the orbit of Mars, we come to the planet Jupiter, the largest in the solar system. All the evidence so far collected goes to show that this immense planet is still intensely heated, possibly to a point almost approaching self-luminosity. The water which at some future time will make the Jovian oceans cannot therefore exist in the liquid form, but is vaporized by the heat, and floats above the surface in an impenetrable cloud-envelop, beneath which the solid body of the planet (if it has one) is hidden. In the great telescope the surface of Jupiter *looks* like clouds, and the appearance of the gray and white belts on the northern hemisphere of the planet is beautifully reproduced in the sea of terrestrial clouds which, under a clear sky and bright sun, sometimes pours through the valley west of Mount Hamilton, far below the level of the observatory.

Jupiter turns on its axis in a few minutes less than ten hours, and this swiftness of rotation makes the task of drawing its surface a very difficult one. In a single minute the motion can be detected; five minutes later the relative position of the markings has changed very perceptibly; and at the end of fifteen minutes a drawing can no longer be continued. At his first attempt the draftsman simply despairs; but he soon learns to prepare for his work by marking on an outline sketch the features which do not change,—such as the general position, width, and direction of the belts,—and then, at a noted instant, he rapidly sketches in the more prominent markings, completing the drawing with reference to the points so established.

Like the sun, Jupiter has no *definite* period of rotation, the equatorial portions moving more swiftly than those nearer the poles. A comparison of the accompanying drawings will show this peculiarity very clearly. The motion of the surface is from right to left. In the drawing of August 28, a small black spot on the lower of the two strong equatorial belts is just on the point of crossing the central meridian, and so is the remarkable large oval spot some distance above. In the second drawing, made five weeks later, the small spot is again central, the planet in the interval having made eighty-seven complete revolutions; but the great oval spot has not yet reached the central meridian, while still other markings, which were formerly in the same longitude, have passed it, and therefore rotate more rapidly than the small spot chosen as a reference-point. It is not surprising that mere cloud-forms should be so loosely coherent, but the progressive change of their drift from the equator toward the poles has never been satisfactorily explained. It is evidently connected with the internal heat of the planet, and probably analogous to the similar drift which we observe on the surface of the sun.

DRAWN BY J. E. KEELER.

JUPITER. OCTOBER 3, 1890. 7 HOURS 35 MINUTES PACIFIC TIME. THE RED SPOT APPROACHING THE CENTRAL MERIDIAN.

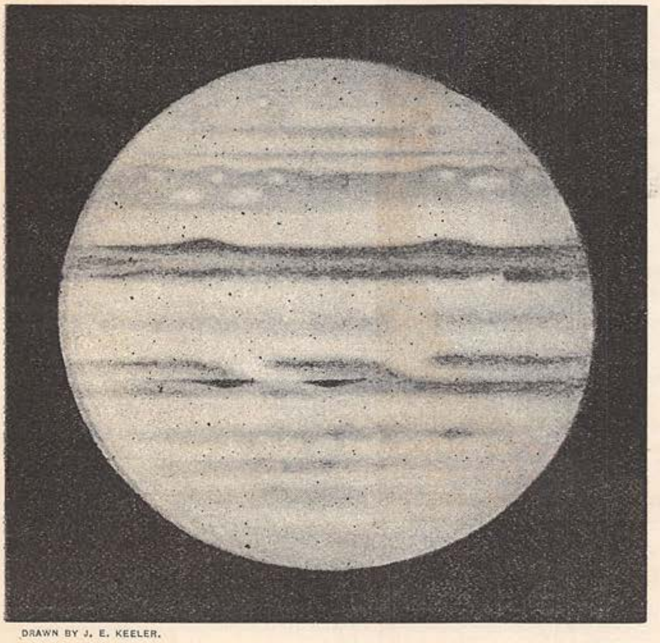
The aspect of Jupiter is not only continually changing in consequence of the drift just described, but the general character of the markings changes greatly from year to year. The feature which shows the greatest permanence is the large oval spot shown in the drawings of August 28 and October 3. It was first seen in 1878, as a pale pinkish ring. The color gradually extended inward, and deepened until it became a full Indian red, and this marking has ever since been known as the great red spot. After some years it became pale again, and in 1884 could hardly be distinguished. In 1890 the color was deeper, particularly around the edges, and the spot had again assumed the aspect of an oval ring. It rotates more slowly than any other marking on Jupiter, so that all other spots drift by it toward the west, or toward the left hand in the drawings. The length is somewhat variable, but at the time of the drawings it was about 18,500 miles.

