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NOTES ON THE HABITS, NESTS, AND EGGS OF THE GENUS *SPHYRAPICUS* BAIRD.

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1. *Sphyrapicus varius*. YELLOW-BELLIED SAPSUCKER.

THE general habits of the eastern representative of this genus, *Sphyrapicus varius*, the Yellow-bellied Sapsucker, have been so well written up by Mr. William Brewster in the 'Bulletin' of the Nuttall Ornithological Club (Vol. I, No. 3, Sept., 1876, pp. 63 to 70), and later by Dr. C. Hart Merriam in the same 'Bulletin' (Vol. IV, No. 1, Jan. 1879, pp. 1 to 6), that there remains nothing new for me to state.

As some of the readers of 'The Auk' may not have access to the above-mentioned articles, I will simply mention that, according to Mr. Brewster, the favorite nesting-sites of *S. varius* are large, dead birches, and that the average height of the excavation from the ground is at least 40 feet, in some instances considerably more, and that a decided preference is manifested by this species for the vicinity of water. He gives the eggs as numbering from five to seven in a set, and varying considerably in shape, some being oblong, others decidedly elliptical. They average .85 in length by .60 inches in breadth, are pure white in color, and, he states, there is much less of that fine polish than in eggs of the other species of Woodpeckers he had examined.

The average measurement of the few eggs of *S. varius* in the Collection of the National Museum, six in number only, is .84 X .65 inches.

2. *Sphyrapicus varius nuchalis*. RED-NAPED SAPSUCKER.

This race of *S. varius* I have met sparingly in various portions of the Blue Mountains of Oregon, Washington Territory, and Idaho, and as far west as the eastern slope of the Cascade Range in Southern Oregon, in the Klamath Lake region, where, however, it was rare and replaced by *Sphyrapicus ruber*, the two species overlapping each other, but not intergrading and remaining perfectly distinct. I first met with the nest and eggs of this bird in a small aspen grove at the edge of a beautiful little park-like prairie, near the summit of the Blue Mountains, in Grant County, Oregon, on June 12, 1877.* I was escorting an Army Paymaster from Cañon City to Camp Harney, Oregon, where I was then stationed. After a laborious climb to the top of the steep mountain at the foot of which the little mining town of Cañon City nestled, I stopped for some twenty minutes to rest the animals, and to eat our lunch. The spot was a lovely one; the little grove at the edge of the heavy pine forest contained perhaps half a dozen aspens, that measured a foot through or more, and a number of smaller ones. I had made myself comfortable under one of the largest ones which stood on the outer edge of the grove, watching the horses enjoying the luxuriant grass, and was busily engaged in eating my lunch, sharing it with several Oregon Jays, *Perisoreus obscurus*, which were quite tame, and absorbed my entire attention for some time. A Red-naped Sapsucker was, in the meantime, flying about my tree, alighting on others in the vicinity, and keeping up a constant chatter. I thought at first he was jealous of the Jays, and paid no attention to him, till he flew on to the tree I was sitting under, which brought out his mate. Their burrow was directly over my head, about twenty feet from the ground, and I might have noticed it sooner, by the fresh chips dropped by the birds in excavating their burrow, and which were lying all around me, had I not been entirely absorbed in watching the Jays, or 'Meat Birds,' as they are called there by the hunters and trappers. It did not take long for one of my men to climb up to the burrow and chop a sufficiently large hole in the tree to insert the hand. The entrance to the burrow was exceed-

* But I had previously found a nest with young in June, 1875, in the same locality, as well as several in 1876.

ingly small, not over $1\frac{1}{4}$ inches in diameter, about 8 inches deep, and about 4 inches wide at the bottom. It contained three eggs, nearly fresh, lying partly imbedded in a layer of fine chips. About a year afterwards, when passing the same spot, June 2, 1878, I took another set of three fresh eggs of this species out of a burrow in another, somewhat smaller aspen tree, in the same grove. Although aspens of suitable size were to be found in several places in the immediate vicinity of Camp Harney, Oregon, which is located at the foot and on the southern slope of the Blue Mountains, at an altitude of about 4800 feet, I failed to find any of these birds nesting there, although they were met with by me at various times in the vicinity, and sometimes even quite a distance away from the mountains. They are only summer residents in that region, but an occasional straggler does remain in sheltered locations throughout the winter. I am inclined to think that this bird is much more common in the Rocky Mountain region.

