

met with them in the genital organs of a *Lumbricus*, accompanied by true *Gregarinæ*. These two facts evidently demonstrate a relation between the Navicellæ and the development of the *Gregarinæ*. Numerous observations made by Dr. Stein on the development of the Navicellæ in the *Lumbricus*, prove that these are only stages of metamorphosis of the *Gregarinæ*. After having observed some transitions between the genus *Zygocystis* (a *Gregarina* where two individuals adhere by the anterior portion of their body) and the cysts in which the Navicellæ are developed, Dr. Stein compares their formation to the reproduction by conjugation observed in some *Confervæ*. Observations made upon other *Gregarinæ* inhabiting the intestinal canal of insects appear to confirm this view. It would thence result that two individuals unite at first by juxtaposition. In these adult pairs each individual assumes an oval shape. The interior septum separating the cavity of the body into two portions is re-absorbed; the two individuals then appear like two hemispheres pressed one against the other; they then secrete a gelatinous liquid, which solidifies, enveloping the two. Lastly, the particular membrane of each individual is re-absorbed, and their contents unite into a single granular sphere, which is gradually converted into Navicellæ. These bodies, called germinating granules by Dr. Stein, are frequently met with in the excrements of different insects, either free from their cysts or still contained in their envelopes (for instance in *Tenebrio molitor*). From thence they arrive with the food in the intestinal canal of other individuals, where on their development they give rise to *Gregarinæ*.—*Muller's Archiv and Bibl. Univ.*, August 1849.

#### WAY IN WHICH TOADS SHED THEIR SKINS.

I have a small house under my care for growing cucumbers. There is a bed in the middle of it, and the soil is about 3 feet high from the ground (*i. e.* to the top of the hills where the plants are in). A person therefore standing in the house can examine an object placed on the hill with ease. Last Saturday, about 7 o'clock A.M., I uncovered the house, and went in to see that all was right, when to my surprise I saw my pet companion, a fine toad, apparently in the agonies of death. It was seated at the end of the ridge or hill of soil; its mouth or rather under-jaw opening every few seconds (the top jaw did not move), the eyes shut, and the body violently convulsed each time the jaw opened, and with each convulsion of the body the right fore-foot was raised to the head. I placed myself in front of it, and perceived that it was drawing something into its mouth each time the jaw moved; at that instant the right eye opened, it then inflated the body on the left side and drew in the right, placing at the same time the left fore-foot on the head behind the eye and drawing it down to the mouth; it then appeared to hold its foot in the mouth for about a second, when it drew it out, and I distinctly saw the three points of skin that came off its toes outside its lips till the next opening of the jaw, when they were drawn into the mouth. When it drew its foot over its left eye (which before was shut), it broke out as bright as ever. Some folds of the skin adhered to the left leg, but by two or three motions of the jaw they were



gone, and in about a minute the skin was drawn off the lips—the toad had eaten its own skin, and there it stood with its new covering as bright as if it had been fresh varnished. I endeavoured to touch it, to feel if it was clammy, but the creature gave a vigorous jump, and the soil adhered to its legs. I looked at it in an hour afterwards; it had then begun to resume its dingy brown colour. The time it took to get off its head-dress was only a few minutes. It appeared to me that each time its jaw opened it drew the skin forward, while it distended the body on the side to be uncovered. W. TURNER.—*Gardeners' Chronicle*, Mar. 1850.

