

PARTHENOGENESIS.

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Recent experiments of the Abbé Giotto Ulivi call in question the theory of parthenogenesis, which is at present almost universally received by beekeepers and other entomologists. Briefly stated, this theory is that queens, while yet in the virgin state, may lay eggs capable of hatching, and that such eggs always produce drones. After the queen has mated with a drone and stored up the spermatid liquid so received in a little vesicle, she may lay at will either drone or worker eggs, according as she does or does not compress this little vesicle at the moment the eggs pass it. Some of the evidence on which this theory rests may be found in an article entitled "Modern Bee Keeping, No. IV.," in the *Scientific News*, November, 1881, p. 345. The received theory also requires that queens and drones can mate only when flying, and that the drones perish in disengaging themselves because they cannot withdraw their organ.

All this is denied by Ulivi. He constructed flat observation hives, in which three combs were placed, one above the other. The two sides were of glass and could be darkened with shutters. Each hive was furnished with a closed tin portico having glass slides and a trap which could be so adjusted as to allow or prevent the passage of queens and drones. By the aid of these hives he performed three series of experiments. In the first series they were filled with bees, stores of honey and pollen, worker and drone brood, and queen cells sealed and unsealed; in the second series the queen cells were left out; and in the third there were no queen cells, drones, or drone brood. In none of the experiments was a queen put into the hive. He then made the following observations:

In five hives the queens, without leaving the hive, were fertilized and laid eggs that hatched into workers and drones.

In four hives he saw the queen mount a drone and curve down the extremity of her abdomen so as to bring it in contact with his virile member. This organ was at least three times too thick to be inserted into the vulva. Fertilization must, therefore, take place by mere touch. Indeed the fertilization of small Egyptian queens by large Italian drones could take place in no other way.

In two hives newly hatched queens were allowed to fly and were captured on their return. They brought with them the ordinary whitish appendage to their abdomen, which has hitherto been regarded as the wrenched-off organ of the drone and the evidence of impregnation. On examination under the microscope this appendage was found to consist of excreta entirely soluble in water and containing no fleshy filaments. The drones of these hives were then imprisoned, and the queens returned to their hives. They laid eggs regularly, but these eggs never hatched. Then the drones were liberated in the hives, the queens mounted them, and the eggs they laid after that hatched into workers and drones.

In three hives the newly-born queens were allowed to fly several times until they returned with the usual appendage to their abdomen. Then they were confined in hives containing no drones or drone brood. One of them did not lay at all. The other two laid eggs regularly, but these eggs never hatched. The two laying queens were then killed and examined, and the three nuclei united and put away for winter. The surviving queen never laid an egg. The following January she was also found dead and examined. In March the colony had neither an egg nor a drone, although there had been plenty of time for a fertile worker to develop if there were such a thing.

It is generally believed that one fertilization lasts a queen for life; but Ulivi saw three queens that had laid fertile eggs refertilize themselves by mounting drones.

He dissected five fertile queens and removed mature eggs ready to be laid from their oviducts just before they passed the spermatid vesicle. These he substituted for others that had been freshly laid, removing the latter to other cells, and isolating both from the other eggs in the hives in which the experiments were tried. The removed eggs hatched, but those taken from the oviducts did not. Under the microscope, six days later, they showed no embryos nor any indication of vitality.

He isolated queens from drones for twenty days and dissected them. Their spermathekas were empty.

He caused queens to hatch in cages, so as effectually to exclude drones, and kept them caged for a long time. On dissection their spermathekas were found empty. The eggs they had laid never hatched.

He caught queens on their return from their so-called wedding flight. Although they brought with them the whitish appendage supposed to be the male organ of the drone, the microscope showed their spermathekas to be entirely empty.

He dissected thirty queens just hatched, and found their spermathekas empty.

He captured a young queen immediately after she had mounted a drone, and found her spermatheka distended and filled with liquid.

He concludes that Leuckardt, who dissected a drone-laying queen, and found no spermatozoa in vesicle, but only a clear liquid, erred in pronouncing her unimpregnated. The clear liquid in the spermatheka was nothing but drone semen.

Having had occasion to transfer a large number of colonies from old-fashioned into movable frame hives, he observed that, contrary to the established belief, old queens do not lay a disproportionate number of drone eggs. They laid

fewer eggs than young queens, but the number of worker eggs greatly exceeded that of drone eggs.

