Removing the Veil: Gymnastic Experience, Wonder, and Reflections of Jean-Henri Fabre

By Dr. Kenneth Klassen

Now fades the glimm'ring landscape on the sight,
And all the air a solemn stillness holds,
Save where the beetle wheels his droning flight,
And drowsy tinklings lull the distant folds . . .

Recently two of our twenty-nine grandchildren for Nana and Granddad recited from memory a poem: "The Song of the Bee".

Buzz! buzz! Buzz!
This is the song of the bee.
His legs are yellow;
A jolly, good fellow,
And yet a great worker is he.

In days that are sunny
He's getting his honey,
In days that are cloudy
He's making his wax:
On pinks and on lilies,
And gay daffodillies,
And columbine blossoms,
He levies a tax!

Buzz! buzz! Buzz!
The sweet-smelling clover,
He, humming, hangs over;
The scent of the roses
Makes fragrant his wings:
He never gets lazy;
From thistle and daisy,
And weeds of the meadow,

Some treasure he brings.
Buzz! buzz! Buzz!
From morning's first light
Till the coming of night,
He's singing and toiling
The summer day through.
Oh! We may get weary,
And think work is dreary;
'Tis harder by far
To have nothing to do.

The simple poem may seem perhaps trivial and a bit moralistic, but certainly is enjoyable to my young grandchildren. But can we evaluate this poem both in its ability to delight and instruct the two ends of the poetic? Is it accurate in its observations as well as morally enjoining us to celebrate our particular duties and work? We might first consider the observational accuracy of the poem. Are the bee's legs yellow, and if so, why? Does the honeybee actually gather nectar's treasure from the poem's identified flowers—and if so, from all concurrently during a particular honey flow? Does the fragrance of roses truly make fragrant the bee's wings? Does the worker bee labor from first light till night all the summer through? Are the worker bees, as the poem suggests, male in gender? And does the bee occupy her time in making wax when inclement weather confines the colony within its hive box? These are questions a trained entomologist such as Jean-Henri Fabre might consider, and indeed perhaps can be answered through observations young St. Martin's Academy boys will be able to make on our Fort Scott harmas. On the moral level, some of us would relish the chance to have "nothing to do", in the sense of having leisure, but the bee the poet describes knows nothing of this leisure, a quality that allows only us reasoning humans to consider those liberal, free aspects of creation as well as God Himself, a leisure that occasions our conversation this evening. The servile duties to which we are called are good and in no way denigrate the poem's apian workers; Fabre wrote to his son Emile, "You will learn, I hope, that we are never so happy as when work does not leave us a moment's repose. To act is to live." (Legros 124). But the leisurely reflection such as that we enjoy tonight exalts the infinitely privileged place we humans occupy in the created universe; such meditative reflection of the mind is a gift and a grace.

My own acquaintance with Fabre began some time during my adolescence when I acquired *The Insect World of J. Henri Fabre* compiled and edited by Edwin Way

Teale, a noted 20th century naturalist. I today don't remember when I read this text; perhaps no magical windows of wonder opened for me, but I enjoyed it because in those years I myself welcomed the opportunity to venture outside and observe, capture, and preserve specimens of the insect world, particularly the Lepidoptera (butterflies and moths). I must have been five or six years old when I first chased swallowtails and sulfur butterflies down a column of zinnia flowers bordering the back edge of our Omaha, Nebraska yard, a floral row that seemed very long in those days, but that was probably no longer than twenty feet or so. My mother was complicit in my entomological hunting, furnishing me with a butterfly net she and my dad had assembled. Fabre's family was not so affirming for the young six-year-old's natural interest. Fabre stayed with grandparents at Malaval when young; these discouraged his vocation to study the world of nature. They were intensely practical persons who thought of insects as either harmful pests to be avoided or as an occasion to waste valuable time. As for his grandfather, "this rudimentary scholar, waging a war on life's acerbities, certainly paid no attention to the insect; at most, if he met it, he would crush it under his foot" (Teale 26). As for his grandmother, "if she found a caterpillar on the lettuce leaves, with a start of fright she would fling the loathsome thing away, thus cutting short relations reputed dangerous. In short, to both my maternal grandparents, the insect was a creature of no interest whatever and almost always a repulsive object, which one dared not touch with the tip of one's finger. Beyond a doubt, my taste for animals was not derived from them" (Teale 26). Later Fabre reflects on the nature of heredity, concluding that many physical and psychological characteristics may be predicted in genetic studies, but the particular genius of men and other creatures is a great mystery and surprise.

> We thus have, all of us, in different directions and in a greater or lesser degree, characteristics that brand us with a special mark, characteristics of an unfathomable origin. They exist because they exist; and that is all that any one can say. The gift is not handed down: the man of talent [may have] a fool for a son. Nor is it acquired; but it is improved by practice. He who has not the germ of it in his veins will never possess it, in spite of all the pains of a hothouse education.