# METEOROLOGICAL OBSERVATIONS FOR MARCH 1850.

*Chiswick*.—March 1. Hazy: very fine: overcast. 2. Densely overcast. 3. Cloudy. 4. Cloudy: clear and frosty at night. 5. Frosty: fine: cloudy. 6, 7. Foggy: fine: clear. 8. Hazy. 9. Slight fog: fine: clear. 10. Very fine. 11. Clear and fine: frosty. 12. Frosty: very fine: clear. 13. Frosty, with slight fog: very fine. 14. Overcast. 15. Overcast: clear, with sharp frost at night. 16. Frosty: overcast: clear. 17. Frosty: cloudy: sunshine occasionally: clear and frosty. 18. Frosty and fine. 19, 20. Cloudy. 21. Cloudy and cold: clear and frosty. 22. Hoar-frost: cloudy. 23. Heavy clouds: sleet-showers. 24. Slight fall of snow-flakes: severe frost at night. 25. Clear and frosty: cloudy: clear: frosty. 26. Overcast. 27. Foggy: slight haze: frosty. 28. Slight haze: bright sun with dry cold air: clear and frosty. 29. Foggy: cloudy: clear. 30, 31. Overcast.

Mean temperature of the month ..... 37°·71  
Mean temperature of March 1849 ..... 41 ·56  
Mean temperature of March for the last twenty-three years 42 ·81  
Average amount of rain in March ..... 1·36 inch.

*Boston*.—March 1, 2. Cloudy. 3. Fine: rain P.M. 4. Cloudy. 5—7. Fine. 8, 9. Cloudy. 10. Fine. 11. Cloudy. 12, 13. Fine. 14, 15. Cloudy. 16. Cloudy: rain A.M. 17, 18. Fine. 19. Cloudy: rain A.M. 20. Cloudy. 21. Fine. 22. Cloudy. 23. Fine: rain early A.M. 24. Cloudy: snow A.M. and P.M. 25. Cloudy. 26, 27. Fine. 28. Fine: rain A.M. 29, 30. Fine. 31. Cloudy: rain A.M.

*Applegarth Manse, Dumfries-shire*.—March 1. Fine: a shower early A.M. 2. Slight shower during night: thick P.M. 3. Rain heavy A.M.: cleared. 4. Frost: clear and fine. 5. Moist all day. 6. Mild and growing: moist. 7. Fine spring day. 8. Still finer: clear and warm. 9. Dull and moist: slight shower. 10. Clear and fine: slight shower. 11. Frost: clear and bright. 12. Frost: cloudy. 13. Frost, not so severe. 14, 15. Mild: cloudy: no frost. 16. East wind: dull. 17. Dull: raw: cold: shower. 18. Dull and cloudy, but mild. 19. Dull A.M.: cleared: rain P.M. 20. Very fine: slight drizzle. 21. Fine, though raw A.M. 22. Dry, but cloudy: stormy P.M. 23. Frost: snow: wind. 24. Hard frost: snow: calm P.M. 25. Frost very hard: thermometer 21½°. 26. Frost slight: heavy snow A.M. 27. Frost severe: snow again. 28. Frost still harder: clear. 29. Frost still. 30. Frost moderate: hail: rain P.M. 31. Rain: cloudy and foggy P.M.

Mean temperature of the month ..... 40°·3  
Mean temperature of March 1849 ..... 41 ·8  
Mean temperature of March for the last twenty-eight years. 39 ·6  
Average rain in March for twenty-three years ..... 2·35 inches.

*Sandwich Manse, Orkney*.—March 1. Showers: drops. 2. Drizzle. 3. Cloudy: showers. 4. Snow: cloudy. 5. Damp: rain. 6. Drizzle: cloudy. 7. Damp. 8. Fine: drizzle. 9. Cloudy: showers. 10. Sleet: aurora. 11. Bright: clear: aurora. 12. Drizzle. 13. Damp: drizzle. 14. Drizzle: damp. 15. Bright: damp. 16. Cloudy. 17. Drops: showers. 18. Hazy: cloudy. 19. Cloudy. 20. Bright: drops. 21. Cloudy: drops. 22. Showers: snow-showers. 23. Hail-showers: snow-showers. 24. Snow-drift: snow-showers. 25. Snow-showers: large halo. 26. Snow-showers. 27, 28. Bright: snow-showers. 29. Bright: clear. 30. Cloudy. 31. Drops: cloudy.





1850. "Way in which toads shed their skins." *The Annals and magazine of natural history; zoology, botany, and geology* 5, 430–431.

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