Signor Ulivi, therefore, maintains that:

1. Queens are usually fertilized inside the hives.
2. They are fertilized several times.
3. Drones are not mutilated in the act of copulation. It should have been mentioned above that he several times examined all the drones in a hive in which impregnation had taken place, and found none of the drones lacerated.
4. Every egg that hatches into a male or a female has been previously fecundated with drone semen; hence there is no such thing as parthenogenesis in bees.
5. Every queen whose spermatid vesicle is distended and filled with any liquid whatever has been fertilized.
6. The eggs of a queen that has never met a drone will not hatch.
7. There is no such thing as a fertile worker.

To explain the last conclusion it is necessary to add that Ulivi found by experiment that fertile eggs will keep through the winter and will hatch in the spring. Hence some who have put away colonies queenless in the winter and found brood in them in the spring have been deceived into believing that a worker had assumed maternal duties.

These experiments and conclusions are of the greatest scientific interest as well as of practical utility. If confirmed they will entirely revolutionize an important branch of the beekeeper's industry. The author hopes to have an opportunity of testing the matter by experiment. Comments not supported by experiment would be of little value.

Prehistoric Races of America.

In his lecture before the New York Academy of Sciences, the other evening, on the "Prehistoric Races of the American Continent," Prof. John S. Newberry furnished, perhaps, the finest and most lucid summary that has yet been given of the present state of our verified scientific information as to the mound builders, the house builders, the Aztecs of the South, and the condition of the arts of civilization among these representatives of lost types. So many ingenious scientific romances have been elaborated by speculative antiquaries as to the origin of these races and their possible relation to the prehistoric types of the Old World, that such a résumé as Dr. Newberry gave of what is actually ascertained or fairly inferable from the data of mounds, pottery, inscriptions, textile fabrics, and other remains, is peculiarly valuable to the general student, who, bewildered by speculative theories cleverly interlaced with facts, and sadly puzzled by remote inferences stated as verified information, finds himself without a starting-point for the formation of an opinion. While not sharing in the fanatic enthusiasm that places these races in advance of the contemporary civilizations of the prehistoric races of Europe and Asia, and while taking no part in the endeavor to trace a relation between them, Dr. Newberry concedes their progress in certain arts and the magnificent scale upon which their public works were constructed. He regards the mound builders of the Valley of the Mississippi, among whom the symbolical form appears to have been neglected in the construction of their works of sepulture, and the races further west who built in the forms of birds and now extinct animals, as belonging to the same primitive stock, now probably represented by a few tribes of Western Indians—Indians so called for want of a better name, but differing in ancestral descent from the savage hordes to whom that term has been appropriated as widely as the Arab differs from the Persian.

Unfortunately for science, and, perhaps, for Dr. Newberry's view of the subject, the remains of textile fabrics that were buried in the mounds have been destroyed by time and dampness, with the exception of a few shreds, which have been preserved by the salts of copper generated by the utensils with which they were originally interred. These shreds are not sufficient to establish an identity of design between the textile products of the mound builders and the curious blankets manufactured by certain house building tribes extant at the present day. Evidences derived from physical structure are, however, by no means to be disregarded in such cases, and here the testimony is strikingly in favor of the hypothesis that the descendants of the mound builders are to be sought in certain types of so-called Indians in the far West. Dr. Newberry has made a large and valuable collection of the textile fabrics bearing upon the question, and it is a singular fact that the distaff in use among these tribes and the mode of weaving are exactly identical with those of the ancient races of the Old World. One must not be misled by such coincidences, which, though striking and curious, are, like philological analogies and resemblances of root words, to say nothing of designs in the decoration of pottery, insufficient grounds for the assertion of a theory. If, as prehistoric geographers contend, the area now occupied by the Indian Ocean was once the seat of a densely populated continent, it is very possible that some historical relation may be finally made out between the primitive races of the great continents on the surface of the globe, but at the present juncture, as Dr. Newberry shows, there is not even sufficient basis for the most shadowy impression to that effect.—*N. Y. Times*.

Wolves in France.

For a country so long settled and well peopled as France, to be grievously afflicted with wolves, which not infrequently attack men and women, seems a little queer. But the secret of their persistent life may possibly be found that the killing of wolves is deputed to certain officers whose business

would fail if the wolves were exterminated. The country folk do not hesitate to charge the official wolf hunters with more discretion than vigor in the performance of their duty. The position of "lieutenant de louveterie" is much coveted, and it is a pleasant one, both for the holder and his friends, as regards hunting, shooting, and social intercourse in the lieutenant's district. The rewards for killing a wolf are now very small, ranging from one to three dollars. The departments most infested demand an increase to fifty or a hundred dollars, so as to make it worth the while of good shots and expert poachers to devote themselves to wolf-destruction. Elisee Reclus has computed that there are 3,000 or 4,000 wolves still in France.

