observed in infancy and childhood, and regarding which anxious parents require the advice and assistance of the surgeon. But, although written by a surgeon, the manual is not confined to what is commonly called "surgical anatomy." The needs of the physician have been consulted, and the position and boundaries of the heart, the lungs, and the great viscera of the abdomen have been described and illustrated by appropriate diagrams. In many instances the author seeks to give an explanation of the symptoms produced by disease of the viscera by a reference to the anatomical relations and connections of the parts.

The marvellous progress which operative surgery has made of late years is illustrated by several chapters in this manual. The antiseptic system of treatment, devised by Sir Joseph Lister, has rendered possible the performance of many operations which would not have been thought of fifteen or twenty years ago. The brain, the spinal marrow, the great serous cavities of the body, and the larger joints, are now with safety made the subjects of operative interference. No treatise on applied anatomy therefore would now be considered complete unless it embraced an account of these parts in their surgical relations, and Mr. Owen has furnished his readers with the necessary information.

The mode of treatment necessitates on the part of the reader some preliminary knowledge, so that the book is not intended for the beginner, but for the senior student and the practitioner.

Advanced Physiography. By John Thornton, M.A. (London: Longmans, Green, and Co., 1890).

THIS is a continuation of the same author's "Elementary Physiography," and, to quote the preface, "It carries the student into the wider realms of Nature, and treats of advanced physiography as defined by the Science and Art Department. Whether physiography be regarded as a separate science or not, it cannot be denied that, as thus set forth, it includes a fairly well-defined and well-ordered series of facts connected with the study of the universe." This is, perhaps, the first really serious attempt which has yet been made to give anything like a full account of the whole subject, and we have no doubt that teachers will find it convenient to have all the parts thus brought together. The author has very wisely quoted the best authorities, a proceeding which is far preferable to mere paraphrase. The book is thus largely a compilation, but it is only fair to say that full acknowledgment is made in nearly every case.

Most of the important astronomical instruments are described in considerable detail, and the fundamental notions of astronomy are clearly explained. The chapters on the so-called "new astronomy" are exceptionally good for a work of this class, and it is quite evident that the author has carefully followed the latest researches. Vogel's work on the orbit of Algol and Schiaparelli's new rotation period for Mercury are included, though only recently published. There is also an excellent summary of the work which has been done in celestial photography. The chapter on the sun is very detailed, and considers all the important facts and theories. No attempt is made to discuss any disputed points—a commendable feature in a school text-book.

There are apparently few mistakes, but one is of sufficient importance to be referred to. On p. 249 it is stated that the dark bands in stars like α Herculis are probably due to carbon absorption; this ought to read metallic fluting absorption, the *bright* flutings being probably due to carbon.

The book is profusely illustrated, but most of the diagrams have already seen service. The drawing of the Orion nebula is perhaps the least satisfactory. The large coloured plate is instructive, but there is a curious mistake. This has probably arisen from the fact that the

plate is compiled from those which have appeared in the last two editions of a well-known text-book of astronomy, one of which was on a scale of wave-lengths, and the other on a prismatic scale. The flutings of carbon have evidently been transferred from one to the other without the necessary corrections, the result being that they are quite out of place relatively to the other spectra.

We can confidently recommend the book to all interested in the subject, whether for examination purposes or for the purpose of acquiring fairly accurate information as to the present state of our knowledge of the Earth's place in Nature.

An International Idiom: a Manual of the Oregon Trade Language, or "Chinook Jargon." By Horatio Hale, M.A., F.R.S.C. (London: Whittaker and Co., 1890.)

IN the district formerly called Oregon, which is of much wider extent than the State of Oregon, a sort of international language, known as the Chinook jargon, is current among the native tribes and white traders. It grew up about the beginning of the present century, and has been of great service not only in facilitating commerce, but in stimulating friendly intercourse between tribes who, if this strange speech had not existed, would have had no means of communicating with one another. Many of the words are of Chinook origin, but contributions have also been drawn from French and English, and various words have been formed by onomatopoeia. In 1841, when connected with the United States Exploring Expedition which surveyed a part of the western coast of North America, Mr. Hale had occasion to study the Chinook jargon; and he has since taken pains to make himself acquainted with information brought to light by later investigators. In the present little volume he gives a full account of the subject, describing the origin and history of the "idiom," and presenting a grammar and dictionary, with specimens of colloquial and narrative phrases, songs, hymns, and a sermon. The facts he has brought together are of considerable scientific interest, and the book ought to be useful to travellers and settlers in the North American Pacific States and Provinces.

