

OUR ASTRONOMICAL COLUMN.

PARALLAX OF BARNARD'S "RUNAWAY" STAR.—In the Journal of the British Astronomical Association for April, it is stated that Prof. Schlesinger, of Allegheny, has found a parallax of $0.52''$, and a proper motion in R.A. of $-0.73''$ for the "runaway" star discovered by Prof. Barnard (NATURE, vol. xcviii., p. 196). Dr. S. A. Mitchell's value for the parallax is $0.47''$, and that found at Yerkes Observatory by Dr. Lee is $0.55''$. The true value is evidently very close to half a second. The star thus appears to come second to α Centauri in point of distance, but is the nearest known star which is visible in our latitudes.

DISTRIBUTION OF STARS OF TYPE O.—The important investigations of Prof. Charlier on the distribution and motions of stars of type B (NATURE, vol. xcviii., p. 116) have been extended to stars of type O by W. Gyllenberg (*Arkiv för Matematik*, vol. xi., No. 28). The general principle of the method is that if the temperature and radius be supposed constant for a given class of stars, the distance of each individual star is given by $r = R \cdot 10^{0.2m}$, where m is the apparent magnitude, and R is the distance corresponding to apparent magnitude zero. In general, R is determined from the proper motions and radial velocities, but alternative methods have been employed by Dr. Gyllenberg for stars of type O (Wolf-Rayet stars). The extension in space and the velocity distribution show a close relation to the B stars, as would be expected if the two classes are contiguous in the spectral sequence. The absolute magnitude of the O stars is -2.78 , this being the magnitude at a distance of 1 siriometer ($= 10^6$ astronomical units). This result is in close agreement with Charlier's value -2.45 to -4.78 for the successive sub-classes of the B stars. The O stars, however, show a much larger extension than those of type B in the galactic plane. The density of O stars in the neighbourhood of the sun is 0.000176 per cubic siriometer.

A similar investigation for A stars has been made by K. G. Malmquist and for F stars by C. F. Lundahl.

THE MINIMUM RADIATION VISUALLY PERCEPTIBLE.—The recent results of Ives with regard to the least quantity of radiant energy capable of producing the sensation of light (NATURE, vol. xcviii., p. 216) have been further investigated by Prof. H. N. Russell (*Astrophysical Journal*, vol. xlv., p. 60). As before, the metre-candle is taken to be of stellar magnitude -14.18 , while a source emitting light of wave-length 0.55μ , and appearing like a star of the 6th magnitude, is regarded as radiating energy at the rate of 1.35×10^{-8} ergs per sec. per sq. cm. The modified factors are those referring to the diameter of the pupil of the eye, and to the stellar magnitude of the faintest visible object. Steavenson's estimate of 8.5 mm. is adopted for the former, and the limiting magnitude is now taken to be 8.5 , from observations made by H. D. Curtis and the author. Since a star of magnitude 8.5 gives only one-tenth as much light as one of the 6th magnitude, it follows that the amount of energy which would enter the eye from a light source of maximum efficiency, and of magnitude 8.5 , is $1.35 \times 10^{-8} \times 0.57 \times 0.10$, or 7.7×10^{-10} ergs per sec. This is regarded as the best available approximation to the true *minimum visibile*. According to this estimate, the minimum perceptible radiation corresponds to the reception by the eye of about 200 elementary quanta of radiation per second, or of one erg in forty years.

WHALEBONE WHALES OF NEW ENGLAND.¹

WITH a record of many previous American authors who had studied the whalebone whales of the eastern shores of the United States, it was no easy task for Mr. G. M. Allen to produce anything novel in this monograph. Yet the systematic manner in which he has handled the whole subject, from synonymy to enemies and parasites, renders the memoir both interesting and instructive, especially in connection with the habits, appearances in life, disposition, food, breeding, commercial value, parasites, and capture.² Some general questions are also dealt with, such as the notion of Ryder, the late able investigator of the fishes, that the tail-flukes of whales probably represent degenerate hind feet, not the whole limb, as Gray and some earlier authors held; whereas Owen, Huxley, Flower, Parker, and Claus were of opinion that the whole hind limb was (externally) suppressed or atrophied, and that flukes and dorsal fin had been secondarily added. The author's countryman, Gill, also thought that the flukes were derived from the greatly hypertrophied integument of the hind limbs, analogous to the hind limbs of the eared seal, whilst the osseous elements have been atrophied, basing this supposition on the fact that the dorsal and ventral vessels are distinct, and that the *crus*, when present, is in the line of the flukes.

On the shores of New England (that is, from the Bay of Fundy to Rhode Island, or thereabout) six well-known forms occur, viz. the Atlantic right whale (*Eubalaena glacialis*, Bonnaterre), the common rorqual (*Balaenoptera physalus*, L.), the "sei," pollack, or Rudolphi's whale (*B. borealis*, Lesson), the great blue whale, or Sibbald's rorqual (*B. musculus*, L.), the little rorqual, or piked whale (*B. acutorostrata*, Lacépède), and, lastly, the humpback whale (*Megaptera nodosa*, Bonnaterre).

The author takes each species in succession, and deals with it systematically, structurally, and under the other heads already noted. Thus, under the Atlantic right whale, which probably sweeps from pole to pole, the vestigial femur, with its ligamentous rod (tibia?), and the occasional double-headed first rib are noted. It is lively when harpooned, rolling over and over so as to wind the line round its body, and, it may be, upsetting the boat and injuring its crew, or in its active movements striking the boat with its "bonnet" (a process at the tip of the snout). Its numbers have diminished since the early settlers peopled these shores (1620), though they were numerous in 1700, when twenty-nine were killed in one day. Now they are scarce. Its migrations northward and southward, its food (chiefly *Thysanoëssa* and *Calanus*), and its breeding are described. In clearing up the synonyms of the next species, the cosmopolitan common rorqual, the author has done good service; and he appears to agree with Kükenthal that it is the third finger which is absent in the *manus*, and not the thumb, since two branches of the median nerve go to the space between the second and third digits. The only trace of a hind limb is a papilla on each side of the anus in the foetus. In addition to the movements recorded, this finner, in a calm and glassy sea, when reconnoitring, will quietly push its head nearly horizontally out of the water and examine, for instance, a boat with its occupants, and then slip underneath

¹ "The Whalebone Whales of New England." By G. M. Allen. Memoirs of the Boston Society of Natural History, vol. viii., No. 2, pp. 107-332, 16 plates and various text-figures. (Boston, September, 1916.)

² The American records of stranded as well as captured whales are creditable so far as they go; but the recently instituted system of notification by the British Government, acting through the staff of the British Museum, is more trustworthy.