

a manner, as to exert no injurious pressure on the vessels, while their new contents impart that peculiar hue which characterizes the disease.

It also throws no little light on the nature and source of the disease. It seems to show that the fat is an *increase of a normal constituent*, and not a formation altogether unnatural in kind; thus distinguishing it from the fatty degenerations of other tissues, where fat is deposited in situations from which it is naturally absent. It likewise indicates an increased activity in the secreting action of the liver, for a considerable period before death, though why the *accumulation* of fat should occur within nucleated particles does not so clearly appear. To explain that fully, will require a more complete knowledge than we yet possess of the chemical affinities at play within these small laboratories of nature.

I cannot conclude without remarking, that the fact which has been detailed, is an admirable example of the kind and degree of insight into pathological changes, which the microscope is calculated to afford. It is happily unnecessary, in the present day, to come forward as the advocate of this invaluable instrument as an aid to the study of disease. The fact is also of uncommon interest, as an illustration of the strict subordination of the study of pathology, as well as that of *minute anatomy* and *minute chemistry*, as to semeiology and that coarse inspection of morbid changes, which has too long usurped the name of *morbid anatomy*.

*Explanation of the Figures, Plate III, Div. 6.*

A.—Nucleated particles from the healthy human liver.

B.—The same, from the liver affected with fatty degeneration.

*a, a.*—Nuclei. *b, b.*—Nucleoli. *c, c, c.*—Fatty globules.

XXIII.—FARTHER OBSERVATIONS ON THE FILLING UP OF RIVER-BEDS AND HARBOURS, BY MICROSCOPIC ORGANISMS.\*

*By M. Ehrenberg.*

SPECIMENS had been received from M. Hagen of the masses which had been removed from the harbour of the Oder at Swinemünde, and from that of the Vistula at Dantzic. The masses which had been removed at Swinemünde, amounted in 1839, to 2,592,000; and in 1840, to 1,728,000 cubic feet (German).

\* Abstract of the Paper read before the Berlin Academy, 10th June, 1841.

According to microscopical analysis, the mud of the harbour itself contained from  $\frac{1}{3}$  to  $\frac{1}{2}$  of its volume of distinguishable organic bodies. The sand taken from the navigable water outside of the harbour, appeared to be principally granitic quicksand.

The masses also deposited by the Vistula at Dantzig, and of which four specimens were sent, taken from the bed of the river, at various distances from the sea, according to a plan of the localities, were, indeed not so rich in microscopic organisms as those from Pillau, Cuxhaven, and Swinemünde, but as those from Wismar, on account of the great admixture of river sand, furnished only from about  $\frac{1}{10}$ th to  $\frac{1}{8}$ th of their volume of organic remains.

Marine forms, however, were found, at the point highest up the river, and marked No. 4, and from this locality also, was furnished the material least mixed with sand (Flugsand), and which was the richest in Infusoria.

Moreover the report, which was given in March of the results of investigation of the deposits of the Nile in Egypt and Nubia, in part furnished by the examination by Dr. Hemprich, on the small portions of earth adherent to plants collected in those countries, and the prospect thus opened of the possibility of readily arriving at a knowledge of these forms, from other and very distant parts of the earth, in a similar way, had prompted Professor Kunth, in the most liberal manner to furnish for microscopical examination, portions of earth which were adherent to some of the exotic plants in his rich herbarium. These materials were a portion of marine *Conferva* from the Falkland Isles, sent by M. Lesson; two specimens of Brazilian bog-earth (von Sellowschen Gräsern); a similar one from Peru, a portion of *Conferva* from the Sandwich Islands, and from the Marian Isles, both sent thence by M. Gaudichaud. All these materials, were respectively, as clearly from the places indicated, as the plants to which they were still attached.

Finally the author had received, by the kindness of the worthy traveller in Iceland, Dr. Thienemann of Dresden, at his request specimens of earth from Iceland, Labrador, and Spitzbergen. As the chief part of these materials thus belong to the American hemisphere, their investigation forms especially an addition to the "report, &c.," furnished on the 25th of March.\*

From the examination in this way of the above mentioned particles, often extremely small, or scarcely a line in thickness from those distant

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\* Vide Ehrenberg's remarks, Vol. II., p. 26, of this Journal.

countries, the following results, as to the extent of animalcular life have been obtained.