What is predictable in the instincts of creatures and charisms of human beings is that they are unpredictable and wondrous, providential gifts. Ironically, both grandparents did accidentally promote Fabre's gymnastic experience of nature, which in turn occasioned Fabre's wonder, that led to his entomological vocation. We might explain

here that the term *gymnastic* refers to direct, immediate experience and confrontation with things; the word derives from the Greek *gymnos*, meaning naked. Fabre was in charge of herding a few ducks, raised to supplement the family's income, to a pond for a daily swim; while "duck-sitting", Fabre gathered specimens from within and around the pond—rocks, plants and creatures--and filled his pockets with these treasures. When he returned home with his small flock, he was ordered to empty his pockets and not to bring such worthless debris home again. Fabre thus concludes that his genius—his intense affinity for the natural world and his powers of observation—was definitely not hereditary.

My second exposure to Fabre came somehow when the entomologist was mentioned in the Integrated Humanities Program at the University of Kansas. His gymnastic attention to the natural world, poetic description of whatever objects he described, and his subsequent philosophical reflections made Fabre an apt subject for the professors' references to him. But this in turn led me when we opened St. Paul's School in 1976 to find Fabre's *Botany* in its original French, "buried" in the fifth floor below ground level stacks of Watson Library at KU. I checked the book out from the library and over several months translated the text chapter by chapter as I used it for the out-of-doors observational science course I taught at St. Paul's. I remember being stuck when trying to find appropriate English technical terms for Fabre's French descriptors, but overall I felt the course was simple and straight-forward, incorporating direct observation the students could themselves accomplish, while not so full of what Fabre labels the "Iroquois idioms" that only pedantic scientific specialists might remember. We would walk along the road by the school and around the two acre or so schoolyard. I remember well the killdeer who lay her eggs on the bare chat by a swing set and lured us away from her brood by feigning injury to a wing. I also recall the buckeye butterfly chrysalis which the larvae attached under a slight overhang near the ground. And I remember the swarm of bees located by a student as he rode his bicycle near the school one day, a swarm I captured as my first colony of bees. Wonderful memories for me, and, I'm sure, for many students.

After this period almost forty years ago, Fabre has largely lain fallow on my bookshelves, a sort of bibliophilic harmas, and has been forgotten in my memory. There shelved has lain a beautiful, though aged, edition of *Fabre's Book of Insects*, as retold from a translation of the first volume of the *Souvenirs Entomologiques*. My wife in the last few years has added graciously another Fabre volume of collected essays: *The Passionate Observer*, edited by Linda Davis.

Now resurrected through the efforts of Patrick Whalen in establishing a lecture series offered by St. Martin's faculty and staff, Jean-Henri Fabre is the central means

tonight to examine the role natural history, intimately connecting boys to the natural world and taught in a poetic mode, might play in the new academy of St. Martin's. Listen to Fabre's words, contrasting his living out-of-doors classroom to the typical indoor textbook approach: "And then, my dear insects, if you cannot convince those good people, because you do not carry the weight of tedium, I, in my turn, will say to them:

> You rip up the animal and I study it alive; you turn it into an object of horror and pity, whereas I cause it to be loved; you labor in a torture chamber and dissecting room, I make my observations under the blue sky to the song of the cicadas, you subject cell and protoplasm to chemical tests, I study instinct in its loftiest manifestations; you pry into death, I pry into life. And why should I not complete my thought: the boars have muddied the clear stream; natural history, youth's glorious study, has, by dint of cellular improvements, become a hateful and repulsive thing. Well, if I write for men of learning, for philosophers, who, one day, will try to some extent to unravel the tough problem of instinct, I write also, I write above all things for the young. I want to make them love the natural history which you make them hate; and that is why, while keeping strictly to the domain of truth, I avoid your scientific prose, which too often, alas seems borrowed from some Iroquois idiom.

Fabre may indeed not be a man for all seasons, but certainly he is an illuminating, guiding star among this culturally-impoverished, technophilic, artificial modernity for our humble new school set in the rural countryside south of Fort Scott. Fabre's harmas at Serignan (an harmas being a fallow piece of land) was a scant two and one-half acres, or one hectare, as land area was measured in 19th century France. Our school land allotted for farm usage will be larger; and yet a small piece like Fabre's could be set aside exclusively to study the insects and other creatures that inhabit a similarly sized area on the Kerr farm. Fabre was fifty-seven years old when he finally could purchase his harmas; some of our faculty are much younger to begin to work and study on our Bourbon County harmas, but my brother, Father McElwee and I are significantly older. Perhaps we average out to roughly Fabre's age when he acquired his own harmas. Fabre bought his harmas to be at last free to do what was for him his dream and life's work; he had struggled for most of his 57 years to survive economically and support his family and only at last due to some good fortune was able to live freely, though never securely, to pursue what was not only his dream but also his true vocation in the service of almighty God, becoming, as we hear expressed today, the best version of himself for which he had been created, fulfilling Fabre's

"urg"—the scientific vocation to which he was called. We pray we too may be free to pursue what currently is our dream, one that we like Fabre completely commit ourselves to accomplish.

Our humble beginnings may have advantages Fabre never had, but we too will rely on the support of friends and kindred spirits in order to make the education of these young men at St. Martin's possible. Fabre's value was not broadly nor fully appreciated during his lifetime; so that too may be our fate. But he was always supremely confident of the value of his labors and knew they would serve as a vehicle in pursuing truth; we at St. Martin's share in this confident expectation of fighting the good fight and attempting to finish our race. The noted French scientist Moquin-Tandon encouraged Fabre to pursue his career: "Get to the beast, the plant, and, as I believe, with the fever that burns in your veins, you will find men will listen to you." And so we pray that by the grace of God and the help of friends by means our students will learn from nature and us.