A Class-book of Geography, Physical, Political, and Commercial, for Intermediate and Senior Pupils. By W. B. Irvine, B.A. (London: Relfe Brothers, 1890.)

THE compilation of this volume must have cost the author a good deal of hard work, but we cannot say that the result seems to us satisfactory. The subject is treated in an extremely uninteresting way, and the appearance of the pages, with their short, jerky paragraphs and masses of disconnected facts, might alone suffice to deter many boys and girls from the study of geography. In the teaching of this subject almost everything depends on the intelligence and skill of the teacher; so that even the present work, in good hands, might be made the basis of instructive and useful lessons. But the book would increase rather than diminish the difficulties in the way of teachers who have no exceptional degree of ability or knowledge.

LETTERS TO THE EDITOR.

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of NATURE. No notice is taken of anonymous communications.]

Idiocyclophanous Crystals of Calcite.

IT seems to have escaped notice that one at least of the many crystal-forms of calcite can be induced to show its ring-system—can be made, in fact, into a Bertrand prism—simply by proper cleavage, without any artificially-worked planes at all.

Hexagonal prisms of the mineral are of frequent occurrence; good, clear, regular-shaped specimens, 1 cm. (or more) in diameter, coming especially from Cumberland. The sides of these prisms are, of course, parallel to the optic axis; and hence a pair of opposite sides, if smooth and well developed, serve for two of the plane surfaces required for the Bertrand prism (see NATURE, May 15, p. 52) without any alteration. Moreover the crystal has a very strongly marked cleavage along the planes of the fundamental rhombohedron; and since these planes make angles of almost exactly 45° with the optic axis, a pair of them will supply the two remaining surfaces of the prism.

If, then, we select a good hexagonal prism of calcite, as shown below—

and carefully cleave it in two places, AB and CD, and allow a beam of ordinary light (preferably from an opal lamp shade) to enter the side of the prism near A, it will be affected in its passage through the crystal in the manner explained in my former letter (*ante*, p. 53), and the usual pair of ring-systems will be visible to an eye receiving the light emergent near D.

If there are any slight imperfections in the natural plane surfaces, we can easily improve upon Nature by cementing thin plates of glass upon them with Canada balsam.

Queen's College, Oxford.

H. G. MADAN.

Testing for Colour-blindness.

MAY I ask, in connection with the lecture of Mr. Brudenell Carter, why those interested in the testing of colour-vision do not avail themselves of a scientific instrument like Lord Rayleigh's colour-box, wherein a given yellow has to be matched by proportions of red and green adjusted by turning a handle over a dial graduated on the back; instead of contenting themselves with crude methods, such as selection of coloured wools, which cannot give results definite enough to be of much interest, even if they were quite efficient in detecting the grossly colour-blind?

OLIVER J. LODGE.

IN Mr. Brudenell Carter's interesting paper read at the Royal Institution on Friday, May 9, a physiological explanation is suggested of an easily-verified fact of colour-perception.

An eye with the pupil dilated is proportionally more perceptive of red rays than one with the pupil contracted. If we stand at right angles to a window, or other light, shading the further eye with the hand, and look at a piece of white paper with the two eyes alternately, we shall find that, to the eye in the light, the tint of the paper seems distinctly colder than to the shaded eye.

Dr. Waelchli's observations of the retinal red zone in birds, surrounding the central green region, makes the cause of this phenomenon comparatively clear; while the phenomenon itself tends to prove that the distribution of colour-zones in the human eye resembles that of birds.

E. H.

May 16.

I do not know whether the following will be considered too trivial to be admitted as an illustration of Dr. Brudenell Carter's lecture.