An esteemed friend of mine, Mr. Denis Gale, an enthusiastic naturalist in the fullest sense of the term, and a close observer, residing in the mountains of Colorado, has at my request furnished me with the following observations regarding this species. He writes as follows:—

“My observations have been, that this species invariably selects for its nesting-site a living aspen tree. I have never met with it in any other. This tree favors the mountain gulches, and low sheltered hillsides at an altitude of from 7000 to 10,000 feet. Above this point they do not attain sufficient size, and are mostly dwarfed and scrubby. Here in Colorado *Sphyrapicus varius nuchalis* is seldom found above 9000 feet, or much below 8000 feet. The aspen tree is short lived, and ere much of a growth is attained a cross-section in the majority of instances will show a discolored centre of incipient decay, involving half or two-thirds of its entire diameter, with a sound white sap zone on the outer circumference, next the bark. This sound healthy zone nourishes the tree, until the decayed core discovers itself in some withered limbs, and frequently the top of the tree manifests the canker.

“Such trees the Red-naped Sapsucker selects for its nesting-site, and with great perseverance chisels through this tough, sound zone, from an inch to an inch and a half through — com-

mencing with a very small hole and gradually extending its circumference with each stage of the deepening process, working from the lowest centre out, till the exact circumference of the intended aperture of entrance is attained. In thus radiating in circles from the central point, the minute chips are chiselled out with considerable ease. This mode of working is observed until the tough zone is worked through; what remains then is comparatively easy work; the soft, soggy, lifeless inside is worked into and downwards, with greater facility, and a roomy, gourd-shaped excavation quickly follows, the female doing the excavating from beginning to end, and, according to exigencies, completes it in from six to ten days.

"Some idea of the vitality and toughness of this zone of sap in a live aspen tree may be realized, when in a tree used consecutively three or four years, which if undisturbed is the general custom of *S. varius nuchalis*, the entire aperture will be almost closed by the recuperative agent in the sap of the tree to heal and close up the wound. No other Woodpecker will face such a formidable task. *Picus villosus harrisii* comes next as a borer; then follows *Sphyrapicus thyroideus*. Both of these species nest sometimes also in apparently live aspens, but upon close inspection such trees will be found to be badly decayed.

"*S. varius nuchalis* usually insists upon a new excavation each year. The height of nesting-sites from the ground varies from five to thirty feet; the full set of eggs is four or five in number, sometimes a smaller number of eggs mark a full set, presumably the nest of one of last year's young birds. Fresh eggs may be looked for in Colorado from June 1 to 15, and should the first set be taken, a second one may generally be found in from ten to fifteen days later; and as a rule the second nesting-site will not be greatly distant from the first one. Several nests of this species may be found within a short distance of each other in the same aspen grove."

Two sets of four eggs each of this species, taken by Mr. Gale and kindly presented to the National Museum, Washington, D. C., measure as follows: 1st set, taken June, 1884, four eggs, .91 x .67, .90 x .68, .89 x .68, .88 x .64 inches; 2nd set, taken June 1, 1887, .90 x .69, .90 x .69, .90 x .68, and .89 x .65. A set of three eggs taken by the writer in the Blue Mountains, Grant County, Oregon, June 12, 1877, measures, .90 x .65,

.90 \times .64, .88 \times .66 inches. A second set, taken at the same place a year later, on June 2, 1878, measures .89 \times .68, .84 \times .66, .82 \times .66 inches. A third set, taken by me near Fort Klamath, Oregon, on June 3, 1883, contained five eggs partly incubated; two of these were broken in chopping them out; the remaining three measure as follows; .84 \times .68, .84 \times .66, .82 \times .66 inches. A single egg taken also near Fort Klamath, Oregon, June 5, 1883, measures, .89 \times .64. The average measurement is .88 \times .66 inches. These eggs, like those of all Woodpeckers, are pure white after blowing; they are generally ovate in shape, and but moderately glossy or lustrous.