Fabre, like we ourselves, sees nature as a manifestation of the glory of God. This is not new intellectually in the Scholastic tradition, but Fabre certainly helps crystallize this vision for us. The book of Wisdom (13:5) says, "For by the greatness of the beauty and of the creature, the creator of them may be seen, so as to be known thereby." The encyclopedic Venerable Louis of Grenada, writing 300 years before Fabre, writes an exegesis to this Scriptural verse, substantially providing a prologue to the work of Fabre. "We have two teachers: Sacred Scripture and creatures," Venerable Louis says (11). He further elaborates:

> The entire visible world is a great marvelous book which Thou hast written and offered to the eyes of all nations of the world, the Christians as well as the pagans, the wise as well as the ignorant, wherein they may study all things and know who Thou art. What are all the creatures of this world, so beautifully and perfectly made, but so many illuminated letters that declare the beauty and wisdom of the Author.

And furthermore, Venerable Louis invokes God much as Fabre will do:

> Take this rustic woodsman by the hand and with the finger of Thy spirit point out the marvels and mysteries of Thy works so that in them I may recognize and adore Thy wisdom, Thy omnipotence, Thy beauty, Thy goodness, Thy providence and may bless Thee and praise Thee and glorify Thee forever and ever. Amen.

Like the woodsman described by Venerable Louis, Jean-Henri Fabre lifts not only the veil concealing the divine when he exposes mysteries in creation, but he also lifts the natural veils that have concealed creatures from our sensible perceptions and intellectual understanding.

Fabre's instrumental means—his gymnastic observation, his poetic descriptions pointing out and singing the praises of nature's mysteries, his experiments analyzing and examining instinct, his philosophical reflections: these all contribute to the extraordinary value Fabre's work has for us here tonight to consider. Fabre's work may well serve as an antidote to the intellectual ennui and spiritual fatigue of our modern world, described by the Thomistic philosopher Charles de Koninck as a "hollow universe", devoid of truth in the public square where pervasive relativism reigns supreme. Fabre's realism and common sense analysis refutes the popular subjectivism of the modern world and promotes the study of objective truth while preserving the mystery that permeates all of creation.

But let's then back up to where Fabre's life began, follow his progress as a teacher and researcher through the years, look at some of his research and writing, recall his interaction with other scientists and historical figures, and finally consider the implications Fabre's work may have for St. Martin's program of study.

> Let not Ambition mock their useful toil,
> Their homely joys, and destiny obscure;
> Nor Grandeur hear with a disdainful smile
> The short and simple annals of the poor.

Imagine a grown man lying prostrate on a country road, remaining immobile while passersby walk around the man, who seemingly is unaware of his surroundings. It seems he stares at a spot on the ground where there is nothing to see except a small hole in the dry, dusty pathway. Some of the passersby make the Sign of the Cross. One is heard to quietly utter, "Le pauvre idiot!" In a Catholic world the simple innocence of those mentally handicapped is recognized for its closeness to God, its closeness to His grace, its freeing of the will to love deeply. And so these passersby regarded Fabre as someone of limited faculties; they prayed for and gave their blessing to this poor "idiot". How could they know here was a scientific giant at work in one of his laboratories of the open fields? Small wonder they thought Fabre an eccentric; his neighboring village residents always thought him rather odd.

If as Wordsworth says, "The child is father to the man," what was the

childhood gymnastic experience that led to Fabre's adult genius—so different from the callings of most of the simple, poor country stock from which Fabre came?

As a young child Fabre's grandmother "lulled him to sleep with beautiful stories and legends, while she wound her distaff or spun her bobbin" (Legros 18). There Fabre enjoyed his work shepherding ducks as previously mentioned, which provided Fabre a chance to observe pond life and capture specimens for study. Omnipresent butterflies and grasshoppers were always objects for study, and also for sheer youthful pleasure. "From his earliest childhood, "the brain hardly released from the swaddling bands of unconsciousness," the things of the outer world left a profound and living impression. "He sees himself in ecstasy before the splendors of the wing-cases of a garden beetle, or the wings of a butterfly. . . . He made for the flowers and insects as the Pieris makes for the cabbage and the Vanessa makes for the nettle" (Legros 19). "The riches of the rocks; the life which swarms from the depths of the waters; the world of plants and animals, that "prodigious poem; all nature filled him with curiosity and wonder. . . . A voice charmed him; untranslatable; sweeter than language and vague as dream" (Legros 19).

In 1833 Fabre's father took the entire family to Rodez to operate a café. In 1837 they moved to Toulouse, again to operate a café. Fabre attended a minor seminary school and served at mass to pay for school expenses. Natural history was not a serious course at his school, so Fabre studied this on his own when he was supposed to be studying other academic areas. He was marked as mediocre and even remedial in his grades; to which he immediately responded with intensive study so as to complete his remaining two years of study in one and one-half years. Even then while he studied the established curriculum in which he construed Virgil's *Georgics*, he remembered "exquisite details concerning the cicada, the goat, and the laburnum." His heart remained in the fields more than in the classroom, where it was too limited and confined. After his fifth year Fabre left to try to make a living; he sold lemons at the fair of Beaucaire, worked as a day laborer as part of a work crew, and did whatever odd jobs presented themselves. Then he decided to enter a competition to pay for training to certify himself as a teacher for the primary school at Avignon. Fabre won the bursary scholarship; after three years he received his teaching certification.

