This basin consists of the two haunch bones which meet together in front, but behind are separated by the lower part of the backbone (called the sacrum), to which the haunch bones are attached, and which forms the hinder portion of the pelvis. The pelvis has a depression, or "socket," on each side, into which fits the head of one of the thigh bones. Each "haunch bone" consists of three parts, which are, in man, primitively distinct, but afterwards anchylose together, and all three elements (in each haunch bone) take a share in the formation of the bony thigh-socket, or *acetabulum*. These three elements are named—1, *ilium;* 2, *ischiam;* and 3, *pubis*. It is the ilium which is adjoined to the sacrum. The pubis, in man, meets its fellow of the opposite side in the middle line in the front of the body. The two ischia (one to each haunch bone) support man's body when in a sitting posture.

The pelvis of man is often quoted as one of the most peculiar and characteristic parts of his skeleton, and its shape in him *is* very peculiar. Nevertheless the pelvis as it exists in frogs and toads is a far more exceptional structure. It is so in the extraordinary elongation, yet small vertebral attachment, of the haunch bones *ilia*, as also in the fact that these bones as well as the other pelvic elements (*ischia* and *pubes*) are all closely applied to each other in the middle line of the body. Thus these elements form a bony disc, and the two sockets (*acetabula*) destined, respectively, for the heads of the two thigh bones, come to be closely approximated one against the other. The great elongation and small attachments of the ilia allow the pelvis as a whole to be bent upon the backbone. Thus the hinder part of the body is moveable and forms as it were an additional common root segment for the two limbs.

ST. GEORGE MIVART

(*To be continued.*)

SOUNDINGS IN THE NORTH PACIFIC

OVER a year ago the United States Congress authorised preliminary measures for laying a submarine cable from the west coast of America to Japan. The United States steamer *Tuscarora*, then on duty off the Isthmus of Darien, was despatched on this business, and started September 22, 1873, from San Francisco for the Straits of Juan de Fuca. Reconnaissances off Victoria, Vancouver's Island, discovered a gradually shelving bottom in all respects suitable for a cable landing. The steamer coaled at Nanaimo. Coal is also found at Newcastle Island, which is not far distant. It may be mentioned that the coal of this region is semi-bituminous, and that recent discoveries have largely increased its product.

The line of soundings extended along a great circle drawn from Cape Flattery to Oonalaska Island. At lat. 53° 58′ N., long. 153° W., within about 400 miles of Oonalaska, the coal was exhausted, and the vessel returned to Victoria. The ocean bed sank rapidly from Cape Flattery to lat. 48° 54′ N., long. 126° 21′ W., then rapidly and steadily to lat. 49° 26′ N., long. 128° 37′ W., then more rapidly to lat. 49° 46′ N., long. 129° 27′ W., at which point the depression was 1,452 fathoms. Thence a peak rose in the sea bottom, with a summit at 1,007 fathoms depth, in lat 51° 40′ N. long, 137° 32′ W. Its rise was fully as rapid as the depression preceding it, and the depression beyond it, the side being equally steep, was somewhat greater. The slope after the western bottom of this submarine mountain was reached was exceedingly gradual, and somewhat undulating. Perhaps the following estimates, roughly made from a sketch, will give a clearer notion of the ground surveyed. At about 100 miles from Cape Flattery, depth about 400 fathoms; at 150 miles, 1,000 fathoms; 170 miles, 1,400 fathoms; 200 miles, 1,000 fathoms; 300 miles, 1,600 fathoms; 400, 1,900 fathoms; 500, 2,000 fathoms; 600, 2,000 fathoms; 700, 2,100 fathoms; 800, 2,200 fathoms; 900, 2,300 fathoms; 1,000, 2,300 fathoms; 1,100, 2,500 fathoms.

During soundings on the return voyage to San Francisco, another submarine mountain was discovered in lat. 41° 30′ N., long. 127° 11′ W., the depth at its summit, which the sounding instruments showed to be of a rocky character, being only 996 fathoms. Around it, at distances of 20 miles, the depth was between 1,600 and 1,700 fathoms.

The water temperatures along the line of soundings for the cable, at depths of over 1,000 fathoms, varied from 0° 45′ C. to 2° 43′ C.; surface, 10° 35′ C. to 14° 15′ C. In lat. 53° 58′ N., long. 153° 00′ W., the increase from 50 fathoms to surface, was gradual; but at 50, 100 and 200 fathoms the same temperature was found as at 2,500 fathoms.

The conclusion has been reached in the course of a series of observations made during the return voyage, and subsequently, that what is known as the "California coast current," is really a warm, and not as hitherto supposed, a cold stream. The observations determined the existence of a warm current, presumably a continuation of the "Great Japanese Circle Current," setting toward the south and east, of a surface temperature averaging 15° C., between the positions lat. 48° 36′ N., long. 126° 36′ W., and lat. 50° 34′ N., long. 131° 38′ W. Outside of this current the temperature was but 10° C. Its width, between what is known as "Fleurier's Whirlpool" and the coast of California, is about 700 miles; its depth in lat. 44° 54′ N., long. 125° 13′ W. is about 200 ft.; its speed, one to two knots per hour. Under-currents below this stream have been determined, setting to the north and west. The counter-current does not appear to extend more than 30 to 35 miles from shore, moving at a half to one knot per hour, with a depth of 200 to 300 fathoms.

The expedition was equipped with a great variety of sounding apparatus, of which only a few instruments gave perfect satisfaction, and several proved quite useless. The vessel carried 32,000 fathoms line, of which 21,000 were 1¼ in., carbonised. Among the satisfactory instruments, Prof. Thomson's is mentioned. This is worked by hand, winding No. 22 piano wire, capable of resisting a strain of 200 pounds. It has a registering indicator and a dynamometer attached. For bringing up material from the bottom, Belknap's cylinder, No. 2, gave the best results, the lower half of the cylinder being usually filled with about three ounces of sea-bottom material, and the upper half with water that had rested on the sea-bottom. The material is brought up secured in the case of a "Sand's cup" by a cylindrical sleeve. The latter is held by a spiral spring, in a position just covering a small orifice in the hollow cylindrical case. On striking bottom, the sleeve is forced up, permitting the material of the ocean bottom to enter the orifice. The instrument is driven into the bottom material by a weight which carries it down with great velocity. This weight, consisting of two hemispheres of iron attached just above the spring, is automatically detached when bottom is struck, by the slackening of the line. Upon drawing up the line, the spiral spring again forces the sleeve down, covering the orifice. The material drawn from the greatest depths was the usual chalky, pasty mud, smooth and homogeneous, rarely containing sand, chiefly composed of casings of diatoms and foraminifers, with here and there the spiculæ and siliceous skeletons of the smaller sponges and *polycystina*.

Although the expedition met for the most part with unsettled and unfavourable weather which interfered with its work, that which it has accomplished is regarded as eminently satisfactory. There is little doubt but that the route upon which the soundings have been made, will be the one selected for the cable; and next spring the work will be extended from the point at which it was discontinued.