My own limited observations during the breeding season bear out Mr. Gale's statements completely, viz., that this species breeds exclusively in live aspen trees. Dr. J. C. Merrill, U. S. A., in Bull. Nutt. Club, October, 1881, states, however, that he found a nest of these birds in a dead cottonwood tree in Montana. In Southwestern Oregon, in the mountain parks of the Klamath Lake region, these birds breed sparingly at as low an altitude as 5000 feet, and it is more than probable that at a higher one, near the summit of the Cascade Range, they may be quite common.

In the Blue Mountain region, in eastern Oregon, I only found them breeding in the single locality already mentioned, at an altitude from 6000 to 7000 feet. During the winter months I have occasionally observed a Red-naped Sapsucker in the Harney Valley in Oregon, busily engaged in hunting for food amongst the willow thickets found growing along the banks of the small streams, in that sage-brush-covered region, often long distances away from timber of any size. In the young birds of the year of *Sphyrapicus varius nuchalis*, the red or crimson markings found about the head and throat of adult birds are usually wanting or else are replaced by a pale claret-colored tinge on the corresponding parts. The black on the back and wings is also duller and not so deep, and the general pattern less distinct.

3. *Sphyrapicus ruber*. RED-BREASTED SAPSUCKER.

This handsome representative of the genus *Sphyrapicus* seems to be strictly confined to the Pacific Coast region, occurring only as far eastward as the eastern slopes of the Sierra Nevada Mountains in Central and Northern California, and the Cascade

Range in Oregon and Washington Territory, passing thence northward through British Columbia well into Alaska. In the winter it is found in the mountains of Southern California, but I do not believe that it breeds there. In my various travels throughout the interior of Oregon, Nevada, Washington and Idaho, covering over fifteen years, I never met with this bird till the summer of 1882, when I was ordered to take station at Fort Klamath, located near the northern end of Klamath Lake, in the southwestern part of Oregon. Here I found the Red-breasted Sapsucker an abundant summer resident, and I have no doubt a few of these birds winter in the more sheltered portions of the deep cañons of the lower Klamath River region. They are among the earliest birds to arrive in the spring. The first bird of this species shot by me in the spring of 1883 was obtained on March 13, and I have seen a few as late as November. On one of my collecting trips, the morning of April 4, 1883, while riding through a patch of pine timber near Wood River, the principal stream running through the centre of Klamath Valley, I noticed a flock of these birds, at least twenty in number. They were very noisy, apparently glad to get back to their summer homes, and seemed to have an excellent time generally, flying from tree to tree and calling to each other.

As I wanted a couple of specimens, I was compelled to disturb their jollification; those procured were both males, and presumably the entire flock belonged to this sex. By April 20 they had become very common, and some pairs at least were mated and had already selected their future domiciles—in every case a good-sized, live aspen tree. The males might at that time be heard in almost all directions drumming on some dry limb, generally the dead top of one of these trees. They scarcely seemed to do anything else. At least five pairs nested within half a mile of my house, and I had excellent opportunities to observe them. Some birds, apparently more industrious than others, would not be satisfied with one burrow, and excavated several, sometimes all in the same tree; others contented themselves with a single one. It is possible that the extra ones, after being begun, were abandoned, either being found to be too damp inside, or for some other cause unknown to me, or they may have been made by the male for his own use to pass the nights in, and be close to his mate in case of danger, or again, just to

keep his bill in practice, chiselling. I am myself inclined to think that the female does nearly, if not quite all the work on the burrow in which she deposits her eggs.

