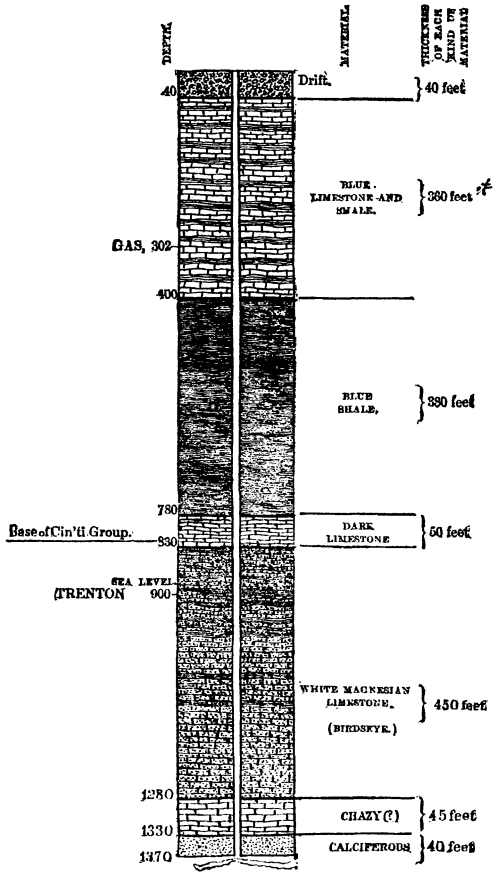
Well drilled for gas at Oxford, O.

The accompanying cut represents a section of the strata passed through in a well recently bored in Oxford, O., for the purpose of finding oil or natural gas. A very full series of samples, eighty-seven in number, was saved as the drilling proceeded, and by their means it is possible to give an accurate account of the strata passed through. The drill penetrated the soil and drift to a depth of from forty to fifty feet. Immediately below, the bed-rock was struck. This consisted of layers of solid blue limestone, interstratified with beds of indurated clay or shale at various depths. The rock came up generally in



SECTION OF STRATA PENETRATED BY THE OXFORD GAS AND OIL COMPANY'S WELL.

small, angular fragments, often of the size of peas, sometimes larger, but always recognizable as the true blue limestone of the Cincinnati group. At a depth of 302 feet a small vein of gas was struck. When lighted, the flame was ten or twelve feet high, but it soon went out, accumulating in small quantities, and being lighted from time to time afterwards.

The limestone continued to the depth of 400 feet, and was succeeded by a bed of exceedingly compact, blue shale. This showed no change in character for 380 feet, and it seems to be the equivalent of the Eden shales of the Ohio geological survey. Below this, and at a depth of about 780 feet, there was struck a stratum of hard, dark, almost black limestone, which was penetrated but slowly, the drill making only three feet in two and one-quarter hours. The fragments came to the surface very finely ground up, the pieces seldom as large as wheat-grains. This rock continued for a depth of fifty feet, and it marks the dividing-line between the Cincinnati group and the Trenton. This is the only stratum which can be referred to the Utica slate; and, if it is this, it is 250 feet less in thickness than at Findlay and other places.

The rock immediately below this stratum, reached at 830 feet, is a whitish limestone, evidently foreign to the surface of Ohio. It may be the equivalent of the bird's-eye limestone of New York, as certain specimens show the 'bird's-eye' feature with greater or less distinctness. The rock was much the same, whitish, and containing appreciable quantities of magnesia, down to 1,100 feet. Here it became darker, was more compact, and this continued to 1,280 feet, being alternately lighter and darker in bands. Below 1,280 feet there came another decided change. It was a change from very light to very dark limestone, coarser, with at times a greenish, then a bluish tinge. Some samples had a strong smell of oil, and this could also be readily seen floating on the water. It was also magnesian. This possibly represents the Chazy of New York. At 1,325 feet the drillings were coarse, blue and white, and argillaceous. At 1,330 it was a coarse white rock, but arenaceous; so much so, that the drillers said 'sand!' Each successive drilling, at 1,340, 1,345, 1,350, 1,355, 1,360, 1,365, was finer than before; and when the last depth had been reached, and the drill was withdrawn for pumping, the rope showed the presence of water in what had previously been a dry hole. Soon a strong smell of sulphuretted hydrogen told the story that sulphur-water had been struck, and the drilling was at an end. The last forty feet passed through is in all likelihood the upper portion of the calciferous sand-rock of New York.

The following table represents the formations passed through in the well, with their respective thicknesses: —

Drift	40 feet.
Cincinnati group	790 "
Trenton	495 "
Calciferous	40 "
Total	1,365 feet.

JOS. F. JAMES.

Oxford, O., June 6.

Another muscle in birds of taxonomic value.

Whatever laborers in ornithotomy in past times may have done, it is certainly chiefly due to the late and talented British anatomist, Garrod, that certain muscles, and groups of muscles, found to be present or absent in natural divisions of birds, were pressed into service with telling effect in the taxonomy of the class.