The delicate colors of the different belts of Jupiter add greatly to the beauty of the view with a telescope, but they cannot be shown in a drawing in black and white, and they must be supplied by the imagination of the reader. The narrow stripe which is nearly on the planet's equator is salmon-pink, and on each side are brilliant white clouds, forming what is called the equatorial zone. Beyond this, one on each side, are the red belts, the color of which is indicated by the name, and between the red belts and the poles are a number of parallel belts, alternately white and gray. Pale lilac, olive, and slate-color are frequently met with. This has been the general arrangement for several years, but space does not permit a description of the smaller details which can be seen on a fine night with the thirty-six-inch refractor on Mount Hamilton. Attention must be called, however, to the remarkable small spots on the lower red belt. They were first discovered at the Lick Observatory in April, 1890, when their color was a very deep red. Two more of these spots on the other side of the planet are, of course, not shown in the drawings. It frequently happens that such spots spread, become paler and more diffuse, and, blending together, add a new dark belt to the surface ornamentation of Jupiter.

The view represented in the third drawing owed much of its beauty to the small white spots in the southern hemisphere, and to the curious symmetry with which they were grouped. Long white streamers are seen in this drawing, extending from the equatorial zone into the red belts. They are perhaps cloud-masses projected outward from the equatorial zone, and drawn out into their characteristic shape by the current due to the relative drift.

Ever since its discovery the red spot has been the object of a great deal of study. In June, 1890, an English observer, Mr. Stanley Williams, called attention to a large dark spot which was drifting down on the great red spot from the east, and if in no way diverted would pass directly over it during the month of August. It was obviously of great interest to see what would happen. Cloudy weather, most unusual at that season, prevented observation at the Lick Observatory until August 28, so that what happened when the contact occurred was lost; but the subsequent history is clearly shown in the two drawings of August 28 and October 3, which were indeed made specially for this purpose. In the first drawing we see Mr. Williams's spot lengthened out into a narrow dark stripe, and so far diverted from its course that it lies above and entirely clear of the red spot. In the other drawing the spot has drifted still farther westward, but it has not returned to its original line of travel; its latitude has been permanently altered.

These interesting observations, as well as others which have been made at Mount Hamilton, show that the clouds which form the belts of Jupiter flow around the great red spot, as foam floating on the surface of a river flows around a sand-bank in the stream. By applying a scale to the drawings we find that the rate of drift is 18,000 miles in about five weeks, or about twenty miles an hour. Evidently it is no gentle current that flows past the shores of the great red spot.



DRAWN BY J. E. KEELER.

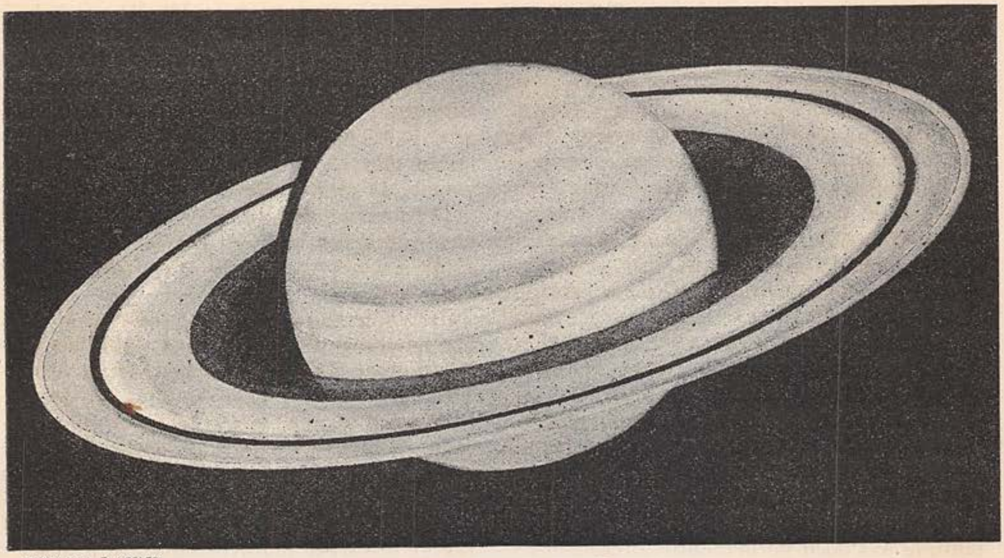
JUPITER. JULY 10, 1889. 10 HOURS 2 MINUTES PACIFIC TIME. THE RED SPOT IS ON THE OTHER SIDE OF THE PLANET.