These birds are not at all shy during the breeding season, allowing you to approach them closely, but they have an extraordinarily keen sense of hearing. I frequently tried to sneak up to a tree close to my house which I knew had been selected by a pair of these birds, to watch them at work, but I was invariably detected by the bird, no matter how carefully I tried to creep up, before I was able to get within thirty yards, even when she was at work on the inside of the burrow and could not possibly see me. The bird would cease working at once, her head would pop out of the hole for an instant, and the surroundings be surveyed carefully. If I kept out of sight and perfectly still, she would probably begin working again a few minutes afterwards, but if I moved ever so little, without even making the least noise, in my own estimation, she would notice it and stop working again at once. If the tree were approached too close she would fly off, uttering at the same time a note resembling the word *jay* or *chüe*, several times repeated, which would invariably bring the male around also, who had in the mean time kept himself busy in some other tree, either drumming or hunting for food. While the female was at work on the inside of the burrow, the male would from time to time fly to the entrance and look in, probably asking his mate how her work was coming on. how soon they might begin housekeeping, etc.; and at other times he would hang for five or ten minutes even, just below the entrance to the burrow, in a dreamy sort of study, perfectly motionless and seemingly dazed, evidently thinking of the family responsibilities that were soon to come.

I am inclined to think that this species does not indulge in the habit of girdling trees for the sap, and the soft inner bark (cambium) to the same extent that *Sphyrapicus varius* does, at any rate not during the breeding season. These birds were, as I said before, extremely abundant in the vicinity of Fort Klamath, and this being the case, evidence of their work in this direction should have been rather common. I don't remember having seen more than two instances, showing extensive and systematic signs of girdling; one, a medium-sized cottonwood limb, showed the punctures all over for a distance of three feet, the

other, a species of mountain ash, on which none of the shoots were over three inches through, had been riddled all over by the birds. These mountain ash shrubs, none of which grow to any size, were rare, however, in that vicinity.

In its range, I think this species breeds at a lower altitude than *S. varius nuchalis*. Fort Klamath, however, although but 4200 feet above sea level, has a very cool summer climate, frosts occurring almost in every month of the year. The surrounding country is very beautiful at that time. Heavy, open forests of stately pines and firs, amongst these the graceful and beautiful sugar pine, are found on the mountain sides and reaching well down into the green park-like valleys. Interspersed here and there are aspen groves of various extent, their silvery trunks and light green foliage blending artistically with the sombre green of the pines. These aspen groves are the summer home of the Red-breasted Sapsucker.

As far as my own observations go, healthy, smooth-barked aspens are always selected as suitable nesting-sites by these birds. The trees used vary from 12 to 18 inches in diameter near the ground, and taper very gradually. The burrow is usually excavated below the first limb of the tree, say from 15 to 25 feet from the ground. The entrance seems to be ridiculously small for the size of the bird, perfectly circular, from $1\frac{1}{4}$ to $1\frac{1}{2}$ inches in diameter only, so small indeed that it seems as if it took considerable effort for the bird to squeeze himself in, and wriggle out of the hole.

The gourd-shaped burrow varies in depth from six to ten inches, and it is from three inches, near the top, to four or five inches wide at the bottom. The finer chips are allowed to remain in the burrow, forming the nest proper, on which the eggs are deposited. Frequently they are more than half covered by these chips. The interior of the entire excavation is most carefully smoothed off, which must consume considerable time, considering the tough, stringy and elastic nature of the wood, when filled with sap, making it even more difficult to work when partly decayed, which seems to be the case with nearly all aspens of any size. Probably eight or ten days are consumed in excavating a satisfactory nesting-site. All the larger and coarser chips are dropped out of the burrow and scattered about the base of the tree. From the quantity of these found under every tree,

occupied by these birds, during the nesting season of 1883, I am inclined to believe that they are only satisfied with an entirely new burrow every year, and not simply with an old one repaired to answer the purpose. These same chips are an extremely simple and sure guide to their nest.

