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D. PAREUS, ON THE ABRAHAMIC COVENANT.

BREETEE—*foedus meum.*

Why is this covenant, evidently mutual, called *God's covenant*?

A. 1. Because the covenant originated in the free and sovereign grace of God.

2. Because it was enforced by divine authority; God being the first and principal party contracting, and we the second.

3. Because, by this covenant, we are made partakers of God's rich munificence, (*immensa liberalitas*;) while we confer nothing upon God—

“*Ipse dat, nos capimus, foederis bona.*”

In Moses' account of this covenant, the following particulars are to be noticed.

I. The institution of circumcision, and how it was to be administered. Gen. x. 10, 11. II. The design and use of this seal. Ver. 12, 13. III. To whom and when it ought to be administered. ver. 10, 12. IV. How

But if thy peace of mind remain,
Then my speaking is in vain :
Still believe me honour'd Lord,
One moment's peace I'd not disturb—
Didst thou but know the healing word.
Art thou more noble than the ancient kings,
Or him to whom Paul spoke converting things ?
Or wouldst thou be more blind than he
Just for a moment's sweet security ?—
O ! give thy thoughts a better channel,
As we our waters to the new canal ;
Then come and see the grand design,
Which to our *theme* is but a pantomime.

DISSERTATION ON THE MUSQUITOE,

Read in the Newburgh Lyceum, by Jas. R. Willson, A. M.

The subject to which the attention of the members of this Lyceum is invited, in this short paper, is the Musquitoe ; and it is not selected for the purpose of trifling with your time, by displaying the mere amusements of Natural History, but with a view, if possible, to excite the zeal of our younger members, to active researches into the kingdom of animated nature.—Should I be so happy as impart any interest, in a few remarks on one of the humblest species of the great assemblage of living beings ; its tendency must be to awaken a desire after the knowledge of the more noble.

Before I proceed to give the history of the species, it is proper that the place which it occupies on the great map of animated nature, should be settled. It belongs to the family of insects ; the description of which is called entomology. The limits of this depart-

ment of nature were first settled by Linnæus. The term entomology, is derived from *εντομα*, *insecta*, and *λογος*, *ratio*. As much order has been introduced into this, as into any other subject of natural history; an order any one may see, by examining Linnæus' *Systema Naturæ*, especially the later editions, which were published by the author with many improvements. I cannot altogether agree with a remark made in the very learned and eloquent address, read before the New-York Alpha of the Phi Beta Kappa, at its late anniversary—that the science of entomology has been almost utterly neglected. It is true that numerous species are very imperfectly known, and that owing to the minuteness of the subjects, the physiology of insects has advanced slowly. But is not this true of many varieties, if not species of plants? Is not the physiology of vegetables yet in its infancy? I heard the Abbe Carrea say, judiciously as I think, that “the physiology of plants was a log house beyond the mountains.” Geological investigations have not yet advanced beyond the threshold of nature. Though before Linnæus, not more than 200 species were described, yet in the last edition of his *Systema Naturæ*, he defines 3000. Since his time, entomologists have increased the number to 18,000, of many of which, specimens are to be found in the cabinets of the curious. Very many of them are exhibited on the shelves of Peale's Museum, in Philadelphia, elegantly arranged.

The lines of demarkation, too, between insects and all the other families of animated beings, are accurately drawn by Linnæus, who distinguishes them from hupocampe, pike-fish, and other amphibious animals; as well as from the *vermes*, with which they had been con-

founded until his time, but from which they are as distinct as birds from the mamalia. All insects have heads, feet, and antennæ, none of which belong to the vermes.

Having ascertained their station, a few remarks may be made as to their perfection and dignity, in relation to which there has been some controversy among naturalists. Some contend that they are more perfect than the larger animals ; because, however minute the most of them are, they are still perfectly and most curiously organized. The amazing strength and industry of the ant ; their affection for their young, in conveying them to where they can procure food for themselves, and in carrying away with care even their dead bodies ; the sagacity, economy, labouriousness and social order of the bees ; the exquisitely beautiful tints of the papilones ; (butterflies ;) and the musical powers of the cicada, (wood cricket,) displayed by the most simple apparatus, are thought to establish their title to more dignity and perfection, than those animals which are commonly esteemed to be more noble. These and numerous other wonderful properties, do indeed exhibit the astonishing wisdom of the Creator, and lead to adoration of his excellency, while they impart delight to the enlightened and enthusiastic student of nature. But we must not be zealous in the advocacy of their claims. They have many marks of comparative imperfection. They live long, when deprived of some of those organs necessary to life in the larger animals.— The caterpillar lives though its heart and lungs are entirely destroyed. Their instincts cannot be improved by culture, as those of the horse, dog, &c. ; even did the length of their lives correspond with that of the larger animals, their existence is too brief to make the

