and contained about a dozen spines each. After a careful examination, I came to the conclusion that they were most likely to be the seat of the venomous propensities attributed to the insect, so I struck the back of my right hand against them two or three times to see what would be the effect. They were very brittle, and broke off as they entered the skin. I thought no more about it till about an hour had elapsed, when I experienced in the wrist a dead pain which gradually extended to the arm-pit, followed by a swelling of the glands.

For the whole day the pain was sufficient to render my arm useless; hence I thought that there must be some poisonous secretion in the spines, for the irritation caused by fine points, even if barbed, would scarcely produce such an effect. The pain died away in the evening, unattended by any feverish symptoms whatever, for I was in excellent health at the time. Next day I examined several of the spines under the microscope; they were not barbed, but hollow, and under pressure emitted a colourless transparent fluid, to which I attributed the poisonous qualities which caused me so much pain. A. M. FESTING

## The Demagnetisation of Needles.

IT may not be generally known that magnetised needles, like those used in galvanometers and telegraphs, are easily and rapidly demagnetised in the neighbourhood of other magnets, when the fields of the two magnets are not coincident—that is, when their respective lines of force are not in the same direction.

A striking instance of this has just been brought to my notice. A tangent galvanometer used for taking daily readings of the escape of the current to earth upon wires, when they are disconnected at their terminal points, was found constantly and gradually to be losing its delicacy. This was traced to be due to the demagnetisation of the needle. The needle was re-hardened and even changed but with the same effect. The galvanometer was fixed near some Wheatstone's A B C instruments, which, being worked by magneto-electric currents, have powerful permanent magnets within them. The galvanometer was shifted to the other side of the office, when the effect entirely ceased.

Hence those who have delicate galvanometers should be careful to see that they are not kept in the field of permanent magnets, unless, as in the case of the mariner's compass, they are free to move in the direction of the lines of forces of the magnetic field in which they lie.

Southampton, May 20 W. H. PREECE

## Microscopes—Information Wanted

I AM following up some investigations and experiments in which I require certain data, which, however, I cannot at present arrive at, not being in possession of sufficiently delicate and exact instrumental appliances. The information which I now desire to elicit from some more experienced observers than myself is of such importance as to be both useful and interesting to many of your readers, and I therefore crave your insertion of this communication. The information I require is all the more important as having a bearing upon many questions which are now attracting public attention, such as spontaneous generation, the initial stage and transitional forms of living organisms, also various researches in experimental physics, chemistry, &c. I desire to arrive at the following data:—

1. What is the estimated dimensions of most minute particles of matter which can be visible, under any circumstances or conditions, under the highest powers of the microscope? I leave out of consideration (under this head) the question whether such matter is living or dead, organic or inorganic, or in fact regardless of any of its properties whatever except its mere visibility as a minute portion of matter. Some observers speak of visible particles $\frac{1}{200000}$th and $\frac{1}{300000}$th of an inch diameter; this is surely near the limit.

2. What is the best or most accurate method of arriving at an estimate of the dimensions of such minute objects as are too small to admit of actual measurement by any of the appliances now in use? Every microscopist knows from experience that objects may be distinctly visible, not as a mere point, but having an appreciable diameter, and yet be too minute for actual measurement to any degree of accuracy.

3. Have the most recently constructed microscopic objectives, such as the $\frac{1}{50}$th or $\frac{1}{25}$th, any advantages over the $\frac{1}{10}$th or $\frac{1}{12}$th inch objectives in the determination of the data above referred to? and have immersion lenses any advantage in this respect? I find some difference of opinion on this point. Some microscopists consider that a really first-class $\frac{1}{12}$th with the use of deep eyepieces will enable us to see anything whatever which can be seen by any other objective of shorter focus. On the other hand, it is evident that a great number of the most experienced microscopists think otherwise; and from the very fact of their purchase of such expensive high powers, argue that such lenses are found to supply what other powers cannot accomplish.

It appears to me that there is too much of vague and indefinite assertion in regard to the comparative powers and qualities of microscopic objectives, and it is very desirable that some more definite results should be arrived at. With what precision and accuracy the results of astronomical observations are made! and taking into consideration that many of these results are obtained by different methods of observation, using different instruments, and by different observers, it is astonishing that the discrepancies and errors of observation are so small. It is generally admitted that the microscope is, to say the least, equally perfect, if not more so, than the telescope; and we should therefore expect a corresponding degree of accuracy in the results of microscopical observations. There are no doubt many who, like myself, have hitherto worked with only the medium and low powers, but wish to be possessed of the improved objectives of high power, but from want of sufficient information it is difficult to make a suitable choice. H. H.

Melbourne, Victoria, March 27

## Arctic Exploration

THE story of the American Arctic Expedition under Mr. Hall is a wonderfully curious one; but are we justified, from what we have been told, in coming to the conclusion that the part of the crew of the *Polaris*, that has been rescued in so remarkable a manner, are "deserters?"

As far as I have understood the reports which have appeared in the papers, none of the rescued men have said they were deserters; and until we hear what those who remained on board the *Polaris* have to say, it appears to be unjust and reprehensible to bring so grave an accusation against men, possibly innocent.

Should it so happen that Mr. Tyson and his companions are deserters, can we put faith in the correctness of any part of their story?

There is certainly some mistake about the disposal of the six boats of the ship. As far as I can make out, only four, or at most five, are accounted for, namely, two abandoned in Smith Sound, and the two on the ice with Mr. Tyson, one of which was burnt for fuel, and the other, that in which they were when rescued, and which was taken on board the *Tigris*.

May 31 JOHN RAE

## The Westerly Progress of Cities

IN his work on the Atmosphere, M. Flammarion draws attention to a peculiarity in the habits of our large towns which everyone must have noticed. "The wealthy classes have a pronounced tendency to emigrate westward, leaving the eastern districts for the labouring populations. This remark applies not only to Paris, but to most great cities—London, Vienna, Berlin, St. Petersburg, Turin, Liége, Toulouse, Montpellier, Caen, and even Pompeii."

Having frequently remarked this "westing" in many English towns, I have lately written to several friends, asking for definite information on this point, concerning the town in which they are resident. With scarcely an exception the reply of each showed, to alter Bishop Berkeley's line a little, that:—"Westward the course of fashion takes its way." This is true, I believe, of Edinburgh, Dublin in former years at any rate, Glasgow, Birmingham, Leeds, Southampton, Bristol, and Liverpool and Manchester to some extent. No doubt many of your readers can very largely extend this list; it would be interesting to collect wide information on this question. For supposing it established as a general fact, what an excellent speculation to buy up land in the west of a rapidly growing town like Leicester or Bradford! Perhaps it is common to do so already.

Whence arises this tendency? It can hardly be an accident, nor can it be due to the direction of the river beside which the town may happen to be built, for in the towns named, many of