French Field Mice.

Darwin's now familiar paradox, that the fertilization of certain flowers may depend upon the number of cats in their neighborhood, has an illustration now in France, where it may even be carried a step further. Any observer who knows the French rural districts well must be struck by the immense number of mouse holes which may be seen in some places. The surface of the ground at times has quite the appearance of a network of little burrows, where it would be impossible for one of the field-bees required for the fertilization of Mr. Darwin's flowers to find a secure spot for its nest. In the department of the Aisne alone it has just been calculated by a special commission that these field mice have cost the farmers no less than thirteen million francs. The climate seems to be especially favorable to these creatures; and, the population being sparse, the number of cats is few, and the mice increase and multiply beyond belief. Arsenic has been tried in the open; but the hares and rabbits get killed first; and now the plan adopted is to construct heaps or small stacks of straw, to which the mice resort in myriads. These heaps are placed partly below the level of the ground, and securely packed and covered in; being first stored with poisoned beet root, turnips, and carrots. This plan is said to be succeeding well, and without harm to the hares and rabbits.—*Pall Mall Gazette*.

Development in Foot Racing.

The winner of the six day "go-as-you-please" contest, which began in this city February 27, made the unparalleled record of 600 miles. The second in the race covered 577 miles, beating every previous score save his own of 582 miles made in this city a year ago. The winner, Hazael, was on the track a few minutes short of 106 hours.

The scores made by the winners of the various six-day contests that have taken place since 1878 stand as follows:

	Miles.
O'Leary.....Astley Belt, London, March, 1878.....	520½
Rowell.....Astley Belt, New York, March, 1879.....	500
Weston.....Astley Belt, London, June, 1879.....	550
Corkey.....First race Championship of England, 1878.....	521½
Brown.....Second race Championship of England, 1879.....	542
Brown.....Third race, Championship of England, 1880.....	553
Hart.....Rose Belt, New York, September, 1879.....	540
Murphy.....O'Leary Belt, New York, October, 1879.....	505½
Hart.....O'Leary Belt, New York, April, 1880.....	565
Rowell.....Astley Belt, London, November, 1880.....	566
Panchot.....O'Leary Belt, New York, March, 1881.....	541½
Hughes.....O'Leary Belt, New York, January, 1881.....	568½
Fitzgerald.....Ennis Race, New York, December, 1881.....	582
Hazael.....Contest at Madison Square Garden, March, 1882.....	600

In the last race, Rowell, who broke down, ran on the first day 150 miles in 22½ hours, the first 100 miles being covered in 12½ hours.

Icebergs.

Ice fields and icebergs appeared off Newfoundland nearly two months earlier than usual this season. The steamship Averill, from West Hartlepool, England, was the first to tell of ice on the Banks, having sighted it in latitude 47° north, longitude 47° west, on February 11. She was surrounded for twelve hours. Nearly every day since then the arriving steamships have reported ice, which has drifted to the southward and eastward. The steamship Vandalia, which passed around the ice field, February 11, sighted two towering bergs about 60 feet in height and 120 and 200 feet on the sides.

The White Star steamship Germanic, from Liverpool, reports that on March 1, in latitude 43° 35' north, longitude 49° 10' west, she was confronted with a great field of ice, and did not reach clear water for two hours. This seems to indicate that the ice extended for at least twenty-five miles. As no icebergs were seen, it is probable that in floating 205 miles to the southward and about 90 miles to the eastward they crumbled under the influence of warmer waters. The Belgian steamship Helvetia encountered a field of ice and icebergs, and was forced to run to the southward 80 miles before she got to clear water. The steamship New York, from Bristol, fell in with large fields of ice and bergs, varying from 60 to 300 feet in height, and ran a south-southeast course for 160 miles at slow speed before she found open water. The British steamship Milanese, from Boston, February 18, for London, was so seriously damaged by the ice on the Banks of Newfoundland that she put back to Halifax for repairs.

Herbert Lawrence.

Herbert Lawrence, who died recently in this city, at the advanced age of 94, was one of the oldest shipbuilders of this port. He became a member of the firm of Sneden & Lawrence, shipbuilders, in 1816. Their first boat was the Bellona, Cornelius Vanderbilt, captain, launched in 1817. They launched the first Sound steamers, the President, New York, and others.