

they could obtain a good store of honey with very little trouble, and would have brought a lot back with them."

Later on he says that he has come to the conclusion that what sometimes "appeared like affection was invariably dictated by selfishness."

Now, is the example given by Sir John of the want of communicative power afforded by the bee sufficient, or, indeed, any evidence of the fact? Is it not rather an excellent instance of the intense selfishness which governs the bee, in common with all other creatures, in its aim to prolong the life of the individual without a care for that of its fellows?

Again, Sir John says:—

"It was not altogether a selfish feeling which induced bees to show such eagerness to gather honey, for what they took to the hive was for the good of the whole colony."

This act seems to me to be in no way inconsistent with absolutely selfish motives. Bees find that there is strength in union, and that the winter months, which would kill them if left alone, they can survive by adopting principles of co-operation. The stronger the individual bee the more likely is she to derive benefit from the partnership, and a hive may, in fact, be regarded as a "tontine" association.

Lastly, when Sir John Lubbock says—"With regard to swarming bees by beating the warming pans, he thought there was nothing in it, but that it was an idea which had got possession of some people in the same way as many savage tribes believed that by making hideous noises during the eclipse of the moon they could frighten away the evil spirit which held her"—he would appear to have overlooked the fact that this is a practice arising from the peculiar ownership, of which, under English law, bees are the subject.

"Bees are *fera natura*, but when hived and reclaimed a man may have a qualified property in them, by the law of nature as well as by the civil law" (Puff. c. iv. c. b. s. 5., Inst. 11, l. 14.) "Though a swarm," says Blackstone, "lights upon my tree, I have no more property in them till I have hived them than I have in the birds which make their nests thereon, and therefore, if another hives them he shall be the proprietor; but a swarm which flies from and out of my hive are mine so long as I can keep them in sight and have power to pursue them, and in these circumstances no one else is entitled to take them."

Hence the origin amongst villagers of pursuing a swarm with the clamour of pans and fire-irons; not for the benefit of the bee, *quæ bee*, but in order to inform others that the followers are the possessors of the swarm.

It is easy to imagine that now some villagers may (confounding cause and effect) assert that the sound assists the operations of the bees or those of their hiver.

ALFRED GEORGE RENSHAW

Doctors' Commons, London

#### On the Value of the so-called Chameleon Barometer as an Hygrometer

A PIECE of filter paper soaked in a strong solution of cobaltous chloride ( $\text{CoCl}_2$ ) is blue when dry, and red when moist; and I have found it very sensitive to slight changes in the quantity of moisture in the atmosphere, being more delicate than the thermometers I used.

The paper was suspended in a room, on the wall facing a south window, which was kept open during the day. By the side of the paper was hung a wet and dry bulb thermometer, reading to  $2^\circ$  Fahr., and observations were recorded three or four times a day for nearly a year.

I adjoin a few of the readings taken, as from their regularity it is unnecessary to give them all. The scale of change of colour was reckoned from 0 to 10, from red to blue.

It will be observed that for a difference of  $13^\circ$  between the two thermometers, the paper is quite blue, and it becomes red at a difference of from  $1^\circ$  to  $3^\circ$ . There is, of course, a limit to the change of colour, as when blue it cannot be any more blue, although the air should lose moisture. However, on the hottest day last summer it stood at 10, or maximum blue, for a difference of  $13^\circ$  between the thermometers, and when this difference fell to  $12^\circ$  the paper showed a decided change in tint.

It appears that the *actual* temperature has nothing to do with the colour of the paper, as it registers the same tint for the same difference between the two thermometers (with very slight variations) whether the day be hot or cold.

I think that such a paper is a handy addition to the thermo-

meters, as you can see at a glance whether the air is wet or dry.

DATE.	Dry-bulb Thermometer.	Wet-bulb Thermometer.	Difference.	Colour of Paper. 0—10.	REMARKS.
July 8, 1874.					
1.30 P.M.	72	60	12	9	Very hot day.
5.30 "	74	61	13	10	
12.30 "	70	59	11	8.5	
July 10.					
9.30 A.M.	74.5	65	9.5	8	Much hotter than the 8th, and yet paper not so blue.
1.30 P.M.	77	67	10	7	
5.30 "	79	67	12	9	
Sept. 30.					
1.30 P.M.	62	56	6	3	Barometer falling for rain.
8.0 "	64	61	3	1	
Oct. 1.					
9.30 A.M.	62	58	4	0.5	Rained in night. Barometer rising.
10.30 P.M.	63	59	4	1	
Oct. 2.					
1.30 P.M.	59	55	4	0.5	Bar. fallen, showery. Bar. steady, cleared up. These two days show the paper to be more sensitive than the thermometers.
6.40 "	58	53	5	1	
Oct. 23.					
1.30 P.M.	52	48	4	1	Wind N.
6.30 "	55	54	1	0	Wind W.
Dec. 3.					
10 A.M.	43	40	3	2	Sharp frost.

Rugby, Jan. 16

A. PERCY SMITH

#### Phosphorus and Carbon Disulphide

KNOWING the highly refractive power of phosphorus, and also of carbon disulphide, it occurred to me that a solution of the former in the latter might yield a liquid more highly refractive than any I had yet met with.

I could not succeed in making a solution so saturated that when another piece of phosphorus was put in it should not be affected. I made, however, an exceedingly concentrated solution. This solution had to be filtered. The clear liquid had the property of continually precipitating phosphorus, in what I believe was the red form. The solubility of phosphorus in carbon disulphide is very remarkable. Has it a definable limit? or is phosphorus, at ordinary temperatures, really a very viscous fluid?

Also I made a perfectly saturated solution of sulphur in carbon disulphide. This was much more easily accomplished, and it showed no tendency to change from its condition of a clear light-yellow coloured fluid.

A hollow glass prism, angle  $60^\circ$  was used, and kept in position of minimum deviation for sodium light for each substance.

Values of Refractive Indices are given in the following table:—

#### Refractive Indices.

	Lithium a.	Hydrogen C.	Sodium D.	Hydrogen F.	Hydrogen G.
P in $\text{CS}_2$ at $51\frac{1}{2}^\circ$ F. }	1.7548	1.7749	1.7780	1.8136	—
S in $\text{CS}_2$ at $51\frac{1}{2}^\circ$ F. }	—	1.6840	1.6890	1.7254	—
$\text{CS}_2$ alone at $55^\circ$ F. }	—	—	1.6321	—	—
Flint glass at $51\frac{1}{2}^\circ$ F. }	—	1.6193	1.6244	1.6370	1.6470

The hydrogen lines were obtained by a Geissler tube.

I do not give the measurements as more than near approximations, as I had no time to repeat them. They were made in the Cavendish Laboratory at Cambridge.

Harrogate, Jan. 21

CHAS. T. WHITMELL

#### The Micrographical Dictionary—Pollen Grains

IT is a pity that Mr. W. G. Smith (NATURE, vol. xi. p. 286) did not take the trouble to satisfy himself of the truth of Dr. Hugo