In the Malvinas or Falkland Islands the following 30 species of microscopic organisms still exist;—

- |                                    |  |
|------------------------------------|--|
| 1. <i>Achnanthes pachypus</i>      | 17. <i>Grammatophora oceanica</i> .        |
| 2. <i>Actinocyclus senarius</i> .  | *18. ———— <i>stricta</i> .                 |
| *3. <i>Amphora navicularis</i> .   | 19. <i>Navicula amphioxys</i> .            |
| *4. <i>Arthrodesmus Taenia</i> .   | 20. ———— <i>aspera</i> .                   |
| 5. <i>Cocconeis placentula</i> .   | 21. ———— <i>Didymus</i> ?                  |
| 6. ———— <i>scutellum</i> .         | *22. ———— <i>Lyra</i> .                    |
| 7. <i>Cocconema Lunula</i> ?       | *23. ———— <i>peregrina</i> .               |
| 8. <i>Eunotia Faba</i> .           | 24. ———— <i>viridis</i> .                  |
| 9. ———— <i>amphioxys</i> .         | *25. <i>Surirella</i> ? <i>australis</i> . |
| 10. ———— <i>biceps</i> .           | —————                                      |
| 11. <i>Fragilaria constricta</i> . | 26. <i>Spongia acicularis</i> .            |
| 12. ———— <i>rhabdosoma</i> .       | 27. ———— <i>capitata</i> .                 |
| *13. ———— <i>Trachea</i> .         | 28. ———— <i>Clavus</i> .                   |
| 14. ———— <i>Ventriculus</i> .      | 29. ———— <i>fustis</i> .                   |
| 15. <i>Gomphonema clavatum</i> .   | 30. ———— <i>aspera</i> .                   |
| 16. ———— <i>minutissimum</i> .     |  |

Out of all this number of forms, there are only seven new species, (\*) which had not already been met with elsewhere. As a whole the forms belong to already known genera. Most of them are as yet only known as marine, and from this, it may with greater probability be concluded, that the whole of them are so. Several species belong to those, which assist in the formation of the chalk marl in the south of Europe.

For the Brazils, twelve still living species, from alluvial deposits are added to the nine already stated to have been met with in the edible clay of the Amazons, furnished by M. Martius, viz :—

- |                                 |                                       |
|---------------------------------|---------------------------------------|
| *1. <i>Arcella ecornis</i> .    | 8. <i>Synedra Ulna</i> .              |
| 2. <i>Gallionella distans</i> ? | —————                                 |
| 3. <i>Himantidium Arcus</i> .   | 9. <i>Lithodontium Bursa</i> .        |
| 4. <i>Navicula viridis</i> .    | 10. <i>Lithostylidium Serra</i> .     |
| 5. ———— <i>amphioxys</i> .      | *11. ———— <i>articulatum</i> .        |
| *6. ———— <i>microstauron</i> .  | *12. <i>Lithodermatium macrodon</i> . |
| 7. <i>Surirella oblonga</i> ?   |                                       |

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\* The new species, which as far as is yet known are characteristic of the countries, are marked with an asterisk.

There are among these, two new forms of Infusoria; but besides and accompanying them, silicious parts of phanerogamous plants, probably grasses, and of *Equisetaceæ*, are worth remarking. It would seem proper to distinguish such fragments with generic names in separate lists, in order they should not be disregarded; since it is not easy to determine to what plants they might belong. The silicious, marginal serratures of grasses are found plentifully under the silicious shields of the Infusoria. These will be named *Lithodontium* (*Thylacium*). The serrated, silicious fibres of the elongated cells of grasses, which are not immediately the epidermis, will be named *Lithostylidium*, and the silicious epidermis of the *Equisetaceæ*, *Lithodermatium*.

By this means, such botanical forms, which are frequently very distinct and characteristic, and hitherto unremarked, can be retained and compared by the microscope, without loading systematic Botany with misapplied names, by groundless guesses at their origin.

From Peru, besides the five species of marine Infusoria already noticed, as yet only four, from the interior are known, viz.:—*Eunotia Zebra*, *Fragilaria*?, *Navicula viridis*, *Spongilla lacustris*, of which no form can with certainty be indicated as new.

