

### Bees and the Scarlet-Runner Bean.

DARWIN directed attention to the slight asymmetry in the petal growth of the scarlet-runner bean, *Phaseolus multiflorus*, that offered advantage to the bee for more easily reaching the nectar on that side of the flower where fertilisation would be helped by the visiting insect. I remember some years ago many times satisfactorily confirming the recorded fact by observation, but this year I am surprised to note quite a different practice in respect to insect visits to these flowers.

The humble-bees follow the habit they have long acquired in rifling the tubular flower of the jasmine of its honey: that of gnawing a hole near the base of the corolla, through which the proboscis can reach and extract the nectar. A similar plan is now adopted with the flower of the scarlet-runner bean. The bee no longer dives into the more open side of the bloom, where it would brush against the protruding anthers and stigma in an endeavour to reach the nectaries at their base, but on alighting moves immediately to underneath the blossom and, if not already done, gnaws through the calyx and sheath of filaments close to the nectaries, which are then easily reached and emptied. The honey-bees follow, and this season I have observed no instance of an insect attempting to reach the honey in the way the development of the flower suggests as that of reciprocal advantage.

The asymmetry of the bloom is due to the peculiarly coiled shape that the carina or keel part of the papilionaceous corolla develops. This causes the stamens and pistil to take a spiral form as they grow through and protrude together from the extremity of the enveloping carina, and exposes them between the more separated left wing and standard petals.

Though perfectly adapted to self-fertilisation, the flower, by the change of habit of the bees, would appear to lose the occasional advantage of cross-pollination, and the injury done by the gnawing of the bloom apparently causes a diminution in the amount of pollen formed and a quicker fading and falling of the bloom, with the probable consequence of fewer pods "setting."

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### The Condition of Kent's Cavern.

SINCE a recent visit to Kent's Cavern I have been wondering if it would be possible for something to be done by which any important finds that may be made there could be brought to the notice of those interested in ancient man. The cave now seems to be one of the sights of Torquay which any curious visitor can see, just as he visits the caves elsewhere when on a holiday. There is a well-informed man who shows the sights to visitors, and he stated to a party, of which I was one, that quite recently a jaw of a human being had been found, and that this was in the possession of a local collector. A human tooth has also been found. It seems highly desirable that the jaw should be examined by a competent authority. During the famous excavations which were made some years since a jaw was found, but this was examined and described only a year or two ago; and although Prof. Keith thought that it represented the Neanderthal type in this country, I believe Dr. Duckworth pronounced that it did not differ from modern races. If this further jaw were examined the question might be settled, and it would be of great interest if it were found that, after all, the race was actually represented in this country.

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NO. 2650, VOL. 105]

### Calculation of Vapour Densities.

WHEN determining vapour densities I believe that many, if not most, experimenters go through three processes, viz.: (1) Correct the observed volume to that at N.T.P.; (2) find the mass of hydrogen which would occupy this latter volume; and (3) divide this mass of hydrogen into that of the substance used, whence density  $d$  on the *hydrogen standard* is found.

Now if we evaluate the constant  $R$  in the gas equation  $pV = RT$ , using mm. of mercury-column as units of pressure  $p$ , and taking  $v$  as the gram-molecule in litres—which on the *oxygen standard* at N.T.P. is 22.4 litres—we get the figure 62.36.

Then, for finding density, the equation becomes

$$d = \frac{mRT}{2pv},$$

where  $m$  is the mass in grams and  $v$  is in litres.

To quote an example: 0.5 gram of iodine expelled 50 c.c. of air at 17° C. and 750 mm. from V. Meyer's apparatus. Was the temperature to which the iodine had been subjected high enough to cause dissociation?

This problem, if done by the "three processes," takes some time, and gives  $d = 119.6$ , which now requires to be multiplied by 1.008 if we wish to compare it with published figures for atomic weights ( $119.6 \times 1.008 = 120.56$ ).

Using the single equation given above,

$$d = \frac{0.5 \times 62.36 \times 290}{2 \times 750 \times 0.05} = 120.5.$$

The answer to the problem is evident. Slight dissociation had occurred, since  $d$  for  $I_2$  demands 126.9.

I venture on these remarks because  $R$  is seldom, if ever, given in the above-mentioned units. It is expressed usually in such units as are suitable for solving energy problems. This number, 62.36, is an "equator" of the four steps which themselves, no doubt, are valuable from an educational point of view. Readers of NATURE who are engaged in science teaching may find the "equator" of some service.

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Rosetree, Marlborough, July 31.

### Use of Sumner Lines in Navigation.

CAPT. TIZARD's reference to my book entitled "The Sumner Line," etc. (NATURE, July 1, vol. cv., p. 552), contains an error which should be corrected. His statement regarding what he calls the zenith point, "which spot is named by Mr. Comstock the sub-polar point," seems to imply that I have introduced a new name not approved in the criticism that follows. In fact, I have nowhere used the obnoxious term "sub-polar point," but have employed in this connection a well-known phrase, "the sub-solar point," for which I can claim no authorship. See Young, "General Astronomy," 1898 edition; Muir, "Navigation," 1918, et al. G. C. COMSTOCK.

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I REGRET that I inadvertently wrote "sub-polar" for "sub-solar" in my remarks on Prof. G. C. Comstock's book on Sumner lines, but this lapse makes no difference really to the statement that the proper description should be zenith point, and not sub-solar point (see p. vi of preface and pp. 2, 3, 5, etc.). Sub-solar refers to the sun only, and does not necessarily include sub-stellar or sub-lunar, but zenith point is common to all.

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August 5.