In hunting for them I looked for the chips on the ground first, and after finding these it did not take long to find the hole from which they came. In this manner it was an easy matter to find their nest, and I took no less than fifteen sets of their eggs in a single season, and might have taken more had I been so inclined, especially by following up the birds for their second set, where they had been robbed previously. Ordinarily but one brood is raised in a season.

The number of eggs varies from five to six to a set. Full sets of fresh eggs may be looked for in that locality from May 20 to June 5, and I have taken nearly fresh eggs as late as June 13; I took my first set on May 23, 1883. It contained six fresh eggs, and the burrow was about seven inches deep, the entrance about eight inches below and directly under the first limb of the tree, as usual a live aspen, about 18 feet from the ground. While the nest was being rifled of its contents, both parents flew about the upper limbs of the tree, uttering a number of different sounding plaintive cries, like *peeya*, *pinck*, and *peurr*, some of these resembling somewhat the purring of a cat when pleased and rubbing against your leg. I used to note the different sounds in a small note book at the very time, but scarcely ever put them down alike; each time they appeared a trifle different to the ear, and it is a hard matter to express them exactly on paper.

The eggs, when fresh and before blowing, like those of all Woodpeckers, show the yolk through the translucent shell, giving them a beautiful pinkish appearance, as well as a series of straight lines or streaks of a more pronounced white than the rest of the shell, running towards and converging at the smaller axis of the egg. After blowing, the pink tint will be found to have disappeared, and the egg changed to a pure delicate white, the shell showing a moderate amount of lustre. There is considerable variation in their shape, running through all the different ovates to an elongated ovate. The average measurements of sixty specimens now before me are $.94 \times .68$ inches; the largest egg in the lot measuring $1.00 \times .70$, the smallest $.86 \times .68$ inches.

Both sexes assist in incubation, which lasts from twelve to fourteen days, I think. Their food consists principally of grubs, larvæ of insects, various species of lepidoptera which they catch on the wing, like Flycatchers, and berries. Of the latter quite a number of different edible species are found about Fort Klamath, and they seem to be especially fond of wild strawberries, which grow there in abundance. The young after leaving the nest stick to the tree in which they were hatched for the first day or two, without venturing to fly.

The beautiful carmine or crimson on the head and breast in the adults is replaced by claret-brown in the young, varying in amount and intensity in different individuals; in some it is very distinct and prevalent. The yellow so plainly noticeable on the belly of adult birds is also wanting in the young. The colors throughout are much duller and the general pattern less distinct. By the latter part of September, the majority of these birds leave for their winter haunts, only a few stragglers remaining. These are possibly birds that breed further northward and winter in the warm valleys of Northern California, and are then comparatively near the end of their migration, remaining in the Klamath Valley region where there is always an abundance of food for the Woodpecker family, judging from the number of different species of these birds found there throughout the year, till the heavy winter snows drive out the less hardy, amongst which the Red-breasted Sapsucker must be included.

While stationed at Fort Klamath, Oregon, I took especial pains to collect a good series of both adult and young birds of this species, as well as a number of sets of their eggs, and devoted considerable time, at no little inconvenience to myself, to observe their general habits closely. Although my personal observations differ materially from those of other naturalists (see 'History of North American Birds,' by Baird, Brewer, and Ridgway, Vol. II, pp. 544 and 545), I am confident that they will be found substantially correct by future observers. The egg described in the above-mentioned work, purporting to belong to this species, certainly does not, and I also doubt very much that these birds ever breed in coniferous trees of any kind.

4. *Sphyrapicus thyroideus*. WILLIAMSON'S SAPSUCKER.