attempt. Their countless numbers, is another evidence of their imperfection. The meaner kind are multiplied with a lavish profusion, while the more important, and noble, are produced with a dignified economy. The terminology of this branch of natural history, is settled in a definite manner, and is much more simple than that of botany, while it has connected with it some curious physeological facts, that import considerable interest to the learner. Though insects have all heads, yet they are not furnished with brain, nor is it known that their medullary cord is an organized substance. though the function which this organ is destined to perform, renders its organization probable. They have certainly the power of hearing, otherwise they would not utter sounds, especially musical, as many of them do ; but where the organ of hearing is planted, or what part of the insect is occupied by the auditory nerve, has never been ascertained. They respire through pores, which are termed *spiracula*, and which are placed on the sides of their bodies. They are endowed with the power of vision, and have generally two eyes each, with one lens only ; though in the diptera, (butterfly,) and in some beetles they are numerous. In the cornea of a butterfly, Pugett says he discovered 17,325, and Lieuwenhoek, that he counted 800 in that of a common house fly. Whether they have the sense of smelling, has never been ascertained, though when subjected to strong fetid effluvia, it is evidently disagreeable to them; but this may have been the effect of its action on the spiracula, as exciting inflammation, or some other diseased state of the system, and not any influence on nerves appropriated to the olfactory functions. Their lives are generally short, and in the course of their

transitory existence, they pass through many remarkable metamorphoses, so that their appearances in one state, bear no resemblance to those of another.

But I have detained you too long on the properties of the class, and yet I must enlarge a little on the genus, to which the musquitoe belongs, before treating of the species.

This genus belongs to the order of diptera, (two-winged,) and is among the smallest of the visible insects, and is by countless myriads more numerous, than the larger species of their class. In the genus *culex*, there are seven species, and to them all the following outline of their peculiarly interesting history applies. Before they exist in the form of flying insects, they are what Lord Manboddó, and some other infidel philosophers have said our original ancestors were, a kind of tadpoles, or fishes, and these of two distinct forms.— From the commencement of the warm season in May, until the frosts in autumn set in, they may be found in stagnant and putrescent waters, of the figure of small grubs, poised perpendicularly, the head downwards, and the hinder part just visible above the surface. That part which is exposed to the air, is furnished with a funnel-shaped tube, which performs the function of a trachea or windpipe, through which they breathe, and by means of which their blood (if the fluid that circulates through their vascular system, will bear that name) is probably oxygenated. With the hooks that arm its head, it seizes on still smaller insects, makes them its prey, and on tender blades of grass, on which it feeds; for like man, it is both carnivorous and graminivorous. It is furnished with four small fins, that

enable it to swim, and even, like the whale, to dive and continue at the bottom, until it needs a fresh supply of vital air. In this aquatic state the larvæ continue for two or three weeks, and then changing the condition of their existence, are transformed into chrysalids. The chrysalis, is a stage in the progress of an insect's life, intermediate between the larva and butterfly states. It is sometimes encased in a corset of very firm texture, sometimes enshrouded in a robe of many folds and delicate texture. It takes no nourishment, is incapable of hastening the process to the butterfly state, and must wait until set free by the operation of constitutional energies, over which it has no controul. Some insects remain chrysalises for no more than a few days, others for many months. Even in the same species, some individuals are much longer detained in this transitive state than others. In the various tubes of insects, the chrysalids assume a very great variety of figures; some are spherical, others of the tubular form, others conical, others nearly square, others spiral, &c. From their forms, the skillful entomologist can refer them to their several species. By covering them with certain preparations, they can be long preserved, so that they may be dissected from the chrysalis envelope. Eggs, which have been compared with the insect in the chrysalis state, may be preserved for years by the same means.