Fabre had become a serious student, largely self-taught, always successful in academic endeavors he pursued. His first teaching job as a young nineteen-year-old at Carpentras commenced a teaching career that was to span over thirty-five years, years of hard work in which he was paid little, barely enough to survive when he was paid his contracted meagre amount, which sometimes was not paid at all when promised paychecks were not forthcoming. In addition, his teaching position was anything but

ideal. "It was a laborious life, full of distasteful and repugnant duties" (Lagros 30). He made up for an economic shortfall by extra tutoring, teaching additional classes, and even delivering lectures. But he never made enough money to freely pursue the object of his love, the study of natural history in the areas in which he lived. Legros, Fabre's chief biographer, relates, ". . . he had to labour prodigiously to earn a little money to feed and rear his family, to the great detriment of his scientific inquiries . . . "(Legros 5).

Fabre, wanting to escape this lower level of instruction, studied physical and mathematical science for "hope of making an opening in the world of secondary schoolmasters" (Lagros 31). He studied chemistry using pipe bowls for crucibles and aniseed flasks for retorts." Then he learned algebra, of which he knew nothing until he gave his first lesson. In mathematics he eventually mastered conic sections and calculus. He continued to fervently go to nature and note as much as he could. "Nothing is to be neglected. Every plant; whatever it may be, great or little, rare or common, were it only a frond of moss, may have its interest" (Legros 35). Always Fabre himself pursued truth and beauty and shared that vision with his students; a cultivated mind, he said, is the only patrimony any of us can count.

Fabre developed a passion for hunting larks and became an excellent shot. He married in 1844 a young lady from Carpentras. He then to better himself financially studied hard for two baccalaureate exams in the physical sciences and mathematics. Both he passed but no job openings developed for him, though his advanced degrees normally should have opened doors in several schools. Fabre comments, "The injustice was unheard of, and no one had ever seen or would ever see the like: to give two licentiate's diplomas, and to make him conjugate verbs for a pack of brats! It was too much!" (Fabre as quoted in Lagros 41). In addition, Fabre endured the loss of his first child, who seemed healthy but suddenly grew ill. Fabre with much emotion describes the boy's open eyes gazing towards heaven as the soul departed from the infant's fragile frame. And furthermore, he and his family lived from hand to mouth like beggars. His minimal salary was often in arrears.

Fabre then enjoyed his first significant advancement, a teaching position at Ajaccio on the island of Corsica. The salary was roughly doubled from that of Carpentras, up to L72. More importantly, Fabre now enjoyed a life in the midst of a luxuriant natural environment. "He would lose himself in a delicious intoxication, amid the deep woodlands, the mountains rich in scented flowers, wandering through the maquis, the myrtle scrub, through jungles of lentisk and arbutus; barely containing his emotion when he passed beneath the great secular chestnut trees of Bastelica, with their enormous trunks and leafy boughs, whose solemn majesty inspired in him a sort

of melancholy at once poetic and religious" (Legros 44). There on Corsica Fabre became a pupil and colleague of the renowned Requien, a retired botanist from Avignon. After working closely with Requien and seeing the distinguished scientist engaged in his work, Fabre committed to the vocational path from which he was never to deviate. On Corsica Fabre also worked with a noted botanist named Moquin-Tandon and assisted the naturalist in collecting and naming specimens. After becoming violently ill, Fabre left Ajaccio for Provence to recover and then returned to Ajaccio, but only for a short while. Fabre then moved back to Avignon to teach at the lycee. During all this Fabre completed another baccalaureate, this time in the natural sciences. On his oral examination one of his examiners was a strong proponent of spontaneous generation; Fabre did not himself agree with the theory based on his own investigations and reasoning, and, as we all know, Louis Pasteur was about to disprove the theory altogether. Fabre held to his own position that opposed that of his examiner, but was so brilliant in his responses on the qualifying exam that he readily passed. Instead of pursuing additional advanced degrees, Fabre was content now to study nature rather pursuing additional academic credentials. "At heart he was utterly careless of dignities and degrees. He worked only to learn, not to attain and follow up a second calling" (Legros 57). What he hoped was to succeed in devoting all his leisure to these marvelous natural sciences . . . something animated and vital; a thousand fascinating themes, and an atmosphere of poetry (Legros ?). Fabre's true education was the school of nature.

> Of scientific education, the fruit of college training, I had none whatever. I never set foot in a lecture hall except to undergo the ordeal of examinations. Without masters, without guides, often without books, in spite of poverty, that terrible extinguisher, I went ahead, persisted, facing my difficulties, until the indomitable bump ended by shedding its scanty contents. Yes, they were very scanty, yet possibly of some value, if circumstances had come to their assistance. I was a born animalist. Why and how? No reply.

