

the D-line into the instrument, however, I found the stellar line to be distant from it towards the violet by a quantity equal to the interval between the nebular lines. This gives a wavelength of $580\cdot 1$, which agrees closely with a bright line in Nova Cygni, in the Wolf-Rayet stars, and in γ Argus (compare *Copernicus*, ii. p. 112, and iii. pp. 205 and 206). The continuous spectrum seemed to begin somewhat suddenly at $569\cdot 4$, and faded away about 540 .

On each night of observation the star was about $9\cdot 6$ magnitude.
RALPH COPELAND.

Dunecht, September 6.

Daytime Seeing at the Lick Observatory.

To some of the readers of NATURE it may be a matter of considerable surprise, as it certainly was to the writer, to find the marked superiority which a small telescope sometimes offers over a large one for the observation of solar prominences.

On numerous occasions during the last year, while adjusting the large star spectroscope of this observatory to the 36-inch refractor, I have improved the opportunity to examine the limb of the sun with a Rowland grating. At no time, however, has it been possible to get any definition in prominence. With the 6-inch equatorial, on the contrary, one gets very fair definition, even in the middle of the day; while in the early morning, from six to eight o'clock, the seeing is, as a rule, superb. Thinking these differences might possibly vanish if the larger glass were used earlier in the morning, I have recently made a systematic comparison of the three equatorials, viz., the 6-inch, the 12-inch, and the 36-inch. For this purpose a small grating spectroscope (kindly loaned by the Chabot Observatory) was used with an adapter which fitted all three telescopes, so that the whole comparison could be made in a few minutes. The third and fourth orders of a 14438-line grating were employed.

The result of a half-dozen mornings' observations was that no detail whatever could be made out with the 36-inch, however much care one might use in the adjustment of his instrument. One could form a rough estimate of the height and general outline of the prominence, but nothing more.

On the 12-inch the general features were considerably more distinct, but the fine delicate tracings of the various parts of the prominence could be seen only with the 6-inch. The capping down of the 36-inch and the 12-inch failed utterly, as might have been expected, to improve the definition on any occasion.

The large image of the sun given by the 36-inch (six inches in diameter), combined with the poor seeing during the daytime, makes the instrument act, for sunspot observation, very much like an integrating spectroscope. The lines affected by absorption, in spots of any considerable size, can be picked out readily, but one finds it quite impossible to compare the absorption of the nucleus with that of the penumbra. These three telescopes each give images of nearly the same brightness, and one does not find much, if any, difference in the amount of dispersed light in the field.

During the dry season, the sides of the cañons surrounding this observatory become intensely hot, and highly heated currents of air are continually rising from them. So that, probably, the conditions which make the order of efficiency of these telescopes in the daytime just the reverse of what it is at night, are purely local.

HENRY CREW.

Lick Observatory, August 19.

Ridgway on the Humming-birds.

MR. ROBERT RIDGWAY, curator of the bird department of the U. S. National Museum, has just published (in separate form), in the report of that institution for 1890, his monograph of the Trochili. Coming from such an authority and essaying to deal with such an interesting group, this work will undoubtedly command the attention of ornithologists, and be studied with the care it no doubt merits. It makes its appearance in octavo form, of some 130 pages, being illustrated by 46 full-page plates, and has besides a number of cuts in the text. The plates give us many species of humming-birds and their nests; they being all of the "electro-process" variety, and chiefly copied from Gould's princely work upon the Trochili. As is usually the case, most of the figures given have suffered by the method of reproduction employed, and not being coloured, they offer us, at the

best, with but a poor idea of the "living gems" they are supposed to portray. With more or less thoroughness Mr. Ridgway has touched upon the early history and the literature of his subject; upon the geographical distribution of the various species; upon their number, which he makes out to be about 500; upon their natural history in general (treated in various brief sections); and there are descriptions of their external characters and a short note upon a few of their internal ones. It is with the statements made in the latter that I chiefly propose to deal in the present connection, and, aware as I am of our author's knowledge of the literature of what we may call the natural history and classification of the humming-birds, as contra-distinguished from their morphology and affinities, I must confess my surprise at his ignorance of the latter part of his subject. Mr. Ridgway remarks (p. 290) that "the humming-birds possess nothing absolutely peculiar, although certain features, shared by other groups of birds, notably the swifts (*Microphididae*), are developed to an extreme degree; as, for example, the very high keel to the sternum and consequent excessive development of the pectoral muscles, the short armwing (humerus) and extremely long handwing (manus), and minute feet with relatively large, strongly curved, and sharp claws. The humming birds and swifts further agree in numerous anatomical characters, and there can be no doubt that they are more closely related to each other than are either to any other group of birds. In fact, except in the shape of the bill and structure of the bones of the face, the humming-birds and swifts present no definite differences of osteological structure." As the present writer has probably published double the number of accurate figures illustrating the *entire anatomy* of a great many species of humming-birds as compared with any other worker; and, further, has published correct accounts of the same to the extent exceeding that of any three living avian-morphologists, and those figures and descriptions having been very extensively accepted as correct, perhaps our author will consider me competent to criticize the statement which I have just quoted from his work. Notwithstanding the extensive and painstaking labour I have given to such matters, I reckon it but as little when compared with the opinions given us by Huxley and Kitchen Parker in the same premises.

As long ago as 1867 (P. Z. S., p. 456), Huxley expressed the view that "in their cranial characters the swifts are far more closely allied with the swallows than with any of the Desmognathous birds, the swift presenting but a very slight modification of the true Passerine type exhibited by the swallow;" and Parker has said in *The Zoologist* for March, 1889 (p. 2), "I agree with my friend, Dr. Shufeldt, that the 'swallow and the swift are near akin.' My opinion is not the simple judgment it was forty years ago. I have observed a good many things since then in the structure of birds of all sorts." Both of these high opinions I can confirm, and in support of them, and as contradicting every statement almost that my good friend and ornithologist, Mr. Ridgway, has made in his work touching the structure of swifts and humming-birds, I would invite his attention to many comparative figures and accounts published by me in the Proceedings of the Zoological Society of London at various times, and also to an extensive paper of mine which appeared in the Journal of the Linnean Society of London, in 1888 or 1889, having been read at the Society by W. K. Parker, F.R.S., who accepted, in the main, what I had stated in it. Therein I anatomically compare the *entire* structure of every species of United States swallow with the corresponding structures in a great many swifts and a great many humming birds, and I would invite Mr. Ridgway's attention to the synoptical comparisons given on pages 376-378, especially as off-setting his statement, as quoted, that "in fact, except in the shape of the bill and structure of the bones of the face, the humming-birds and swifts present no definite differences of osteological structure." And, unless as a true systemist and believer in *colours and measurements* rather than in structural characters as determining the real affinities of vertebrate forms, I would finally invite his consideration of my comparative figures and description of the humerus of a swallow, a swift, and a humming-bird given in the Proc. Zool. Soc., Lond., for 1887 (pp. 501-503), and then ask his candid opinion upon the question whether the humerus of a swift is morphologically more like that of a humming bird than it is like that of a swallow, and the humerus is one of the bones that has been so frequently dragged into the discussion to prove cypselo-trochiline affinities.

Washington, D.C., July 24.

R. W. SHUFELDT.