

WHAT is a microscopist? First and last, an amateur who rejoices in the beautiful variety of microscopical specimens; one who treasures slides in the exact centre of which is a ring of cement neatly put on, and holding a cover-glass under which lies some fine test-object, — a delicate diatom, a podura scale, a bit of tissue the vessels of which are injected with gorgeous red, a polarizing crystal: in short, almost any tiny scrap of the universe, if so it be pretty in the pattern of its shape and color. These same treasured slides must have neatly bordered labels, and be catalogued and stored by a special system. The microscopist is one who has a formidable and extensive deal of brass stand, which can hold together a cabinet of appliances; and he will display the most admirable patience in getting them in position, until at last he sees the specimen, and is ready to clean and pack away his apparatus. His series of objectives is his glory; and he possesses a fifteenth of Smith and Brown, which will resolve a band of Nobert's not to be resolved by the objectives of any of his friends. His instrument is his pet: about it his interest centres, while the direction of his studies is determined, not by any natural bond between the objects, but by the common quality of minuteness. Is it not curious? Imagine any one deliberately setting out to study whatever he could cut with a knife. We should pity the man who chopped up the sciences according to the instrument he used. We cannot be brought to regard anatomy as a department of cutlery, nor can we seriously admit histology as a department of microscopy.

Scientific men have been very lenient towards the microscopists; and yet the latter, who have long been allowed to march as hangers-on to the regular scientific army, have gradually lagged behind. The army has grown, and divided into many separate corps, traversing the country of the unknown in all directions, and the microscopist knows not whither to follow. If he turns in any direction, he must join with the special work there, and can glean only in one field: he is no longer the universal gatherer. One

must be of the army to be with it, and the forces are too scattered for any hanger-on to flit from one division to another. The would-be microscopist has no place among scientific investigators. He must enlist in one company and there remain, or else be content to rank as an amateur, and not as a scientific man.

LETTERS TO THE EDITOR.

. Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.

The north magnetic pole.

WITH my article in *Science*, No. 98 (Dec. 19, 1884), entitled 'The Netschilluk Inuit,' there appeared a map of the distribution of those Eskimo, in which I placed the north magnetic pole in about longitude $99^{\circ} 35'$ west from Greenwich, or about sixty-five miles due west of the position given by Ross, its discoverer, in his sledge-journey of 1831. Since this map was issued I have received two letters from well-known scientific gentlemen, and a personal inquiry from another, asking why I so mapped this change in the magnetic pole, and on what observations or conclusions it was based, even though I had put an interrogation-point after the words indicating the position. It is well known that many calculations have been made respecting the western movement of this pole since its discovery; and, varying as they do, they all, so far as I have seen, would place it much farther to the west, for the year 1879, than my location gives it.

The above inquiries and facts make me think it would be interesting to give in your publication the rude and approximate manner in which I located it as above, leaving each one to judge of its value. Its latitude I assumed to be the same as that determined by Ross, as all writers speaking of its revolution, whatever be its rate, give the geographical pole as its centre. Its latitude, therefore, would not vary. I consider this co-ordinate, determined in this manner, by far the most unreliable of the two; I believe, however, that those interested in the subject will consider it also the least important, as being the least likely to vary considerably. My only instrument for determining the position of the pole was an ordinary compass, but an extremely delicate and reliable one in its proper sphere, and returning to the same point, in the temperate zones, to within less than a degree of arc started from any position that could be given. When at Cape Felix, the most northern point of King William's Land, the needle remained sluggishly in almost any position that was given it; when pointed in a north-east or south-west direction, I thought I detected a slight tendency to move to the westward. At Franklin Point I made some seventy-five to one hundred observations (the exact number I have in my journals, packed in Portland, Ore.; but I think my memory will be close enough for descriptive purposes, and probably more exact than the rough approximations), and the horizontal needle now commenced to show a little activity; a mean of the observations showing about longitude 99° , where its direction cut the Ross latitude of the magnetic pole. Near Point Little, I took the longest and most careful series of observations, and the needle always returned to within 18° (this I distinctly remember) of the pole as I have located it in the Netschilluk map, and this

return was made from every quarter-point of the compass several times (my records show this more accurately). My other observations of similar character were at camp on Terror Bay, and at Reindeer Camp on Simpson's Straits. All of these points are somewhere between 99° and 100° west longitude; and I firmly believe the observations sufficiently accurate to say, in no rough way, that in 1879 the north magnetic pole was between these two meridians, with its latitude quite undetermined.

In the fall of 1880 I published a small note about this interesting point, in which the above appeared, and also a few calculations regarding the westward rate of progress, which I cannot give from memory. I think that the thermometric observations close to this district, straggling and interrupted though they were, go far to prove that the magnetic pole, and pole of minimum depression, are identical, or nearly so.

FRED'K SCHWATKA.