What is the nature of this remarkable object? Is it really a projection of the more solid interior portion of the planet above the general level of the surface? If so, the projection is too slight to be noticeable when the red spot passes around the limb, although it is true that it might amount to several miles without being visible at this distance. At any rate, no explanation of the red spot more probable than this has been given, and we may accept it provisionally while waiting for the light of future discovery.

In connection with Jupiter, one of the special triumphs of the great telescope has to be mentioned. On the evening of September 9, 1892, Mr. Barnard was examining the sky close to Jupiter, keeping the planet just outside the eyepiece in order to prevent its light from overpowering any faint object in the field. He soon detected a tiny point of light, which was visible for a short time, and then disappeared in the glare of the planet. Subsequent observations showed that it was a new satellite, with an estimated diameter of only one hundred miles, revolving around Jupiter in a period of about twelve hours.

The last of the preceding achievements of this nature was the discovery of the satellites of Mars by Hall, in 1877. It has been mistakenly supposed that both of these telescopic discoveries were accidental. Both were, on the contrary, the reward of a deliberate search for just such objects as were actually found. It would be almost impossible to make an accidental discovery of a new satellite, for the reason that an object so conspicuous as to attract the attention of an observer engaged in other work would have been found long ago as the result of a special search with smaller instruments.

From the micrometric measurements which have been made, it appears that the new satellite revolves nearly in the plane of Jupiter's equator. A body which had recently entered the system from without could move in this way only by the merest chance. It is practically certain, therefore, as Mr. Barnard has pointed out, that the new satellite has been revolving in its present orbit for ages. It is not some eccentric asteroid which has been drawn out of its path and adopted into the family of the great planet,



DRAWN BY J. E. KEELER.

SATURN. JANUARY 7, 1888.

but an own brother to the satellites discovered by Galileo.

Four hundred million miles beyond Jupiter is the planet Saturn, which is represented in the drawing as it was seen under the most favorable conditions, shortly after the great telescope was erected. The body of the planet is marked with belts like those of Jupiter, but there is an absence of detail, and indeed it is seldom that any spot appears on Saturn sufficiently definite to serve as a mark for measuring the rotation of the planet. We notice on the drawing the same darkening and indistinctness at the limb that characterize the disk of Jupiter. The general color, which again must be supplied by the imagination, is golden yellow, the belts exhibiting various faint shades of gray, dove-color, and pink.

The most interesting feature of Saturn is of course the great flat ring by which it is encircled—an object at which every telescope in the world has been leveled, and which has furnished material for the profoundest researches of philosophers. It is now certain that the rings are nothing more or less than a swarm of small bodies, too minute to be separately distinguished, revolving around Saturn in orbits like satellites, but doubtless jostling one another rudely on the way. For convenience of reference, astronomers divide the ring into three components, designated by the letters A, B, and C. The outermost ring, A, is separated from B by a black gap 1600 miles wide, known as the Cassini division. The innermost ring, C, is often called the gauze, crape, or dusky ring, on account of its hazy appearance and partial transparency. Here the particles of the swarm are thinly scattered, and some light passes between them.