Leon Dufour, another famous French entomologist, provided the inciting force that began Fabre's pyrrhic rise to scientific fame when Dufour published his observations of Buprestis beetle larvae found in the nest of Cerceris wasps. Dufour observed the Cerceris lays her egg on an immobile larva of the Buprestis, a larva stung by the female wasp. Dufour assumed the larva was dead and that the Cerceris was devouring the dead carcass of the deceased grub. Observationally, this was a reasonable assumption. But Fabre observed the preserved state of the larva during

the roughly two-week period in which it was eaten by the rapidly growing wasp larva. Fabre killed other Buprestis larvae and determined they decayed rapidly, so much so that they would not serve as edible food for the Cerceris after a few days. So Fabre concluded the Cerceris did not kill the Buprestis larva but rather paralyzed the grub. Then he observed how the wasp disabled the host for her own progeny, witnessing the solitary sting right at the point of the nerve ganglia that controlled the central nervous system of the larva. Fabre tirelessly worked to observe this occur again and again. He then attempted to imitate the delicate surgeon wasp by piercing the same nerve ganglia in a type of precise acupuncture. Almost all the time Fabre killed the larvae; the few times he did not, the victim regained motion and would have proven an inhospitable host for the Cerceris grub. Somehow the insect wasp blindly performed a precise paralyzing thrust instinctively, a surgery difficult to perform by any human even by means of a very fine pin directed by an expert scientist using the magnification of a microscope. And so Fabre opened to the scientific world a window showing the marvelous instincts followed blindly by this small sometimes unseen world of insects.

Fabre remained at Avignon for twenty years without any increase in pay or promotion in rank. His pay had been reduced to L64 from the L72 he had received at Ajaccio, so he continued to depend on additional hackwork to supplement his meagre sustenance—additional classes, repetitions and private tutoring occupied his spare hours. His students treated Fabre with respect; he alone of the faculty had no nickname; these were assigned by students to privately poke fun of teachers. Fabre would sometimes take students to the field with him. There "he was their elder, their master, but still more, their companion and friend", lighting in them his own sacred fire, and amazing them by the deftness of his fingers and the acuteness of his lynx-like eyes" (Legros 70). Not so well was he treated by his fellow faculty. They because of his love of insects called Fabre pejoratively "The Fly." He really had no interest in impressing his colleagues; he did not associate with his fellow teachers, and in school ceremonies continued through the years to wear an old shabby felt hat, which was "a blot among all the carefully polished 'tippers' of his colleagues." Fabre did not care what anyone else thought of him. He was called in and reprimanded for his inappropriate attire, but simply continued to act in the unassuming but independent manner in which he had always taught. The fields around Carpentras were good home for insects; with these creatures rather than pedants he spent his free time.

Fabre soon produced a second masterpiece of observation and inference: the parasitic relationship between the Anthophora bee and the Sitaris, one of the Meloidae, diminutive beetles with astonishing habits and surprising metamorphoses.

Fabre observed that the Sitaris larvae, "miserable black mites," as he called them, wait at the cells of emerging bees in the spring. The males hatch first, so the Sitaris mite climb aboard the Anthophora male abdomen. Once the females hatch and are courted by the males, the Sitaris mites climb onto the females and then fall into the bottom of the cells prepared for the Anthophora larvae. The mites then consume and develop on the stores needed for these bee larvae, which in their own turn perish. Charles Darwin singled Fabre out for his distinguished work and called Fabre "the inimitable observer." He and Fabre corresponded for about two years, with Fabre disagreeing with Darwin's evolutionary theory. Darwin's theory the Frenchman thought was highly poetic and imaginative, but did not seem reasonable. Interestingly enough, Fabre, as far as I've read, did not counter fossil developmental connections and speculation nor did he react negatively to what today we call micro-evolution. Species certainly do adapt to influences in their environment, and Fabre provided Darwin with data that substantiated this sort of transitional change. But Fabre thought what he called transformationalism (Today we would call this macro-evolution.) was totally unsubstantiated and unreasonable. His reasoning was tied to his observation and subsequent analysis. For example, Darwin proposes with the principles of natural selection and survival of the fittest that organisms who "discover" advantages that favor their ability to thrive and endure will perpetuate those qualities in their offspring through random genetic mutations. Fabre observes that the instinctive faculties that make species successful could never be learned over time randomly, but rather are a result of an inexplicable, well-ordered providential principle he calls genius. For example, one species of wasp, the Scolia attacks only the rose beetle larva, paralyzing it blindly with one sting, instinctively applying its weapon precisely in the location of the one central nerve ganglia in the larva. A second species the Pompilius attacks the imposing Tarantula, stabbing the spider exactly twice—this time at precisely the locations of the two nerve ganglia. The Sphex stings three times each cricket it assaults, as you can guess, in the precise location of the three nerve ganglia the cricket possesses. Then the wasp compresses the head for greater stupefaction. And if that example is not sufficient, the insect Ammophila stabs its victim caterpillars nine times, one sting precisely applied to each of nine nerve ganglia. These insects attend no schools and receive no training to accomplish their maternal role as assassins. To speculate that some random genetic mutation or indefinite series of these mutations accounts for these insects' instinctive, cross-generational behaviors doesn't seem reasonable. So Fabre doesn't exclude the possibility of transformation, but says there is insufficient evidence to support such as conclusion. Darwin's and Fabre's exchange ended in 1883 when Darwin died before there could be any resolution in their

scientific debate. Both well respected the other though they strongly disagreed in their fundamental positions.