The addition to the fauna of Iceland, afforded by the materials collected by Dr. Thienemann is especially interesting. He has furnished marine Confervæ from the coast, and peat from Husavic. The peat is very rich in silicious Infusoria, although it is a good, in fact the best, combustible material in the island. It contains not fewer than the following thirty-six species:—

- |                                    |                                    |
|------------------------------------|------------------------------------|
| 1. <i>Amphiprora navicularis</i> . | 16. <i>Gallionella distans</i> .   |
| 2. <i>Amphora libyca</i> .         | 17. ———— <i>crenulata</i> .        |
| 3. ———— <i>hyalina</i> .           | 18. <i>Gomphonema acuminatum</i> . |
| 4. <i>Arcella hyalina</i> .        | 19. ———— <i>Americanum</i> .       |
| *5. <i>Cocconeis borealis</i> .    | 20. ———— <i>longiceps</i> .        |
| *6. ———— <i>longa</i> .            | 21. ———— <i>truncatum</i> .        |
| 7. <i>Cocconema asperum</i> .      | 22. <i>Navicula amphioxys</i> .    |
| 8. <i>Eunotia amphioxys</i> .      | *23. ———— <i>aqualis</i> .         |
| 9. ———— <i>bidens</i> .            | 24. ———— <i>amphisbæna</i> .       |
| 10. ———— <i>Diodon</i> .           | 25. ———— <i>gastrum</i> .          |
| 11. ———— <i>granulata</i> .        | 26. ———— <i>legumen</i> .          |
| 12. ———— <i>gibba</i> .            | *27. ———— <i>liostauron</i> .      |
| 13. ———— <i>prærupta</i> .         | 28. ———— <i>microstauron</i> .     |
| 14. ———— <i>Zebrina</i> .          | 29. ———— <i>nobilis</i> .          |
| 15. <i>Fragilaria striolata</i> ?  | 30. ———— <i>phænicenteron</i> .    |

- |                                  |  |
|----------------------------------|--|
| 31. <i>Navicula viridis</i> .    | —————                                  |
| 32. <i>Synedra Ulna</i> .        | 34. <i>Thylacium semiorbiculare</i> .  |
| 33. <i>Tabellaria trinodis</i> . | *35. <i>Lithostylidium polyedrum</i> . |
|                                  | 36. ————— <i>pupula</i> .              |

Of Icelandic marine Infusoria, procured from Algæ, sent by Dr. Thienemann, the following twelve species, still living, are found there, viz. :

- |                                      |                                      |
|--------------------------------------|--------------------------------------|
| 1. <i>Cocconeis scutellum</i> .      | 7. <i>Navicula aspera</i> .          |
| 2. <i>Denticella ? aurita</i> .      | 8. ——— <i>gracilis ?</i>             |
| 3. <i>Echinella ? Podosphenia ?</i>  | 9. <i>Podosira moniliformis</i> .    |
| 4. <i>Gomphonema clavatum</i> .      | *10. <i>Striatella Thienemanni</i> . |
| 5. ————— <i>minutissimum</i> .       | 11. ——— <i>arcuata</i> .             |
| *6. <i>Grammatophora islandica</i> . | 12. <i>Synedra fasciculata ?</i>     |

Among the fossil forms of the peat, are five new and peculiar ones, and two among the marine Infusoria. In the whole number of forty-eight Icelandic Infusoria, there is no new genus; but it is worth while to remark the occurrence, together with the serrated Eunotiæ of Sweden, Finland, and North America, which are characteristic of the North, — of *Podosira moniliformis*, which is elsewhere met with only in Peru.

Equally interesting is the microscopic fauna of Labrador, which enumerates fifty-one living species, found in the earth, contained among the roots of some mosses. The following forms are found near Okok in Labrador :—

- |                                   |                                 |
|-----------------------------------|---------------------------------|
| 1. <i>Amphora libyca</i> .        | 17. <i>Eunotia Faba</i> .       |
| *2. <i>Arcella disphæra</i> .     | 18. ——— <i>hexaodon</i> .       |
| 3. ——— <i>hyalina</i> .           | 19. ——— <i>monodon</i> .        |
| 4. <i>Cocconema asperum</i> .     | 20. ——— <i>prærupta</i> .       |
| 5. ——— <i>gracile</i> .           | 21. ——— <i>septena</i> .        |
| *6. ——— <i>Lunula</i> .           | 22. ——— <i>tetraodon</i> .      |
| 7. ——— <i>tenue</i> .             | 23. ——— <i>triodon</i> .        |
| 8. <i>Closterium striolatum ?</i> | 24. <i>Fragilaria binodis</i> . |
| *9. <i>Diffugia lagena</i> .      | 25. <i>Himantidium Arcus</i> .  |
| 10. ——— <i>oblonga ?</i>          | 26. ——— <i>gracile</i> .        |
| 11. <i>Eunotia amphioxys</i> .    | 27. <i>Navicula amphioxys</i> . |
| 12. ——— <i>biceps</i> .           | 28. ——— <i>aspera</i> .         |
| 13. ——— <i>bidens</i> .           | 29. ——— <i>ceratogramma</i> .   |
| 14. ——— <i>Camelus</i> .          | 30. ——— <i>ceratostigma</i> .   |
| 15. ——— <i>Diodon</i> .           | 31. ——— <i>crucigera</i> .      |
| 16. ——— <i>diadema</i> .          | 32. ——— <i>dicephala</i> .      |

