Scientists observe drumlin beneath ice sheet

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Scientists have discovered a warehouse-sized drumlin – a mound of sediment and rock – actively forming and growing under the ice sheet in Antarctica. Its discovery, and the rate at which it was formed, sheds new light on ice-sheet behaviour. This could have implications for predicting how ice sheets contribute to sea-level rise. The results are published this week in the journal *Geology*.

Drumlins are well known features of landscape scoured by past ice sheets and can be seen in Scotland and Northern England where they were formed during the last ice age. They form underneath the ice as it scrapes up soil and rock, and they slow down the rate at which the ice can flow.

Scientists from British Antarctic Survey (BAS), Swansea University and NASA's Jet Propulsion Laboratory Pasadena used a new technique of time-lapse seismic surveys to find the drumlin, and how it formed over time.

Lead author Dr Andy Smith of BAS says, "This is the first time anyone has observed a drumlin actually forming under the ice. These results will help us interpret the way ice sheets behaved in the past, and crucially, will help predict how they might change in the future".

To the team's surprise the drumlin grew ten times faster than they had ever expected, giving a new and important insight into the drag on the underside of the ice and hence how fast ice sheets are able to flow. The study took place on the Rutford Ice Stream – a 2-km thick, fast flowing

ice stream draining part of the West Antarctic ice sheet.

The team used seismic reflection data gathered three times over the last 13 years to map the changes beneath the ice.

Second author Professor Tavi Murray of Swansea University's School of the Environment and Society says, "The new study was recently described at a conference as 'hunting drumlins in the wild'. The analogy with wildlife is good. We learn a lot more from seeing an animal born and growing up, than just dissecting an ancient body. The same is true of drumlins. By observing the birth and growth of this drumlin, we can see that the landscape beneath an ice sheet is changing at a rate faster than previously thought".

Source: British Antarctic Survey