

Road, and other thoroughfares having an east and west direction the paving flags were all covered with a striking, vegetable-like pattern which might be most appropriately described as an arborescent tracery. The pattern was not formed of the usual small and delicate frost figures such as we are familiar with on window panes, but was made up of large and boldly-fronded designs such as shown in the sketch, which I hurriedly made on the spot:—



The "fronds" were from one to two feet in length, and often most gracefully curved. A keen wind was blowing at the time from a few degrees north of west and the flags had evidently been coated with a thin layer of mud from the previous night's rain. I attribute the pattern to the rapid freezing and evaporation of the water in this surface layer of mud which was going on during the morning. I only noticed the tracery along east and west thoroughfares; in sheltered streets not swept by the cold wind no design was visible. The phenomenon may be known well enough to others, but by many, like myself, it may have hitherto been passed over unnoticed. My chief object in sending this description is to call attention to the very vegetable-like appearance of the pattern. If allowed to dry in a calm atmosphere and then buried under a fine alluvial or other deposit a record would be preserved which the future geologist might at first sight be tempted to read as "vegetable remains." I have seen very similar tracery in the London clay about Clacton-on-Sea and elsewhere.

R. MELDOLA.

#### Ice Crystallites.

THE interesting facts recorded by your correspondent C. M. Irvine on p. 31 recall some unrecorded observations of my own. On several occasions during recent winters I have observed these crystallographic forms of ice on a gravel walk by the side of my lawn, in places where, owing to faulty gradients, the water does not completely drain away at the surface, and the ground just below the surface is in consequence more saturated with water than at other spots. The acicular ice-forms have appeared in bundles standing up between the pebbles and capped by earthy material, just as described by Mr. Irvine, and in previous communications to NATURE by Mr. B. Woodd Smith (see his letter on p. 79). The nature of the soil agrees with that described by these two observers, so far as permeability to water is concerned; and I think they appeared on the occurrence of clear frosty weather after a thaw and melting of previous snow. My observations, however, extended further than theirs appear to have done. I was at the time pursuing the study of the glassy acicular *crystallites* of sulphur (which are erroneously described as "crystals" in most textbooks on chemistry). These, on examination with polarized light (as I have described elsewhere) are found to be destitute of any crystalline internal structure (in fact truly vitreous or isotropic masses in spite of their crystallographic outlines); such structure developing, as devitrification proceeds, by crystallization in the orthorhombic system, to which the outlines of the crystallites do not conform.

In NATURE (vol. xxxvii. p. 104) is a letter from myself, recording some observations on the vitreosity of ice, as exhibited under certain suitable conditions by hailstones, and referring to a previous letter (*Ibid.* vol. xxxvi. p. 77), wherein the vitrification and devitrification of water was suggested as the possible

cause of certain structural phenomena observed in them from time to time. It was with those ideas present to my mind that during recent winters I have made an examination of the acicular ice-forms referred to, which struck me as made up of unusually clear and transparent ice. On taking my microscope out of doors, fitted with a polarizing apparatus, when the temperature was a few degrees below freezing, with a thick overcoat on to prevent the heat of one's body from affecting the ice-needles, I found that, on taking them from the ground and placing them at once on the stage between crossed "Nicols," they appeared to be *completely isotropic*, as they had no reaction on polarized light. I have concluded, therefore, that these ice-needles are strictly analogous (physically) to the prismatic crystallites of sulphur; and they resemble precisely the microscopic lathe-shaped forms, into which I have seen a perfectly clear minute plate of sulphur-glass break up in the first stage of devitrification. The explanation suggested by Mr. Woodd Smith, that they may have been formed by a slow growth of ice at their base, the molecular movement of water in the soil keeping up the supply so long as refrigeration continued, has seemed to me the most natural one; their isotropic molecular structure is no doubt due to the rapidity of freezing owing to a sudden fall of temperature at the spot.

A. IRVING.

Wellington College, Berks, November 27.

#### The *Volucella* as Alleged Examples of Variation "almost Unique among Animals."

IT is barren work for the parties in a controversy merely to deny each other's statements without adducing further evidence. Mr. Bateson first stated that var. *mystacea* did not mimic *Bombus muscorum*. I replied that it did, and the statement in my letter in no way depended on the case at the Royal College of Surgeons, but on a careful comparison of the insects in the Oxford Museum. It is useless for me to repeat that I regard it as an example of mimicry, not indeed equal to that afforded by the same fly and *Bombus hortorum*, but far better than many others which are generally believed to be instances of this principle (such as the resemblance of *Clytus arctus*, or even the resemblance—admitted by Mr. Bateson in his first letter—of *Volucella inanis*, to a wasp). I therefore propose to furnish the Editor of NATURE with photographs of the *Volucella* and humble-bees for reproduction, so that readers can judge of the matter for themselves. I will do my best to obtain a negative which shows the coloured bands.

Although I believed that the two London Museums supported my view, it will be obvious to any one who reads the letter that I did not rely on such support, but on my own comparison of the insects.

Mr. Bateson has offered no further evidence in support of his remarkable assertion that the variation of the *Volucella* is unique. I am not surprised that he should pass over this part of my letter, for I felt sure that there was no further evidence to offer. It will be remembered that this evidence was contained in the "brief statement of facts" given in his first letter, and is practically summed up in the sentence "This fly exhibits the rare condition of existing in two distinct forms in both sexes." In assuming this rarity to be so excessive that the words "almost unique" may be applied to it, and in evidently considering that we must proceed as far as the peach and nectarine in order to find a parallel, Mr. Bateson exhibits a want of acquaintance with the facts of variation which is very surprising in one who is believed to have spent some years in their study. For there is no essential biological difference between this variation and many others, examples of which I gave in my last letter, and which could easily be multiplied. In fact, many a "showcase" would have corrected such a mistake. Compared with the magnitude of this erroneous statement in Mr. Bateson's first letter, the details under discussion assume very small proportions. In considering that "no speculation is needed to enhance the exceptionally interesting facts of the variation and the resemblances of the *Volucella*," it would appear that Mr. Bateson seeks to replace that most invaluable servant of science, speculation, by far-reaching and unsupported assertion.

In his last letter Mr. Bateson says "it is admitted that in making this statement Mr. Poulton relied not on original authorities, but on the general impression of others." So far from this being the case I stated my belief that the impression is prevalent among those who are original authorities on the Hymenoptera and their parasites, and I also showed that nothing