The chrysalis of the *culex* is of the spiral form. The organ of breathing, consists of two openings near the head, and occupies the situation of the stigmata, through which the insect is to breathe, after its next transmutation. It lies on the surface of the water, for the purpose of breathing, and upon the slightest agitation,

unrolls its spirals, and descends to the bottom, by means of two fins placed behind. Three or four days it continues in this state of total abstinence from food, and then is metamorphosed into a gnat. The head first bursts the envelope, its wings are then disengaged, and expanded, but it is not prepared to fly; for it still adheres to a part of the robe which clothed it when a chrysalite, and which, like the paraschute of the aeronaut, in descending from his balloon into the sea, is converted into a ship in which it sails—itsself the mast, and its wings the canvass. A storm is always frightful to a young mariner, but the slightest breeze is an awful tempest to this insect, and attended with the most fatal consequences; for the little vessel is swamped, sinking with its passenger, to rise no more. *Sic transit gloria culicis.* But should the weather be calm, it is, after a short voyage, disengaged from the bark, spreads its wings, becomes ærial, and revels in luxury upon the blood of man and beast.

Small bristles, in the point resembling stings, are inclosed in a flexible sheath, which forms the mouth. These spicula, five or six in number, and exquisitely minute, enveloped in the sheath, form, what appears to the naked eye to be the proboscis, or, as some call it, the sting. Some of the sheaths are shaped like an arrow head, others are like the edge of a very sharp knife.

The insect is furnished with two antennæ, or feelers, two wings, and six legs. The leg has two joints, uniting at the shoulder, arm and tarsus; the articulation at the joints is formed by firm ligaments like those of the cancer or crab. They procreate in the air; and the

female deposits her eggs on the surface of stagnated waters, one close by the side of another, to which it is attached by a glutinous substance. Three or four hundred of these, the product of one female, are commonly united together, and form a vessel which floats on the surface. Should a storm overtake it, the frail bark sinks, and all perish together. But in favourable weather, their incubation is effected in a short time, by the warmth of the water. All these transformations are accomplished in about one lunation, and so every month there is produced a new race, consisting of myriads so innumerable, that were they not devoured by small birds, and other larger carnivorous insects, the air would be darkened by clouds of them, near to stagnant, marshy places, where they are most abundant.—“How manifold, Lord, are thy works in wisdom wonderful.”

This detail of the history of the genus, illustrates that of the *Culex pipiens*, (musquitoe,) as well as the other five species. The musquitoe is more annoying to man than any other species of its genus. It is somewhat larger and more ferocious. Its abdomen is party-coloured, green, yellow, and lurid, like noxious reptiles, and beasts of prey, as the rattle snake, tyger, &c.

When the musquitoe lights on the hand or any other naked part of the body, it travels over the skin, applying its feelers, as if looking for some vein, rich with blood, and lying near the surface. Having fixed upon the spot that suits its purpose, it poises itself with its wings, stretches back its two hind legs, which are much the longest, while its fore and middle legs, are firmly stationed; it then thrusts its proboscis into the skin,

with great force and dexterity, while the hind legs, that appear to be made long for that special purpose, are drawn up to add force to the proboscis, for penetrating the integuments. As soon as the vein is pierced, the blood, on the principle of capillary attraction, ascends the small spicula articles inclosed in the sheath. The blood, however, that is thus sucked up is not pure; for as soon as the vein is penetrated, a small quantity of liquor is injected, from the proboscis, by which the blood is diluted, and undoubtedly rendered more appropriate for the nutriment of the rapacious little animal. It is the injected liquor acting as a poison that produces the disagreeable itching, that ensues on the bite of the musquetoe, and not the wound which is too small to excite the inflammation. Rubbing and washing with cold water, if attended to immediately, or an application of volatile alkali, cures speedily the disease. The effects would be still more unpleasant did not the insect suck up with the blood the poisonous diluting liquor very copiously; for like the lion, the tiger, the fox, the drunkard, the glutton, and the miser, it does not let go its hold until it is red, swollen and gorged, so as to be often incapable of flight, or other locomotion, until the system works off the surfeit: When their forces are very numerous, they issue from their marshes in squadrons innumerable, to plunder their more noble and unoffending neighbours, like the Turkish hoards to rob, murder and plunder the Greeks, or like the armies of the holy alliance to glut themselves with the blood and spoils of the Spaniards. An instance of this kind I witnessed, last August, in New-Jersey, between Elizabethtown and Newark. They