- |                                |                                  |
|--------------------------------|----------------------------------|
| 33. <i>Navicula dilatata</i> . | *43. <i>Navicula semen</i> .     |
| 34. ——— <i>gibba</i> .         | 44. ——— <i>silicula</i> .        |
| 35. ——— <i>gracilis</i> .      | 45. ——— <i>viridis</i> .         |
| 36. ——— <i>inæqualis</i> .     | 46. <i>Striatella arcuata</i> .  |
| *37. ——— <i>isotauron</i> .    | 47. <i>Synedra Ulna</i> .        |
| 38. ——— <i>Legumen</i> .       | 48. <i>Tabellaria trinodis</i> . |
| *39. ——— <i>leptogongyla</i> . | 49. ——— <i>gastrum</i> .         |
| 40. ——— <i>microstauron</i> .  | 50. ——— <i>biceps</i> .          |
| *41. ——— <i>pachyptera</i> .   | —————                            |
| *42. ——— <i>scalaris</i> .     | 51. <i>Lythostyldium rude</i> .  |

There are eleven peculiar species in Labrador, but no new genus among them.

From this list is afforded the very important result, that the northern *Eunotia*, which are here as elsewhere in northern countries, very numerous, occur in this locality with living *Closteria*, and such *Diffugia*, which are not preserved in the fossil state. Hitherto they were only known as fossil; and only one species, near Saltzburgh, has as yet been observed in the living state. They consequently appear to be forms peculiar solely to Northern climes, and will probably be found here and there in the Alps.

On this account, especially, was a small specimen of marine mud, from the bottom of the sea near Spitzbergen, examined with greater care and precaution. There were found in it nine species of the smallest organisms, among abundant clay ? particles. Three Infusoria with silicious shields, one *Spongia* or *Spongilla*, and four or five species of calcareous *Polythalamia* :—

- |                                  |  |
|----------------------------------|--|
| 1. <i>Coscinodiscus patina</i> ? | 5. <i>Triloculina trigonula</i> .        |
| 2. <i>Navicula aspera</i> .      | *6. <i>Nonionina arctica</i> .           |
| 3. <i>Synedra Ulna</i> .         | *7. <i>Rotalia borealis</i> .            |
| —————                            | *8. <i>Uvigerina</i> ? <i>borealis</i> . |
| 4. <i>Spongia acicularis</i> .   | *9. <i>Serpula</i> ? <i>discus</i> .     |

Four of the *Polythalamia*, are hitherto undescribed. From the investigation of the former twenty-four American localities, which was presented to the Academy in March, there was afforded the sum of two-hundred and fourteen species of the smallest organisms, of which seventy-one were peculiar to America, ninety-four living, and one hundred and twenty fossil.

The six localities now adduced, which are in great measure new, and embracing half the globe, contain one hundred and fifty-four forms, of which one hundred and sixteen are living, thirty-eight fossil, and thirty-one

new; consequently the number of species peculiar to America, amounts to one hundred and two; of those known as common to America and the Islands, to two hundred and forty-five; and of those known to be yet living there to two hundred and ten.

Besides this we are now able to determine the thirty-nine following species from materials collected in the Sandwich Islands:—