This interesting species is so unique in the entire difference of coloration of the sexes, that for a long time they were considered and described as separate species. It remained for Mr. H. W. Henshaw, then attached as Naturalist to Lieut. George M. Wheeler's expedition, engaged upon the geographical exploration of Colorado and New Mexico, in 1873, to establish their identity, he finding the supposed two species paired and breeding near Fort Garland, Col., in June of that year. Like *Sphyrapicus varius nuchalis*, it has an equally wide and extended range, reaching from the eastern slopes of the Rocky Mountains to the western spurs of the Sierra Nevada and Cascade Ranges in California and Oregon. In its habits, however, it differs considerably from the three other species of the genus *Sphyrapicus*, all of which seem to prefer regions abounding in deciduous trees, and using these as far as at present known, exclusively for nesting purposes, while Williamson's Sapsucker gives the preference to coniferous forests, selecting pines to burrow in, at least as frequently as aspens, and according to my own observations oftener than the latter.

Although it undoubtedly occurs in the region intervening between the Rockies on the east, and the Cascades on the west, I cannot positively recall a single instance where I have seen this bird in the entire mountain system, beginning at the Bitterroot Range in Montana in the east, following the continuation of this through the Blue Mountains of Washington Territory and Oregon, as well as most of the Salmon River mountain country in Idaho Territory, till I first met with it on the eastern slopes of the Cascade Range near Fort Klamath, Oregon, in the autumn of 1882. It was here Dr. Newberry obtained the type of the so-called *Sphyrapicus williamsoni*. Here I saw it for the first time on September 23, and as late as November 8, of the same year, taking specimens on both dates. Strange to say, all the birds I saw and secured for a period covering about five weeks, at that time, were females, and I only succeeded, on October 28, in seeing and obtaining my first male of this species. It was obtained under rather peculiar circumstances. I had only to walk a couple of hundred yards from my house to find myself in a fine open pine forest. Gun in hand I, as usual, took a short stroll that

morning, following close along the banks of Fort Creek, directly east of the post, towards its source, and I had not proceeded more than half a mile from my house when I saw two males chasing each other about a dead pine stump, and uttering at the same time shrill cries; this is what attracted my attention to them. I tried to get within ordinary shooting distance of them, but they took alarm and flew in opposite directions before I was near enough. Nevertheless I took a snap shot at the one nearest to me, but it continued its flight apparently uninjured, crossing the creek, which was too deep and cold for me to ford, about sixty yards in advance of me, and much to my disgust disappeared in the heavier pine timber on the opposite side, without stopping while it was in sight. As it was useless as well as impracticable to follow this one, I kept on in the direction the other had taken, but failed to see it again. Fully an hour afterwards, on my way returning to the post, and when within a few yards of the place where I first noticed the two birds, tired out and disgusted, I sat down on an old log and was taking a rest, absorbed in reflections on my bad luck, when from quite a distance, I noticed a black-looking bird flying towards me, coming from the opposite side of the creek, and from the same direction the one I shot at had taken earlier in the morning. Its flight was so peculiar and strange, constantly sinking, that I refrained from shooting when it first came within range. No wonder; it was its last expiring effort, and it actually dropped within a yard of where I was sitting. It was unquestionably the very bird I had shot at more than an hour before; no one else was out hunting at the time, as no other shots were heard. A single No. 12 pellet had penetrated the lungs, and the bird in its dying struggle had evidently tried to reach the same stump again on which I noticed it at first.

My earliest record for 1883, on which I obtained a specimen, a male, was March 20. It seems to me to be a more solitary bird than *S. ruber*. I never saw more than two together or in close proximity of each other. It is also more shy, and does not allow itself to be approached so readily as either of the preceding species. Its breeding range extends, near Fort Klamath, from an altitude of about 5000 feet to the higher peaks of the Cascade Range, which attain in that vicinity a height of about 9000 feet. On the mountain slopes about Crater Lake, it seems to be most abundant, but not as much so as *S. ruber* is in the lower valley,

