

James Cattell for the best pen of chickens of the same variety; and the fourth by Mr. G. F. Greensill for the best pen of Game fowls.

It is at present too early to form an opinion as to the extent and character of the approaching Exhibition, but it is already known that a number of breeders and feeders of stock who have not hitherto taken part in the competitions in Bingley Hall, will send stock this year, while as regards the older members of the Society we do not expect that there will be many absent. This will be the thirteenth Exhibition held in Birmingham, and it is certain that the interest felt in these useful and pleasant gatherings suffers no diminution, but seems rather to increase from year to year as the practical objects which the Council seek to promote become more distinctly apparent.—(*Midland Counties Herald*.)

TUMBLING PIGEONS.

No doubt the readers of your Journal may remember the accounts given by Mr. Paton and "HANDY ANDY" some time back, respecting the Scotch House and Air Tumblers and the Birmingham Rollers. The statements then published of the excessive tumbling of those birds greatly astonished me, and I was much delighted to accept some of the varieties above mentioned, and was surprised to find that those statements were not at all exaggerated. As I have bred several pairs of these birds, I thought an account of their mode of tumbling might interest some of your readers. I enclose you the following remarks:—

The Birmingham Rollers, or at least those I had sent me, are coarse, common-looking birds of various patchy colours, mostly like a very foul-feathered Baldhead, and that seems to be generally red, or as it is termed, a "red badge." Their eyes seem to be as often "bull" or "mud" coloured, as they are pearl; the feet unfeathered, and the beaks long—altogether a very mongrel-looking set. But we must not always judge by appearances. At first sight I readily thought the birds had been changed—they could not be Tumblers; but when once they were let out there was no mistake. Their tumbling is extraordinary. Every few seconds over they go, one, two, or three summersaults at a time. Here and there a bird gives a very quick and rapid spin, revolving like a wheel, though they sometimes lose their balance, and make a rather ungraceful fall, in which they occasionally hurt themselves by striking some object. I manage to make most of mine fly for an hour a-day, but their excessive tumbling fatigues them much.

The House and Air Tumblers are a Scotch variety. I do not know if they are descended from the Indian Ground Tumblers; but certainly some of them are scarcely able to fly on account of their excessive tumbling.

In comparison to the Short-face Tumblers they are certainly coarse in appearance; yet they have all the features of common Tumblers, and their eyes are mostly pearl. In plumage they are very various; many whole-coloured, some pretty good mottles, but mostly red, with a few white feathers.

In tumbling there is much diversity of style. They generally begin almost as soon as they can well fly; at three months old they tumble well, but still fly strong; at five or six months they tumble excessively; and in the second year they mostly give up flying on account of their tumbling so much, and so close to the ground. Some fly round with the flight, throwing a clean summersault every few yards, till they are obliged to settle from giddiness and exhaustion. These are called Air Tumblers, and they commonly throw from twenty to thirty summersaults in a minute, each clear and clean. I have one red cock that I have on two or three occasions timed by my watch, and counted forty summersaults in the minute. Others tumble differently. At first they throw a single summersault; then it is doubled till it becomes a continuous roll, which puts an end to flying, for if they fly a few yards over they go, and roll till they reach the ground. Thus I had one kill herself, and another broke his leg. Many of them turn over only a few inches from the ground, and will tumble two or three times in flying across their loft. These are called House Tumblers, from tumbling in the house.

I have a pretty good flight of young ones still capable of flying their hour daily, of which in a few months' time few will be safe to trust out on a windy day. When on the earth they often make many unsuccessful attempts to reach the roof. Owing to their tumbling over the act seems to be one over which

they have no control—an involuntary movement which they seem to try to prevent; as I have seen a bird sometimes in his struggles fly a yard or two straight upwards, the impulse forcing him backwards while he struggles to go forwards. If suddenly startled, or in a strange place, they seem less able to fly than if quiet in their accustomed loft.—B. P. BRENT, *Dallington, Sussex*.

COCHIN-CHINAS AT WORCESTER SHOW.—The pen of Cochins with which Mr. Tudman took the first prize at Worcester, were not (as stated in our report) claimed by Mr. Tudman at the Crystal Palace in August last.

ASTHMATIC CANARY.

SOAK some bread in hot water, then squeeze and drain the water off and pour a little milk on, this also drain off, and then give this soft bread to the bird, and let him eat as much as he will for a week or fortnight, and at the same time, or every third day, for a change, give him some bread-crumbs (dry), and some yolk of an egg chopped fine; groundsel, of course, or lettuce or watercress, and cleaned and gravelled daily. With this treatment the bird will be well and singing in fourteen days, and, if not singing, rapidly improving. The writer has had two valuable birds also songless nearly twelve months, and this treatment in six days has already brought one to sing, and the other is improved.—T. G. H.