Fabre provides many examples of such unique entomological genius; he asserts it is entirely reasonable to believe in a special providential creation of these amazing creatures, who have no capability to reason or even recognize prudentially the world around them, but instead must rely on a blind, innate capabilities to behave singularly as they do. I do not have an exhaustive catalogue of Fabre's similar examples of traits that substantiate his position. Many of them involve sequential behaviors that unless they were perfectly performed at an exact time, a certain species could not continue. "At the right moment they invincibly obey some sort of mysterious and inflexible prescription. Without apprenticeship, they perform the very actions required, and blindly accomplish their destiny. Then, the moment having passed, the instincts disappear and do not re-awaken. A few days more or less modify the talents, and what the young insect knew the adult has often forgotten" (Lagros 170). Some examples involve steps in insect metamorphosis in which some characteristic present at one stage is not present in the next, but would be life threatening if it did occur. One wasp, for example, lays its egg in the cell of a host larva cell of a bee only after consuming all the honey that had been preserved in the cell for the incunabular host bee larva. The honey turns out to be toxic to the wasp larva, and the parasitic wasp Philanthus is preserving its young when imbibing the honey stored in the cell. In another case the Osmia bee lays male eggs in smaller cells and female eggs in larger cells, where she has stored greater provisions necessary to develop the young female bees. But even though the Osmia normally preferentially produces females, when Fabre only allows the mother access to small cells instinctively she lays only male eggs, even the survival of the Osmia is put at risk. Thus the ovipositor has an on/off switch of sorts in gender selection, a selection the mother can in no way be aware of herself. In one further example, Fabre examines the Lycosidae spiders who develop a climbing instinct upon hatching unknown to the adult spider. After emerging from the eggs they become Argonauts releasing a long, light thread which serves it as a parachute. Once the spider flies to its destination, no trace of ingenuity is left. Suddenly acquired, the climbing instinct no less suddenly disappears. What remarkable providential events! How unlikely are they to have evolved time through random evolutionary changes! And nature repeats this pattern miraculously in infinite variations. Contrary to Darwin's theoretical conclusions, the instinctive behaviors, Fabre asserts, have little or no necessary connection to physiological structures; sometimes insects with similar structures manifest very different behaviors. Parent insects generally abandon their young, and the new generation exhibits behaviors that

only could have been fortuitously provided by some unforeseen but nonetheless well directed guidance. This certainly of itself does not serve as a refutation to Darwinian evolution, but Fabre decides the evidence of his observations more objectively and conclusively support an infinitely creative deity who manifests his glory through His universe, which includes the many marvels of Fabre's beloved tiny insects.

Fabre did experience some worldly success and touched shoulders with some of the great figures of his day. He was appointed conservator of Requien's Museum in Avignon with its extraordinary collection of plants and received an annual stipend of L48, which allowed him to cease his supplementary tutoring. After working on ways of producing red dyes used in the manufacture of the French military uniforms for eight years, Fabre was honored by Victor Duruy, Minister of Public Instruction and Grand Master of the University, by receiving the French Legion of Honor, bestowed on the recipients by Emperor Napoleon III. Fabre could not wait to leave the sophisticated world of high society and return home. He worked four additional years in perfecting the formulation of the dye needed for the military dress, only to have his work taken by others who profited greatly by Fabre's unrecognized, unremunerated efforts. Still things seemed to be looking up. Fabre in 1865 met with the great scientist Louis Pasteur, who was investigating disease present in silkworms. Pasteur admired Fabre's genius, but was shocked by Fabre's poverty. The crowning blow was delivered when Pasteur, who had also worked with the fermentation process in the production of wine, asked to see Fabre's wine cellar, which cultured Frenchmen all enjoyed; Fabre pointed to a two-gallon jug on a reed-backed chair in the corner of his kitchen. Pasteur left in a sort of disdain for this man who lived such a humble life. At Avignon Fabre gave well attended free lectures, "celebrated in the memory of that generation. No one could teach as he did, in a fashion so simple, so animated, picturesque, and by methods so original" (Legros 81-2). He included "the spirit that gives life"; he decried mere servile utility (Legros 82). At the Requien Museum Fabre met the retired John Stuart Mill, who had moved to Avignon when Mill retired. Mill's wife died suddenly and the great English philosopher was grief stricken. Fabre commiserated with and struck up a deep friendship with Mill; they shared a common love of nature and together gathered botanical specimens. They often worked in silence, Mill dealing with his loss, Fabre pursuing his passion.

Then the small window of success Fabre enjoyed was closed; it even slammed shut. Fabre had offended officious clerics who objected to women being allowed at the public lectures. Likewise, this same teaching incited the intolerance of pedants, whose eyes, Fabre said, "blink at the daylight." Colleagues did not support him; some even denounced him as "a man at once dangerous and subversive" (Legros 87).