Close to the outer edge of ring A, the drawing shows a very fine line or division, which is distinct from the line or shading usually seen either near the middle of the ring, or a third of the way from the outer edge. It was discovered with the great telescope on the night of the drawing, and has since been seen occasionally with the same instrument, but it is beyond the power of the smaller (twelve-inch) telescope. It is not quite certain that this marking is a permanent division; still, its appearance remained the same for two years after discovery. Outside this fine division was the brightest part of ring A, but the difference in brightness was very slight, and it is necessarily much exaggerated in the drawing. The darkest part of the ring was a little way inside the division.

The outer edge of ring B is the brightest part of the whole system of Saturn. In many drawings this ring blends gradually into the gauze ring, but in the Lick telescope the boundary has always appeared sharp. Another feature of the view with this instrument is the uniform tint of the gauze ring, which is frequently drawn notched, mottled with black spots, or otherwise singularly marked.

This brings up the case of large versus small telescopes, on which much argument was once expended. Are the appearances (always at the limit of perception) seen with small instruments and not confirmed by large ones illusory, or is the large telescope inferior in defining power to the small one? As the question is purely one of instruments, and not of the relative skill of observers, only those who have used both classes of instruments have the opportunity to form an unbiased judgment, and such observers invariably put their faith in the large telescope.

In the following incident, which may be considered a case in point, the advantage of a large aperture is illustrated. I was once observing Saturn with the smaller telescope of the Lick Observatory, and noticed that (as often represented in drawings) the shadow of the planet on the ring was convex toward the ball, contrary to what it should have been according to geometrical principles. The abnormal appearance was so marked that with much difficulty I opened the great dome (the machinists were still working on the floor and shutter), and turned the thirty-six-inch telescope on Saturn. The shadow at once appeared curved in the proper direction, while the superiority of the view left no doubt as to which aspect was the true one. In this case, if no appeal to a higher court had been possible, it would have been necessary to abide by the decision of the inferior instrument, and the result shows with what caution abnormal appearances should be accepted when they are nearly at the limit of distinct perception.

The partial transparency of the gauze ring is shown by the fact that the limb of the planet can be seen through it, and still better by an interesting observation with the great telescope on the night of April 9, 1890. On this evening the satellite Japetus emerged from behind Saturn, crossed the dark space between the body of the planet and the gauze ring, and passed behind the latter, through which it was distinctly visible as a bright knot on the surface of the ring, until it was lost behind the inner edge of ring B. With the smaller telescope the satellite was at all times invisible.

A unique observation by Mr. Barnard gives us the only information we possess in regard to the distribution of particles in the gauze ring, and again the satellite Japetus is the bearer of the information. On the night of November 1, 1889, this satellite passed through the shadow of the gauze ring, from its inner edge outward, at such a distance from Saturn that the phenomena of the eclipse could readily be observed. What happened was this: on entering the shadow, the light of the satellite was greatly reduced, but not completely extinguished; it grew fainter and fainter as the satellite moved onward, and suddenly vanished when the satellite entered the shadow of the bright ring. These observations show that either the thickness of the gauze ring, or its density, increases gradually and uniformly from the inner to the outer edge, and that the supposed interruptions in the ring already referred to have no real existence.

These are some of the instances of observations at Mount Hamilton which throw light on the problems set before us in the other worlds of the solar system. Many more might be mentioned, but those already given are sufficient to show what has been done, and what may be hoped for in the future. The field is interesting and still a large one. The wonders, undreamed of twenty years ago, brought to light in Mars by the researches of Schiaparelli, show that surprises may yet be in store for us. In the abundance of light supplied by a great lens familiar features take on a new aspect, and suggest new ideas, and while a startling revelation of novelties is not to be expected, careful and systematic study can hardly fail to add surely, if slowly, to our store of information; and this is the more usual method of progress in the advance of knowledge.

James E. Keeler.

A SYLVAN FANTASY.

HERE in the deep heart of the wood,—
  Beyond whose marge the sunset pales,—
While virgin Twilight dons her hood,
  Slowly the wind of evening trails
Above the dank and darkened ground
The soft, invisible skirts of Sound.

William Hamilton Hayne.