IS THE FEMALE BOMBUS FERTILISED IN THE AIR?

WOULD Col. Newman, who has so carefully attended to the habits of humble bees, have the kindness to state whether the queen humble bees are fertilised in the air or on the ground? I have a special reason for wishing to know this little fact, and whether the fertilisation does not often take place as late as in September?—C. DARWIN.

[The queens or females of the humble bees are not fertilised in the air, and the act of fertilisation takes place either in the nest or on some flower, or on the ground.]

I have made observations, more or less, since the year 1798, and give the result—scarcely half a dozen instances in sixty years.

1st. I have seen one couple come out of the nest of the *Bombus terrestris*; these flew away instantly, and were united until I lost sight of them.

2nd. I observed one male and a female come out of the nest of the *Bombus lucorum*, they separated near the entrance of the nest in the earth. The male was unable to fly, I examined him and found evident signs of recent connection.

3rd. The best view I ever had was at Upton Hall, in Northamptonshire, where I saw a male come to a young queen which was busy on a flower; they clung together, and went about 10 yards to another flower, and I watched these for about ten minutes until they separated; the male continued united during their flight, and both used their wings apparently with great ease.

4th. I saw a couple of the *B. hortorum* on a flower, and watched them until they separated; they took one flight and separated in about seven minutes from the time I saw them first. All these cases were in the month of August.

5th. The next case was of the *B. muscorum*. I watched a male of the *B. muscorum* among some long grass—at first I thought it was coming out or going into its nest, but on going very near I observed the bee alight near a young female of the same species, and after showing signs of kindness they flew off in union, but so rapidly that I could not follow to observe them again; this last was about the first week in September. The *B. muscorum* is the latest in appearing and the latest in nidification. I have seen nests of the *B. muscorum* as late as the last week in August, when the combs contained unhatched drones; and the latter almost always hatched before the young queens.

WASPS.—I have never except once observed the fertilisation of the wasp near Thornbury. On the 7th of September, 1847, I was walking with my bailiff, Mr. Cossham, of Thornbury, when we saw a curious long-looking insect about 20 feet in the air; on its coming very near (it was gradually descending) it proved to be a male and female wasp united. Each of the wasps was trying to fly in a different direction. They fell to the

ground, and I immediately crushed them both so as to kill them, but not to mutilate them at all. I had them carefully packed and sent to the Committee of the Entomological Society, in London, directed to their Secretary; but as ill luck would have it, the box was intercepted by some letter-carrier or other person, and never reached its destination. The queen wasp was more than double the size of the male.—H. W. NEWMAN, late Lieut.-Col. (Commandant) the South Gloucester Militia, Hill-side, Cheltenham.

N.B.—In late seasons such as 1816 and 1860, and in a few springs such as May, 1837-1838, I have noticed nearly one month difference in the hatching of the drones or male Bombi, and I have no hesitation in saying that the fertilising of the young queens, particularly of the *B. muscorum* may be retarded until the second week in September.

DRONE INFLUENCE.

WHILST driving a condemned stock of bees to-day (Oct. 9th), I found very many of them well-marked Ligurians. The hive contained a second swarm, and was one of four stocks and swarms standing at a distance of a mile and a half from my apiary, which is, as far as I know, the only apiary in the county of Devon containing Ligurian drones. There is, therefore, no doubt that the queen has been hybridised by one of my drones, and it is my intention to present her to "A RENFREWSHIRE BEE-KEEPER," who will I hope report her adventures in due course to the readers of THE JOURNAL OF HORTICULTURE.—A DEVONSHIRE BEE-KEEPER.

PARTHENOGENESIS IN THE HONEY BEE.

THE account of the investigations of the German naturalists, and the wonderful revelations of the microscope so kindly furnished by the "DEVONSHIRE BEE-KEEPER," may well seem to establish the fact of true parthenogenesis in the honey bee; yet there is a feeling of regret that the opportunity afforded of applying the test was lost by removing the queen whose wings were undeveloped. I may appear prejudiced or sceptical when I say that surely she would, impelled by her instinct about the fourth day of her age, have sought the open air, traversed the alighting-board, and fallen to the ground never to rise again. Such was the fate of a young queen in one of my hives, one of whose wings was imperfect, and which I supposed had been mutilated in the struggle for pre-eminence. On the other hand, it may be argued, if the wings are naturally defective when the insect is hatched, such is the extreme delicacy in the organisation of the queen bee, that her instinct might be impaired in a corresponding degree.

It is, however, quite certain that queens which produce the eggs of drones only are usually found in external appearance to be quite perfect. A queen has been known to exist many months without laying any eggs whatever, and, it was supposed, would have remained sterile. Such an instance occurred in the apiary of a very intelligent and experienced bee-keeper, whose bees enjoyed the advantages of the heather, and were in consequence in full activity late in autumn. Perhaps a solitary instance such as this may be regarded rather as the exception which proves the rule, or it may possibly point to some hidden truth.