New-York City, Feb. 9.

Total eclipse of the sun in August, 1886.

In the year 1886, Aug. 28-29, will occur an eclipse of the sun, whose maximum duration of totality is over six minutes of time. Opportunities like these for the study of solar physics are sufficiently rare for astronomers to be always eager to improve them whenever it is deemed practicable. Although the circumstances of this eclipse are found upon examination to be beset with peculiar difficulties, still it may not be amiss to make a statement of them, that the possibilities of its observation may be clearly understood.

In this eclipse the axis of the moon's shadow, soon after touching the earth, passes very near or through the following islands, — Los Roques, Orchilla, Blanquilla, Grenada, and Cariacou, — which are some of the Windward Islands which skirt the northern coast of South America. From this point the shadow sweeps across the broad Atlantic, and touches no land until it reaches the African coast at Benguela, which place lies almost exactly on the central line.

By examination of the chart of this eclipse, published by the 'American ephemeris,' it will be seen that the totality will occur only about half an hour after sunrise at the most favorable station in the West Indies, with a duration of totality of about three and a half minutes. On the African coast the duration of totality is about four and a half minutes, and the altitude of the sun is amply sufficient for favorable observation.

Benguela is about four hundred miles south of the mouth of the Kongo, and about two hundred miles south of the mouth of the Koanza. The climate of the lowlands bordering the coast near Benguela is fatally unhealthy for strangers, making it compulsory, on the score of prudence, for an observing party to penetrate the interior sufficiently to attain the mountainous highlands which lie not far inland.

The American board of commissioners for foreign missions has for some three years occupied two mission-stations in this region; viz., Bailundu, about a hundred and thirty miles eastward from Benguela, and Bihe, about seventy miles south-east from Bailundu. Through the courtesy of Rev. Judson Smith, D.D., secretary of the American board, and Mr. Frederick A. Walter, secretary of this west-central African mission, I have received definite statements of some of the precautions necessary, and some of the difficulties to be encountered by an observing party locating in this region. I will give in brief the points with which Mr. Walter favors us.

Dangers to the person from savages are not to be apprehended. The climate of Bailundu and vicinity is exceedingly salubrious. During a residence of nearly three years, Mr. Walter and his family have experienced no illness to be ascribed directly to the climate, but in every case to overwork, over-exposure to the sun, or want of proper food.

The difficulties in reference to transportation are considerable. Transportation is done entirely by men: wagons and animals cannot be used. The gross weight for a carrier is from sixty-five to seventy pounds: commonly it does not exceed fifty-eight pounds. Packages, either bales or boxes, should be of about the following dimensions: fourteen inches by nine inches by thirty inches, or, if more convenient, sixteen inches by ten inches by twenty-four inches. No single package should exceed eighteen inches in width by ten inches in depth. Pieces not exceeding sixty pounds in weight, though eight or ten feet long, can be carried by a single carrier.

As to means of subsistence, an observing party must bring *all their supplies with them*, as it is essential to the health of new-comers that they should live on food to which they are accustomed. The time required for a round trip of a caravan from Bailundu to Benguela may be stated as one month to six weeks.

Mr. Walter states that the chances for clear sky at the time of the eclipse are very favorable.

It may be stated that the land rises very abruptly as one leaves the coast from Benguela, and in a few miles attains a very considerable altitude, and throughout these highlands the climate is very healthful.

A. N. SKINNER.

A simple calendar reform.

Reform in the standard of daily time having now been happily accomplished, to the great convenience of the public, another simple reform in the monthly calendar remains desirable, which would greatly simplify commercial calculations, and computations depending on the calendar. In our present calendar the disturbing elements which cause inconvenience are connected with the month of February, which at once is shorter than the average month, and also disturbs the revolution of the Dominical letters by the addition of the intercalary day in the leap-years. From this method of inserting the intercalary day in the midst of the year, arises the necessity of having two Dominical letters in the leap-years, and of distinguishing the two unequal parts of such years in all calendar computations.

Now, it is evident, that, if the intercalary day were inserted at the end of the year, the revolution of the Dominical letters would go on undisturbed, and we should never have more than one in any year. But as December already has thirty-one days, to obviate the inequality of months, one day should be taken from it, and one from some other month of thirty-one days, say July, and both be added to February. Thus an equality would be established, as nearly as possible, by an alternation of months of thirty and thirty-one days each, with the least possible alteration of the existing calendar. In each half-year, any two successive months (with the exception of November and December in ordinary years) would have sixty-one days, and each quarter not less than ninety-one, nor more than ninety-two days.

As it is now, the first two months have usually only fifty-nine days, while July and August have sixty-two; the first quarter has ordinarily only ninety days, while the third and fourth quarters have each ninety-two days. The new arrangement would establish a simplicity and symmetry in the calendar, which