where almost every aspen grove harbors a pair of these birds. Crater Lake itself is such a strangely interesting and unique freak of nature, the peer in sublime grandeur of the Yosemite Valley in California, and the Yellowstone Park, with its grand cañons and geysers, in Wyoming, and so little known withal, that I am sure the readers of 'The Auk' will forgive me the transgression of interlarding a short description of it in this paper. The lake is about seven and a half miles long and six wide, and unlike anything found in this or any other country. It is situated on the summit of the Cascade Range, about twenty-five miles north of Fort Klamath, at an altitude of about 7500 feet; the highest peak in the vicinity reaches up to 9000 feet. The rocky walls surrounding it on all sides are nowhere less than 1000 feet, and in places more than 2000 feet high, in many points almost perpendicular, so that a stone can be thrown without striking anything on its way till it reaches the water, fully 2000 feet below. It is said to be some 1800 feet deep, and in places is probably more. One cannot realize the magnitude of this hole in the ground without seeing it. A mountain the size of Mt. Washington, the highest peak of the White Mountains in New Hampshire, might be dumped in, and not fill it up then. The water is beautifully clear, and deep azure blue in color; the only living thing seen on it on a visit to the lake on July 27, 1882, was a solitary female Wandering Tattler (*Heteractitis incanous*), apparently very correctly named. An island, covered with good-sized trees, rises out of the water to a height of nearly a thousand feet, on the west side of the lake. It is composed mostly of volcanic scoriæ and pumice, and evidently was the principal cone of the now extinct crater, traces of whose activity in former times, in the shape of heavy pumice deposits, can be found for fifty miles inland to the east, on the road from the De Chutes River to Fort Klamath. There is only one place from which the shore of the lake can be reached with comparative safety, and even from there it is by no means an easy matter. But enough of the lake.

Mr. Gale, who is quite familiar with this species, writes me that in Colorado they nest sometimes at an altitude of 10,000 feet, and that they are generally distributed between that limit and 8000 feet. The nest-sites, he says, are as often met with in moderately thick woods as in the more open clearings and isolated

pine trees and shrubs, the only condition guiding their choice of a home being a shelter from the strong west winds. My own observations agree pretty well with his. He says: "A marked peculiarity I have noted with *S. thyroideus* is that the male takes a lookout station upon some suitable tree, where at the approach of any possible danger he gives the alarm by striking a short dry limb with his bill, by which a peculiar vibrating sound is given out, which the female, not very distant, fully understands, and is at once on the alert. If either excavating, guarding or covering her eggs, she will immediately look out of her burrow, and should the intruder's path lie in the direction of her nest, she will silently slip away and alight in a tree some distance off, but in view of both her nest and the intruder. The first or second blow of your hatchet upon the tree trunk in which the nest is excavated will mark her movement again by a short flight, so managed as not to increase the distance, in fact oftener coming nearer. When satisfied that her treasures have been discovered, she utters a peculiar, low grating sound, not unlike the purr of a cat. The male then comes to the fore and braves the danger, is very courageous, and should the eggs be far advanced by incubation, he will enter the nest when you are almost within reach of it. When the latter is rifled, he is always the first to go in and discover the fact, repeating the entrance and exit business several times, in a surprised sort of manner. The large gaping opening, made by the robber's hatchet, he seems to ignore altogether. To him it seems impossible that a few minutes only suffices to cut through the wall of wood that took his mate as many days of hard labor to accomplish. Presently he is joined by the female, a joint inspection is made, a verdict of grand larceny quickly reached, and the conclusion arrived at, 'well, we shall have to try again, with the hope of better luck next time.'"

Nidification is similar to that of the other species of the genus, with the exception of the difference in the matter of trees preferred already mentioned. The height of nesting-sites varies considerably, say from five to sixty feet, and perhaps more still in exceptional cases. Fresh eggs may be looked for, according to altitude, from May 20 to June 15; Mr. Gale took a fine set of six, which I judge to have been perfectly fresh, from the exquisite manner in which they are prepared, on May 26, 1887.