About 30 years ago, being then an assistant master at a school, I one day asked an older colleague (since dead), "Who's that boy in the red cap?" Several were standing in a line, most of them with black caps. "Red cap?" said my friend; "I don't see any red cap" (it was scarlet flannel); "I can see the red head"—meaning another boy with so-called "red" hair.

The same gentleman could see no difference in colour between the flower and the leaf of the *Pirus japonica*; but it will be observed that he distinguished "red" hair without difficulty.

Otham Parsonage, Maidstone.

F. M. MILLARD.

NO. 1074, VOL. 42]

Red Spot on Jupiter.

ON May 22 last, at 15h., I observed Jupiter through a 10-inch reflector, power 252, and saw the red spot between the east limb and centre of the planet. It was rather faint, and not nearly so conspicuous as some of the belts in its vicinity. According to careful estimation, the spot reached the central meridian of Jupiter at 15h. 35m. This is 15.5 minutes before the time given in Mr. Marth's valuable "Ephemeris for Physical Observations of Jupiter," published in the *Monthly Notices* for March 1890, p. 344. The difference proves that the motion of the spot continues to accelerate in a slight degree relatively to the mean rate of rotation of 9h. 55m. 40.63s., adopted by Mr. Marth in his recent ephemerides. Observers, therefore, who wish to see the spot at mid-passage across the disk of Jupiter must turn their telescopes upon the planet at least a quarter of an hour before the predicted times based on the daily rate $870^{\circ} 27'$.

During my observation on May 22 I saw a very dark, if not black, spot of circular form threading its way across the disk, and projected upon the northern half of the great north equatorial belt. I ascertained by reference afterwards to the *Nautical Almanac* that this object was the fourth satellite in transit.

Bristol, May 25.

W. F. DENNING.

Coral Reefs, Fossil and Recent.

I PUBLISHED a review of the third edition of Darwin's "Coral Reefs," with appendix by Prof. Bonney, both in the *Biologisches Centralblatt* and in the *Naturwissenschaftliche Rundschau* of last year. This will, I think, considerably modify the meaning of Prof. Bonney's statements, published in NATURE of the 15th inst. (p. 53), according to which I was ignorant of this work of his when I wrote my letter on "Coral Reefs, Fossil and Recent."

R. VON LENDENFELD.

Swallows at Sea.

THE following notes from my journal as to meeting swallows at sea during the autumn migration may be of use to anyone interested in that subject.

On board ss. *Port Victor* from Plymouth to Sydney, 1889.—"October 31, lat. 16° N., long. 19° W. A quantity of swallows flying about the ship evidently tired and very tame, perching freely within a few feet of anyone. Look thin. A solitary swallow or two were seen yesterday and day before in lats. 20° and 24° N. respectively. 9 p.m., passed Cape Verde at a distance of forty miles.

"November 1.—The swallows roosted last night on board, and left during the forenoon, with the exception of one or two who remained on board all day. Saw a curlew and a wagtail at noon, lat. 12° N., long. 18° W.

"November 2.—One swallow still on board, roosted last night on the poop. Calm. Saw a wagtail.

"November 3.—Five swallows and two martins about the ship, apparently in very fair condition, so tame that they would perch on one's hand; had three or four sitting on my hand at once sometimes. Noon, lat. 5° N., long. 14° W., about 150 miles off land.

"November 4.—Swallows left, could not see in what direction they went. Picked up south-east trade, lat. 2° N."

HERBERT E. PUREY-CUST.

H. M. S. *Egeria*, Auckland, April 6.

The Corolla in Flower-Fertilization.

I HAVE noticed a curious fact in reference to the blue gentian of the garden here that will interest you. This flower (like the daisy) closes at night and opens in the morning, and is exquisitely sensitive to the time of sun rising and setting (it is a lasting, and with its bronzed throat an exquisite flower). The fact observed is this, that, when visited by the large handsome bee that fertilizes it, the beautiful widespread pentamerous flower closes gently on the bee, if the insect effectually enters and fertilizes it, on its passage to the honey of the five cups at the base of the corolla; and after the insect's exit, does not again unfold, if the fertilization is complete, but remains a folded flower—a protection (shorn of its beauty) for the precious seed-vessel and its maturing contents within.

JOHN HARKER.

Hazel Grove, near Carnforth, May 13.