Duruy, who had supported Fabre, was removed from his post, and Fabre lost his teaching position and museum conservatorship. To make his situation even more dire, Fabre's landlady expelled him from his residence, and Fabre was left basically unemployed and homeless. Fabre, financially destitute, felt abandoned as he struggled against great misfortune. Fabre turned to the wealthy Mill and explained his predicament; Mill immediately loaned Fabre L120, for which Fabre remained grateful all the rest of his life.

> Far from the madding crowd's ignoble strife,
> Their sober wishes never learn'd to stray;
> Along the cool sequester'd vale of life
> They kept the noiseless tenor of their way.

By 1878 Fabre had accumulated sufficient studies to publish the first of his ten volumes entitled *Souvenirs Entomologiques*. These reflected thirty years of work and a lifetime of focused entomological research. But his life was still difficult. Fabre's sixteen-year-old son Jules died. Jules was, of Fabre's six children, the one who spent the most time sharing in his father's passion for nature; to the day Fabre died Fabre could not mention Jules's name without weeping. When his new landlady cut down the tree haven for birds and insects that was beside his rented house, Fabre felt even more desolate. Even his natural "friends" had been taken away.

In 1879, however, he at last decided to free himself from the burdens of the tedium, politics, and constrictions of working in the world. Fabre found a scanty plot of ground, a fallow hectare of abandoned field, where he could live and pursue his entomological studies in private seclusion. This harmas at Serignon, filled with brush, flowers, and insects, became Fabre's "laboratory of living entomology". Fabre used his seclusion and leisure to author thirty or so works for children in addition to his major 10-volume work. These dealt with many subjects from weather to plants to animals to geology; Fabre was able to capitalize on his generalist background and keen observation of everything around him to produce these many works. Legros encouraged parents to provide these books for their children:

> Give them as sole guides these exquisite manuals, which touch upon everything, initiating them into everything, and bringing in reach of all, for their instruction or amusement, the heavens and the earth, the planets and their moons, the mechanisms of the great natural forces and the laws which govern

them, life and its materials, agriculture and its applications. (Legros 96)

For a while these books provided Fabre's family with a good income. Someone commented these provided a "bird's-eye" view through all the windows of creation, and represented a major step forward in bringing an accurate, reflective view of natural history to the general population of France. For more than a quarter of a century these catechisms of science, models of lucidity and good sense, effected the education of generations of Frenchmen. But they were printed cheaply by Fabre' publisher, and other fancier though much more superficial and less well-written pulp juvenile science books replaced Fabre's in sales.

Fabre's last thirty years were rather private; his last years sedentary. His teaching career lay behind him but strong memories remained. His students vividly remembered him; his girls from the Avignon free lectures sent him a clock which remained on Fabre's mantle until the day he died. Fabre wrote a great deal and labored as diligently to write well as he had studied for long hours in the field. He would walk around his writing table as he formulated ideas and carefully crafted his prose. But he continued to spend many hours in the fields, studying the humble creatures that had inspired him all his life. Fabre was not afraid to challenge accepted authorities, whether they be venerable ancients like Pliny or tellers of tales such as La Fontaine. The test of truth Fabre always thought was in things, and Fabre's sharp discerning eyes saw deeply into the reality of the world around him. That view was sympathetic; he said "there is no communion with nature without sentiment and emotion and that intelligence must be at the service of feeling and intuition."

Fabre lifts his observation ultimately to consider the fundamental questions of human existence. His intense joy in the extraordinary beauty of creation is tempered by his recognition of the tension and conflict sewn into the very fabric of life. Death, he says, is everywhere, and in nature there is no peace. The battle between Good and Evil is always present in nature, with destructive forces always trying to undermine the integrating order of the universe.

> What marvels indeed when seen from above! But consider the Reverse—what antinomies, what flagrant contradictions! What poor and sordid means! And Fabre is astonished, in spite of all his candid faith, that the fatality of the belly should have entered into the Divine plan, and the necessity of all of those atrocious acts in which the Unconscious delights. Could not God ensure the preservation of life by less violent means? Why these subterranean dramas, these slow assassinations? Why has Evil, the poison of the Good, crept in

everywhere, even to the origin of life, like an eternal Parasite? (Legros 233)

Fabre passionately observed the intensity of the short-lived insects. He witnessed the insect pairs urgently seek to mate and reproduce. He watched the males, having fertilized the eggs, be often consumed by their mates, as if sacrificing themselves to furnish enrichment for the eggs developing inside their mates. He witnessed the incredibly strong maternal instincts to provide for larvae that mothers would never see; to sacrifice everything for the good of the next generations; and then for the next generations to repeat blindly and inviolably what their ancestors had done. Fabre saw love as the chief principle of all life, but wondered why love had to play out so violently in the tapestry of life. And he saw the marvelous pageantry of the insect world so often, in his words, come from the offal, the waste from other life. Dung beetles live of of fecal waste, digging beetles and carrion beetles live off of decaying flesh, flies do the same, extending their nourishment to decaying vegetable matter as well. Hosts of parasitic insects live within and eat the interiors of paralyzed hosts. As God created Adam "ex limo" from slimy mud as best translated, so God the imminent Creator continues to create the marvels of the insect world from humble, even somewhat repulsive matter.