There are three principal muscles in the pectoral limb of a bird, or rather in one that possesses them all, which Garrod, by dwelling upon their modifications, their constancy, their various modes of origin and insertion, throughout the group, brought into classificatory play: these are the tensor patagii longus, the tensor patagii brevis, and the 'bicipital slip to the patagium.' He referred to no others especially, in this patagial region, and these three are now sufficiently well known to anatomists to ob-

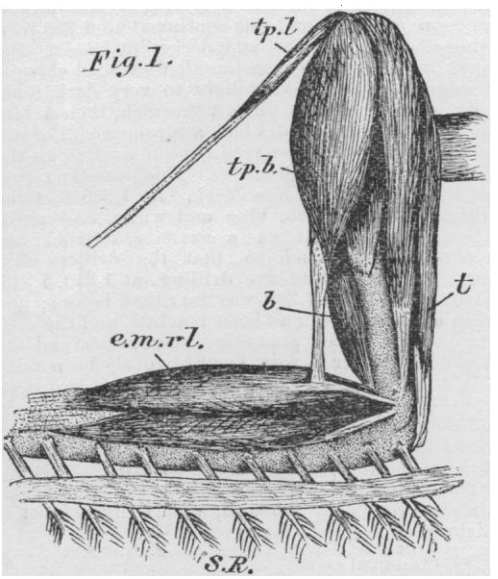
viate the necessity of my further alluding to them here.

Among my manuscripts in the hands of publishers, I have some very extensive work upon the myology of birds, illustrated by nearly a hundred original drawings; and, as many of my friends are aware, I have been engaged for a number of months past upon my second contribution to the anatomy of the Macrochires, a work now drawing towards completion. Quite recently, while investigating the muscular system of the Hirundinidae, in this latter connection, I discovered, in the course of my dissections, a muscle for which at this moment I recall no published description, and one the importance of which Garrod, even if he knew of its existence, certainly overlooked. When present, its chief carneous portion occurs in the free marginal fold of that triangular duplicature of the common integuments found between the root of the neck and the tip of the shoulder in birds. It first came to my notice in a specimen of Progne subis, whereupon I at once dissected a number of other individuals of the same species; and I found it equally well developed in all of them.

This muscle, in part, is a dermal muscle, and arises from the integuments on the anterior aspect of the neck at about its lower third; at its origin its fibres spread out fan-fashion, their terminal fibres meeting those of the muscle of the opposite side in the median line. Here it is quite adherent to the skin, but its fibres rapidly converge as they pass in the direction of the shoulder-joint, opposite which region they gradually free themselves from the skin to form a small fusiform muscle, which, ending in a delicate tendon, runs along within the free marginal fold of the patagium of the wing, in common with the tendon of the tensor patagii longus, to blend with it just before arriving at the carpal joint.

Garrod chose the wing of Ramphastos cuvieri to illustrate the arrangement of the patagial muscles in the Passeres, but not a hint of this one is given; while in the figure (Icterus vulgaris) next to it a tendinal slip is shown cut short, of which he says nothing, but which evidently belongs to this muscle. Nowhere else is this shown or alluded to in his work.

I propose to call this muscle the 'dermo-tensor patagii,' it being partially connected with the integumentary system of muscles in the birds wherein I have thus far found it.



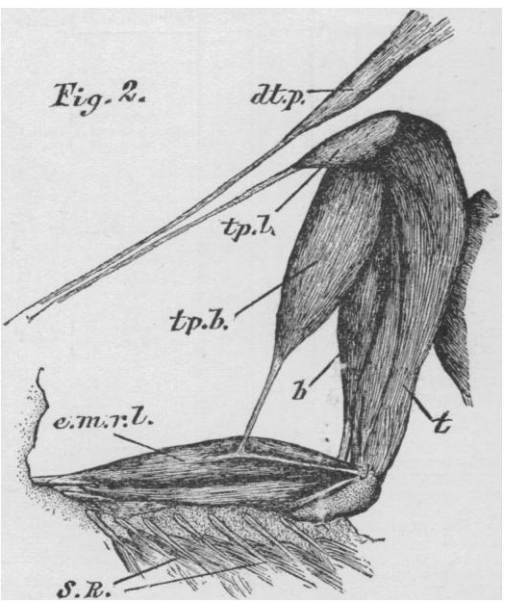


FIG. 1. — VIEW, FROM THE OUTER SIDE, OF THE MUSCLES OF THE PATAGIUM OF THE LEFT WING OF A PASSERINE BIRD' RHAMPHASTOS CUVIERI (AFTER GARROD, AND SLIGHTLY REDUCED FROM ORIGINAL).

FIG. 2. — SAME VIEW, AND CORRESPONDING PARTS OF THE SAME WING OF A PASSERINE BIRD, PROGNE SUBIS (BY THE PRESENT WRITER).

tp. l., tensor patagii longus; *tp. b.*, tensor patagii brevis; *dt. p.*, dermo-tensor patagii; *e. m. r. l.*, extensor metacarpi radialis longus; *t.*, triceps; *b.*, biceps; *S. R.*, secondary reminges (fig. 2 nearly × 2).

Upon dissection, I find it present in each and all of the other United States Hirundinidae; in all true passerine birds, including Ampelis; but absent in the Caprimulgi, in the Trochili, in the Cypseli, and, if we may judge for all the typical Passeres mesomyodi from the condition in Tyrannus tyrannus, it is also wholly absent in them. Further than this, I have not investigated the matter, as my work on the Macrochires prevents; but it will be highly interesting, to say nothing of its importance, to look up the subject for other groups of birds. Its importance at once becomes evident by finding it in such a form as Ampelis, showing by this character, at least, the passerine affinities of this bird over its clamatorial ones, which latter have been more than once suspected, at different times, as predominating in its organization.

R. W. SHUFELDT.

Fort Wingate, N. Mex., May 24.