

When you have finished with it, I should be glad to have the Man. returned.

New Haven June 19. 1845.

Friend Gray -

I received your kind letter some time since, and found every thing satisfactory, - one single doubtful point remains - your ~~also~~ quote from page 159 - and my author from 255 - as follows Pontopp. Norg. Naturh. i, 200, nr. 10. t. 19, fig. 5. - Can you reconcile it? - While I am much indebted to you for your kindness I am going to beg another favor of you - In the first place, however, a word about the notice of the Vestiges, which Silliman put on my shoulder in a letter to you. It is true that I penned it, but I had before me a ^{long} notice by the Professor - which was the basis of it - for I had never seen the book itself - Prof. S. criticised some few geological facts, but not the fundamental error of the work - about which he only expressed ~~about the amount~~ of doubt in the notice. I have myself no faith in ^{the author's} ~~his~~ views (derived from the German School) and more in Mûller's peculiar theories, ^{with} regard to which Silliman's letter to you seemed to express for himself a favorable opinion - yet I think it is well that such points are brought forward & discussed, as the Truth will be the sooner established. All the possible false theories must be proposed and supported with every force of argument that mind can bring to bear upon them, before the sublimity will be wholly cleared away and the truth be generally perceived and its full influence felt. Such works I would oppose rather with close argument than ridicule. Ridicule may amuse ~~the uneducated~~ but will have little effect in convincing ~~these~~ minds, that are apt to be led astray by such speculations. - I regret that the few words said were not of a more conservative character but still think that no permanent injury will result from the wide distribution of the work. - As to the form - it is simply that you will read and give me your suggestions & corrections with regard to the enclosed. You may think that I am getting a little Mûllerish - but I am convinced that the ^{opposed} views afford the basis for a complete overthrow of Mûller's theories - I was led into the speculations by the singular forms of life & modes of development in Zoophytes. I trust you will have patience to go through with it - especially as Botanical facts are concerned and apparently illustrated. I wish especially to know if I am right in such statements respecting ~~your~~ facts in your Science.

as are made in the course of the article, and whether the principles are borne out by your knowledge of vegetable physiology. — A few explanations will be necessary to enable you to understand it — I wish I could be by your side & talk it over, — or give you the preceding chapters of my Report on Zoophytes — but as that may not be — at least at present — I go on with my explanations —

1. The structure of a polyp — Figure 1 is a coral animal or an actinia, ^{consists} of a series of tentacles in two rows (the inner ones larger (like the petals of a rose) surround a disk with the mouth at the center — The mouth opens into a stomach, and through the bottom of the stomach into the general visceral cavity which occupies the whole interior of the animal exterior to below the stomach.

Figure 2 is a transverse section through the stomach — The stomach is ^{connected with} the sides of the polyp by fleshy lamellae which divide the ^{visceral} cavity into small compartments — The intermediate lamellae are much narrower — The compartments, composed each of a tentacle & communicate with the tentacular interior of the tentacles.

Below the stomach the fleshy lamellae have the inner margin free — Some are bordered by a white, filament which appears to be ^{intermediate} spermatheca and others by clusters of ova. The animal expends itself by taking in water at the mouth, through the stomach into the visceral cavity, & injecting it into the tentacles & throughout its structure. So much for the Coral animal — There are others

much simpler without fleshy lamellae within — There are the Sertularians & Hydroids — but I will not stop to describe them —

2. Mode of budding — Some of these zoophytes bud, as in the annexed figure representing a top of a branch of a madrepore — Each prominence (or calicle) ^{consists of} a distinct polyp — having a separate mouth & stomach, though united to the others by the side tissues — In this figure there is a terminal parent-polyp — which keeps elongating indefinitely and giving off young buds from its sides —

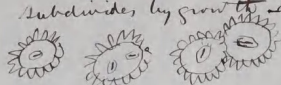
In other species, the instead of one parent polyp there is a parent cluster which continues budding, and thus produces a long, thin, stem. The polyps of the cluster ^{are} after

cease to bud, ^{and then gradually pass} ~~after a certain age, to bud~~, and then ~~are thrown~~ out of the cluster to form the lateral surface of the branch. In another mode, each apical polyp gives off, on each side, and this another and so on. — There is a distinct spiral arrangement of these buds, — sometimes from right to left & the reverse — and in their species there are 6 polyps to a single turn of the spiral.



There are other masses which proceed from buds produced equally in every direction, and ^{the forming budding} not limited by the age of the polyp — this produces hemispheres — Each new bud has

the surface enlarges, either the intervals between polyps must increase — or else the disks of the polyps must enlarge — this increase has its limit, for in those species in which the intervals begin to increase, a new bud grows when this increase begins, in order to fill up the space & prevent the ~~enlarged~~ intervals from exceeding much their normal breadth — When the polyp-disk enlarges — a new mouth grows in the enlarged disk, and the polyp spontaneously subdivides, by growth as here shown.



In an Anthozoa the polyp sends out a little creeping shoot from its base unattached, which after ~~some~~ growing to a certain length develops a new polyp — and this in turn gives origin to other shoots and budding polyps —



In the Sargassum setosa — (the growth of which is shown in the annexed figure) budding goes on continuously at the apex of a branch — and as the termination ^{branches} of the branch elongates, branchlets form on either side — usually at nearly regular distances from the summit. These branchlets ^{as the buds show} have on their sides a very large number of polyps in two or three ranges. A branchlet begins by one of these polyps becoming a budding polyp, which it cannot do until toward a ^{certain} ~~stage~~ ^{stage}



distance of beyond the influence of the apical budding
polyp. — This gives a system & regularity to the state of
ramification, and the same principle is illustrated in all branching zoophytes.
I wish I could explain to you the whole
subject from specimens — but I must leave much for
you to guess out — as my paper is already nearly exhausted —

The little alga figured — Can you give me the name of
the genus — or genus & species if described — The dissections were
made in the freezer —

If you have ^(Zoological & Medical) a friend at hand who is interested in such

Prof. A. A. Gray M.D.
Cambridge Mass.

13. I believe you are among those who keep with his wife & child — little
service with him (I am supposing) — perhaps a child from consumption (perhaps
in a few days) — in a few days — you little encourage — 14. I will probably be back

physiological discussions, and in authority on the subject, I should be
glad to have your united opinions — But I wish you would not show the MSS.
to others — I am daily expecting to have my MSS. sent for in order to
commence printing — and you will be very much obliged me, if you could
send the whole an early perusal — Excuse the liberty of my request, and
always make as free use of your sincere friend James S. Dana



Dana, James Dwight. 1845. "Dana, James Dwight Jun. 19, 1845." *James Dwight Dana letters* –.

View This Item Online: <https://www.biodiversitylibrary.org/item/288143>

Permalink: <https://www.biodiversitylibrary.org/partpdf/337701>

Holding Institution

Harvard University Botany Libraries

Sponsored by

Arcadia (Open Collections)

Copyright & Reuse

Copyright Status: Public domain. The BHL considers that this work is no longer under copyright protection.

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.