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THE BIOGRAPHY OF NIP AND TUCK

A STUDY OF INSTINCTS IN BIRDS

By LOYE MILLER

A MEASURE of unwelcome clouded the arrival at my office of Nip and Tuck, a cloud, to be sure, not realized by those unheavenly twins, yet none the less distinctly a cloud. Nor did they realize anything within or without beyond the supreme crisis of their unlimited hunger. For that matter, how much farther does the appreciation of any three day infant extend? Naked, blind, and helpless little linnets they were, thrown upon the care of a human foster parent by some agency that had destroyed their natural habitation and its builders. A paper carton from the delicatessen counter, a mattress and a coverlet of cotton batting, a pair of dissecting forceps, a medicine dropper, and a willing but not over sanguine human male constituted the equipment to which they fell heir. It was not a fair substitute for the natural abode and the tireless parents which had been theirs for the three days of their existence outside the shell. Nor was it a fair chance that they had for survival, yet it was a fighting chance and the brief story of that fight with some of the things they taught their foster parent (we learn much from our children) is offered you for what it may be worth.

The foster parent whom necessity forced upon these naked "cell aggregates" (that's all they were) happened to be a biologist and an educator with, very naturally, the conviction that education is the supreme refinement of biology—a treatment of the highest function of the highest animal. Somewhere during his biological communings he had gotten the impression that linnets are strictly vegetarian in diet and that the young are fed by regurgitation of partially digested food from the parent crop. Something had to be done rather promptly to simulate the natural food of the starving waifs if their lives were to continue. Where should one more naturally turn than to the department of Domestic Science? That department was in charge of a mother, so the appeal of helpless infancy met with an instant and a hearty response. Whole wheat bread constituted the initial step in the building up of the artificial schedule of dietetics. Why? Because the cooking had brought about therein a series of chemical changes comparable, in a measure, to those fermentative changes worked upon weed seeds within the parent's crop. What next? The lining of the crop in some birds secretes a chemically perfect milk containing butter fat, cheese, and milk sugar. Probably young linnets receive some such product mixed with their fare of cracked and partially di-

gested seeds pumped from the parent's crop into their yawning mouths. The probability seemed strong enough, at any rate, to warrant the trial of dairy milk as the fluid medium and, behold, a time-honored baby food was the result, bread and milk. Quite a long and laborious process of reasoning to arrive at so simple a prescription as bread and milk, you may think. Yes, but you know one of the great values of scientific education is that it offers a good excuse for continuing to do some of the things we have done for generations anyway—if they happen to please us.

The interesting part of the whole matter was the final and wholly satisfactory influence upon the twins. Let me remind you in the words of that homely philosopher of the day's fiction, Mr. Dooley, "Af ut worrks uts roight." What better test could be asked for an experiment than that it succeed? Here was a scientific theory and a homely, common sense practice operative to a perfectly satisfactory result. The biologist and educator, who believed in the synonymy of his two titles, was delighted. More to the point, the twins were, too.

From that time on until their comparative independence in food gathering, Nip and Tuck throve upon bread and milk, corn flakes and milk, shredded wheat and milk, or some equally grano-lactose combination. "So are we kin to all that is."

To the parent of mere human offspring who has labored days (and nights), months and years to navigate the customary shoal waters of croup, measles, whooping cough, etc., the almost explosive suddenness with which the successive growth stages in birds appear is little short of startling. After the first day of readjustment to a new regime the twins were carefully weighed each morning at the same hour on delicate chemist's balances. Results for the first twenty-four hours had to be checked over repeatedly before the unassailable facts could be credited: The twins had gained 24.3 per cent in weight since the previous day at the same hour! Is it surprising, then, that feathers seemed almost to pop from their skins to cover an infant nakedness? What wonder that each morning seemed to show a change in appearance since the night before? Much of that stuffing of bread crumb and milk had been transformed by the alchemy of biology, into baby bird instead of into the human deity which is so commonly the product of that homely ambrosia. What wonder that young birds are little else than digestive apparatus surrounded by a relatively thin wall of potentialities? They need all that laboratory of digestion. Digestion and assimilation are their chief business and they attend to that business pretty strictly. As is usually the case, attending to business produced good results and within fifteen days Nip and Tuck had changed from speckled, pale blue eggs to feathered birds able to fly up hill.

