

*The Portal Vein*

Is of large size. The large trunk (coccygo-mesenteric, Pl. XII. fig. 7) which forms its commencement passes off from the summit of the arch formed by the union of the retro-current branches of the crural veins of opposite sides. After leaving this arch, the portal vein travels forwards, lying between the layers of the meso-rectum as far as the posterior surface of the liver. Immediately behind that organ, the portal vein receives numerous tributary branches from the stomach, intestine, spleen, and pancreas, and thereafter divides into two branches, which enter the liver above the bile ducts. Of the two terminal branches, one passes to the right and the other to the left lobe of the liver. At its entrance into the liver the hepatic artery lies below both the portal vein and the bile ducts.

## COMPARATIVE REMARKS.

From the preceding description it will be seen that the venous system of the Penguins does not present any very striking peculiarities, as compared with that of other birds. Barkow<sup>1</sup> has pointed out that the jugular veins in birds are subject to three different arrangements. In some birds the jugular veins are of equal size, and symmetrically disposed on either side of the middle line of the neck. In others the jugular vein of one side exceeds in size that of its fellow, while in a third group the jugular vein of one side only is present, and carries off the blood from both sides of the head.

In every species of Penguin the two veins are of equal size, and are symmetrically disposed on either side of the cervical middle line.

In birds in general, according to the observations of Hunter<sup>2</sup> and Neugebauer,<sup>3</sup> the portal vein consists of two distinct trunks—a right and a left. The right portal vein is formed chiefly by the junction of the coccygo-mesenteric with the anterior mesenteric veins, while the left portal vein is formed by the union of branches derived from the stomach.

In every species of Penguin the whole of these veins unite to form a single trunk, which only divides, as in the mammal, into two branches immediately before these enter the substance of the liver.

## LYMPHATIC SYSTEM.

With respect to the detailed anatomy of the lymphatic system in the Penguins, I regret that I am able to give but little information, the state of the parts in the majority of the species examined preventing me from making the necessary injections.

Reid<sup>4</sup> states that in the Patagonian Penguin "The absorbent system is more perfect

<sup>1</sup> Untersuchungen über das Schlagadersystem der Vögel, Meckel's Archiv für Anatomie, 1829, p. 496.

<sup>2</sup> Catalogue of Mus. of Roy. Coll. of Surgeons, tom. ii. pl. xxv. fig. 1.

<sup>3</sup> Systema venosum Avium, Nova Acta Acad. Nat. Curios, vol. xxi.

<sup>4</sup> Proc. Zool. Soc., 1835, p. 147.