- |                                    |                                    |
|------------------------------------|------------------------------------|
| 1. <i>Amphiprora navicularis</i> . | 22. <i>Navicula curvula</i> .      |
| 2. <i>Cocconeis placentula</i> .   | *23. ——— <i>distauridium</i> .     |
| 3. <i>Cocconema fusidium</i> .     | 24. ——— <i>gibba</i> .             |
| 4. <i>Diffugia hyalina</i> .       | 25. ——— <i>gracilis</i> .          |
| 5. <i>Eunotia amphioxys</i> .      | *26. ——— <i>insularis</i> .        |
| 6. ——— <i>bicornis</i> .           | 27. ——— <i>pusilla</i> .           |
| 7. ——— <i>Cocconema</i> .          | 28. ——— <i>sigma</i> .             |
| 8. ——— <i>gibba</i> .              | 29. ——— <i>viridis</i> .           |
| 9. ——— <i>prærupta</i> .           | 30. <i>Podosphenia cuneata</i> ?   |
| 10. <i>Fragilaria striolata</i> .  | 31. <i>Staurosira construens</i> . |
| *11. ——— <i>lamella</i> .          | 32. <i>Synedra scalaris</i> .      |
| 12. ——— <i>trachea</i> .           | *33. <i>Tabellaria platysoma</i> . |
| 13. ——— <i>diopthalma</i> .        | 34. ——— <i>rhabdosoma</i> .        |
| 14. <i>Gallionella distans</i> .   | —————                              |
| 15. <i>Gomphonema augur</i> .      | 35. <i>Lithodontium bicornis</i> . |
| 16. ——— <i>clavatum</i> .          | 36. <i>Lythostylidium rude</i> .   |
| 17. ——— <i>longiceps</i> .         | 37. <i>Spongilla acicularis</i> .  |
| 18. ——— <i>rotundatum</i> .        | —————                              |
| 19. <i>Himantidium Arcus</i> .     | *38. <i>Rotalia punctata</i> .     |
| 20. <i>Navicula amphibæna</i> .    | *39. <i>Nodosaria punctata</i> .   |
| 21. ——— <i>ceratostigma</i> .      |                                    |

Of these thirty-four belong to the silicious Infusoria; three are silicious particles of plants; and two are calcareous *Polythalamia*. From the two latter forms the mass is distinctly indicated to be of marine origin. Six species are peculiar; all belong to known genera.

Finally there is a small fauna of the Marian Islands, in which may be reckoned thirteen species:—

- |                                   |                                   |
|-----------------------------------|-----------------------------------|
| 1. <i>Cocconema fusidium</i> .    | 9. <i>Navicula viridis</i> .      |
| 2. <i>Fragilaria diopthalma</i> . | *10. <i>Tetragramma libycum</i> . |
| 3. ——— <i>rhabdosoma</i> .        | —————                             |
| 4. <i>Gomphonema Augur</i> .      | 11. <i>Spongia acicularis</i> .   |
| 5. ——— <i>clavatum</i> .          | *12. ——— <i>Amphidiscus</i> .     |
| 6. ——— <i>longiceps</i> .         | —————                             |
| 7. <i>Himantidium Arcus</i> .     | 13. <i>Rotalia globulosa</i> .    |
| 8. <i>Navicula pusilla</i> .      |                                   |

This small number contains two new species, and the *Rotalia* of the chalk, the lower shell of which is here abundant, indicates the marine or brackish origin of these animalculæ. Moreover the occurrence here of *Tetragramma Libycum*, is remarkable, as being a form which a short time since was met with in saliferous earth brought from Siwa, in the Oasis of Jupiter Ammon, and at one time was found nowhere else.

As a general result of these researches, the following may be proposed:—

1. There are in Iceland as in North America, useful beds of good peat, consisting, in great part, even to as much as the  $\frac{1}{3}$  of their bulk, besides vegetable remains, of dead microscopic animalcules—whilst the most common European good kinds of peat, although Infusoria when sought for are rarely found wanting in them, have not hitherto been found to contain them in the same proportion.

2. There is a minute organic invisible life diffused entirely through those parts of the soil rich in humus; but sandy situations of the earth's surface from near the South to the neighbourhood of the North Poles, and the bottom of the sea near the North Pole, are also filled with similar organic forms.

3. It is possible according to the method of research pursued by the author, to render evident the forms in which this life occurs, from the smallest particles of earth adhering to the plants in Herbaria, or to bodies of any kind; and to determine much further than has yet been done, with ease and scientific certainty, a more or less numerous fauna of microscopic organisms, from all parts of the earth.

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XXIV. — CONTRIBUTIONS TO VEGETABLE EMBRYOLOGY, FROM OBSERVATIONS ON THE ORIGIN AND DEVELOPMENT OF THE EMBRYO IN *TROPÆOLUM MAJUS*.\*

By *Herbert Giraud, M.D.*

AFTER referring to the researches of MM. Schleiden, Wydler, Mirbel and Spach, and A. St. Hilaire, on this important point, Dr. Giraud states that he was induced to select *Tropæolum* as the subject of his own observations on account of its solitary ovula, and their compara-

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\* Abstract of a Paper read before the Linnæan Society, February 1st, 1842, and published in the Proceedings of that body.