Of course the biography of every infant must take cognizance of his dawning mentality as evidenced through the oracle of the first spoken word. What vast interpretations are placed thereon! How profoundly interested everyone else is supposed to be! Long tedious months must elapse before even his mother can claim for the child that he has indulged in articulate speech. During that time unlimited volumes of baby talk have been poured in upon the plastic matrix of his brain cells without tangible result. Ultimately, however, our words come back to us with growing distinctness, though regrettably they too often bear those mutilations of the mother tongue which have been poured into his ears as "baby talk" and which later have to be unlearned. Of whatsoever nationality, caste, or hereditary strain the infant may be, the speech of

the nurse becomes the first tongue of the child. Is it so with birds? Do the little ones learn by their mother's twitterings?

The early speech of Nip and Tuck was a matter of great concern, therefore, to their foster parent. At the time of their adoption into human society their vocal expression was limited to a subdued squeak inaudible at a distance greater than a yard. What possibilities were there for training such voices and fashioning them to an ideal set by the teacher? Educators are wont to stick their fingers into the plastic clay of childhood merely to see how perfectly their thumb prints may be impressed. Why not try out a theory on the twins? Do the offspring acquire a vocabulary by imitation or do they inherit it through the generations? Parent linnets, during visits to the nestling young, utter a very definite note of constant character. If another note were substituted and were sufficiently frequent in its repetition, would that sound be acquired by the young? Since the twins were obliged to accompany their new parent to and fro on a ten mile trip daily, there was every reason to believe that the dominant musical influence of their impressionable period would be the song of a Ford engine. However, with the commendable optimism of the educator who believes that a small leaven of uplift will raise the sodden mass of grosser influence, the foster parent set to work to administer that uplift.

The linnet's feeding note was carefully avoided and, in its place there was given the sharp, ringing note of the Canyon Wren, and on this auditory diet the little birds' receptive centers were fed during the period of infancy. Would they first lisp in the language of linnet or that of the Canyon Wren? Would the chromosome of inheritance yield to the stimulus of environment? Not so, as we shall see. With the growing strength of the young birds, the squeak increased in volume up to a limited maximum. Then on a certain morning Nip awoke from his after-breakfast nap and burst forth with an entirely new note, not a mere squeak, but a truly vocal sound, the perfect call of the young linnet. Despite his artificial upbringing, Nip had discovered himself a true linnet and spake in the tongue of his ancestors. Tuck soon followed in the way of the more progressive Nip and the infantile squeak was no more heard. Nip and Tuck had refused "baby talk". Again the cheerful educator pocketed his failure and consoled himself that he had gained by his loss—through his failure had a new truth been established.

Perhaps such a result should have been expected from an attempt to modify those more fundamental notes we might designate the call notes, but what of the more superficial, the more complex and variable character, song? Voice quality in birds is largely, it would seem, a matter of structure of the vocal chords and hence is conveyed by the bearers of heredity as definitely as are the characters of beak or claw. Song, however, may be modified as to its sequence of notes, and some highly imitative birds of varied vocal power have been taught a variety of performances.

Not discouraged by the seeming failure of the first attempt at uplift, the uplifter therefore continued his effort at vocal education throughout the growth period of his charges, in the hope of influencing the song of the male. Was it disappointment or was it secret satisfaction over a substantiated theory that held first place in the biologist's mind when, six weeks later, just before the necessary interruption of the intimate association of pupil and teacher, Nip burst into his first song? It was a song he had never heard before and had never rehearsed, the tribal song of his fathers.

That there are instinctive responses on the part of animals to certain qualities in sound is a matter of common experience. The distress quality in bird notes is difficult to define and may sometimes be wholly imaginary, yet it is many times the stimulus of an instinctive response. Individuals representing many varieties of birds will, in a state of nature, come hurrying through the woods, each one giving its own call, to the spot where a bird of an alien race is uttering its note of distress. It was interesting in this connection to observe the response of these young linnets to the distress call of chicks, a sound entirely foreign to their individual and, doubtless, to their racial experience. The little birds were kept upon the lecture room desk where their frequent meals could be administered by student or by instructor with a minimum of disturbance. One morning, while the twins were serenely quiet beneath their cotton blanket, a discussion of the quality of bird sounds brought about the illustration of a certain point by an imitation of the chick's distress call. Immediately the cotton blanket was heaved up and two excited young linnets tumbled about in the nest in response to the stimulus of a sound they had never before heard. The incident means much to us when we consider the many times we have seen the distress calls of excited bird parents rouse the nest full of young to efforts at flight. We so often say that the mother is teaching her young to fly when, in reality, all she is doing is to apply unconsciously a stimulus. An Anglo-Saxon reared pack mule when treated to a series of expletives in Mexican-Spanish, gets the same psychic message from his driver as though he were an accomplished linguist. So Nip responded to the complaint of a lost chick by rising up on his wobbly legs and uttering the call note of his race.