I obtained my first set of eggs of this species on June 3, 1883,

about nine miles north of Fort Klamath in the open pine forest on the road to Crater Lake. It consisted of five eggs, slightly incubated. The burrow was excavated in a partly decayed pine, whose entire top for some twenty feet was dead. Height of burrow from the ground about fifty feet. The man climbing the tree stated it to be about eight inches deep, and about five inches wide at the bottom and freshly made. A second set, of six fresh eggs, was taken June 12, of the same year, about twelve miles north of the post, at a still higher altitude than the first one. It came also out of a pine about forty feet from the ground. A third nest, found a week later near the same place, contained five young just hatched. This nest was in a dead aspen about twenty feet from the ground. The full number of eggs laid appears to be five or six. These are pure white, a trifle less lustrous than those of *S. ruber*; they are a little more elongated and pointed in shape, some approaching a distinct ovate pyriform or pear shape, a characteristic not apparently found in the eggs of the other species of this genus. The average measurements of seventeen specimens now before me are $.97 \times .67$ inches. The largest in the lot measures $1.02 \times .68$, the smallest $.94 \times .67$ inches. Only one brood is raised, and, like the two other species, it is only a summer resident in the vicinity of Fort Klamath. Its food seems to consist almost exclusively of insects and their larvæ, various species of lepidoptera and an occasional grasshopper. Berries I think are seldom used by them.

I have found fully fledged young in July; a young female shot July 21 must have left the nest certainly by the beginning of the month. When the young are large enough to fly they are not at all rare at the lower altitude of Fort Klamath. They show the same difference in coloration in the sexes, in their first plumage, with these exceptions: the young males lack the red on the throat, which is replaced by dirty white, the sulphur yellow on the lower parts is mostly wanting, a slight trace of it being noticeable on some specimens, and the black on the back is much duller. The young females differ likewise by the absence of yellow on the belly, the black patch on the breast is wanting, the markings and barrings on the upper parts are less distinct, and the colors generally duller.

In its undulating flight from tree to tree, this species utters a shrill note like *huit, huit*.

From the foregoing description and measurements of the eggs of the different species of the genus *Sphyrapicus*, it will be seen that the eggs of *S. varius* are the smallest; those of *S. varius nuchalis* come next in size; then *S. ruber*, and those of *S. thyroideus* are the largest.

The following additional species of the Family Picidæ, occur in the vicinity of Fort Klamath, Oregon.

Dryobates villosus harrisii.

Dryobates pubescens gairdnerii.

Xenopicus albolarvatus.

Picoides arcticus.

Ceophlæus pileatus.

Melanerpes formicivorus bairdi.

Melanerpes torquatus.

Colaptes cafer.

All of these species breed there more or less commonly, excepting *Melanerpes formicivorus bairdi*, which occurs only as a straggler on the eastern slope of the Cascade Range, owing to the absence of oaks, but is quite abundant on the western side of these mountains, wherever oaks are found, especially so near Ashland and Jacksonville, Oregon, in the Rogue River valley. I shall have something to say about the nests and eggs of some of these species in a future paper, having found them all breeding there, and taken the eggs of all excepting *Ceophlæus pileatus*.



NEW AND RARE BIRDS FOUND BREEDING ON THE SAN PEDRO MARTIR ISLE.

BY N. S. GOSS.

THE island, a rock about one and a half miles long, nearly as broad, and 1045 feet in height, is situated in the Gulf of California, a little north of latitude 28°, and not far from midway between shores. I was enabled to visit the same through the kindness of Mr. E. J. Reed, of Guaymas, Mexico, agent for the San Francisco Phosphate and Sulphur Company. I landed from their little steamer that takes out supplies, March 15, 1888, and remained until the 28th. The Company has a large force of Yaquie Indians collecting the guano that has formed a crust on the rocks of from one to four inches in thickness. The island