That fecundation is sometimes repeated was not overlooked by Huber, though he alludes to it only in a casual manner. I once found it occur in my apiary. A queen which I had reared artificially in August was fecundated on the ninth day.* Forty-eight hours afterwards, when I was congratulating myself on the reduced numbers of the colony being about to be replenished, I was not a little surprised to see the queen again leave the hive. She continued her excursions four days, and then returned fecundated.

I believe few bee-keepers are aware of the frequency of these excursions. With this queen it was very remarkable. As I have not my notes to refer to I cannot be certain of the exact number of times she left the hive, but it was more than thirty. The weather was favourable, and drones had become scarce. She was of small size, and I did not remark that she became much distended during this period, and she proved an excellent queen. I have sometimes observed the workers worry at the drones while the queen was still going out; but they did not

* After an absence of fifty-eight minutes.

appear to disable them, only to give a rough hint that it was only by sufferance for a little while that they were allowed to live at ease, or I thought perhaps some of the drones were becoming old and feeble. I should like to know if the drones of the defective queen were destroyed or only bullied, also the age of the queen when she was removed.

How valuable the Ligurians will be for making experiments! but how impossible to sacrifice such treasures! The raising of artificial queens and forming artificial swarms are sad impediments to the ordinary labours of the hive, and it fills one with wonder to hear of the fruit of their labours. Is it to be understood that the ten families which have proceeded from one stock are sufficiently strong to be reserved over the winter? I presume they have been furnished with combs and supplied with food.—INVESTIGATOR.

THE QUEEN BEE.

A VIRGIN QUEEN CAN UNDOUBTEDLY BREED DRONES.

WHEN I wrote the reply to "INVESTIGATOR," which appeared in THE JOURNAL OF HORTICULTURE of the 17th ult., I was only able to describe the difference which was apparent to the naked eye between the spermatheca or seminal reservoir of a virgin, and that of an impregnated queen bee. Since that time I am indebted to the skill and kindness of Mr. J. U. Huxley, the talented house surgeon of the Devon and Exeter Hospital, for the opportunity of verifying and confirming, by means of the microscope, some of the statements made by Siebold, the distinguished German naturalist, and ultimately of establishing beyond question the fact that a drone-breeding queen is a virgin queen.

Mr. Huxley first dissected out and then punctured the spermatheca of a fertile queen, and having extravasated some portion of its contents placed it under the microscope. It immediately became evident that the spermatheca contained countless thousands of lively spermatozoa, consisting of slender filaments which rotated, turned, and twisted with inconceivable rapidity. For some time the movements and contortions of this animated mass of delicate filaments were so amazingly swift, that we found it impossible for the eye so to separate a single spermatozoon from its fellows, as to follow its movements or to detect either of its ends, which gradually tapered off to such an extreme degree of tenuity that it appeared almost impossible to detect where it either began or ended. After the lapse of from a quarter to half an hour the rapidity of their movements was so far diminished that we were able to perceive that these spermatozoa consisted of thread-like filaments tapering at both ends and entirely unconnected with each other.

The next proceeding was to dissect out the vesiculæ seminales, or seminal receptacles of a drone, and having punctured one of these and submitted its contents to examination in the microscope, we were soon able to detect the presence of similar spermatozoa to those found in the queen, thus proving beyond all question the identity of the contents of the spermatheca of an impregnated queen bee with the semen of the drone.

At this point our investigation must have terminated, but for the unsolicited kindness of Mr. J. E. Briscoe, of Albrighton, near Wolverhampton, who on the 12th inst. forwarded to me by post a living queen which had never laid any but drone eggs, with a request that I would ascertain by dissection whether she still remained a virgin. Here, then, was the very thing which we required, and it will readily be imagined with what cautious eagerness I dissected out the spermatheca preparatory to submitting its contents to the test of the microscope. The result was exactly what I anticipated. The contents of the spermatheca turned out to be a limpid, colourless fluid as clear as crystal, and in which the highest microscopic power failed to detect the faintest trace of those lively spermatozoa which were found in such countless multitudes in an impregnated queen.

These investigations establish the fact that a virgin queen is capable of laying eggs which will hatch into drones, and place the correctness of Dzierzon's theory beyond cavil. In order that no link in the chain of evidence may be wanting, I append the history of the drone-breeding queen in Mr. Briscoe's own words.—A DEVONSHIRE BEE-KEEPER.

Wolverhampton, October 16th, 1861.

"Dear Sir,—I will briefly give the history of the queen I sent you from my book of memoranda taken at the time:—

"June 15.—6.30 A.M., removed queen from box No. 4.