I am obliged to confess to an undercurrent of guilty feeling within me when I recognize in my own offspring a perfectly orderly sequence of events as they develop the grasping reflex, the suckling reflex, or later on, the self assertion and the play instincts, a chain of natural traits that follows the law of a million ancestors. It seems a bit underhanded, especially in the presence of that other and happily less analytic partner in the infant's ancestry, even to admit the possibility that ours is not the first child who has performed such a wonderful and so perfectly adorable a trick. However, no such sense of treachery marred my pleasure in watching the twins' orderly progress. That progress was so rapid that it seemed like twenty years of human experience concentrated into a twenty days resumé. Sometimes there even arose a half formed wish that human young might be still more biologic than they are. Take the bathing instinct as an illustration. One day the very masculine Nip, without coaxing of any zealous parent but wholly from some inward urge, took a bath and made an impressionistic toilet. Oh, that our own young might feel that heaven-born inspiration toward clean hands and a smooth part!

Really though, the trouble is not with our children but with our own impatient selves. If we were willing to wait fourteen long years for that tornado of new instincts at adolescence, we would find that even the human male would think of his personal appearance and would voluntarily wash at least the front part of his face and polish the toes of his boots. Nip waited six weeks for the inspiration toward cleanliness, but it came all in good time. Let me not be understood as favoring fourteen years of unwashedness for boys. No indeed. We must live with them and some of us actually enjoy the living, artificial as life may seem to the boy. But isn't it interesting to note how four-

teen years of ineffectual training (or of nagging) will slough off like an old pupa skin and the urge finally come from within?

Another great source of friction between the generations, and a thorn of tribulation for both, is table manners. Would the twins learn to eat properly? How the educator did labor with his adopted offspring only to find that his efforts went for nought. For three weeks they were fed with medicine dropper and tweezers. The subjects performed most dutifully. They came to the finger at "mess call", opened their mouths, and gulped their portions in proper bird fashion. Then, all at once, Nip refused this infantile treatment and would not open his beak. He was not the victim of green apples nor of eating between meals, for, when the food dropped from the tweezers, Nip picked it up and made his meal man fashion. The time had come to put away childish things and they were put away. He was never again fed by hand. Now, although she was born at the same time as Nip, little Miss Tuck was always a goodly bit behind him in development of her instincts. Despite the splendid example of the precocious Nip and the labored efforts of the foster parent, who felt that his most tedious task should be at an end, Tuck refused to pick up her food. The table would be set before the two and Nip would plunge in with boy-like exuberance, bent solely upon the engulfing process. Tuck would see the food and recognize it, would open her mouth and beg, seemingly entreating it to come and satisfy her craving. The tweezers would pick up morsels and dangle them before her and she would follow the movement with open mouth, but never, unless the lining of the beak was touched, would she seem to get the proper stimulus for taking food. For five days this ineffectual effort at education continued, then the proper instinct ripened as it had in Nip, and Tuck picked up her own food. The ripening, however, was incomplete and for three weeks at the beginning of each meal she continued to beg to be fed.

I wonder why we parents of human young are so intolerant of the petty bickerings that arise between children—children, too, who are really fond of each other. A distracted mother or even the less intimately associated but short-memoried father, may wonder where, in their long line of respectable ancestors, those children picked up so much quarrelsomeness. We worry about such things. On the other hand, how cunning are little puppies, or above all things, little bear cubs! They tussle and growl and chew at each other as they roll and scuffle in the straw. We laugh at them. Is not the cub quarrel due to the natural development of individuality, the birth of the ego? At any rate it seems to come in the natural course of events in cubs, human or otherwise. The tendency should be recognized even though society demand that it be curbed. Nip and Tuck, being normal infants, developed the quarrel instinct at the proper time in their history. There was nothing to quarrel over, there was plenty of perch room and plenty of food—yes, and plenty of plebeian "human nature", or animal nature, taking its natural course. All at once the combative instinct appeared and they quarreled over nothing. As Uncle Remus would say, "Dey quarr'l 'an quarr'l' jes like folks." Here was good evidence that Nip and Tuck were developing normally and the foster parent rejoiced in that normality. The quarrels didn't last long and they were so fascinatingly human.