are numerous every summer in the region around the extensive swamps bordering on Newark-bay. But I apprehend the copious rains and hot suns of last season, which rendered fever and ague, dysentery, spotted fevers and other billious affections, very mortal and extensively prevalent in that district, had increased their numbers far beyond those of ordinary years. Between ten and twelve o'clock in the forenoon, under a clear sky and burning sun they covered both men and horses in such multitudes that they might have been swept off in handfuls. But in common cases, like the thief, they commit their depredations, in the shades of the evening, or in the darkness of the night. If there is any ingress, they invade the bed-chamber, giving no other signal of the attack, but a melancholy humming, produced by vibrations of their wings when hovering over their sleeping prey.

They are most abundant in high northern latitudes, where stagnant waters are more readily rendered putrescent by the summer suns. On the shores of our northern lakes, and around Hudson's bay, their swarms fill the air, and in our own state we have a place called Musquitoe Point, because it is perhaps thought to be their head quarters in the United States. Yet they are often found in lower latitudes in great numbers, very large and mischievous; as along the banks of the Mississippi, from the mouth of the Ohio, to New-Orleans, and in the marshes of the Lake Ponchertrian.

What beneficent purposes do these insects subserve in the economy of nature? They are doubtless useful, for God has made nothing in vain. We may not indulge the supposition that the innumerable hosts of

these insects of exquisitely delicate structures, and passing through so many curious transmutations, in the short course of their fugitive being, as almost to equal the metamorphoses of Grecian and Roman mythology, to whose origin they perhaps contributed, was not designed to answer some benevolent purpose in the wise economy of animated nature. They were among the living creatures which the waters brought forth abundantly in the infancy and innocence of the world; and were not designed for punishment to sinful, fallen human beings, however, they are now employed as the instruments of Heaven's displeasure. They afford provision for larger insects, that prey upon them, and these again to ample tribes of small birds, whose beautiful plumage delights the eye and imparts life and loveliness to rural scenery,—to birds whose harmonious notes fill the groves with melody—and whose flesh replenishes our tables with some of the choicest delicacies. Their production too from stagnant waters possibly diminishes the quantity, or at least the virulence of the noxious gasses there generated. Perhaps originally all these gases were no more than sufficient for their generation and food.—Analogy strengthens this theory. The larvæ, chrysalids, and flies that are produced in putrescent animal matter do certainly diminish the putrid effluvia originating from this source. We may add to all this, that the pleasure enjoyed by the insects themselves, is not to be overlooked in accounting on benevolent principles, for the fact of their existence; because however short the term of their life is, its changes must present to them new sources of enjoyment which are

doubtless considerable ; and the scene of the enjoyment of the whole race in its innumerable myriads cannot but be great. Their very annoyance of human beings may answer the good end of admonishing us to drain, correct and cultivate our barren marshes, and convert them into luxuriant meadows.

Their collecting in swarms around nobler animals to suck their blood, may remind us of the conduct of some men, who swarm around nobler and better men for no other object, than that for which the musquetoe fastens upon the lion—to sting and bleed him. Such men's character should be examined rather by the entomologist, than by the intellectual philosopher. Their littleness, their buzzing, their sting, their impertinence are properties that assimilate them to the insect class ; especially to the mischievous little genius of the culex.

In fine, the successive and marvelous changes of this curious little insect, furnishes a striking emblem of a subject of more delightful contemplation. What are now aquatic larvæ, are destined ere long to sail in gallant trim through the aerial fluid, and expatiate on spreading wings over tracts of air, so the good man, "sown in weakness is raised in power ; for this corruption shall put on incorruption, and this mortal shall put on immortality." He who furnishes wings for the flight of the larvæ, will accomplish this glorious change.

Bishop Hobart, of New-York, after having been for some months, in habits of intimate association, with the Episcopal bishops of England, is now preaching to large congregations, in the city of seven hills.

In Political Danger, page 157, line 17, for theory, *throne*.