Fabre's solitary life his last thirty allowed few intrusions. His aging father lived with Fabre's family for a while. Fabre enjoyed the company of the local schoolmasters Jullian Laurent and Louis Charrasse, a blind assistant named Marius, and of his second wife with whom he had three children; these became Fabre's eyes, hands, and legs after he became an octogenarian. And he enjoyed the return of his daughter Aglae, born of his first wife, who came to live with her aging father at Serignan. Fabre was honored three years before his death by a festival to celebrate his life's work. This served as a national gesture of gratitude and a recognition of Fabre's achievements; his biographer relates this final great event in Fabre's life:

> The festival took place on the 3rd of April of the year 1910, and was touching in its simplicity. What an unforgettable day in the life of Fabre! That morning the gate of the Harmas was left open to all, and many of the people of Sérignan who invaded the garden were able to look for the first time on the face of their fellow-citizen, who had so long lived among them, and whom they had now, to their astonishment, discovered. But among the crowd of friends and admirers who, coming from all parts, pressed around the little pink house, the most amazed of all was Marius, the blind cabinet-maker, unable to contain his intense delight at the sudden burning of so much incense before his idol, for to

him it had seemed that this day of apotheosis would never dawn!

Among other compliments and marks of homage the old man was presented with a golden plaque, on one side of which Sicard, who stood revealed as a master of the burin, had engraved his portrait with rare fidelity. The reverse was resplendent with one of the most beautiful syntheses which the history of art has known; a surprising allegory, in which the imagination of the artist evoked the man of science, the singer of the insects, the landscape which had seen the birth of so many little lives, and the village amid the olive-trees, in front of the sun-steeped Ventoux.

At this festival, the jubilee of a scientist, the scientists were least numerous. The banquet was given in the large room of a cafe in the midst of Sérignan; in order, no doubt, that in this humble life even glory should be modest. As Fabre could not walk, he was helped into the carriage of ceremony, which was sent expressly from Orange, and the little procession, which was swelled by the municipal choral society, spurred on by Marius, moved slowly off along the sole central street. Edmond Perrier brought the naturalist the homage of the Institute, and expressed in unaffected terms the just admiration which he himself felt. The better to praise him, he gave a summary of his admirable career, and his immortal work. At the evocation of this long past of labour Fabre regretted his poor vanished joys, "the sole moments of happiness in his Life." Moved to tears, by his memories and by the simple and pious homage at last rendered to his genius, he wept, and many, seeing him weep, wept with him. Others spoke in the name of the great anonymous crowd of friends, of all those who had found a source of infinite enjoyment in his works. At the same time the greatest writers, the greatest poets sent on the same day, at the same hour, their salutation or eloquent messages to the "Virgil of the insects" , to the "good magician who knew the language of the myriad little creatures of the fields."

His biography written by G. V. Legros began with an epigraph chosen by Fabre himself: Fe *fimo ad excelsa*, translated "From offal to the heights." Several of Fabre's definitive works detailed the life and instincts of dung beetles. These beetles, of which there are several species occupied over fifty years of study for the scientist. One of these the Scarab beetle gathers its balls of dung, tumbles them over the ground to its chosen tunnel, rolls them into a central chamber, molds a four-inch pear-shaped form, hollows out a small depression and the lays a single egg. The beetle larva feeds on the waste gathered and emerges as the attractive insect worshiped in Egypt as an image of the god who rolls the sun through the sky, over the horizon, and under the Earth until rolling it up the next day. Thus the Scarab was regarded as sacred and its image was as holy for the Egyptians as the Cross is for us Christians. The beetle

operates as a sort of waste processor; the dung placed under the earth preserves the manures nutrients and thereby enriches the soil. There is no question that Fabre connected the humble humus of the earth to the transformed heights to which he brought human understanding by means of creatures such as the scarab beetle.

Fabre could have been recognized as a forerunner promoting the cause of equality of women in education. He could have been recognized as a leader in initial environmental concerns and an active promoter of agricultural research.

> To know thoroughly the history of the destroyer of our vines might be more important than to know how this or that nerve fiber of a Cirriped ends; to establish the line of demarcation between intellect and instinct; to prove, by comparing facts in the zoological progression, whether human reason be an irreducible faculty or not: all this ought to take precedence of the number of joints in a Crustacean's antenna. . . . The depths of the sea are explored with many drag-nets; the soil which we tread is consistently disregarded.

Fabre wanted to lead no causes; he simply wanted to go to the fields and to observe, describe, and then meditate on the creation he saw unfold before his senses. He said, "While waiting for the fashion to change, I open my harmas laboratory of living entomology; and this laboratory shall not cost the taxpayers one farthing" (*Passionate Observer* 14). *Hoc erat in votis*. That is what Fabre chose to do; his work provides a template for St. Martin's instruction—may we go to the fields with open investigating eyes, fertile imaginations, and sympathetic hearts; all to work finally for the glory of our God and the service of our fellow man, whether others recognize our efforts or not.

If this be our gift—to educate young men so they might develop a trained eyes, formed intellect, disciplined moral character, physical strength, and spiritual integrity—then we must retreat to our harmas, our scanty plot of ground to till and cultivate according to our vocation the fields of heaven, where they toil not neither do they spin. In the meantime, let's get to work! In the words of the French, "Allons y!"