Again the fond and sometimes censurable parent takes pride in the lack of self-consciousness of its offspring. The child is taught all manner of "cute tricks" which it performs that the older folk may be politely amused. Final-

ly comes a day when the child is afraid, it hides its face and screams or else it retires behind the mask of a child's immobile stare. Often he is punished for being naughty, wilful, or silly while the chagrined and disappointed parent may make more of a fuss and disturbance over the matter than does the child itself. The visitor, according to his lights, feels sorry for the one or for the other. Nip and Tuck, brought up by hand, were on very intimate terms with their foster parent. They performed most cleverly for visitors, coming to the finger to be fed, allowing themselves to be warmed in the enclosing hand, or to be transferred from cage to table freely. There was no consciousness of self or of the parent. But one morning the instinct of fear had come. Like a migratory warbler flying at night, all at once it was there, and Nip was afraid of me. He would not come to call, he would not tolerate approach. He saw this great creature through different eyes, the eyes of self-consciousness, and he was afraid. He had never been mistreated but he never entirely lost again his attitude of reserve. You may be sure he was not punished for wilfulness or for silliness, the child's common cloak for inward fear.

But, like most fond parents, I lose perspective and prolong the story of my infant prodigies. The biologist has proven his point. Learning to feed properly is but the development of an instinct as are the learning to bathe and to preen the feathers. Like learning to sing, to quarrel, to fear, even to fly, they are not learning processes at all. They are but stages of growth. That magnificent series of reflexes involved in flight is not the result of experience. The first time the birds attempted to fly they flew, not far, but well. They could not fly far because they lacked strength. They flew well because of an inborn coordination of sensory and motor nerves, a sort of racial knowledge conveyed by heredity to the fertile egg from which each had sprung. All these tricks and traits developed in orderly fashion as the time for each arrived. In this development Nip was always just ahead of Tuck, but the order of appearance was the same in both. Yes, the biologist had proven his point; but did he leave anything for the poor educator?

The educator can learn much from the story of Nip and Tuck. One lesson is that much of our so-called education is but a superficial patting of the human clay, a holding of child activity to certain orthodox lines pending arrival of the inward urge upon which we may work. Can we truly say that education ever creates the impulse? Rather does it liberate impulse. The twins did learn many things, some of which were temporary expedients to serve through the formative period. We need a few such in education. Finally, is it not the function of education to take the native worth and make it more worthy? Nip's instinct of fear, tempered by education, became a proper reserve toward clumsy humans, however well meaning. Birds' inherited voices respond to later training after their adult structure has been attained, and they may come to execute a variety of songs.

The aim of education, then, is not an uprooting of the natural attribute but is a sort of top working effect for the improvement of that native rootstock. Education should be constructive, not destructive.

Rodin enscribed one of his celebrated marbles with these words: "I feel two natures struggling within me." The phrase well depicts the unstable attitude of mind of this particular foster parent in regard to his experiments on the heavenly twins. Did he fail in one attempt, there is consolation for the biologist in saying "I told you so." Did he succeed in another, there was the

pleasure of the optimistic educator who sees training lay hold upon and glorify the inherent tendency. Altogether, remembering that he claims to be both biologist and educator, he derives much pleasure from the entire experience, which same constitutes a commendable philosophy. Try it, patient reader who may have followed to this point the lengthened but truthful biography of Nip and Tuck.

Los Angeles, California, December 9, 1920.

NOTES ON TWO CHARACTERISTIC BIRDS OF THE SAN GABRIEL WASH

By ROBERT S. WOODS

WITH FOUR PHOTOS

ON THE STONY, brush-covered lands along the San Gabriel River at Azusa, Los Angeles County, California, the bird usually most in evidence is the Cactus Wren (*Heleodytes brunneicapillus couesi*), by reason of its active, noisy ways and the abundance of its bulky, flask-shaped nests in various

Fig. 9. ADULT CACTUS WREN PERCHED ON "LEAF" OF PRICKLY PEAR CACTUS; SAN GABRIEL WASH, NEAR AZUSA, CALIFORNIA; MARCH, 1916.

stages of decay. The majority of the nests, which are constructed of dead weeds and grass and lined with feathers, are placed in the taller clumps of prickly pear, probably on account of the small size of most of the cholla cac-